5. INTERNATIONAL CONGRESS ON CONTEMPORARY SCIENTIFIC RESEARCH

Conference Proceedings Book

APRİL 21-22,2024

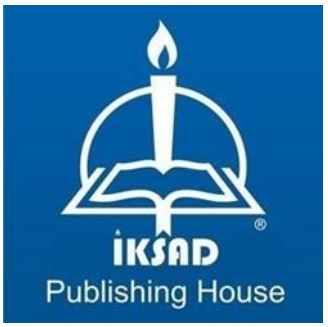
KAYSERİ/TÜRKİYE



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5th INTERNATIONAL CONGRESS ON CONTEMPORARY SCIENTIFIC RESEARCH



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5th INTERNATIONAL CONGRESS ON
CONTEMPORARY SCIENTIFIC RESEARCH

5th INTERNATIONAL CONGRESS ON CONTEMPORARY SCIENTIFIC RESEARCH

April 21-22, 2024 / Kayseri, Türkiye

PROCEEDINGS BOOK
(Abstracts & Full Texts)

EDITORS

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5th INTERNATIONAL CONGRESS ON CONTEMPORARY SCIENTIFIC RESEARCH

EVALUATION PROCESS and POLICIES

All applications have undergone double blind peer review process. In addition, each paper was accepted and the process of publishing in the book was carried out through editorial oversight. The published papers were presented and discussed at the meeting.

Full texts and abstracts published in accordance with the Symposium Policy have been prepared in accordance with ethical rules and APA standards. Authors of all papers are both ethically and legally responsible.

PARTICIPANTS COUNTRIES

Türkiye, Albania, Algeria, Azerbaijan, Bangladesh, Bulgaria, Ethiopia, Georgia, India, Indonesia, Iran, Kazakhstan, Malaysia, Morocco, Nigeria, Pakistan, Philippines, Saudi Arabia, Slovenia, Sri Lanka, Uganda, Ukraine

TOTAL ACCEPTED ARTICLES: 306

The Number of Accepted Papers from Türkiye: 114
The Number of Accepted Full Papers from Other Countries: 127
The Number of Total Papers: 241

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/

APRIL 21-22, 2024

Kayseri, TÜRKİYE

SYMPOSIUM SCHEDULE

5th INTERNATIONAL CONGRESS ON CONTEMPORARY SCIENTIFIC RESEARCH

April 21-22, 2024 / Kayseri, Türkiye

CONGRESS PROGRAM

Online (with Video Conference) Presentation

IMPORTANT, PLEASE READ CAREFULLY

- To be able to make a meeting online, login via https://zoom.us/join site, enter ID instead of "Meeting ID or Personal Link Name" and solidify the session.
- The Zoom application is free and no need to create an account.
- The Zoom application can be used without registration.
- The application works on tablets, phones and PCs.
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- Make sure your computer has a microphone and is working.
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- If you think there are any deficiencies / spelling mistakes in the program, please inform by e-mail until March 20, 2024 (17:00) at the latest.
- **(All speakers required to be connected to the session 15 min before the session starts)**
- Moderator is responsible for ensuring the smooth running of the presentation, managing the group discussion and dynamics.
- **Before you login to Zoom please indicate your name_surname and HALL number, exp. Hall 1, Gülen**

21.04.2024
Ankara Local Time: 10:00-12:00

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SESSION-1, HALL-1 / OTURUM-1, SALON-1

MODERATOR: Anvar Goyca Jalilov

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Hüseynov Ceyhun Əşrəf Oğlu	*A.A.Bakıxanov adına Tarix və Etnologiya İnstitutunun doktorantı*	XIX əsrdə Quzey Azərbaycanda həyata keçirilmiş aqrar qanunların tarixindən
Elmi Rəhbər: Dos Qədim Rufullayev	*Lənkəran Dövlət Universiteti*	Xx Əsrin Əvvəllərində Uşaq Ədəbiyyati Və Mətbuati
Əliyeva Cəmilə Ələmdar Qızı	*Lənkəran Dövlət Universteti*	Fundamentals of Azerbaijani ideology and teaching methodology
Anvar Goyca Jalilov	*Institute of Zoology*	Biodiversity Of Mesoplankton In The Azerbaijan Sector Of The Caspian Sea
Nihad Gurbanzada Ruslan Memmedov Aysan Farajova	*Azerbaijan Technical University*	Analysıs And Evaluatıon Of The Impact Of Sustaınable Development Of Green Fınance Applıcatıons In The Republıc Of Azerbaıjan
Nevila Xhindi	*Mediterranean University of Albania*	Municipal Statistical Empowerment Through Stakeholder Collaboration in Albania: A Pathway to EU Accession
Sándor Földvári	*Debrecen University*	Vısual Representatıon Of The State Power In The Mosaics In The South Vestibule Of Hagia Sophia And In The Hungarian Kingdom
Emmanuel U. Anaso Fidelis E. Solomon Olurotimi A. Olafadehan	*University of Abuja*	Body Thermoregulatory Responses Of Rabbits Supplemented Camel's Foot (Piliostigma thonningii) Essential Oil Based Diet
Savica Dimitrieska	*International Balkan University*	Application Of Generative Ai In Marketing
Fatima Bouizzal Marouan El Mourabit Youssef El Madhi Moulay Laarbi Ouahidi	*University Ibn Tofail*	Relationship between Fatigue and psychological distress among teachers of physics and chemistry in Morocco

21.04.2024
Ankara Local Time: 10:00-12:00

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SESSION-1, HALL-2 / OTURUM-1, SALON-2

MODERATOR: Manal Adnani

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Ivan Lenard Dragana Božić Lenard	*University of Osijek*	Role and Characteristics of Classmasters in the Croatian Education
Joseph Anokye Akwesi Adutwum Abunyewa Uffe Jorgensen James Seutra Kaba Victor Rex Barnes John Tennyson Afele	*KNUST-Ghana*	Mitigation of greenhouse gas (GHG) emissions through shade systems and climate-smart soil fertility interventions in cocoa landscapes in the Semi-deciduous ecological zone of Ghana
Tran Kim Anh Le Quoc Minh	*Vietnam Academy of Science and Technology*	Nanomaterials Containing Rare Earth Ions And Applications
Mónika Fekete Andrea Lehoczki Anna Alliquander János Tamás Varga	*Semmelweis University*	The Impact of Gut-Brain Axis on Cognitive Health: A Review of Dietary Supplements and Functional Foods
Manal Adnani	*Université Ibn Tofail*	Exploring the efficacy of a Trichoderma asperellum-based seed treatment for controlling Fusarium equiseti in chickpea
Elton Bano	*R.M.K. Engineering College*	The Impact Of The Aerobict Of The Impact Of The Aerobic Fitness Program On Stress Level In Women
Džana Rahimić Ramić	*University of Sarajevo*	The Challenge of the New Age: “technique as human destiny” and technology achievements
Atta ul Haq Hafiz Muhammad Abubakar	*Government College University Faisalabad*	Synthesis of Nickel Oxide/Graphene Oxide Composite for the Degradation of Clothianidin Pesticide
K Prithvika D Rithanya	*R.M.K. Engineering College*	Sun Tracking Sunflower Robot Using Arduino
Eldana Zhumatayeva	*SDU University*	Translation of newspaper headlines (based on «The Times»)

21.04.2024
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SESSION-1, HALL-3 / OTURUM-1, SALON-3

MODERATOR: Miguel Gonçalves

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
R R Sanjana M Monika	*R.M.K. Engineering College*	Smart Agricultural Management System
Hooman Fatoorehchi Asadollah Houshmand	*University of Tehran*	Analytical solution of Schrödinger equation with power law nonlinearity
M. Choubi S. Harira A. EL Ghazrani M. Sougrati A. Lahbibi A. Elidrysy Y.Boughaleba	*HASSAN II University - Casablanca*	Thermodynamic properties and magnetocaloric effect of mixed spins (3/2, 1) square lattice
Aadi Rajesh László Pitlik László Pitlik	*Kodolányi János University*	Risk-evaluation possibilities concerning IT-activities in home-office
Aderibigbe, I.A. Omotoso, A.B. Daud S.A Sulaimon, O.I.		Consumption of carbonated drinks in Oyo State
Mukhabbat Massadikova	*Hoca Ahmet Yesevi Uluslararası Türk-Kazak University*	Öğretmenin, Öğrenci Üzerinde Çalışma Yöntemleri
Miguel Gonçalves Ana Ramos Neves Inês Reis Baptista	*Polytechnic University of Coimbra*	Pacioli: A Franciscan Friar At The Beginning Of Global Accounting
Miguel Gonçalves	*Polytechnic University of Coimbra*	Portugal, 1759: a pedagogical note about the first Accounting school in Europe
Qurat-ul-aen Malik Rafraf Shakil Ansari	*Sharda University*	Thematic Analysis of Farah Bashir's Memoir 'Rumours of spring: A girlhood in Kashmir'
Zineb Ait Fares Rachid Ouchn Noureddine Kamil	*Hassan II University of Casablanca*	Poly (ethylene chlorotrifluoroethylene) (ECTFE) membranes for desalination using membrane distillation

21.04.2024
Ankara Local Time: 10:00-12:00

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SESSION-1, HALL-4 / OTURUM-1, SALON-4

MODERATOR: Francisca Machado

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Fatos Ukaj Ramiz Livoreka Shaqir Elezaj	*Prishtina University "Hasan Prishtina*	Green Marketing an orientation in marketing with ecological tendency as a strategic response to environmental dynamics
Arieta Camaj Ibrahimi Marigona Maliqi Hetemi Aferdita Camaj Isa Shyhrete Muriqi	*University Haxhi Zeka*	Assessment of Aflatoxin B1 contamination in peanuts sold in markets across Kosovo during winter 2024
Arieta Camaj Ibrahimi Marigona Maliqi Hetemi Aferdita Camaj Isa Shyhrete Muriqi	*University Haxhi Zeka*	Analysis of Aflatoxin B1 Presence in Peanut Butter Sold in Kosovo Markets
Anna Romanova	*Kyiv National Economic University*	A Holistic Approach to Mental Health Support in American Educational Institutions
Brenno Eloy da Cunha Maribondo Mateus David Finco	*Federal University of Paraíba*	The Motıvatıon To Learn From Unıversıty Students Athletes
Meriem Sandaoui Sanae El Ghachtouli Mohammed Azzi Zaina Zaroual	*University Hassan II of Casablanca*	Degradation Of An Emergent Antibiotic Using Sono-Fenton Process In Aqueous Media
Manassés Pereira Nóbrega Anderson Salvaterra Magalhães	*State University of Rio Grande do Norte*	A Dialogic Approach To Statistical Literacy
"Nguyen Thi Huynh Phuong Nguyen Thi Be Ba Lê Hồng Cẩm Truong Thi Hong Van Mai Thi Kieu Lan"	*Can Tho University*	An Indepth Analysis Of Attractive Factors For Visitors To Hon Son Island, Kien Hai District, Kien Giang Province

21.04.2024
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SESSION-5, HALL-1 / OTURUM-1, SALON-5

MODERATOR: Dániel Váradi

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Kai Xin Meng Wu Dongzhao Jin Zhanping You	*Michigan Technological University*	Contemporary Scientific Exploration on Reducing Carbon Footprints: An Study of Asphalt Mixtures Enhanced with Recycled Glass and Waste Tire Rubber
K.S. Naveen P. Sivaraj	*Annamalai University*	Garbage And Waste Collector Machine For Road And Seashore Area
Devendra Kumar Singh Rajesh Kumar Verma	*Harcourt Butler Technical University*	Thermal Morphological and Fracture-Based Evaluation of ZrO2- modified Ultra-High Molecular Weight Polyethylene
Rachid Kellal Driss Benmessaoud Left Abderrahmane Thoume Zakaria Ait El Caid Yassine Moughazi Mustapha Zertoubi	*Hassan II University of Casablanca*	An Environmental Approach Exploiting Food-Agro Waste As A Corrosion Inhibitor For Low Carbon Steel In Aggressive Corrosive Medium
Enes Thaci Alessandra Ruggiero	*University of Verona*	Apolipoprotein E Genotyping in the Context of SARS-CoV-2 Vaccine Outcome
Dániel Váradi László Pitlik Mátyás Pitlik László Pitlik	*Kodolányi János University*	Homogeneity analysis for sustainable regions – case study: Mezőföld
Rodes Angelo Batista da Silva Héliton Pandorfi Filipe Rolim Cordeiro Gledson Luiz Pontes de Almeida José Antônio Delfino Barbosa Filho Gabriel Thales Barboza Marinho	*Rural Federal University of Pernambuco*	Automatic Identification of Bovine Mastitis using sequential transfer learning with Bayesian Optimization

21.04.2024
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SESSION-2, HALL-1 / OTURUM-2, SALON-1

MODERATOR: Margherita-Gabriella De Biasi

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Lamine Brahim Mgharaz Driss	*Ibn Zohr University*	Chaos Synchronization for Enhanced Cryptographic Protocols in Optical Communication Systems
Ha Viet Hung Le Van Thap	*Nha Trang University*	The Relationship Between Perceived Supervisor Support, Employee Felt Obligation, And Innovative Behavior In Organizations
János Angyal László Pitlik	*Kodolányi János University*	Price-performance analysis for server procurement
Margherita-Gabriella De Biasi	*University Federico II Naples*	Arsenic Treatments On Triticum Durum Modifies Ionome Profiles
Faik Idrizi Arbër Çeliku	*University of Tetova/North Macedonia*	Ver derivation with the prefix ver- in German and the possibilities of their textual realisation in Albanian and English language
Vignesh K Sathiya Aravindan V Lokesh R Ajaydesouza Sabari Grish P	*Annamalai University*	In-vitro efficacy of fungicides against Damping off of Tomato (Solanum lycopersicum L.) caused by Pythium aphanidermatum (Edson) Fitzp
Ilir Mazreku Elona Matoshi Zana Gërxhaliu Medina Rexhiqi	*University of Prishtina*	The Effects Of Tdcs Stimulation In Learning A New Skll
Muhammad Aminu Musa	*Ahmadu Bello University*	Evaluating The Performance Of Various Shading Devices On Daylighting And Visual Comfort In The Temperate Dry Climate Of Nigeria
Habil Laura Diaconu	*University of Iasi*	Public Spending Efficiency From The Lens Of Education. Empirical Evidences
Aigerim Zhampetova Yavuz Selim Alkan	*International University Of Information Technology*	Public Opinion: The American View Of Israel And Palestinian Authority

21.04.2024
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SESSION-2, HALL-2 / OTURUM-2, SALON-2

MODERATOR: Benjamin Honti

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Dang Hoang Xuan Huy Phan Vinh An Lê Đức Tâm	*Nha Trang university*	Sustainable Tourism Development In The Phu Yen - Khanh Hoa - Ninh Thuan Region, Vietnam
Le Duc Tam Le Chi Công Dang Hoang Xuan Huy	*Nha Trang university*	Developing A Smart Tourism Destination Linked To Sustainable Management In The Phu Yen, Khanh Hoa, Ninh Thuan Region
Mehrdad Karimimoshaver Banu Özkazanç	*Bu-Ali Sina University*	The impact of tall residential buildings on cities
Rachid Kellal Driss Benmessaoud Left Abderrahmane Thoume Zakaria Ait El Caid Yassine Moughazi Mustapha Zertoubi	*Hassan II University of Casablanca*	A Sustainable Approach Exploiting Food-Agro Waste As A Corrosion Supressor For Low Carbon Steel In Monoprotic Corrosive Medium
Benjamin Honti László Pitlik	*Kodolányi János University*	Evaluation of the food-rationality-trend in Hungary based on FAO-data
Roza Yerezhepkyzy Aruzhan Zholmakhan	*Al-Farabi Kazakh National University*	Judicial Procedure For The Protection Of Environmental Law And Order In The Republic Of Kazakhstan: Problems Of Theory And Practice
Baiju Thomas	*Ramakrishna Mission Vivekananda Educational and Research Institute*	Fostering Women Empowerment Through Women Entrepreneurship in the 21st Century Inclusive Society
Rina Turcan Iuliu Turcan	*Technical University of Moldova*	Global Perspectives On Sustainable Development Goals: Statistical Analysis And Correlations
Berillo Dmitriy Ermukhambetova Asel Zhangabay Zhanat Neumyvakin Pavel Ershova Anna	*Asfendiarov Kazakh National Medical University*	Synthesis And Properties Of Silver Nanoparticles Stabilized By Extracts Of Medicinal Plants

21.04.2024
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SESSION-2, HALL-3 / OTURUM-2, SALON-3

MODERATOR: Subhashish Dey

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Csaba Ruzsa	*University of Pécs*	Artificial intelligence-based solutions in small and medium size businesses – History, definition and application of the technology
Ayşe Melek Öztürk Cem Özkurt	*Sakarya Uygulamalı Bilimler University*	Personalızed Notıfıcatıons Wıth Fırebase Messagıng
Farhan Ahmadi-Mirghaed Mohammad Rahmani	*University of Mazandaran*	Measuring the impact of land use on the quality of natural habitats in Mazandaran Province, Northern Iran
Rodrigo Costa Gomes Marta Silvério	*University of Évora*	Exploring A Multi-Theoretical Lens In Mixed Methods Research On Insurers Brand Positioning
Lyudmila E. Kan Tlebaldyev Alikhan Talgatova Dilnaz Yessenbolatov Anuar Suleimenova Anel	*"Turan" University*	Comparative Analysis Of The Gdp Of Germany And Kazakhstan: Approaches To Considering Their Economic Development And Industry
Assel S. Bekbossinova Akbota Anessova Syzdykbayeva Ainur Zhanashova Dilnaz	*University of International Business named after K. Sagadiyev*	Analysis On The Effect Of Digitalization Of Higher Education On The Labor Market In Kazakhstan
M Dibane S Zyade M Hlaibi	*University Hassan II of Casablanca*	Study of extra virgin olive oils: Effects of storage at different conditions and its relationship with the quality losses of these oils
Drilona Mulaj Christopher Tushaj	*University of Tirana*	Investment In Gold And Numismatics
Subhashish Dey	*Gudlavalleru Engineering College*	Experental Analysis On The Effect Of Cbr Results For Fly Ash Purified Clayey Soil Materials

21.04.2024
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SESSION-2, HALL-4 / OTURUM-2, SALON-4

MODERATOR: Siarhei Marozau

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Muhammad Nur Iman Amir Nurhidayatullaili Muhd Julkaplia Saba Afzalb	*Universiti Malaya*	Enhancing Titanium Oxide Photocatalysis and Adsorption for Wastewater Treatment by hybridization with chitosan biopolymer
G.A. Amageldina Zh.Zhanataeva	*A.Saginov Karaganda Technical University*	The Economy Of Kazakhstan
Meryem El Rharib Mohamed Azzi Sanae El Ghachtouli Zaina Zaroual	*Hassan II university of Casablanca*	Applications of natural Zeolite in Various Fields: Focus on Moroccan natural Zeolite in Wastewater Treatment and Building Bricks
Ama Otele Ayibawari Obiene Egai	*Niger Delta University,*	Assessment Of Heavy Metal Concentration Of Surface Water Using Geochemical Method Of Water Analysis: The Case Of Yenagoa Metropolis Of Bayelsa State, Nigeria
Vasyl Puzanov	*Zaporizhzhia National University*	Ultra-Low-Cost English Translations
Juan David Hernández Santafé Elmer Sorrentino	*Universidad Carlos III de Madrid*	A Review Of Proposed Inverter Control Strategies To Reduce The Impact Of Inverter-Interfaced Generation On Distance Protection
Fernando Vaca-Urbano Elmer Sorrentino	*Universidad Carlos III de Madrid*	Existing Methods To Compute The Contribution Of Short-Circuit Current From Inverter-Interfaced Generation (Iig) To The Synchronous Grid
Siarhei Marozau	*Yanka Kupala Grodno State University*	Belarusian Historical Anniversaries Of 2023 Of Events From The Era Of The Grand Duchy Of Lithuania (Mid-13th – 18th Centuries)
Könül Sadiqova	*Elmi Tədqiqat İnstitutu*	Şah İsmail Hatai And His Place In Our Native Language Literature

21.04.2024
Ankara Local Time: 12:30-14:30

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SESSION-2, HALL-5 / OTURUM-2, SALON-5

MODERATOR: Yanping Sheng

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Holta Heba Mendi Heba	*Mediterranean University of Albania*	Social norms and values in function of communication
Firudin Rzayev	*AMEA Naxçıvan Bölməsi, İncəsənət, Dil və Ədəbiyyat İnstitutu*	Ürk İltisaqi Dillərin Amorf, Flektiv Dıllərdən Qədimliyini Göstərən Tarixi Dil Faktları
Dinara S. Mussabalina Akbota G. Anesova Gaukhar K. Kenzhegulova	*University of International Business named after K.Sagadiyev*	Analysis Of Employment And Unemployment In The Regions Of Kazakhstan
Mustafizur M. Rahman	*International Islamic University*	Vertical dynamics of copepods in the tropical estuary and river environments
Dragana Božić Lenard Katarina Šokčević	*Computer Science and Information Technology Osijek*	ESP students' attitudes towards using online dictionaries and AI-based tools in language learning
Mónica Oliveira	*Faculty of Fine Arts*	What Do Students Think About The İdeal School?
Aminat Damilola Ahmad Adeyinka Elizabeth Ajiboye Bukola Aishat Hammed	*Kwara State University*	Microbiological And Nutritional Quality Of Soybean Curd And Fried Fish From Selected Markets Within Ilorin Metropolis, Nigeria
Insan Ara Rahman	*Pt. Deendyal Upadhyaya Adarsha Mahavidyalaya*	Sequence characteristics comparison of chloroplast genes in reference to phylogenetic study
Oluwakemi Racheal Oshinowo Moses Adeolu Agoi Olasunkanmi Julius Olatunde Benjamin Johnson Olasiju	*Lagos State University of Education*	Pedagogical Implementation Of Multi-Factor Authentication On Information Storage And Retrieval Systems: A Survey On Educational Development
Josip Miletić Ivana Dizdar	*University of Zadar*	Škver (Boat Launch) as a Potential Tourist Offer
Yanping Sheng	*Michigan Technological University*	The mechanical performance of a low-carbon asphalt mixture with bamboo fiber

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Ankara Local Time: 15:00-17:00

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SESSION-3, HALL-1 / OTURUM-3, SALON-1

MODERATOR: Hanfeng Liang

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Vardhana Janakiraman Thamizhselvi R Jeeva S Mohamed Musharraf A Garang Abuoi Arok N.K. Udaya Prakash	*Vels Institute of Science Technology and Advanced Studies*	Salt Tolerance Capacity Of Fungal Species Isolated From Pickles
Hanfeng Liang	*Xiamen University*	Electrochemical Hydrogen Production: From Catalysts to Devices
Seyyid Ahmed Medjahed Fatima Boukhatem	*University of Relizane*	A Binary Coronavirus Optimization For Microarray Gene Selection
Andriy Kolodyazhny Denys Kriutchenko Yury Naumenko Elena Strelnikova	*A. Podhorny Institute of Mechanical Engineering Problems*	Computer Simulation Of Fluid Movement Stability In Tanks Under Periodic Loads
Mohammad Imran Eun-Bi Kim Sadia Ameen M. Shaheer Akhtar Dong-Heui Kwak	*Jeonbuk National University*	Tungsten Oxide Nanowall thin film deposited through Hot Filament Chemical Vapor Deposition for Electrochemical Detection of Methylamine
Kenzhegulova Gaukhar Baitekova Ayaulym Zaiidova Malika Mukhametkaliyeva Amina Grebenyuk Kira	*K. Sagadiyev University of International Business*	Influence Of Education On Economic Outcomes
Ivan Pavlovic Aleksandra Tasic Sara Simeunovic	*Scientific Institute of Veterinary Medicine of Serbia*	Syngamosıs In Of Partrıdges (Perdıx Perdıx) In Belgrade Area
Kazi Md Salim Newaz	*Universiti Malaya*	Synthesis of carbon structured bio-based nanofluids for various applications

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SESSION-3, HALL-2 / OTURUM-3, SALON-2

MODERATOR: Andrijana Bojadzievska Danevska

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Valentina Sinaj Malvina Xhabafti Feruze Shakaj	*University of Tirana*	Investigating Patterns And Trends In Educational Demand: A Statistical Exploration Of Albania's Education Landscape
Saha, Pranoy Hasib, Ashrarul Halder, Bitop Sultana, Surovi	*Jagannath University*	Nanoparticle-mediated Gene Silencing Strategies for Reshaping Tumor Immunosuppressive Microenvironment
Aysel Aliyeva	*Baku State University*	The Contributions Of Mustafa Kemal Atatürk, The Founder Of The Republic Of Turkey, To The Education System.
Blerta Rumano Etleva Qeli (Droboniku) Gerta Kaçani	*University Dental Clinic*	Glass ionomer sealants and resinous sealants in the permanent dentition. (literature review)
Andrijana Bojadzievska Danevska	*International Balkan University*	Exploring the complementarity of fintech and ethical banking
Nazrul Islam A. Y. Bokhary R. A. Khaled Amjad Ali Pasha	*King Abdulaziz University*	Enhancement Of Convective Heat Transfer With Nonuniform Distribution Of Particle Volumetric Concentration In Nanofluids
Pham Duc Thuan Huynh Trung Hon	*Can Tho University*	French Education In The Southwest - Cochinchina Of Vietnam In The Early 20th Century
Fal Soufiane Amenzou Noureddine Benahmed Aziz Boughribil Said	*Hassan II University of Casablanca*	Effect of salinity and water stress on tomato seeds at germination stage
Merouane El Mourabit Abderrahim Lougman Amina Elkassri Fatima Bouizzal Hajar darif	*freelance researcher*	Analysis of Pedagogical Standards: The Ongoing Evolution of Teacher Training
Abdulai, B.Sule Mahlon, A.Wisdom	*Federal Polytechnic Ekowe*	Identifying The Factors Affecting Processing And Storage Of Garri In Bomo Clan Of Southern Ijaw Local Government Area

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SESSION-3, HALL-3 / OTURUM-3, SALON-3

MODERATOR: Btissam NIYA

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Btissam Niya Salah Eddine Azaroual Salma Kaichouch Kaoutar Yaakoubi Soufiane Fal Reda Rabia Fatima Zahra Beraich Moha Arouch Issam Meftah Kadmiri	*Mohammed VI Polytechnic University*	Metagenomic insights into the inoculum effect on microbial community during anaerobic digestion of cattle manure
Morteza Safarzadeh Mahdi Gharabaghi Ziaaedin Shafaie	*Sahand University of Technology*	Recovery of zinc from cold filter Cake Waste Residue of Zinc Plant by Hydrometallurgical Route
Luljeta Sadiku	*International Balkan University*	The Impact Of Agriculture Sector On The Economic Development Of Western Balkan Countries
Marouan Mrabet	*Ibntofail University*	Analysis of pedagogical standars: the ongoing evolution of teacher training
Marvel Reuben Martin Culbert Maria Charlottian Titin Sulastri	*Indonesia Adventist University*	Exploring the Antidiabetic Potential of Rumex obtusifolius: An In Silico Approach for Binding Affinity Computation and ADME/Tox Prediction
Frischa Radja Titin Sulastri Marvel Reuben Suwitono	*Indonesia Adventist University*	Lip Balm Formulation and Evaluation Based on Anthocyanin as Natural Coloring from Extracts of Beetroot (Beta vulgaris L.), Bougainvillea Flowers (Bougainvillea sp.) and Red Rose Flower (Rosa damascena Mill)
Walnetha Brenda Dameria Silalahi Titin Sulastri Marvel Reuben Suwitono	*Indonesia Adventist University*	Development of a Multifunctional Natural Eyeshadow Compact Powder with Rose, Bougainvillea Flower, and Beetroot Extracts for Color Cosmetics and Potential Skincare Benefits
Tshewang Rinzin Raf Raf Shakil Ansari	*Sharda University*	Between Worlds: A Critical Examination of Representations of West and Non-West in Nadia Hashimi's 'A House Without Windows'

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Ankara Local Time: 10:00-12:00

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SESSION-1, HALL-1 / OTURUM-1, SALON-1

MODERATOR: Atakan Pirli

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Meltem Akçin Meryem Karaaziz	*Yakın Doğu University*	Pozitif Psikoterapi ile Depresyonun Ele Alınması: Vaka Sunumu
Atakan Pirli Damla Pirli Bahriye Gülgün	*Ege University*	Cultural Styles In Landscape: 'Turquerie Movement' In Terms Of Historical Design Concepts
Atakan Pirli Bahriye Gülgün	*Ege University*	The Importance Of Water In The Readability Of Cities' Formation Descriptions: Kizilçullu Aqueducts
Faik Kumbaraci Bünyamin Ağalday	*Mardin Artuklu University*	Comparıson Of Englısh Teacher Traınıng And Appoıntment Systems İn Türkiye And Sıngapore
Adem Ahlatcı Kenan Yıldızhan Ahmet Şevki Taskıran	*Van Yuzuncu Yil University*	The Protective Effect Of Venlafaxine On Hydrogen Peroxide-Induced Cytotoxicity In C6 Glioma Cells
Cansu Tutkun	*Bayburt University*	Prospective Teachers' Views On The Integration Of Augmented Reality Into Preschool Education: Conditions, Limitations And Suggestions
Cansu Tutkun	*Bayburt University*	Geography In Preschool Period: Structure, Content And Problems
Cengiz Parlak	*Adıyaman University*	Ihyâ' And Ba'as Poetry School And Understanding Of Poetry

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Ankara Local Time: 10:00-12:00

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SESSION-1, HALL-2 / OTURUM-1, SALON-2

MODERATOR: Tolga Ulusoy

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Tolga Ulusoy	*Kastamonu University*	Negatıve News Culture In The Medıa And Its Impact On Socıologıcal And Psychologıcal Problems In Economıc Decısıon-Makıng Processes
Tolga Ulusoy	*Kastamonu University*	Examınatıon Of The Demand For Inıtıal Publıc Offerıngs In The Context Of Behavıoral Fınance
Ahmet Emre Gökçek Mehmet Yilmaz Ufuk Sekmen Murat Toptaş Mevlana Sancakoğlu	*MASKİ Genel Müdürlüğü*	Reducıng Energy Consumptıon In Water And Sewerage Admınıstratıons: Malatya Example
Ilayda Apaydın Fatmagül Yur	*Muğla Sıtkı Koçman University*	Kız üniversite öğrencileri tarafından algılanan anne tutumu ile yeme davranışları arasındaki ilişkinin incelenmesi
Cemil Örgev Sefa Yaprak	*Sakarya University of Applied Sciences*	A Comparıson Of Pre-Hospıtal Emergency Health Servıces System (Ambulance): Türkiye-Canada Example
Perihan Gözüm Gözde Orman	*Çankırı Karatekin University*	Providing Discipline For Children Who Are Driven Into Crime Without Punishment Or Reward
Merve Ayyildiz Zehra Meliha Tengiz	*Yozgat Bozok University*	Evaluation Of Consumer Perception Towards The Purchase Of Local Agricultural Products Via E-Commerce: The Case Of Ankara Province
Zehra Meliha Tengiz Merve Ayyildiz	*Yozgat Bozok University*	Consumers' Perception Of Local Honey: The Example Of Bingol Honey

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SESSION-1, HALL-3 / OTURUM-1, SALON-3

MODERATOR: Kübra Yazici

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Banu Özbucak Albar	*Zonguldak Bülent Ecevit University*	A Situation Evaluatıon On Guy Standing's Concept Of Precariat And Opposıtıon To Immıgratıon
Kübra Yazici Sergen Ilikçi	*Yozgat Bozok University*	An Examınatıon Of Ecologıcal Approaches That Support Recyclıng In New Generatıon Archıtecture
Buket Kaya	*İstanbul Esenyurt University*	The Impact Of Wearable Health Technologies On The Quality Of Life Of The Elderly
Buket Kaya	*İstanbul Esenyurt University*	Biomimetic Leadership
Hikmet Yazici Sinem Çolak Utku Duran	*Zonguldak Bülent Ecevit University*	The Use and Biochemical Effects of Laurel (Laurus nobilis L.) Essential Oils in Veterinary Medicine: Comprehensive Review
Sinem Çolak Utku Duran	*Zonguldak Bülent Ecevit University*	The Applıcatıons Of Raman And Ftır Spectroscopy In Food Adulteratıon Detectıon
Kimya Peyrovisaray Güneş Mutlu Avinç Semra Arslan Selçuk	*Gazi University*	Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis
Emine Malkoç True Deniz Karadan	*Ege University*	Mıtıgatıng Usage Damages In Coastal Landscapes Wıth Envıronmentally Frıendly Approaches
Emine Malkoç True Deniz Karadan	*Ege University*	Cultural Herıtage And Its Preservatıon

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SESSION-1, HALL-4 / OTURUM-1, SALON-4

MODERATOR: Servet Aras

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Hacer Tüfekci Hilal Tozlu Çelik	*Ordu University*	The Effects Of The Covıd-19 Pandemıc Perıod On Anımal Productıon And Some Studıes
Berna Özdenoğlu Kutlu	*Sivas Cumhuriyet University*	Effect Of Vıtamıns E And D On Skın And Bladder In Rats
Tuba Albayrak Servet Aras	*Yozgat Bozok University*	Economic Investigation Of Fruit Growing In Yozgat Province In Terms Of Climate Conditions
Tuba Albayrak	*Yozgat Bozok University*	Kırsal Kalkınmada Kadının Rolü; Yozgat/Türkiye Örneği
Merve Yazici Mehmet Rıfat Akbulut	*Mimar Sinan Güzel Sanatlar University*	Urbanızatıon Hıstory Of Malatya In The Last Century
Hüseyin Fidan	*Burdur Mehmet Akif Ersoy University*	Clustering And Performance Analysis Of Small Datasets
Feza Demir Ayşegül Erdoğan	*Kahramanmaras Sutcu Imam University*	After The 6 February Earthquake, Evaluatıon Of The Increase In Aır Pollutıon In Kahramanmaras Provınce And Recommendatıons
Bekir Ayyildiz	*Yozgat Bozok University*	Forecastıngs Of Agrıcultural And Forest Areas In Turkey Through The Arıma Method Based On Agro-Ecologıcal Economy Prıncıple For The Year 2028
Yağmur Yaman Doğan Emirhan Ergül Eren Özçelik Hayriye Sundu	*Istanbul Medeniyet University*	Investıgatıon Of Mesons Wıth Dıfferent Spın-Parıtıes

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SESSION-1, HALL-5 / OTURUM-1, SALON-5

MODERATOR: Neşe Aykut

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Emre Adıgüzel	*Karamanoğlu Mehmetbey University*	Boron Mıneral In Terms Of Its Effects On Health
Ayhan Aksakalli	*Bayburt University*	Scıence Teachers' Revealed Educatıonal Belıefs About Artıfıcıal Intellıgence
Onur Öztürk	*Malatya Turgut Ozal University*	Network Analysıs Approach In Populatıon Genetıcs Research
Aydın Sellioğ	*Ministry of National Education*	The Effect Of Actıvıtıes Based On Project-Based Learnıng Approach On The Socıal Development Of Students Wıth Mıld Intellectual Dısabılıty
Neşe Aykut	*Ağrı İbrahim Çeçen University*	Nursıng Care Accordıng To Functıonal Health Patterns In Vertıgo: A Case Report
Rıfat Saidoğlu Bünyamin Ağalday	*Mardin Artuklu University*	Albert Malche's Impact On The Development Of Hıgher Educatıon İn Türkiye
Muhammed Malkoç Sibel Ünaldi Sibel Çimen	*Bilecik Şeyh Edebali University*	Low Profile Mm-Wave Transmitarray Design For 5g Applications
Ecem Kaçar Veli Yavuz	*Samsun University*	Determınatıon Of Dıurnal Characterıstıcs Of Thunderstorms: Comparıson Of Nocturnal-Daytıme Thunderstorms For Samsun

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SESSION-2, HALL-1 / OTURUM-2, SALON-1

MODERATOR: Hülya Doğan

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Turhan Yilmaz	*Kahramanmaraş Sütçü Imam University*	Unveiling The Potential Of Essential Oils In Mitigating Weight Loss Of Grapevine Cultivars (Vitis Vinifera) Across Varied Temperature Conditions
Hasan Demir Atıl Emre Cosgun Metin Yüceant	*Aksaray University*	Android Mobile App Controlled Modular Tennis Ball Throwing Machine
Gökhan Karayünlü Murat Ercan	*Çankırı Karatekin University*	The Effect Of Syrian Migration On Municipal Services
Ömer Faruk Alemdar Jale Yılmazkaya Süngü Elşen Veli Veliev	*Kocaeli University*	The Extensıon Of Temporal Gauge And Pole Treatments In Green Functıons
Efgan Uğur Tolgay Kara Abdulhafez Abdulhafez	*Gaziantep University*	A Revıew Of Recent Developments In Autonomous Wheelchaır Control
Özlem Eda Demircan Hayriye Sundu Jale Yılmazkaya Süngü Elşen Veli Veliev	*Kocaeli University*	Response Of All-Charm Resonance To Hot Medium
Ayşe Keskin Geçer Kelimetullah Geçer	*Bitlis Eren University*	Metaphorical Perceptions Of Secondary School Students Towards The Concept Of Environmental Education
Hülya Doğan Hatice Baş	*Yozgat Bozok University*	Anthemis tinctoria L. (Asteraceae): Insecticidal Activity Against Galleria mellonella (L.) (Lepidoptera:Pyralidae)
Hatice Baş Hülya Doğan	*Yozgat Bozok University*	Lipoxygenase, A-Amylase, Tyrosinase And Xanthine Oxidase Inhibitory Activities of Centaurea depressa Bieb. (Asteraceae)

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SESSION-2, HALL-2 / OTURUM-2, SALON-2

MODERATOR: Ülkü Saygılı Düzova

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Ülkü Saygılı Düzova	*Selçuk University*	Bibliometric Analysis Of Studies On Brachytherapy Nursing
Elifnur Alniaçik Halime Uğur	*İstanbul Medeniyet University*	Effect Of Omega-3 Fatty Acids On Sarcopenıa In Old Agıng
Işıl Keçik Büyükhatipoğlu Ahmet Sabak Fatih SARI	*Gaziantep University*	Intraoral Scanners Used In Dentistry
Fatih Sari Ahmet Sabak Işıl Keçik Büyükhatipoğlu	*Gaziantep University*	The Use Of Virtual Articulators In Prosthodontics
Mualla Akçadağ	*Sivas Cumhuriyet University*	A Qualıtatıve Study To Determıne The Problems Encountered By Woman Enterprısers In Marketıng Actıvıtıes
Olcay Salici Figen Yildirim	*Süleyman Demirel University*	Öğretmen Adaylarının Empatik Eğilimlerinin İncelenmesi: Akdeniz Bölgesi Örneği
Carla Santos Cristina Dias	*New University of Lisbon*	Teaching Probabilities With Counterintuitive Problems
Fethiye Sağkan Cansu Aksu	*Zonguldak Bülent Ecevit University*	Exploratıon Of Current Trends At The Intersectıon Of Informatıon Systems And Sustaınabılıty

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SESSION-2, HALL-3 / OTURUM-2, SALON-3

MODERATOR: Hakan Selvi

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Cansu Aksu Fethiye Sağkan	*Zonguldak Bülent Ecevit University*	The Role Of Dıgıtal Transformatıon In Sustaınable Supply Chaın Management: Strategıes, Opportunıtıes And Challenges
Eşref Yalav Meryem Evecen	*Amasya University*	Installatıon And Operatıon Of Solar Power Plants
Ceren Cengiz Menderes Levent	*Yozgat Şeker Fabrikası*	Methylene Blue Removal In Aqueous Solutions With Mihalıççık Clay And Bentonite
Ceren Cengiz Menderes Levent	*Yozgat Şeker Fabrikası*	Methylene Blue Removal In Aqueous Solutions With Powdered Activated Carbon And Bentonite
Mustafa Mert Yamaç Mehmet Inceoğlu	*Eskişehir Teknik University*	Examınıng The Concept Of Net Zero Energy Buıldıng Through The Concept Of Embodıed Energy
Aylin Ulu Kerem Ilaslan	*Bahçeşehir University*	Gastronomıcal Comparıson Of Turkısh And Greek Coffee
Shahrukh Samson Wafa Majeed Farooq Azam Akmal Farooq	*University of London*	Pervelance Of Erm (C) Resistance Genes Expression In Staphylococcus Aureus In Comparison To Lactobacilli
Olufemi Adeyemi Adetola	*Federal University of Technology*	Selected Physical, Mechanical And Chemical Properties Of Fresh Fruit Bunches For Processing Of Palm Oil
Hakan Selvi	*Usak University*	Graphene-Based Acoustic and Optical Sensors for Alcohol Detection
Wafa Majeed Humaira Muzaffar Muhammad Naeem Faisal Bilal Aslam Haseeb Anwar Usman Haider Muhammad Jawad Aslam Muhammad Rehan Sajid Shamshad Ul Hassan Kashif Iqbal	*Government College University Faisalabad*	Prevalence of Qard and QarB resistance gene expression in Escherichia coli in comparison to Lactobacillus

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SESSION-2, HALL-4 / OTURUM-2, SALON-4

MODERATOR: Ismail Yildiz

Meeting ID: 858 1117 0419
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AUTHOR	AFFILITION	ABSTRACT TITLE
Elif Demirden Erişti Gülay Yazici	*Ankara Yildirim Beyazit University*	To Prevent Postoperatıve Urınary Retentıon Of Surgıcal Nurses The Methods He Applıed Towards
Filiz Erşin Aslı Ece Acar Filizci Dilek Öztaş Ergün Eraslan	*Ankara Yıldırım Beyazıt University*	Safe Water Wıthın The Scope Of Occupatıonal Health And Safety In Workplaces
Bahar Ulaşzade Aslı Güneş Gölbey	*İzmir Demokrasi University*	The Impact Of Mıgratıon On The Urban Landscape
Bahar Ulaşzade Aslı Güneş Gölbey	*İzmir Demokrasi University*	A Joint Examination Of Low Impact Development And Landscape Urbanism
Şükriye Şimşek Burcu Güvenek Zeynep Karaçor	*Selçuk University*	Water Crısıs In Turkey And Its Economıc Effects
Ismail Yildiz	*Van Yüzüncü Yıl University*	Morphological Investigations On Two Urotricha Claparede & Lachmann, 1857 Species (Eukarya, Ciliophora) Obtained From Ponds In Van, Türkiye
Ismail Yildiz	*Van Yüzüncü Yıl University*	Morphological Redescriptions Of Three Trithigmostoma Jankowski, 1967 Species (Eukarya, Ciliophora) Isolated From Temporary Puddles In Van, Türkiye
Gülden Kabakçı	*Duzce University*	Effect Of Nanoparticle Reinforcement On The Curing Kinetics Of Epoxy Resin
Bedriye Yildizoğlu Porduğan Serap Doğan	*Mardin Artuklu University*	The Importance Of Organic Farming In Turkey And The Current Situation Of Organic Crop Production By Years

22.04.2024
Ankara Local Time: 12:30-14:30

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SESSION-2, HALL-5 / OTURUM-2, SALON-5

MODERATOR: Şura Boyraz

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Deniz Sezgin Müge Sari Yilmaz	*Yildiz Technical University*	Preparatıon And Characterızatıon Of Bınary Layered Double Hydroxıde
Çağdaş Kaner Aslı Güneş Gölbey	*İzmir Demokrasi University*	The Importance Of Ratio Concept In Landscape Design
Fatih Isa Yücel Aslı Güneş Gölbey	*İzmir Demokrasi University*	Comparing "Social Space Theory" With Landscape Architecture In The Metaverse
Ece Miser-Salihoğlu	*Gazi University*	Evaluatıon Of Commercıal Tablets Of Ganoderma Lucıdum Effects On Healthy And Cancer Colon Cells
Şura Boyraz	*Yozgat Bozok University*	The Future Of Hemp In Dentıstry
Yusuf Hasan Abubakar Sani	*Umaru Musa Yar'adua University Katsina*	A Review On Synthesis And Antionchocercal Activity Acetals
Özge Nur Yurddaş Hülya Çakir	*Yozgat Bozok University*	Factors Affectıng The Formatıon And Change Process Of Consumptıon Perceptıon
Melike Emirali Nazlı Gülriz Çeri	*Afyonkarahisar Health Sciences University*	Evaluatıon Of Quadrıceps Angle Wıth Weıght Transfer
Adeyinka Elizabeth Ajiboye Aminat Damilola Ahmad Bukola Aishat Hammed	*Kwara State University*	Microbiological And Nutritional Quality Of Soybean Curd And Fried Fish From Selected Markets Within Ilorin Metropolis, Nigeria
Murat Ata	*Dokuz Eylül University*	The Key Principles Of Century Language Testing And Aseessments
Tuzelbay S. Oryngozhin E.	*Al-Farabi Kazakh National University*	Application Of Gis In Engineering And Geodetic Research

22.04.2024
Ankara Local Time: 15:00-17:00

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SESSION-3, HALL-1 / OTURUM-3, SALON-1

MODERATOR: Levent Yazici

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Oğuz Erol Levent Yazici Güngör Yilmaz	*Yozgat Bozok University*	Medical Hemp Cultivation İn Greenhouse Conditions
Levent Yazici Güngör Yilmaz Oğuz Erol	*Yozgat Bozok University*	Ecologıcal Requırements For Industrıal Hemp
Fatma Boran Nazan Torun	*Ankara Yıldırım Beyazıt University*	Quality Of Work Life And Its Importance In The Healthcare Sector*
Mehmet Hanifi Kebiroğlu	*Malatya Turgut Ozal University*	Examınatıon Of The Chemıcal Calculatıon Of The Molecule By Dft Method Of Isothıocyanıc Acıd Usıng The Electron Localızatıon Functıon (Elf)
Lerzan Öztürk Bahadır Şin	*Namık Kemal University*	Nematicidal Potential of Citrus spp. Essential Oils on Soil Nematodes Under In-vitro Conditions
Sultan Karahan Azize Atik	*Çiftçiler Oil Industry and Trade Co. Ltd*	The Impact Of Beetroot Use On Sausage Productıon
Ramazan Burak Ötgün Özlem Onay	*Eskisehir Technical University*	Coatıng The Cathode-Anode Surfaces In Fuel Cells Wıth Functıonal Thın Fılm To Increase The Performance And Lıfetıme
Rajeev Arora	*Iowa State University*	Adsorption of Lead from Waste Water by Nano Composite Materials for Environment Management
Doğancan Doğançay Aslı Ece Acar Filizci Dilek Öztaş Ergün Eraslan	*Ankara Yıldırım Beyazıt University,*	The Importance of Health Safety Training in the Workplace
Bakhyt M. Kerimbay N.	*Al-Farabi Kazakh National University*	Description Of Agricultural Land Monitoring Using Remote Sensing Technologies

22.04.2024
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SESSION-3, HALL-2 / OTURUM-3, SALON-2

MODERATOR: Gürcan Samtaş

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Mustafa Tombul Hakan Kazan	*Amasya University*	Statistical Comparison Of The Effect Of Modified Composite Materials With Different Mixture Ratios And Layer Numbers On Tensile Stresses In Bomb Disposal Suits Using Taguchi L9 Orthogonal Array
Eslem Şahin Merve Ünal Murat Yazici	*Bursa Uludağ Uviversity*	Mıcrocapsule-Based Self-Healıng Of Thermoplastıc Composıtes
Burak Özerol Hakkı Özer Murat Yazici	*Bursa Uludağ Uviversity*	Flexural and penetration behavior of sandwich structures developed with Two Dimensional Corrugated Aluminum Core and composite plates
Büşranur Nalbant Gürcan Samtaş	*Düzce Uviversity*	Reverse Robot Arm Mechanısm Desıgn
Rabia Sima Ilikçi	*Muğla Sıtkı Koçman Uviversity*	Research On Allergies Developing İn İnfancy And Childhood
Fatmagül Yur Rabia Sima Ilikçi	*Muğla Sıtkı Koçman Uviversity*	Recent Studıes On The Effect Of Cannabıs In Cancer Treatment
Hasan Yıldız Esad Sami Polat	*Selcuk Uviversity*	Effect of Probıotıc Addıtıon of Bacıllus Subtılıs to Lamb Ratıons on Fattenıng Performance and Carcass Qualıty
Özden Öngün Murat Tutar Nahit Baylan	*Nişantaşı University*	Investigation Of The Change İn Training Loads At Different Match Frequencies During The Covid19 Pandemic
Hüseyin Hatirli Sevilay Köse	*Tokat Gaziosmanpaşa Uviversity*	The Effects Of Anterior Restorations On Smile And Self-Confidence: 2-Year Control
Sultan Bayrak Sibel Yiğiter Nihal Can Ağırbaş	*Eskişehir Osmangazi Uviversity*	Situation Analysis Of Producers And Middleman In The Indoor Ornamental Plants Sector During And After The Covid-19 Pandemic: Yalova Case

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SESSION-3, HALL-3 / OTURUM-3, SALON-3

MODERATOR: Gülşah Kaçmaz Akkurt

Meeting ID: 858 1117 0419
Passcode: 050505

AUTHOR	AFFILITION	ABSTRACT TITLE
Abdullah Sessiz Sercan Ezin	*Dicle University*	Evaluation of the Performance of a Drone Used in Vineyard Spraying
Osman Asi Ahmet Efe Gezmişoğlu	*Uşak University*	Investigation Of Failures Occurred In The Manufacturing Of Tread Segments In Tire Curing Molds Using The Casting Method
Mehmet Yusuf Hazar	*1International Balkan University*	The Impact Of Consumptıon Taxes On The Standard Of Lıvıng In Turkey: Current Approaches And Future Perspectıves
Tahsin Gökhan Telatar	*Recep Tayyip Erdoğan University*	Türkiye'de Beş Yıllık Bebek Ölüm Hızlarının Bölgesel Değişimi
Simge Nükte Gülşah Kaçmaz Akkurt	*Dokuz Eylül University*	How To Desıgn Thermally Comfortable Playgrounds For Chıldren?
Gülşah Kaçmaz Akkurt	*Dokuz Eylül University*	Clımate Change And Human Health
Faris Karahan Oğuz Gökçe	*Atatürk University*	Ecovıllage Models For Sustainable Tourism And Development: The Case Of Sapaca Vıllage
Şüheda Basire Akça Yilmaz	*Zonguldak Bülent Ecevit University*	Scented Cut Flowers
Şüheda Basire Akça Yilmaz Kübra Yazici	*Zonguldak Bülent Ecevit University*	Investigation Of The Use Of Ruscus Hypoglossum L. And Ruscus Aculeatus L. Species Used As Medicinal Aromatic Plants In Landscaping As Ornamental Plants
Faris Karahan Oğuz Gökçe	*Atatürk University*	Evaluatıon Of Agrıcultural Terrace Landscapes For Sustaınable Local Development: Mulberry Orchards
Hüseyin Çetin Ketenci	*Recep Tayyip Erdoğan University*	Forensic Evaluation of a Rare Traumatic Death During Wood Transportation by a Primitive Cable Car; Case Report
Francisca Machado	*University of Minho, Portugal and not University of California*	Urban Transformation In 19th And 20th Century In Oporto Social Challenges and the Working-Class Struggle

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ABSTRACT

FUNDAMENTALS OF AZERBAIJANI IDEOLOGY AND TEACHING METHODOLOGY

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ABSTRACT

The ideology of Azerbaijanism is the civil unity and solidarity that unites and preserves the traditions, national-spiritual values, ethnic-political characteristics of the Azerbaijani people from ancient times to modern times. This means that the sense of homeland and citizenship is the main line of Azerbaijaniism. Regarding the concept of national consciousness, its main features can be characterized as follows: 1. National culture, 2. National ethical and moral norms, 3. Public unity and solidarity, 4. Statehood and respect for its attributes, 5. Patriotism, 6. Reconciliation of national-spiritual values with human values. The study of history in the formation of personality is carried out in the process of history education in three directions that are closely related to the educational work in the field of the formation of a certain personality: acquiring universal, national and social values. If the national ideology is not based on strong and stable foundations, it has a negative impact on the development of the state and traditions of statehood. In addition to all this, there is a need to pay special attention to the promotion of Azerbaijaniism in educational institutions. Azerbaijanism appears not only in the way of teaching, but also in the example of practical work. At the same time, the essence, basics and methodology of Azerbaijaniism are taught. Azerbaijanism should be promoted at all events, lectures, and even excursions. In the modern era, the study of the ideology of Azerbaijaniism is set as a task in the education system. The methodological features of this system are reflected in the idea of Azerbaijaniism, in the ideology of Azerbaijaniism. At the same time, this approach creates opportunities to understand the national education system as the source of Azerbaijani ideology and to apply it in this direction. Therefore, in the pedagogical process, first of all, questions such as what should be taught and for what purpose should be thought about and answers should be sought. In schools, national education is carried out according to the age and development level of students in different classes. Starting from the lower grades, students gradually acquire the most necessary knowledge about Azerbaijan, the state of Azerbaijan, the people of Azerbaijan, traditions, the homeland, the nation as a systematic introduction to traditions, our history, the role played by our state in the life of the nation, the bravery of war heroes, the achievements of scientists and other issues. and skills arise. Problem solving in training, creative searches, oral interpretation method, visual training method, work with published material, use of interactive training methods, book discussions, conversations, lectures, debates, scientific discussions are also important in terms of worldview education and national ideology. The idea of moral education carried out in classes is continued through extracurricular and extracurricular activities. Various forms are used for this purpose: a) Mass events; b) Club and association events: activities of socio-political clubs, museums and associations; c) Moral individual works: personal education of students, various individual tasks (newspaper, stand, report preparation), etc. Educators should understand that Azerbaijaniism, as a system of thought, serves the further consolidation and development of our national unity, the sense of integrity and protection of our homeland, and our state.

Keywords: National ideology, national consciousness, Patriotism, interactive methods, methodological feature.

XƏZƏR DƏNİZİNİN AZƏRBAYCAN SEKTORUNDA MEZOPLANKTONUN BİOMÜXTƏLİFLİYİ

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ÖZET
Bizim tərəfimizdən 2020 – 2023-cü illərdə Cənubi Xəzərin Azərbaycan akvatoriyasında mezoplanktonun biomüxtəlifliyi öyrənilmişdir. Rotifera qrupuna aid olan 8 növ qeydə alınmışdır. *Asplanchna priodonta priodonta* və *Keratella cochlearis* say və biokütləcə daha geniş yayilmışlar. Qrupun orta sayı 1314 fərd/m^3, biokütləsi isə 1,38 mg/m^3 təşkil etmişdir. Cladocera qrupuna daxil olan 11 növ qeyd edilmişdir. *Pleopis polyphemoides* say və biokütləsinə görə daha çox inkişaf edir. Qrupun orta sayı 576 fərd/m^3, biokütləsi isə 17,58 mg/m^3 olmuşdur. Copepoda qrupunun sayı 751 fərd/m^3, biokütləsi isə 41,64 mg/m^3 təşkil etmişdir. *Acartia clausi* biokütləsinə görə bütün mezoplanktonda dominantlıq edir. 2021-ci ildə Cənubi Xəzərin Azərbaycan akvatoriyasında mezoplanktonun sayı 3749 fərd/m^3 , biokütləsi isə 62,45 mg/m^3 təşkil etmişdir. 2022-ci ilin yazında Cənubi Xəzərin Azərbaycan akvatoriyası mezoplanktonunda Rotifera qrupunun sayı 1327 fərd/m^3, biokütləsi isə 1,40 mg/m^3 təşkil etmişdir. Cladocera qrupunun sayı 162 fərd/m^3, biokütləsi isə 4,87 mg/m^3 təşkil etmişdir. Copepoda qrupunun sayı 677 fərd/m^3 , biokütləsi isə 42,89 mg/m^3 təşkil etmişdir. *Acartia clausi*-nin biokütləsi yazda 22,99 mg/m^3 təşkil etmişdir. Mezoplanktonun biokütləsində fəsillər üzrə onun payı aşağıdakı kimi olmuşdur; yaz – 30,23%, yay – 40,02%, payız – 40,01%. Görülmüş işlər nəticəsində Cənubi Xəzərin Azərbaycan akvatoriyasında mezoplanktonun faunasının biomüxtəlifliyi, miqdarı və ehtiyatlarının müasir vəziyyəti qiymətləndirilmişdir.
Anahtar Kelimeler: Xəzər dənizi, növ, Copepoda, Cladocera, Rotifera

BIODIVERSITY OF MESOPLANKTON IN THE AZERBAIJAN SECTOR OF THE CASPIAN SEA

ABSTRACT
In 2020-2023, we studied the biodiversity of mesoplankton in the Azerbaijani waters of the South Caspian Sea. 8 species belonging to the Rotifera group have been recorded. *Asplanchna priodonta priodonta* and *Keratella cochlearis* were more widespread in numbers and biomass. The average number of the group was 1314 ind./m^3, and its biomass was 1.38 mg/m^3. 11 species included in the Cladocera group have been recorded. *Pleopis polyphemoides* grows more in number and biomass. The average number of the group was 576 ind./m^3, and the biomass was 17.58 mg/m^3. The number of Copepoda group was 751 ind./m^3, and its biomass was 41.64 mg/m^3. Acartia clausi dominates all mesoplankton in terms of biomass. In 2021, the number of mesoplankton in the Azerbaijani water area of the South Caspian was 3749 ind./m^3, and its biomass was 62.45 mg/m^3. In the spring of 2022, the number of Rotifera group was 1327 ind./m^3, and its biomass was 1.40 mg/m^3. The number of Cladocera group was 162 ind./m^3, and its biomass was 4.87 mg/m^3. The number of Copepoda group was 677 ind./m^3, and its biomass was 42.89 mg/m^3. The biomass of *Acartia clausi* was 22.99 mg/m^3 in spring. Its share in the biomass of mesoplankton by season was as follows; spring – 30.23%, summer – 40.02%, autumn – 40.01%. As a result of the work carried out, the biodiversity, quantity and current state of resources of the mesoplankton fauna in the Azerbaijani waters of the South Caspian Sea were evaluated.
Keywords: Caspian Sea, species, Copepoda, Cladocera, Rotifera

MUNICIPAL STATISTICAL EMPOWERMENT THROUGH STAKEHOLDER COLLABORATION IN ALBANIA: A PATHWAY TO EU ACCESSION

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ABSTRACT
This paper investigates the impact of stakeholder collaboration, focusing on municipalities and line ministries, in supporting local statistical empowerment in Albania, particularly within the context of EU accession negotiations. The necessity to modernize Albania's statistical system aligns with EU standards outlined in Chapter 18, emphasizing the collection of local data and empowering municipalities to enhance sectoral statistics, classifications, and statistical registers. Additionally, focusing on regional and local statistics can contribute meaningfully to Albania's aspirations for EU membership and improve its statistical infrastructure to international standards.Municipalities serve as primary beneficiaries and users of local statistical information, playing a critical role in EU accession. Efforts aim to empower municipalities by enhancing their understanding of statistical data, aligning with the law on Local Government Units (LGUs), and exploring synergies with performance units under the Law on Local Governance to optimize data-related tasks.The establishment of the Ministry of State for Local Government and the Agency for the Support of Local Governance presents opportunities for collaboration between Albania INSTAT and these institutions. This collaboration is essential for utilizing official statistics effectively for local and regional development. Looking ahead, ongoing stakeholder engagement remains paramount, driving initiatives that resonate effectively at local and regional levels, ultimately contributing to broader development objectives in Albania.This research contributes to discussions on effective stakeholder engagement in statistics at municipal level, emphasizing the importance of collaboration in local governance and development contexts. This paper highlights pathways to enhance local statistical empowerment and support Albania's trajectory towards EU accession.
Keywords: Stakeholder collaboration; Statistical empowerment; Municipality engagement; EU accession

AYASOFYA'NIN GÜNEY GIRIŞINDEKI MOZAIKTE VE MACAR KRALLIĞINDA DEVLET İKTİDARININ GÖRSEL TEMSİLİ

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ÖZET
Araştırma yöntemi: iki mozaiğin ikonografik karşılaştırması ve alandaki literatürün değerlendirilmesi. – Konu: Yazar İstanbul'da Ayasofya'yı birkaç kez kendisi ziyaret etti. İlk olarak, Ayasofya'nın güney vestibülündeki mozaik, 11. yüzyılda yaratılmıştır. 10. Yüzyılda Bulgarlara karşı kazanılan zafer sayesinde yapıldı. Ancak, hakkında hala tartışmalar var flört, tam yazıda gözden geçirilecekler. Mozaik, İmparator II. Basil'in kararnamesi ile yaratılmıştır ama mozaikte tasvir edilmedi. Büyük Konstantin ve Kanun veren Julian var, yanlarda tasvir edilenler ve ortadaki Theotokos (Tanrı'nın Annesi). Bu, Tanrı'nın Annesinin devletin koruyucusu olduğunu gösterir. Dolayısıyla bu mozaik, Theotokos'un İmparatorluk Gücünün Hamisi olduğunu temsil ediyordu. — İkincisi, bu Bizans mozaiğinin Macar paralelliği. Bizans imparatoru I. Manuel, Macar Prensi Béla'yı evlatlık oğlu olarak evlat edindi onu tahtın halefi olarak yetiştirmek. Sonra yerli oğlu imparator Manuel'de doğdu, bu nedenle Prens Béla'nın Bizans'tan ayrılması gerekiyordu, fakat o sırada Macar tahtı boşaldı ve Béla, Macaristan'daki konumunu güçlendirmek için Manuel'den askerler aldı. Macaristan Kralı III. Béla, Macaristan'da mozaikli "Porta Speciosa" Kapısını inşa etti. Macaristan Kralı III. Béla, Macaristan'da ”Porta Speciosa" Kapısını inşa etti, bir mozaik, Béla III, Macaristan Kralı, built the “Porta Speciosa” Gate with a mosaic in Hungary, Ayasofya'nın Bizans mozaiğinin yapısını doğru bir şekilde tasvir eden. Tanrı'nın Annesi çocukla birlikte merkezde oturuyor. Yanlarda Macar kralları tasvir edildi, yani, devletin kurucusu Kral Aziz Stephen I, ve Kral III. Béla'nın kendisi. Dahası, iki başpiskopos da tasvir edildi, ilk başpiskopos, devletin kurucusu kral Aziz Stephen I'i vaftiz eden kişiydi, ve ikinci başpiskopos, Kral III. Bella'yı taçlandıran kişiydi. – Sonuçlar: Krize karşı emperyal zafer, Macar Krallığında Bizans mozaiğine tam bir paralel olarak tasvir edildi. İkincisi, Tanrı'nın Annesini devletin Savunucusu olarak tasvir etti.
Anahtar Kelimeler: Ayasofya, İmparator_Basil_II., Macar_Krallığı, Kral_Béla_III, İmparator_Manuel_l.

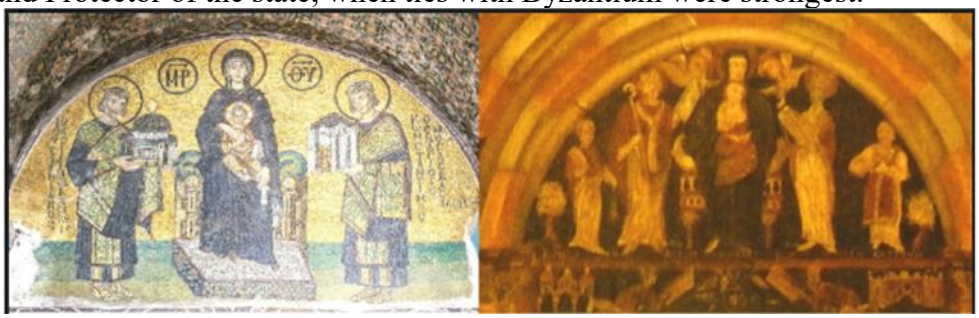
VISUAL REPRESENTATION OF THE STATE POWER IN THE MOSAICS IN THE SOUTH VESTIBULE OF HAGIA SOPHIA AND IN THE HUNGARIAN KINGDOM

ABSTRACT

First, as for Byzantium, that mosaic in Constantinople was created thanks to the victory over the Bulgarians in the 10th century (or, according to other theories, over the East Slavs), and the mosaic was created later, in the 11th century, however, there are still discussions about the dating. (An overview of debates will be given in the paper). The mosaic was created by the decree of Emperor Basil II but he was not depicted in the mosaic. There are Constantine the Great and Julian the Lawmaker depicted on the sides and the Theotokos (Mother of God) in the middle. It demonstrates that the Mother of God is the protector of the state, therefore, those previous emperors who founded and reestablished the empire, offered their state under the protection of the Mother of God. Hence, after a new victory, such a mosaic was created which represented that Theotokos was the Patron of the Imperial Power.Second, the Hungarian parallel of this Byzantine mosaic. The Byzantine emperor Manuel I adopted the Hungarian Prince Béla as his adopted son to raise him as a successor to the throne. Then his son was born to the emperor Manuel, hence Prince Béla was supposed to leave Byzantium, but at that time the Hungarian throne became empty, and Béla received soldiers from Manuel to strengthen his position in Hungary. Béla III King of Hungary 1172-1196 was a strong ruler, and Byzantine influences were the strongest. King Béla III built the "Porta Speciosa" Gate with a mosaic in Hungary, which accurately depicted the structure of that Byzantine mosaic in Hagia Sophia. The Mother of God with the Child is sitting in the center. On sides, there were depicted Hungarian kings, that is, the founder of the state, King Saint Stephen I, and King Béla III himself. Moreover, two archbishops were depicted, too, the first who baptized the state-founder king, thus Saint Stephen I, and the second, who crowned King Béla III.

Method of research: iconographic comparison of the two mosaics and evaluation of the literature in the field. The author visited in İstanbul the Ayasofiya several times and took many photos of that.

Consequences: the imperial victory over the crisis was depicted in the Hungarian Kingdom through the visual representation of patronage of the Mother of God over the imperial power, as an exact parallel to the Byzantine mosaic which depicted the Mother of God as the Defender and Protector of the state, when ties with Byzantium were strongest.



Keywords: Hagia_Sophia, Emperor_Basil_II, Hungarian_Kingdom, Béla_III, Emperor_Manuel.

BODY THERMOREGULATORY RESPONSES OF RABBITS SUPPLEMENTED CAMEL'S FOOT (Piliostigma thonningii) ESSENTIAL OIL BASED DIET

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ABSTRACT
This experiment investigated body thermoregulatory responses of the rabbits fed *Piliostigma thonningii* essential oil (PEO) supplemented diet. Forty-five clinically healthy weaned male Dutch rabbits of about five weeks of age were used in a 12-week experiment. The rabbits were randomly divided into three treatment groups, with fifteen rabbits per group, and balanced for their body weight such that rabbits in each group had similar average initial body weight (BW) of 262.89 ± 22.36 g in a completely randomized design. Treatment 1 was a basal control diet without PEO supplementation (T1). In treatments 2 and 3, the basal control diet was supplemented with 2 ml PEO/kg diet (T2) and 4 ml PEO/kg diet (T3) respectively. The heart and respiratory rates were not affected ($P > 0.05$) by treatments, while the rectal temperature was greater ($P < 0.05$) in T1 than in T2 and T3. It is concluded that *P. thonningii* essential oil supplementation reduced thermoregulatory oxidative stress as indicated by the lower rectal temperature in rabbits supplemented PEO. However, 4 ml PEO/kg diet is the optimum supplementation level, as it was more effective in enhancing (reducing) the rectal temperature of experimental animals.
Keywords:

APPLICATION OF GENERATIVE AI IN MARKETING

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ABSTRACT
One of the branches of AI is generative AI (GenAI) which finds interest and application in a large number of industries. If traditional AI is focused only on analyzing data, generative AI creates new types of content. Generative AI generates creative outputs (texts, video, music, visuals, 3D designs, images, codes) from given inputs i.e. requirements. This artificial intelligence almost replaces the human way of behaving and thinking. Just like a human, generative AI can make decisions, logically connect things and perform the best solutions. It reacts in a way that a human would react and behave. It is precisely for these reasons that it has awakened great interest in marketing. In the field of marketing, generative AI can be used for the preparation and implementation of STP strategy (segmentation, targeting, positioning), personalization, creation of interesting creative content, logos, slogans, market research and analysis. Although the benefits for marketing are endless, generative AI has certain limitations. Ethics, quality control and misuse are considered more significant limitations. Also, it can produce fake and undated information, incorrect or not precise data.This paper aims to present the characteristics, advantages and disadvantages of using generative AI in marketing, by using secondary available data.
Keywords: generative AI, traditional AI, Marketing, STP strategy
JEL codes: M31, M37

RELATIONSHIP BETWEEN FATIGUE AND PSYCHOLOGICAL DISTRESS AMONG TEACHERS OF PHYSICS AND CHEMISTRY IN MOROCCO

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ABSTRACT
Teachers of physics and chemistry experience increased stress and anxiety due to work pressures and teaching constraints associated with the length of school curricula and difficult teaching conditions. Because of that teachers of physics and chemistry are more likely to experience fatigue and psychological distress. This paper describes the relationship between fatigue and psychological distress among 126 Professors of physics and chemistry from Rabat-Sale-Kenitra region in Morocco. To measure fatigue, we used the Individual Strength Checklist (CIS). The average score of teachers (49.7 ± 19.7) was higher than would be expected for civil servants in general. Teachers find their job difficult and harmful to their health. To measure psychological distress, we used the General Health Questionnaire (GHQ). The average teacher score (13.3 ± 4.6) was also high. Teachers expressed their emotional suffering with symptoms of depression and anxiety. Fatigue correlates positively with psychological distress. The social and demographic factors that are associated with either fatigue or psychological distress were determined and explained. Fatigue and psychological distress affect 35% and 24% of Professors of physics and chemistry respectively. Correlational results show that among teachers with prolonged fatigue, 37% reported fatigue only, while 63% reported both fatigue and psychological distress. A strong correlation was observed between the two conditions (psychological distress and fatigue). Fatigue and psychological distress are common among teachers. These two conditions are different and require intervention to mitigate their magnitudes.
Keywords: Teachers of physics and chemistry**,** fatigue, psychological distress, General Health Questionnaire, Individual Strength Checklist

ROLE AND CHARACTERISTICS OF CLASSMASTERS IN THE CROATIAN EDUCATION

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ABSTRACT
The primary educational role in the classroom is played by a classmaster, who should know the psychological changes his/her students are going through, meticulously analyze behavior, prevent, but also show empathy. The classmaster's role is of the utmost importance, which is the reason why it is to be studied unlike so far. This paper aimed to study the opinion of primary and secondary school classmasters employed in all Croatian counties about the role of a classmaster, challenges they face and necessary competencies for the role. The participants voluntarily completed a questionnaire analyzed in SPSS. The results show that higher education institutions do not educate pre-service teachers for the role of classmasters. Classmasters perform administrative tasks more easily than those that involve dealing with interpersonal relationships. The participants believe that a successful classmaster needs to have numerous competencies, which is why it should not be an automatically assigned role.
Keywords: classmasters' challenges, roles and characteristics of classmasters, school culture, SPSS.

MITIGATION OF GREENHOUSE GAS (ghg) EMISSIONS THROUGH SHADE SYSTEMS AND CLIMATE-SMART SOIL FERTILITY INTERVENTIONS IN COCOA LANDSCAPES IN THE SEMI-DECIDUOUS ECOLOGICAL ZONE OF GHANA

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ABSTRACT
Minimizing nitrogen losses, improving fertilizer management practices, and adopting sustainable agricultural practices are essential for mitigating the climate impacts of fertilizer use and promoting agricultural sustainability. This study aimed to address greenhouse gas emissions in cocoa landscapes in Ghana by examining the impact of shade systems and soil amendments on the release of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and overall global warming potential (GWP). The study consisted of two factors; shade systems (no shade and medium shade) and soil amendment (No amendment (T1), mineral fertilizer alone (T2), mineral fertilizer + biochar (T3), ½ mineral fertilizer + compost without rock phosphate and ½ mineral fertilizer + compost with rock phosphate (T5)). The shade system did not significantly influence CO_2, CH_4, and N_2O emissions. Emissions of CO_2 were higher in the amended compared to the non-amended plots in the two eco-zones. Applications of ½ mineral fertilizer + compost (T4 and T5) increased CH_4 production in both eco-zones. However, the application of mineral fertilizer alone (T2) and mineral fertilizer + biochar (T3) had varying effects on CH_4 emissions from the soil. Greater emissions of N_2O were recorded in the amended plots within the two eco-zones compared to the non-amended (T1) plots. Soil water and microbial biomass carbon (MBC) correlated positively with CO_2 and CH_4 fluxes in the two eco-zones where soil water accounted for 48 % of the emissions of CH_4 in the moist eco-zones, and MBC was responsible for 54 and 65 % in the moist and dry eco-zones respectively, of CH_4 emissions. Sole mineral fertilizer application (T2) had the highest GWP,14.70 and 13.56 kg CO_2 eq ha^{-1} yr^{-1} x 10^5 in both the moist and dry eco-zone respectively. This study contributes valuable insights into the potential of shade systems and soil amendments to mitigate greenhouse gas emissions in cocoa landscapes in Ghana, thereby fostering the transition towards more sustainable and climate-resilient cocoa production systems.
Keywords: Agroforestry, Biochar, Compost, Global Warming Potential, Shade trees

NANOMATERIALS CONTAINING RARE EARTH IONS AND APPLICATIONS

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ABSTRACT
Review our study on nanomaterials and nanophosphores containing rare earth (RE) ions such as Ce (III), Tb(III), Eu(III), Sm(III), Er(III), Yb(III) and Nd(III) in the some hot such as Y_2O_3,YVO_4, $LaPO_4$, $NaYF_4$ and Gd_2O_3. Nanomaterials were prepared by different method such as sol gel, combustion or by chemical many steps methods. FESEM, TEM and XRD were controlled. Nanophosphores with size 20-30 nm and monodisperse nanospheres 100-200 nm were synthesed.Optical properties, photoluminescence and upconversion luminescence were studied in detail. The red, blue, green emission, infrared region, different colors were received. Influence of RE concentration and core shell structure to luminescent intensity was investigated. Energy transfer, upconversion luminescence were detail studied. Some advanced functions of polymerics material with the impressive achievement in synthesis and application potential in biomedicine, lighting and security technique will be discussed
Keyword: Eu(III), Tb(III), Er(III), Yb(III) Y_2O_3,YVO_4 , Gd_2O_3. Upconversion luminescence.

EXPLORING THE EFFICACY OF A TRICHODERMA ASPERELLUM-BASED SEED TREATMENT FOR CONTROLLING FUSARIUM EQUISETI IN CHICKPEA

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ABSTRACT
Morocco's biopesticide use is low compared to chemical pesticides, with only a few available. Trichoderma-based products are the most exploited alternative control method.In this work, an in vivo study was carried out on the antagonistic properties of Trichoderma asperellum strain TH2 delivered via a chickpea seed treatment in the form of a formulation (glucose; Trichoderma conidia; Talc), towards a pathogenic strain of F. equiseti (N3), thus the stimulatory effect was determined. This formulation was tested for its efficiency to maintain the conidia of the antagonist around the seed after sowing, taking into account the vegetative and root growth as well as the ability to protect the plants against the pathogen.The application of the treatment formulation was able to stimulate the growth and also the root and aerial biomass, the average length of the aerial part of the LAP was increased by 36,86% in seedling derived from treated seeds, in addition the average number of leaves was improved compared to the control. After the evaluation of the disease severity and the foliar alteration index FAI, it was observed that the symptoms of fusarium were significantly reduced compared to the plants inoculated with Fusarium equiseti without previous treatment, a protective effect was noted.Re-isolation from plants cultivated in a substrate inoculated with F. equiseti was positive, (72.77%), the collar (84.11%) and the petiole (36.11%).Due to both direct antagonist activity and the indirect growth promotion, the findings suggest that seed treatment with T.asperellum TH2 is a viable approach for crop production and protection under field conditions. This strain appears to make plants more resistant to the fusarium wilt and root rot disease.
Keywords: Antagonist; biopesticide; Chickpea; Growth promotion; Trichoderma

THE IMPACT OF THE AEROBICT OF THE IMPACT OF THE AEROBIC FITNESS PROGRAM ON STRESS LEVEL IN WOMEN

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ABSTRACT
Physical activity can reduce stress, alter mood states, influence arousal and attention, and consequently improve our well-being. The ability of physical activity to "activate" and produce a more positive mood has been widely reported. Exercise enables individuals to feel good. This Experimental study aims to investigate the impact of an aerobic fitness program on stress levels in women. Through an experimental approach, subjects were randomly selected from a psychotherapy clinic. The group of women who participated in this structured aerobic fitness program for a 5-week period were identified for stress levels using questionnaires before and after it. Stress levels were assessed through various methods before and after the completion of the aerobic fitness program. Data analysis showed statistically significant changes in stress levels after the completion of the aerobic fitness program. 50 monitored women who underwent our program were able to provide us with real conclusions, and 46 of them expressed a change in their mood and stress levels after the completion of our 5-week exercise program. Such a study would have great benefits in understanding the relationship between physical activity and stress levels in women, and could provide guidance for best practices in using aerobic fitness for stress management. The study suggests that participation in aerobic fitness programs has the potential to reduce stress levels in women, with significant implications for emotional health. However, further research is needed to better understand this impact and to develop more effective strategies for stress management in clinical and health practice.

SYNTHESIS OF NICKEL OXIDE/GRAPHENE OXIDE COMPOSITE FOR THE DEGRADATION OF CLOTHIANIDIN PESTICIDE

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ABSTRACT
In the present work, the synthesis of NiO nanoparticles was carried through green synthesis by using extract of peels of green peas (*Pisum Sativum*). Graphene oxide was prepared through modified Hummer's method and the graphene oxide/nickel oxide nanocomposite was synthesized by ultrasonication method. The prepared nanocomposite was characterized by different techniques including XRD, FTIR and SEM. The FTIR analysis confirmed the functional groups in the prepared NiO/GO nanocomposite. Different experimental parameters such as pH, dose of catalyst, agitation rate, initial pesticide concentration and temperature were studied for the maximum degradation of clothianidin in aqueous solution. By adjusting different temperature range from 303 to 353 K, the maximum degradation was observed at 333 K, which is 78.51%. The degradation rate is increased with increase amount of dose of catalyst and maximum degradation of 92% is observed at 1g of catalyst. The maximum degradation was observed at pH 3. However, after pH 3, the degradation was decreased continuously. The concentration of stock solution of 10 ml showed maximum degradation. Furthermore, the synthesized NiO/GO nanocomposite from green route provided best economical alternative for pesticide degradation.

SUN TRACKING SUNFLOWER ROBOT USING ARDUINO

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ABSTRACT
The aim of this project is to design and develop a sun tracking system inspired by the natural behavior of sunflowers using Arduino microcontroller technology. Sunflowers exhibit a phenomenon known as heliotropism, where they orient their flowers to face the sun throughout the day to maximize sunlight absorption. This project mimics this behavior by creating a robotic sunflower that autonomously tracks the sun's position in the sky and adjusts its orientation accordingly.The proposed system consists of a sunflower-like structure equipped with light sensors and servo motors controlled by an Arduino microcontroller. The light sensors detect the intensity and direction of sunlight, enabling the system to determine the sun's position relative to the sunflower. Based on this information, the Arduino calculates the optimal angle for the sunflower's orientation and sends commands to the servo motors to adjust its position in real time.Key components of the system include photovoltaic cells to power the Arduino and servo motors, as well as a motor driver circuit for precise control of the servo motors. The Arduino programming involves implementing algorithms for sun tracking, including methods for sensor calibration, sun position calculation, and servo motor control.The sun tracking sunflower offers numerous potential applications, including solar energy harvesting, agricultural automation, and educational purposes. By efficiently capturing solar energy, this system can contribute to sustainable energy generation and environmental conservation efforts. Additionally, it serves as an educational tool for teaching concepts of solar tracking, renewable energy, and robotics to students and enthusiasts.In conclusion, the development of a sun tracking sunflower using Arduino technology provides an innovative and practical solution for optimizing solar energy capture. Through its biomimetic design and autonomous functionality, this system demonstrates the potential of integrating nature-inspired mechanisms with modern electronics for sustainable technology development.
Keywords: Solar Tracking, Arduino, Light Dependent Resistor, LCD Display, Solar Panel

SMART AGRICULTURAL MANAGEMENT SYSTEM

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ABSTRACT
Our groundbreaking solution is crafted to meet the multifaceted demands of modern agriculture, prioritizing enhanced crop yields and efficient resource management. We embrace a forward-thinking strategy centered around real-time monitoring of key parameters such as temperature, humidity, soil moisture, and pest activity, laying the foundation for precision farming excellence.Through the strategic deployment of sensor networks spanning agricultural fields, our system seamlessly gathers crucial data, delivering actionable insights directly to farmers. Leveraging cutting-edge sensor technologies, we ensure constant vigilance over environmental conditions vital to crop well-being.From maintaining optimal climate conditions with temperature and humidity sensors to precise irrigation management through soil moisture monitoring, our system empowers farmers with granular control. Furthermore, we integrate advanced pest detection mechanisms, harnessing the power of image recognition and sensor fusion to swiftly identify and mitigate potential threats.Accessibility is at the forefront of our design philosophy, with instant notifications sent directly to farmers' mobile devices via an intuitive application. These notifications, complete with audible alarms and phone calls for urgent attention, enable rapid response to evolving conditions on the farm.Our integrated solution revolutionizes farming practices by providing farmers with real-time information, fostering informed decision-making, and optimizing resource allocation. Through the seamless integration of advanced sensor technologies and mobile alerts, we pave the way for a new era of intelligent agricultural management, driving sustainable crop production and farm efficiency.
Keywords: Precision farming, Real-time monitoring, Sensor networks, Crop productivity, Mobile alerts

ANALYTICAL SOLUTION OF SCHRODINGER EQUATION WITH POWER LAW NONLINEARITY

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ABSTRACT
In this paper, we present an analytical solution to the nonlinear Schrödinger equation, a fundamental equation in quantum mechanics. By employing suitable transformations, the original partial differential equation is converted into a nonlinear ordinary differential equation. We then introduce a novel approach, the extended Laplace transform method, to derive the analytical solution for the transformed equation. This method leverages Adomian polynomials to effectively manage nonlinear expressions within the equation. Our findings provide a deeper understanding of the dynamics described by the nonlinear Schrödinger equation and offer a powerful computational tool for its analysis.
Keywords: Schrödinger equation, nonlinear PDE, extended Laplace transform, analytical solution, quantum mechanics.

THERMODYNAMIC PROPERTIES AND MAGNETOCALORIC EFFECT OF MIXED SPINS (3/2, 1) SQUARE LATTICE

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ABSTRACT
Despite its simplicity, the extended Ising model generates very rich phase diagrams. The present work aim to investigate the thermodynamic properties and magnetocaloric effect of mixed spin-1 and spin- 3/2 Ising ferrimagnetic system on a square lattice using Monte Carlo simulation.This lattice is divided in two interpenetrating sub-lattices with spins S=1 in the sub-lattice shell and σ= 3/2 in the sub-lattice core. The considered Ising model is parameterized by the couplings Js, Jσ and Jσ-s, where Js is the exchange interaction between two nearest neighbor magnetic atoms at the surface shell, Jσ is the exchange interaction between two nearest neighbor in the core and Jσ-s is the exchange interaction between the spins S in the shell and the spins σ in the core.Monte Carlo simulation under under Metropolis algorithm allows us to analyze the phase diagrams in the presence of external magnetic and crystal fields.We show the existence of the

compensation temperature and its dependence on the σ–S , S–S and σ–σ couplings.The obtained results show that the critical temperature, compensation temperatures and the Magnetocaloric Effect are strongly correlated to the parameters Js, Jσ and Jσ-s.
Keywords: Ferrimagnetic system; Monte Carlo simulation; Compensation Temperature; The Magnetocaloric Effect; Model Ising.

RISK-EVALUATION POSSIBILITIES CONCERNING IT-ACTIVITIES IN HOME-OFFICE

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ABSTRACT

History: The AI-based, automated risk analysis is a central topic of the interinstitutional and transdisciplinary-oriented MY-X research team (c.f. https://miau.my-x.hu/miau2009/index.php3?x=e0&string=risk). The focus of the own experiments is the optimized anti-discrimination or term-creation-oriented evaluation process based on stair-case function in frame of self-validating similarity analyses – because of their context-free characteristics.Background and benchmarks: Home office workers are likely to face more cyber risks compared to controlled networking and secured internet access in office. Talking about risks, it is unlimited possible based on naïve (not-optimized) ways. The publication will present a set of alternative techniques (like weighting, ranking, etc.). These rule-based, arbitrary parametrized risk-interpretation processes are intuitive and arbitrary at the same time. About self-validation, it can never be spoken, although the human intuition can unlimited be fine-tuned/matured. The not-optimized solutions can be seen as benchmarks concerning the AI-based approaches.Highlighted details: The risk potential concerning the IT-activities in home-office can be described with a lot of ABSTRACTion (c.f. Compliance Violations, Remote Access Vulnerabilities, Cyber Attacks, Data Breaches, Third-party Software Risks etc.). All these keywords are parts of the phenomenon “magic of words”, where the KNUTH-oriented definitions of these keywords are lacking in general. A definition is KNUTH-oriented, if the data about the keywords/phenomenon can be measured/logged and/or derived based on real observations. An observation is real, if a human expert is capable of making a MP4-movies about the manually realized steps – in order to automate as far as all these steps.The most challenging task is the collection of real or realistic raw data: the generation of quasi randomized OAMs (object-attribute-matrix-variations) can be managed based on Solver-techniques where a lot of restrictions (like maximum, minimum, median, modus, standard deviation, correlation (matrix), etc.) should be approached in form of an optimizing challenge. The realistic datasets should lead to such objects where the anti-discrimination principle is to validate for each generalized dataset – but never in case of a real random (c.f. Monte-Carlo-Method) dataset.
The alternative solutions of the risk-evaluation are compared to each other – with the same anti-discrimination modelling technique as the AI-based evaluation approach itself was created. The tool can be used by IT monitoring team for threat analysis and Management team to provide targeted trainings and preventive measures against cyber security threats.The results are trivial: the arbitrary techniques might not be seen as professional enough. The entire AI-based process can be automated (from the logging to the hermeneutical subsystem concerning the

interpretation of the visualized results. The most complex challenge is the interpretation of the whole combinatorial space of the potential results. Furthermore, cross verifying the results of the solver analysis with the results of threat and intrusion detection systems can help understand the validity both the systems.Future aspects: After closing the manual-driven testcases, the entire evaluation process will be automated in frame of a bachelor's degree/thesis and the software will be available to access as a web application.

Keywords: AI, anti-discrimination, optimization, automation, similarity analysis, Compliance Violations, Remote Access Vulnerabilities, Cyber Attacks, Data Breaches, Third-party Software Risks, Social Engineering, Shadow IT, etc.

THEMATIC ANALYSIS OF FARAH BASHIR'S MEMOIR 'RUMOURS OF SPRING: A GIRLHOOD IN KASHMIR'

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ABSTRACT
Farah Bashir's memoir, 'Rumours of Spring: A Girlhood in Kashmir,' offers a poignant exploration of themes that resonate deeply within the context of conflict-ridden Kashmir. Through a thematic analysis of the text, this study delves into the multifaceted experiences depicted by Bashir, focusing on key themes including *Violence* and *Conflict, Fear* and *Anxiety, Trauma* and *Loss*, and *Survival* and *Resilience*. The narrative vividly portrays the pervasive violence and conflict that engulfed Kashmir during the 1990s, with Bashir's personal anecdotes serving as a window into the harrowing realities faced by residents of the region. The relentless cycle of curfews, military presence, and militant activity creates an atmosphere of fear and anxiety, permeating every aspect of daily life. Central to Bashir's memoir is the theme of trauma and loss, as she navigates the devastating impact of loss and grief amidst the backdrop of ongoing conflict. The narrative unfolds against a backdrop of mourning and upheaval, with each chapter revealing the profound emotional toll exacted upon individuals and communities. Despite the overwhelming challenges, Bashir's memoir also illuminates themes of survival and resilience, portraying the indomitable spirit of Kashmiris who endure unimaginable hardships with courage and determination. Through acts of defiance, solidarity, and quiet resistance, the characters in Bashir's narrative embody the resilience of the human spirit in the face of adversity. In conclusion, 'Rumours of Spring' offers a nuanced exploration of the complex interplay between personal experience and broader socio-political realities in Kashmir. By delving into themes of violence, fear, trauma, loss, survival, and resilience, Bashir's memoir provides invaluable insights into the lived experiences of those navigating conflict and upheaval in the region.
Keywords: Anxiety, Conflict, Fear, Resilience, Survival, Trauma

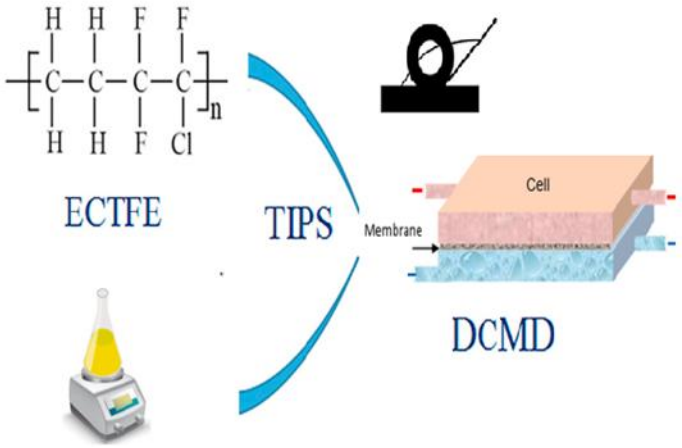
POLY (ethylene chlorotrifluoroethylene) (ectfe) MEMBRANES FOR DESALINATION USING MEMBRANE DISTILLATION

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ABSTRACT
Membrane distillation (MD) is considered an emerging technology for seawater desalination. The hydrophobic polymers commonly used for this process are polytetrafluoroethylene (PTFE), polyvinylidene fluoride (PVDF), and polypropylene (PP). An ideal membrane for MD should exhibit characteristics such as high liquid entry pressure, low fouling rate, high permeability, and excellent mechanical resistance. Therefore, in this work, we are interested in preparing a membrane using poly(ethylene chlorotrifluoroethylene) (ECTFE) via the TIPS method. ECTFE is a 1:1 alternating copolymer of ethylene and chlorotrifluoroethylene with the repeated unit -(CH2-CH2-CFCl-CF2-)n-, which offers excellent chemical stability, wear resistance, mechanical strength, thermal stability, and strong hydrophobicity. Our objective is to investigate the effects of ECTFE content on membrane properties, including morphology, pore size distribution, porosity, liquid entry pressure in water (LEPw), water contact angle(WCA), and mechanical properties. Subsequently, the prepared ECTFE membranes were tested for seawater desalination using direct contact membrane distillation (DCMD).



GREEN MARKETING AN ORIENTATION IN MARKETING WITH ECOLOGICAL TENDENCY AS A STRATEGIC RESPONSE TO ENVIRONMENTAL DYNAMICS

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ABSTRACT
Environmental concerns have become not only an important public issue, but also an important topic in academic research in the field of marketing as well. From many authors in the field of marketing derive the view that environmental issues should be a priority in doing business now and in the future. Choosing the right ecological marketing strategy begins with achieving the ecological behaviors of marketers. Through ecology and green marketing concepts, businesses will be able to do the right thing and be rewarded in the best way. Recent global developments in the field of environment and resource sustainability suggest and push businesses to think and act ecologically, in order to be sustainable and competitive in the market. Businesses with their approach at the same time encourage consumers to think and act green because only in this way we achieve a genuine ecological approach to their activities.As an alternative to finding a solution between environmental problems, business and consumption, it is necessary to intervene in relation to consumption and raising consumer awareness and here is presented green marketing or eco marketing, a term that is rarely encountered in literature in Albanian language. Seeing the need to discuss such an issue, we raise research objectives and questions to research exactly about green marketing and its application in Kosovo businesses. Through this paper we try to clarify and analyze the basic concept of green marketing, then elaborate issues related to the environment and consumption, consumer values, consumer awareness, and up to the research part where we have addressed and researched consumer interest in bio-products, and their attitudes towards green in general.We conclude that the change in the external environment definitely affects the change in the internal environment of the market itself and its participants, and thus changes the approach to ecological problems in the first place.
Keywords: green marketing, ecology, consumer, sustainable, environment.

ASSESSMENT OF AFLATOXIN B1 CONTAMINATION IN PEANUTS SOLD IN MARKETS ACROSS KOSOVO DURING WINTER 2024

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ABSTRACT
Aflatoxin B1 (AFB1) contamination in food commodities, particularly peanuts, poses a significant public health concern due to its carcinogenic properties and adverse health effects. This study aimed to assess the prevalence and levels of AFB1 contamination in peanuts, ready for consumption, available in markets across Kosovo during winter of 2024.A total of 107 peanut samples, mostly packaged, were collected from various markets in Kosovo during January and February of 2024 and analyzed for AFB1 contamination using Enzyme-Linked Immunosorbent Assay (ELISA). The results revealed a minimum AFB1 value of 0.025 µg/kg and a maximum value of 7.375 µg/kg, with a median of 0.475 µg/kg and a mean±std of 1.328±1.489 µg/kg. The maximum tolerable limit for aflatoxin B1 in peanuts, according to European Commission Regulation (EC) No 1881/2006 of 19 December 2006, is 2 µg/kg. Among all samples tested, 27.1% exceeded this threshold. The results indicate notable levels of AFB1 contamination in peanuts across Kosovo markets during winter 2024, surpassing the EU-regulated limit. This presents significant health concerns for consumers, emphasizing the necessity for enhanced storage and handling practices. Improved monitoring and regulatory measures are crucial to mitigate contamination and ensure food safety.The assessment underscores the immediate need for regulatory measures to address AFB1 contamination in peanuts available in Kosovo markets. Strengthening enforcement of storage and handling practices is vital to safeguard consumer health. Further research is necessary to identify contamination sources and implement effective mitigation strategies.
Keywords: Aflatoxin B1, Peanuts, Food contaminations, Food safety.

ANALYSIS OF AFLATOXIN B1 PRESENCE IN PEANUT BUTTER SOLD IN KOSOVO MARKETS

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ABSTRACT
The identification, analysis, and assessment of aflatoxin B1 (AFB1) in foodstuffs, particularly peanut butter, evoke significant concerns about public health due to its carcinogenic properties. AFB1, a mycotoxin produced by certain molds, including *Aspergillus flavus* and *Aspergillus parasiticus*, poses serious health risks when consumed, including carcinogenic effects and adverse health outcomes. Given its potential to contaminate various food products, including peanut butter, understanding the prevalence and concentrations of AFB1 is crucial for ensuring food safety and protecting consumer health. This study aimed to scrutinize the prevalence and concentrations of AFB1 in imported peanut butter samples sourced from various markets across Kosovo during the winter of 2024. Nineteen distinct samples, representing diverse brands imported from European and USA sources, were procured and subjected to meticulous analysis using Enzyme-Linked Immunosorbent Assay (ELISA). The results revealed a minimum AFB1 value of 0.175 µg/kg and a maximum value of 4.925 µg/kg, with a median of 0.300 µg/kg and a mean±std of 0.851±1.264 µg/kg. The maximum tolerable limit for aflatoxin B1 in peanuts, according to European Commission Regulation (EC) No 1881/2006 of 19 December 2006, is 2 µg/kg. Among all samples tested, 10.5% exceeded this threshold.These findings highlight the importance of improving monitoring and regulatory measures to maintain the safety of peanut butter products. It's necessary to take action promptly to address AFB1 contamination and protect consumer health. Collaboration with international stakeholders is crucial for implementing effective strategies to reduce AFB1 levels in peanut butter, ensuring public health and food safety standards are maintained.
Keywords: Aflatoxin B1, Peanut butter, Food contaminations, Food safety.

THE MOTIVATION TO LEARN FROM UNIVERSITY STUDENTS ATHLETES

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ABSTRACT
The research intended to assess how engagement in sports activities can impact academic performance, taking into account factors such as training and competition hours. Additionally, efforts were made to identify the main factors that can positively or negatively influence academic performance and motivation to learn among these students, such as self-determination, time management, and institutional support. The main objective of this study was to investigate the relationship between sports activities and academic performance, as well as the motivation to learn among university student athletes. Sports participation has become increasingly popular among young individuals, and many of them balance their athletic careers with academic studies. However, questions still linger about how this dual commitment can influence academic performance and the learning process of these students. A structured questionnaire was used for data collection, involving 102 university student-athletes from the state of Paraíba. As a result, significant positive correlations were found for variables like the average of extrinsic and intrinsic motivation among the participants in the Paraíba University Games (JUPS) and the Brazilian University Games (JUBS). Conversely, significant negative correlations were observed between the average academic performance and variables such as weekly training time, competition time, and participation in the JUPs. Furthermore, during the content analysis of open-ended responses, three central thematic areas emerged: sports participation as a positive influence on determination and mental health; time, fatigue, and procrastination as the main challenges faced by university student-athletes, and institutional support as a potential strategy for a support network for this demographic. In conclusion, sports participation can enhance the motivation to learn for university student- athletes while potentially negatively affecting academic performance. It is crucial to establish partnerships between universities and student-athletes, including support programs and the involvement of educational psychologists to address academic needs, with a focus on the holistic development of this population.
Keywords: University student athletes; Academic performance; University games; Motivation

DEGRADATION OF AN EMERGENT ANTIBIOTIC USING SONO-FENTON PROCESS IN AQUEOUS MEDIA

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ABSTRACT
During the last decade, scientists have been more interested in the occurrence and fate of pharmaceutically active substances in the environment, such as antibiotics, anti-inflammatory drugs, anti-epileptics, blood lipid regulators, β -blockers, contrast media, and cytostatic agents. The conventional biological methods cannot be used for complete treatment of such pollutants, consequently newer technologies need to be developed to degrade bio refractory molecules into smaller molecules [1].Fortunately, advanced oxidation processes (AOPs) based on the generation and subsequent attack of hydroxyl (OH°) radicals are regarded as one of the most intriguing approaches for treating wastewater containing stable compounds. Besides, a combination of several (AOPs) has been discovered to be more efficient for wastewater treatment [2]. For instance, a combination of Fenton and acoustic cavitation (Sono-Fenton or US/Fenton) can boost the mineralization efficiency of organic compounds [3].This research is primarily focused on the degradation of a synthetic solution containing a troublesome antibiotic under Sono-Fenton, by the optimization of the effects of typical parameters such as ultrasonic power, time of irradiation, pH, initial concentration, temperature, aqueous matrices, mode of ultrasonication, horn immersion depth, and salt additions in addition to the effect of introducing Iron and hydrogen peroxide.The obtained results were encouraging, they reflect the enhancement of degradation under Sono-Fenton conditions. The efficiency of degradation was evaluated by the antibacterial activity tests, ion chromatography analysis. The obtained results will be presented and discussed.
keywords: Antibiotic, Fenton, Pollution, Ultrasound

A DIALOGIC APPROACH TO STATISTICAL LITERACY

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ABSTRACT
In this paper, the aim is to revisit Gal's (2002, 2019) statistical literacy model from a dialogic approach. This is a continuation of the discussion developed by Magalhães & Nóbrega (2023), in which the two axes constitutive of Gal's model is redesigned into two axes related by dialogic relations. According to Gal (2002, 2019), statistical literacy emerges from the articulation of knowledge elements and dispositional elements. Magalhães & Nóbrega (2023) re-elaborated it by distinguishing two types of knowledge elements interwoven by the dispositional elements. From this point of view, the former are distributed into a theoretical dimension and an experiential dimension, and those dimensions are interrelated by the latter, considered as dialogic relations. In this paper, it is proposed to detail these dialogic relations by relating beliefs to its cognitive bases, attitudes to emotions and the critical stance to the ethical responsibility inherent to social acts. Although the research is in its initial stages, the dialogic statistical literacy model seems to be a promising device for describing and analyzing statistical literacy as a social accomplishment.
KEYWORDS: Beliefs. Emotions. Ethical responsibility. Statistical literacy. Dialogism.

CONTEMPORARY SCIENTIFIC EXPLORATION ON REDUCING CARBON FOOTPRINTS: AN STUDY OF ASPHALT MIXTURES ENHANCED WITH RECYCLED GLASS AND WASTE TIRE RUBBER

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ABSTRACT
This paper presents a comprehensive study focusing on the environmental and performance implications of incorporating recycled glass and crumb rubber into asphalt mixtures. In recent years, the focus in asphalt mixture manufacturing has expanded beyond performance to include a critical assessment of carbon emissions, especially when integrating recycled materials. In response, this research explores the dual potential of recycled materials, aiming to unveil both performance advantages and environmental benefits when utilized in asphalt mixtures. The methodology of this study comprises two critical components: a dynamic modulus test and a Life Cycle Assessment (LCA). The dynamic modulus test evaluates the mechanical performance of asphalt mixtures containing recycled glass and crumb rubber, comparing these to conventional asphalt. This assessment provides insights into the resilience, durability, and overall quality of the recycled material-infused asphalt. Concurrently, the LCA quantitatively measures the carbon emissions associated with the material, transportation and manufacturing of these recycled materials in asphalt mixtures. This dual approach enables a holistic evaluation of both the environmental and performance benefits. The dynamic modulus test results reveal that asphalt mixtures with crumb rubber exhibit improved performance, while those with recycled glass demonstrate comparative performance to conventional mixtures. However, both recycled material mixtures exhibit lower carbon emissions than traditional asphalt. The research findings could be instrumental in driving more sustainable practices in the construction industry. By showcasing the effectiveness and reduced carbon footprint of asphalt mixtures with recycled content, the study advocates for a paradigm shift in road construction material usage. This approach is in line with the growing global initiative to net zero emission of road construction and is closely aligned with the overarching goal of fostering a sustainable circular economy.
Keywords: Life cycle assessment, dynamic modulus, rubber modified asphalt pavement, glass asphalt pavement.

GARBAGE AND WASTE COLLECTOR MACHINE FOR ROAD AND SEASHORE AREA

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ABSTRACT
This paper proposes a manual mechanical garbage and waste collector designed specifically for cleaning up from both roads and seashores. The machine is intended to address the challenges of waste management in both urban and coastal environments where conventional methods may be inadequate. The design incorporates simple mechanical components to enable easy operation and maintenance by users with minimal training. The machine's versatility allows it to effectively collect various types of waste, including plastic, and contributing to cleaner and safer environments. Through this innovative approach, the manual mechanical garbage and waste collector offer a cost-effective and sustainable solution to tackle pollution and maintain cleanliness in diverse settings.
Keywords: Garbage And Waste Collector Machıne

THERMAL MORPHOLOGICAL AND FRACTURE-BASED EVALUATION OF ZRO_2- MODIFIED ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

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ABSTRACT
Incorporating nanofiller elements into biomaterials is crucial for the significant advancements in the 21st century, which are aimed at addressing the various demands of the medical industry. The sectors of biomaterials mostly orthopaedics and dentistry have shown great interest in Ultra-High Molecular Weight Polyethylene (UHMWPE) composites because of their enhanced thermal and mechanical capabilities. This paper discusses developing a new thermoplastic hybrid composite containing Zirconia (ZrO_2) nanoparticles. The composite material has been specifically engineered for use in biomaterial applications that experience prolonged loading conditions. The experimental procedure includes the production of test specimens with different proportions of ZrO_2 content (0, 5, and 10 wt.%) using liquid-phase ultrasonication, followed by hot press moulding. The developed UHMWPE nanocomposite samples were subjected to Thermogravimetric Analysis (TGA) to investigate their properties and behaviour. Furthermore, an evaluation of the performance of the developed samples was conducted using Energy Dispersive X-ray Analysis (EDX) and Scanning Electron Microscopy (SEM). The examination of the fracture morphology of the tensile samples was conducted utilizing a SEM micrograph. The experimental findings have revealed the enhanced properties exhibited by the ZrO_2/UHMWPE nanocomposite compared to the pristine UHMWPE material. Various prosthetics, joint replacements, and Artificial Bio-Bearing (ABB) components are among the many potentials uses for the ZrO_2-modified UHMWPE composite. This study's experimental evidence supports the recommendation of the 5wt.% ZrO_2/UHMWPE nanocomposite for use in the stated medical applications.
Keywords: Nanocomposite; ZrO_2; Tensile; TGA; UHMWPE.

AN ENVIRONMENTAL APPROACH EXPLOITING FOOD-AGRO WASTE AS A CORROSION INHIBITOR FOR LOW CARBON STEEL IN AGGRESSIVE CORROSIVE MEDIUM

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ABSTRACT
With the pressing need to address the negative impacts of metal corrosion on the environment and economy, there's a strong focus on finding new ways to prevent corrosion in both everyday and industrial settings. Recent efforts have been aimed at creating corrosion inhibitors that are good for the environment and can protect against corrosion for a long time. This reflects a growing awareness of the importance of protecting the environment and conserving resources. Instead of using traditional inhibitors made from artificial chemicals, there's now a growing interest in using natural alternatives.This study looks into how effective a natural corrosion inhibitor, made from waste from oil press cake extraction, is at stopping corrosion on carbon steel in harsh acidic conditions. We thoroughly examined the chemical makeup of the natural extract and tested how well it works at different concentrations and temperatures using methods like Electrochemical Impedance Spectroscopy (EIS) and Potentiodynamic Polarization (PDP). We also used scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDX) to study the surface of the carbon steel and confirm our findings from the electrochemical analysis.
Keywords: Environment, Corrosion inhibition, Plant waste valorization.

APOLIPOPROTEIN E GENOTYPING IN THE CONTEXT OF SARS-COV-2 VACCINE OUTCOME

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Recent findings show that the Apolipoprotein E (APOE) gene could be associated with the SARS-CoV-2 vaccination response. APOE has three different alleles (E2, E3, and E4) and is essential for lipid and cholesterol metabolism. As regards the four alleles and their association with SARS-CoV-2 vaccine outcome, the literature is inconsistent even though some evidence suggests that the APOE4 allele is associated with a poor immune response to SARS-CoV-2 vaccinations.The present focuses on the association between the APOE genotype and the antibody response after SARS-CoV-2 vaccination. We performed APOE genotyping and observed if there is a correlation between APOE genotype and humoral response, specifically by measuring the different levels of antibody production (the serological IgG anti-spike titers) following SARS-CoV-2 vaccination (3rd dose and 4th dose). A cohort of 37 healthcare workers was enrolled for this project, and a blood sample was collected per each. After performing the DNA extraction from whole blood and quantification, we performed the APOE genotyping using an allele-specific PCR approach (ASPCR). Finally, the genotyping results were studied about the level of anti-Spike IgG (measured in collaboration with Negrar) to observe if any specific allele such as E2, E3, or E4 has any correlation with high or low immune response. We analyzed the whole cohort of HCW and case-control. Specimens consisted of whole blood, either coagulated or non-coagulated and the first step was to optimize a protocol to successfully extract DNA. The extraction of DNA from the clotted blood was much harder. This is related to the relatively poor DNA yields and quality recovered and the more complex sampling before DNA extraction. Whereas DNA extraction from blood treated with an anti-coagulant was more productive. We then proceeded to the APOE genotyping using ASPCR and the touch-down protocols to increase the specificity of ASPCR. Overall, we managed to obtain sequence from all the patients, with n=2 APOE2, n=33 APOE3, and n=6 APOE4. The six patients with the APOE4 genotype showed antibody response in the range of the population.In conclusion, in the present work, we obtained an optimized protocol to define the APOE genotype in DNA extracted from whole blood using the allele-specific PCR through a touchdown approach. Additionally, we can say that the APOE4 allele may be present also in patients with high immune response, and it is not always linked to low antibody production. This result is in line with previous work done in a Spanish cohort showing that this specific allele may not be related to poor immunization. We confirm that the APOE3 allele is the most frequent in the whole studied population as it was proven before in larger groups. The APOE2 was less present than both other alleles, as it was published even in previous papers.The future prospective of this project is to see if the APOE4 allele is a predictive marker of low immune response in longer follow-ups following the vaccination.

Keywords: SARS-CoV-2, vaccine, DNA

HOMOGENEITY ANALYSIS FOR SUSTAINABLE REGIONS – CASE STUDY: MEZŐFÖLD

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ABSTRACT

History: The objective evaluation, the AI-based term-creatin in case of ABSTRACT phenomena is a relevant part of the research activities of the MY-X research team (c.f. https://miau.my-x.hu/miau2009/index.php3?x=e0&string=homogeneity.of.c). The GPS (general problem solver-oriented) AI does need the capability of the handling the terms of "Good<Better<Best" and also the derivation of arbitrary ABSTRACTions (terms) based on measurable variables. The human experts talk about relatively homogeneous/sustainable regions since ever (c.f. Mezőföld). The same question is interpretable for groups of human individuals (e.g. teams in sport and/or in enterprises/institutions). The subjective feelings about group/team-homogeneity should be supported through AI-solutions, where (here and now) groups of settlements will be analysed in order to derive which settlement-constellation can be defined as the most sustainable group – let alone in time-series-view.Background and benchmarks: The observed region (Mezőföld) has 37 settlements having statistical data for 4 decades (1992-2002-2012-2022). 15 settlements can be interpreted as a kind of determining settlement concerning the form of the mapped polygon of Mezőföld. The Hungarian Statistical Office (KSH) has an online statistical service called TEIR. The regional statistics deliver data for relatively few phenomena concerning 4 decades: e.g. Housing stock (pcs) Children enrolled in kindergarten (person) Places to perform tasks in kindergarten (person) Kindergarten places (person) Groups of children in kindergarten (person) Kindergarten teachers (person) Divorces (cases) Internal emigration (permanent and temporary together) (person) Domestic emigration (permanent and temporary together) (person) Infant mortality (died under 1 year) (person) Live births (person) Deaths (person) Marriages (case).Highlighted details: The mathematical challenge is trivial: How the arbitrary dimensions (see 13 statistical variables/descriptors) can be aggregated to a kind of homogeneity index in an optimized way? The antidiscriminative optimization makes possible to derive the expected index values for different objects. Objects are the entire group of the 37 settlements (O1) and each constellation (O2-O16) where always one (i) of the 15 edge-

settlements will be excluded from the calculations of the standard deviations (see group36_i). The lower is the standard deviation concerning each of the 13 attributes the higher is the aggregated homogeneity. The hypothesis is: can we evaluate each object with the same homogeneity index or not?The results are interesting: The homogeneity index for the entire group of the 37 settlements is the highest one. Each reduced group is less sustainable. This is acceptable because the standard deviation of smaller or wider groups can be arbitrary high/low compared to each other. The results are: the most sensitive settlements are the middle voluminous ones (like Dunaföldvár > Enying > Tamási based on the average risks and Paks > Dunaújváros based on the higher standard deviations concerning the time-series values. Parallel: the most stable year is 1992. The less stable year is 2012 (based both on risk averages and standard deviations). The most sensitive settlement is Fadd (1992), Dunaföldvár/Paks (2002), Enying (2012, 2022). All these results belong to the calculation where the standard deviation for the group of 37 settlement was modified (36/37%) compared to the groups with 36 settlements.Future aspects: After closing the manual-driven test-cases, the entire evaluation process can be automated e.g. in frame of development task for a bachelor's degree.
Keywords: AI, anti-discrimination, optimization, automation, similarity analysis, group building

AUTOMATIC IDENTIFICATION OF BOVINE MASTITIS USING SEQUENTIAL TRANSFER LEARNING WITH BAYESIAN OPTIMIZATION

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ABSTRACT: Mastitis is a disease that is considered an obstacle in dairy farming. Some methods of diagnosing mastitis have been used effectively over the years, but with an associated relative cost that reduces the producer profit. In this context, this sector needs tools that offer early, safe, non-invasive diagnosis and that direct the producer to apply resources to confirm the clinical picture, minimizing the cost of monitoring the herd. This study was carried out with the purpose of developing a predictive methodology based on sequential knowledge transfer for the automatic detection of bovine subclinical mastitis by means of computer vision. The image bank used in the research was composed of 165 images of 360 x 360 pixels, referring to the database of 55 animals previously diagnosed with subclinical mastitis and healthy. The images used in the sequential learning transfer were MammoTherm (detection of breast cancer in women). The best network performance was that of the optimized model, which achieved 92.1% accuracy, compared to the model with manual search (86.1%). The proposed predictive methodologies based on knowledge transfer for the automatic detection of subclinical bovine mastitis correctly classified the images, contributing significantly to the automatic detection of healthy animals and those diagnosed with subclinical mastitis from thermal images of the udder of dairy cows.
Keywords: image analysis; dairy cattle; convolutional neural network; infrared thermography

CHAOS SYNCHRONIZATION FOR ENHANCED CRYPTOGRAPHIC PROTOCOLS IN OPTICAL COMMUNICATION SYSTEMS

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ABSTRACT
Contemporary cryptography relies extensively on synchronization protocols embedded within communication frameworks to ensure the secure transmission and reception of encrypted information. These protocols play a pivotal role in facilitating the coherent retrieval of data by intended recipients. Within the realm of optical communications, the erbium-doped fiber laser (EDFL) stands out as a notable example, exhibiting a transition from periodic to chaotic signal behavior under the influence of external forces. These intricate dynamical phenomena hold profound implications for cryptographic applications. In optical communication systems, comprehending the inherent synchronization phenomenon in chaos presents an avenue for enhancing security protocols. In this study, we delve into the complexities associated with achieving identical synchronization within chaotic EDFL systems through the application of optical delay perturbations. Through a comprehensive investigation into the effects of these perturbations on synchronization dynamics, our research contributes to a deeper understanding of cryptographic mechanisms within optical communication systems. By shedding light on the fundamental principles governing chaotic behavior in optical systems, our findings also offer valuable insights into leveraging chaotic synchronization to fortify cryptographic protocols.
Keywords: Cryptography, Fiber Lasers, Chaotic Synchronization, Delay-Differential Equations.

THE RELATIONSHIP BETWEEN PERCEIVED SUPERVISOR SUPPORT, EMPLOYEE FELT OBLIGATION, AND INNOVATIVE BEHAVIOR IN ORGANIZATIONS

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ABSTRACT
This research aims to determine the relationship between perceived supervisor support, employee felt obligation, and innovative behavior in organizations. Specifically, it seeks to investigate the effects of perceived supervisor support on employee felt reciprocal obligation and employee felt role obligation. The second aim is to investigate the effects of employee felt role obligation and employee felt reciprocal obligation on innovative behavior.The study combines quantitative and qualitative research methods to evaluate the measurement scales and test the theoretical model. A sample size of 520 participants was collected for analysis. The data was processed using various statistical techniques, including Cronbach's alpha analysis, confirmatory factor analysis (CFA), and structural equation modeling (SEM).The results show that perceived supervisor support has a positive impact on two factors: employee felt role obligation and employee felt reciprocal obligation. Furthermore, both of these factors positively influence on innovative behavior. Based on the research findings, the study provides recommendations and policy implications for organizational management to enhance innovation activities and foster a culture of innovation within the organization.
Keywords: Employee felt obligation , innovative behavior, employee felt role obligation, employee felt reciprocal obligation, perceived supervisor support.

PRICE-PERFORMANCE ANALYSIS FOR SERVER PROCUREMENT

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ABSTRACT

History: The AI-based, automated price-performance ratio analysis is a central topic of the interinstitutional and transdisciplinary-oriented MY-X research team (c.f. https://miau.my-x.hu/miau2009/index.php3?x=e0&string=price). The focus of the own experiments is the optimized anti-discrimination or term-creation-oriented evaluation process based on stair-case function in frame of self-validating similarity analyses – because of their context-free characteristics.Background and benchmarks: The direct goal of the analysis is to present a manual modelling that facilitates a purchase decision, in which we derive the price-performance of large company servers (objects) in an optimized way, following the Knuth principle (cf. science/knowledge is what can be transcribed into source code), where the market is functioning in a rational way and set seemingly equilibrium-oriented prices. These prices have however a kind of sensitivity interval. An equilibrium-oriented price can have a position near to the bottom or the top of the sensitivity interval. This position can be derived based on a stepwise technique for each server. This stepwise technique delivers new attributes for the price-performance-analysis, where each equilibrium price seems to have the same advantages. The antidiscriminative optimization delivers the real ranking of the servers.The indirect goal is twofold: on the one hand, to prepare for the thesis that requires quality text creation, and on the other hand, to pave the way (for anyone) towards automation with the manual foundation.Nowadays, IT procurement and public procurement are present in almost every company and institution, not to mention that we also buy products of this kind as individuals (e.g. notebooks, motherboards, routers, processors, etc.), but it is certain that we never make an objective decision - despite the simplicity of its methodology, it is not part of public education (yet). Evolutionarily, we tend to make decisions based on emotions or to listen to persuasive marketing techniques, and in such cases a subjective decision is made in every case, because there is no other way to make it. To avoid this, I will use two modelling methods to show how we can make decisions more efficiently/objectively. I will work with real data I chose a specific type from one of Dell's enterprise server families for this purpose.The result: With this optimalized and validated solution, the right decision can be made to buy servers. In nowadays, it is getting more and more important to make right decisions and “spend the money well”, especially in companies, because they are spending a huge amount of money for general procurement. Also, what is not needed, should not buy it, so in this case money can be saved. This modelling is suitable for every procurement, when we are searching for the right item

(object) and we can write on some features of it (attribution).Future aspects: After closing simplier manual modelling cases, a more complex information system designing case will be analyzed and some of the base processes will be half-automated (datasheet converting, ranking, and uploading) in frame of a bachelor's degree/thesis a software will be available to access as a standalone application.

Keywords: price-performance, server, DELL, model, buying, decision, OAM, AI, anti-discrimination, optimization, automation, similarity analysis, COCO STEP-IX process

ARSENIC TREATMENTS ON TRITICUM DURUM MODIFIES IONOME PROFILES

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ABSTRACT
Mineral elements and trace elements found in all organisms can be viewed as a system otherwise ionome. All plants change the ionome in response to physiological stimuli, developmental state, and genetic modification. Arsenic is highly toxic in its inorganic form and is present in contaminated water and soil in several countries. Research aims was to evaluate how ion uptake is modified in *Triticum durum* plants after arsenic treatments. Hydroponic experiments were conducted on *Triticum durum* to investigate on 15 days arsenic (5□M or 20 □M) effects to evaluate ionome profiles effects to evaluate ionome profiles linked and not linked to the treatments. Control plants were grown at the same time without arsenic. Heavy metals, trace elements and mineral elements distributions induced by treatments were revealed by ICP-MS. Results showed that applied treatments influence genotype growth evaluated by DW. Correlation studies carried out by comparing ionome profiles obtained for each arsenic treatment showed a positive correlation between arsenic and the exclusion of other elements compared to un-treated plants. A synergic action of *Triticum durum* plants to control arsenic homeostasis could be hypnotized.
Keywords: Triticum durum, arsenic treatments, ionome profiles, inductively coupled plasma-mass spectrometry.

IN-VITRO EFFICACY OF FUNGICIDES AGAINST DAMPING OFF OF TOMATO (*solanum lycopersicum* l.) CAUSED BY PYTHIUM APHANIDERMATUM (edson) FITZP

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ABSTARCT
Damping off, a prevalent disease in tomato cultivation, poses significant threats to yield and quality. *Pythium aphanidermatum*, a common causative agent, contributes to considerable economic losses worldwide. In this study, we assessed the in vitro efficacy of various fungicides against *P. aphanidermatum*, focusing on their potential in controlling damping off in tomato crops. Employing standard laboratory methods, we evaluated the inhibitory effects of selected fungicides on mycelial growth and spore germination of *P. aphanidermatum*. Our results demonstrate varying degrees of efficacy among the tested fungicides, with certain compounds exhibiting potent inhibitory effects against *P. aphanidermatum* growth and spore germination. These findings underscore the importance of selecting appropriate fungicides for effectively managing damping off in tomato cultivation and provide valuable insights for developing targeted disease management strategies.
Keywords: Tomato, Damping off, Pythium aphanidermatum, Fungicides

THE EFFECTS OF tDCS STIMULATION IN LEARNING A NEW SKLL

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ABSTRACT
Transcranial direct current stimulation (tDCS) is a non-invasive simulation form, which can be used to improve brain activity and cognitive function. However, the extent of enhancement may vary depending on factors such as gender and age. Despite the limited research on the effects of tDCS, existing studies suggest its potential to enhance focus during the learning of new skills, as demonstrated in our study on Sudoku.The research was concluded with a group of 20 participants (n=20), within a similar age range (19-22), with similar height (average 1.70 meters) and weight (average 63.5 kilograms). Each participant underwent five stimulation sessions lasting 10 minutes each, with a current intensity of 1000 mA. Additionally, a subset of participants (n=6) received sham stimulation, involving five sessions lasting 60 seconds each, during which they remained connected to the device for 10 minutes, even though the device remained inactive.During alternate sessions, participants were tasked with completing an easy-level Sudoku puzzle. Our results indicate that tDCS effectively enhances cognitive function for all participants (excluding those in the sham group), although with a subtle gender-based variation. Specifically, females demonstrated notable improvement over time compared to males. As a secondary assessment, we evaluated their microscopic skills, considering the motor function aspect of the stimulation. Notably, no significant gender-based differences were observed in this aspect.Even participants in the sham group displayed notable improvement over time, highlighting the efficacy of the placebo effect.
Keywords: Cognitive Enhancement, Electrical Stimulation

PUBLIC SPENDING EFFICIENCY FROM THE LENS OF EDUCATION EMPIRICAL EVIDENCES

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ABSTRACT
Considering the fact that education is a key factor not only for the economic growth and development, but also for consolidating the democracy, there is an increasing concern in many EU states that higher education systems are not efficiently organized. This concern was mainly related to the fact that many countries finance their higher education systems from public funds and, as states faced with increasing demands for their limited public resources, a growing pressure to improve resource allocation and utilization appeared. Considering the importance of education, in general, and of the tertiary education, in particular, the purpose of the present paper is to examine whether education expenditures are cost-efficient in the European Union states. In order to achieve our goal, we have used a DEA approach in which we had as inputs of the production process of higher education: the accessibility of the system, the availability of financial resources and the human resources, and as outputs: the employability of the graduates, the proportion of population that has attained tertiary education and the attractiveness of the systems. After conducting the analyses, we have identified three clusters, representing the different behaviours of the higher education systems: the first one - high public expenditure, high subsidies, the second one - low public expenditure, low subsidies and the third one - low public expenditure, high subsidies.
Keywords: public spending, efficiency, subsidies, education.

AMERICANS' OPINIONS OF ISRAEL AND THE STATE OF PALESTINE: A BRIEF OVERVIEW OF THE GALLUP'S WORLD AFFAIRS SURVEY

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ABSTRACT
Public opinion is one of the most important tools for creating and building effective public policy. It enables the monitoring and control of various processes in the development of public administration. In (liberal) democratic states, the involvement of public opinion in political/policy-making processes is enshrined at the legislative level. Numerous channels and mechanisms have been created for public opinion to influence public authorities: the institutions of direct democracy (elections and referendums), civil society (NGOs, movements, organisations, associations, etc.), mass media, the Internet, and public opinion polls. In this context, this conference paper aims to critically examine and provide insights into American public opinion on Israel and the State of Palestine, based on the results of the Gallup's World Affairs Survey. The paper highlights two findings from the Gallup's World Affairs Survey: (i) young people in the US aged 18-34 are more supportive of Palestine, while adults aged 35 and older are more sympathetic to Israel, and (ii) while Democrats are much more positive about Palestine, Republicans are overwhelmingly positive about Israel.
Keywords: Public opinion, the Gallup's World Affairs Survey, Americans, Israel, Palestine.

SUSTAINABLE TOURISM DEVELOPMENT IN THE PHU YEN - KHANH HOA - NINH THUAN REGION, VIETNAM

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ABSTRACT
This study focuses on the sustainable development of tourism in the Phu Yen - Khanh Hoa - Ninh Thuan region, Vietnam. The research emphasizes the assessment and analysis of factors influencing the connectivity among tourist destinations in the aforementioned area. Expert discussions and surveys of relevant stakeholders were employed as research methods. The results indicate that, in the tourism linkage of the Phu Yen - Khanh Hoa - Ninh Thuan region, special attention should be given to the following aspects:(i) Identification of linking factors: The study identifies critical factors influencing the level of connectivity among tourist destinations, including local culture, transportation infrastructure, and the diversity of entertainment activities. Additionally, the training of tourism professionals is identified as a crucial factor in fostering connectivity.(ii) Market and consumer analysis: The research conducts market analysis to understand the needs and desires of tourists regarding their travel experiences, aiming to propose suitable products and services.(iii) Sustainable approach strategy: The study proposes a sustainable development strategy, encompassing measures such as rigorous management, recycling, and environmental conservation education to ensure that tourism contributes positively to the local economic development without adversely affecting the environment.(iv) Regional collaboration: The research encourages close collaboration among localities in the region, creating a robust tourism network that leverages the attractiveness of each destination to attract tourists exploring the entire area.(v) Continuous feedback and evaluation: A proposed evaluation and monitoring system is suggested to measure the effectiveness of the strategy and promptly adapt to changes in market demand and environmental factors. This research proposes specific strategies and measures to promote the linked tourism model, enhancing both the tourism experience and the sustainable development of the local economy. The results of this study provide theoretical and practical foundations for tourism development in regions with similar potential.
Keywords: linkage, tourism

DEVELOPING A SMART TOURISM DESTINATION LINKED TO SUSTAINABLE MANAGEMENT IN THE PHU YEN, KHANH HOA, NINH THUAN REGION

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ABSTRACT
The Fourth Industrial Revolution has brought about an unexpected breakthrough, where information and images at tourist destinations can quickly connect and be shared anytime, anywhere. The development of smart tourism has become an unavoidable trend during the Fourth Industrial Revolution, with the strong integration of information technology into societal life. The concept of a smart tourism destination is a newly emerging idea, introducing a new approach to destination management. In Vietnam and the connected tourism regions of Phu Yen, Khanh Hoa, and Ninh Thuan, the adoption of the digital economy and the establishment of smart cities have laid the foundation for the development of smart tourism. The research objective is to build a smart tourism destination linked to the Phu Yen, Khanh Hoa, and Ninh Thuan regions, utilizing both qualitative and quantitative methods. The research content covers concepts related to smart tourism destinations, information technology and communication, smart tourists, and smart destination management. The research results demonstrate that establishing a smart tourism destination linked to the Phu Yen, Khanh Hoa, and Ninh Thuan regions is entirely feasible and offers numerous benefits. In applying qualitative methods, surveying the concepts related to smart tourism destinations has provided a clearer understanding of important factors in the development process. Simultaneously, the robust integration of information technology and communication has created a solid infrastructure to support information management and tourist interaction. The quantitative method has evaluated the performance of the smart tourism destination based on the participation of smart tourists. The results show high acceptance from tourists, while identifying crucial factors for the success of this model. Smart destination management has proven to be effective in optimizing the tourist experience and maintaining environmental balance. Consequently, the research proposes specific development directions to enhance the performance and sustainability of this model in practice.
Keywords: Smart tourism, information technology and communication, regional connectivity

THE IMPACT OF TALL RESIDENTIAL BUILDINGS ON CITIES

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ABSTRACT
Tall buildings as a new form of housing in contemporary growing cities can have many positive and negative effects on cities. Knowing these effects and controlling them can help improve the quality of cities. The expansion of urbanization in the contemporary era and as a result the role of tall buildings as housing has many important consequences both from an environmental point of view and from an economic and social point of view. Considering that housing is a complex phenomenon that requires local studies, knowing the impact of tall buildings helps solve problems such as housing and environmental, social, and economic problems. The research method is a comparative analysis between the impact of tall buildings and middle-rise buildings. This comparative analysis compares the results in two main climatic and social sectors. The methods used to study urban spaces can be divided into two general categories. The first category focuses on urban users' behavior, most of which are qualitative and usually observational and descriptive approaches. The second category is mostly simulation and computation modeling which examine the physical features such as surrounding walls, edges, and microclimate. In this research, the wind flow in the desired site was investigated based on different wind directions. In the continuation of the research, which is supposed to examine the shading and thermal conditions as well as the behavior of the users of these sites, we will try to answer the question if there is a relationship between these variables. And the height of buildings and what positive or negative effects the presence of people in the spaces around tall buildings have.
Keywords: tall buildings, residential buildings, climate condition, behavioral map

A SUSTAINABLE APPROACH EXPLOITING FOOD-AGRO WASTE AS A CORROSION SUPRESSOR FOR LOW CARBON STEEL IN MONOPROTIC CORROSIVE MEDIUM

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ABSTRACT
With the pressing need to address the negative impacts of metal corrosion on the environment and economy, there's a strong focus on finding new ways to prevent corrosion in both everyday and industrial settings. Recent efforts have been aimed at creating corrosion inhibitors that are good for the environment and can protect against corrosion for a long time. This reflects a growing awareness of the importance of protecting the environment and conserving resources. Instead of using traditional inhibitors made from artificial chemicals, there's now a growing interest in using natural alternatives (Ait EL Caid et al., 2024; Kellal et al., 2023).This study looks into how effective a natural corrosion inhibitor, made from waste from oil press cake extraction, is at stopping corrosion on carbon steel in harsh acidic conditions. We thoroughly examined the chemical makeup of the natural extract and tested how well it works at different concentrations and temperatures using methods like Electrochemical Impedance Spectroscopy (EIS) and Potentiodynamic Polarization (PDP). We also used scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDX) to study the surface of the carbon steel and confirm our findings from the electrochemical analysis.
Keywords: Environment, Corrosion inhibition, Plant waste valorization.

EVALUATION OF THE FOOD-RATIONALITY-TREND IN HUNGARY BASED ON FAO-DATA

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ABSTRACT

History: The AI-based, automated trend analysis is a central topic of the interinstitutional and transdisciplinary-oriented MY-X research team (c.f. https://miau.my-x.hu/miau2009/index.php3?x=e0&string=golden, https://miau.my-x.hu/miau2009/index.php3?x=e0&string=food). The focus of the own experiments is the optimized anti-discrimination or term-creation-oriented evaluation process based on stair-case function in frame of self-validating similarity analyses – because of their context-free characteristics. Background and benchmarks: Aggregation of parallel force fields (e.g. food-components) can be made seemingly in a trivial way: the gram/day/capita values might namely be added. But the equivalences between 1 unit alcohol and 1 unit wheat are not given in an objective way. On the other hand: there are food-elements (e.g. alcohol, sugar, etc.) where the literature gives signals concerning their disadvantages compared to other (more useful) products (like fruits, vegetables, etc.) Therefore, the objectivity/optimization-oriented aggregation of diverse inputs needs special mathematics.The FAO delivered for 1961-2013 the daily average consumption of different food-elements for all countries of the world. This made possible to derive a food-rationality-trend – as example for Hungary and Türkiye.Highlighted details: The case—study about Hungary needed the definition of advantageous and disadvantageous food-element. The aggregation was created in form of an anti-discriminative optimization, where the hypothesis was: can we evaluate the rationality of the food-consumption for each year in case of a given country as the same or not?The hypothesis has been proved based on a lot of intuitive/not-optimized techniques and with the optimized antidiscriminative modelling tool where the analyses need in general more than one run if the number of the food-components (attributes) are more than the number of the years (objects). This filtering technique makes possible to concentrate on the relevant attributes.The optimized solution could also be validated based on the symmetry of the staircase functions.The results (HU): The food-rationality-trend for Hungary from 1961 ca. to 2008 (ca. to the economical crisis) is increasing and later decreasing. The first observed period (ca. till the change of the political system) is relative stable, but the last period shows more and more relevant changes in the rationality index year by year.The results (TR): The food-rationality-trend for Türkiye from 1961 ca. to 1987 is decreasing and later increasing. The first observed period (1979) is relative

stable, but the last period shows more and more relevant changes in the rationality index year by year.Future aspects: After closing the manual-driven test-cases, the entire evaluation process will be automated in frame of a bachelor's degree/thesis and the software will be available to access as a web application.

Keywords: AI, anti-discrimination, optimization, automation, similarity analysis, food statistics, national average, food rationality, food consumption trends, nutritional patterns, sustainable diets, food security, dietary habits

ARTIFICIAL INTELLIGENCE-BASED SOLUTIONS IN SMALL AND MEDIUM SIZE BUSINESSES – HISTORY, DEFINITION AND APPLICATION OF THE TECHNOLOGY

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ABSTRACT
The research focuses on describing and explaining a new technology that is based on applying Artificial Intelligence (AI) in the daily life of small and medium size companies. The application of AI technology also fosters digital transformation in the business world. An AI based solution may be applied in various industries from manufacturing industry to medical industry. The object of applying AI based solutions may fasten and simplify business processes.The AI technology may be seen as a disrupting technology that also fosters the digital transformation of companies. It is important to understand how this technology may be applied in various industries, therefore, several examples were collected in the research work. The main technological features of AI are also examined. The different forms and levels of applying AI are also presented. In addition, it is examined whether a new AI based solution may be created for an SME to develop the performance of the organization. Companies should understand this technology and review whether this technology may help developing its products, its service or even support its decision-making system by developing AI based solutions on their own. The paper explains the history, main features and application fields of this technology. Firstly, the main objects, elements and methods of this technology are discussed. Furthermore, the current and possible future fields of application are also reviewed and presented. The mainstream opinion of the topic is also synthetized and presented.
Keywords:artificial intelligence, digital transformation, manufacturing industry, medical industry, small and medium size companies

COMPARATIVE ANALYSIS OF THE GDP OF GERMANY AND KAZAKHSTAN: APPROACHES TO CONSIDERING THEIR ECONOMIC DEVELOPMENT AND INDUSTRY.

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ABSTRACT
This article provides a comparative analysis of the GDP of Germany and Kazakhstan in order to identify similar and different aspects of their economic development. The study is based on the analysis of statistical data, including GDP per capita, the structure of the economy, and other economic indicators. As a result of the study, key differences in the structure of the economies of both countries were identified, related to the characteristics of the industrial base and the level of industrialization. The authors also analyze the factors that determine the development of each country's economy, such as investment, innovation and resource base. The presented results can be useful for formulating development strategies and economic planning for both Germany and Kazakhstan, as well as for researchers interested in comparative analysis of economic models of different countries.
Keywords: comparative analysis, GDP, Germany, Kazakhstan, economic development, statistical data, GDP per capita, industrial base, industrialization, Investment, innovation, resource base, development strategies, economic planning, economic structures, growth patterns, purchasing power parity.

ANALYSIS ON THE EFFECT OF DIGITALIZATION OF HIGHER EDUCATION ON THE LABOR MARKET IN KAZAKHSTAN

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ABSTRACT
The academic community throughout the world has been interested in the topic of digitalization of education because of the unparalleled opportunities that technology presents to record digital footprints of today's students—who, as "digital natives," are engaged in technology-rich learning environments. This article aims to explore and describe both economic and social factors in the digitalization process. There is a limited number of works by Kazakhstani authors on this topic. The hypothesis of this study is the assumption that there is a close relationship between the digital development of higher education institutions and the parameters of unemployment and employment. Part of the study was conducted by means of a questionnaire. The authors identified the main range of issues that concern students in connection with the introduction of elements of digitalization in the educational process. Additionally, in order to confirm the hypothesis, a regression model of the relationship between the development of digital technologies in universities and the development indicator of gross domestic product, as well as in relation to the number of unemployed in the context of available education was built. Having examined the economic interests of developed and developing countries, the authors in their concluding arguments suggest that the information obtained is extremely valuable for conducting additional research on the learning environment of students, as well as for implementing the necessary changes aimed at raising the standards of educational services.
Keywords: digitalization, regression analysis, correlational matrix, employment, economic growth, unemployment

STUDY OF EXTRA VIRGIN OLIVE OILS: EFFECTS OF STORAGE AT DIFFERENT CONDITIONS AND ITS RELATIONSHIP WITH THE QUALITY LOSSES OF THESE OILS

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ABSTRACT
Consumer awareness is increasingly developed, and to meet the requirements of the international market, the Moroccan product must maintain its social and economic value and acquire competitive analytical and taste qualities allowing it to cross customs barriers while respecting the standards. of each destination.The orientations of the Moroccan agricultural policy, in particular the "Green Generation 2020-2030" Plan which consolidated a set of achievements of the Green Morocco Plan, have enabled the achievement of remarkable results in terms of growth and sustainability of the olive sector, through the development, promotion and marketing of extra virgin olive oils.The study is carried out on a series of eighteen samples of extra virgin olive oils from different regions of Morocco which were analyzed namely: physicochemical, bioactive parameters (free acidity, peroxide index, UV extinction specific, total content of phenols, chlorophyll, content of carotenoids, tocopherols and percentage of pyropheophytin A during eighteen months of storage at different temperatures (from 25°C to 45°C). The results obtained concerning different determinations: free acidity, peroxide index, specific UV extinction, total phenol content, chlorophyll, carotenoid content, tocopherols do not have a big difference than those of PPP which has a rate of evolution under normal storage conditions (average increase of 20 %).
Keywords: Green Generation 2020-2030

EXPERENTAL ANALYSIS ON THE EFFECT OF CBR RESULTS FOR FLY ASH PURIFIED CLAYEY SOIL MATERIALS

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ABSTRACT
Clayey soil having low shear strength and high compressibility cannot be used for sub grade as it's CBR value will not be in permissible standard. So it's needed to bemodified when required to use for sub grade under pavements. To modify, stabilizationor ground modification technique is required. In this regard we are making an attempt to modify the properties feasible to be used as sub grade material. Here we are using Fly ash as admixture to stabilize and improve the properties. Many attempts were madeusing fly ash, here we are attempting an study of fly ash stabilization under curing period as the fly ash is being used as an substitute of cement in concrete which gains strength with curing.
Keywords: Clayey soil; Compressibility; Pavements: Ground modifications; Fly ash; Cement; Concrete: Curing

ENHANCING TITANIUM OXIDE PHOTOCATALYSIS AND ADSORPTION FOR WASTEWATER TREATMENT BY HYBRIDIZATION WİTH CHITOSAN BIOPOLYMER

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ABSTRACT
Methyl orange, a prevalent synthetic dye in wastewater, harms aquatic life and human health. To combat this, we propose an advanced oxidation process that combines adsorption and photocatalysis. Although photocatalysis faces limitations like rapid charge recombination and inefficient use of visible light with unsuitable TiO2, it remains promising when using mesoporous or anatase TiO2. In our study, we enhance TiO2 by coating it with Chitosan for better adsorption. Additionally, Cs-TiO2, supported by glass plates, aids separation. Our objective is to synthesize an efficient TiO2 photocatalysis system with promising adsorption and photocatalytic activities. We'll test its efficacy using a simulated MO solution under UV-light.
Keywrods: Nanoparticle; Hybrid; Photoactive; Ultraviolet

APPLICATIONS OF NATURAL ZEOLITE IN VARIOUS FIELDS: FOCUS ON MOROCCAN NATURAL ZEOLITE IN WASTEWATER TREATMENT AND BUILDING BRICKS

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ABSTRACT:
Zeolites, naturally occurring aluminosilicate minerals with unique structural properties, have found diverse applications across numerous fields due to their adsorption, ion exchange, and catalytic properties. Natural Zeolite, finds applications in various industries worldwide. It is utilized in water purification processes to remove contaminants and improve water quality. Additionally, zeolite is employed in agriculture as a soil conditioner and nutrient enhancer, promoting healthier plant growth. In construction, zeolite is incorporated into building materials for its thermal insulation properties and moisture regulation capabilities. Moreover, zeolite's adsorption and ion exchange properties make it valuable in environmental remediation efforts, aiding in the removal of pollutants from soil and water systems.The aim of this work is to provide an overview of the significance of zeolite and its diverse uses in different fields, with a particular focus on the utilization of Moroccan zeolite in wastewater treatment to eliminate heavy metals and dyes by adsorption and building bricks with the use of polluted zeolite in building brick construction.
Keywords: natural zeolite, wastewater, adsorption, bricks.

EXISTING METHODS TO COMPUTE THE CONTRIBUTION OF SHORT-CIRCUIT CURRENT FROM INVERTER-INTERFACED GENERATION (IIG) TO THE SYCHRONOUS GRID

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ABSTRACT
When performing ultra-low-cost translation, the biggest problem is finding a translator (or rather a group of them) most suitable for the task. Firstly, they must be fluent in two languages (source and target), and secondly, they must know the specifics of the translation topic. Practice shows that the situation is different for the latter. It is always worth remembering that translating an article or book is a kind of "rewriting".After all, there will be a different context, a different vocabulary, and most importantly, a completely different recipient. It is absolutely clear that ordering a translation from a professional translator, from a certain field specialist with a good knowledge of the English language, or simply from a mature person with a good knowledge of the English language is not an ultra-budget solution. Schoolchildren and students remain.According to Article 188 of the Labor Code of Ukraine, it determines the age at which a child can become a full member of the work team: persons who have reached the age of 16 are allowed to work without any limitations. In Ukraine, unfortunately, not all schools have high enough standards for teaching English. That is, this person must be a student in a special English class or a special English school and study only with excellent grades. Also suitable are students of non-linguistic specialties who have a fairly high level of English proficiency and, of course, students of the departments of foreign philology and translation from English. However, such performers are definitely poorly versed in any specific subject matter of the original. For this purpose, a senior or chief translator is needed; he usually collects fragments of work distributed to less qualified performers, deeply edits them and collects from them the highest possible quality single text of the translation project. The main translator may not be a professional, but he must understand the subject matter of the translation and have a significantly higher level of English proficiency than other performers.This approach to translation significantly speeds up the translation process and significantly reduces its cost compared to translations from translation agencies and other professionals. Translations of this type are well suited for general translation cases. Translation of texts that are not specialized. Therefore, they do not involve complexity or technical or terminological difficulties. However, all types of text must be translated according to the needs of the client or end user. The texts are aimed at a non-specialized audience, so the language should be clear and natural, moving away from technical details. Specialized texts translated by this method are unlikely to be of high quality and will require additional in-depth editing. Thus, we see that using the example of Ukrainian realities, translation can be made as cheap as possible, but such a translation will only be suitable for an extremely limited number of purposes. If the customer needs to convey only the common meaning of the text without going into details and their explanation, then an ultra-low-cost translation of the text may be a good solution.
Keywords: English translation, amateur translation, translation editing, senior translator.

EXISTING METHODS TO COMPUTE THE CONTRIBUTION OF SHORT-CIRCUIT CURRENT FROM INVERTER-INTERFACED GENERATION (IIG) TO THE SYNCHRONOUS GRID

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ABSTRACT
This article describes the existing methods to compute the contribution of short-circuit current from inverter-interfaced generation (IIG) to the synchronous grid short circuit. A group of described methods is based on phasor analysis and they are supported by international standards (IEC and ANSI/IEEE) as well as grid codes. Another group of methods is based on time-domain solution of an inverter model in the correspondent grid, and a more detailed model of the control of the inverter is necessary in these cases. The description of the existing methods is complemented with the solution of a case taken as an example, using the standard-based methods and one time-domain solution, solved with Matlab/Simulink software, in order to compare the results.
Keywords: methods to compute short-circuit currents; inverter-interfaced generation, grid codes, IEC and ANSI standardized methods.

BELARUSIAN HISTORICAL ANNIVERSARIES OF 2023 OF EVENTS FROM THE ERA OF THE GRAND DUCHY OF LITHUANIA (mid-13th – 18th centuries)

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ABSTRACT
The history of the Grand Duchy of Lithuania (middle of the 13th–18th centuries), of which Belarus was a part, is receding further into the past. A tool for preserving the memory of that era is commemoration. Public acts of "remembering" and rethinking significant events of the past in a modern context are the celebration of their anniversaries. The year 2023 is rich in round dates for events 200–800 years ago. Among them are anniversaries of founding of cities or their first mention in sources: 700 years of the capital of the Grand Duchy of Lithuania Vilno, 700 years of the city of Lida (both were founded in 1323); 600 years of the town of Ivanovo (1423), 500 years of Petrykov (1523). Next group of jubilee dates related to the history of statehood: 555 years of Casimir's code of law of 1468 – the first collection of laws of the Grand Duchy of Lithuania; 250 years since the act of the Belarusian nobleman Tadeusz Reitan in defense of the Polish-Lithuanian Commonwealth, which Russia, Austria and Prussia divided among themselves at the Sejm of 1773. A significant date in the history of culture – 500 years ago (1523) was printed the famous poem "The Song of the Bison" by the native of Belarusian lands Mykola Husouski. Greek Catholics and Roman Catholics of Belarus commemorated 400th anniversary of the martyrdom of Polotsk Uniate Archbishop Jasaphat Kuntsevich, who was killed in Vitebsk in 1623. The memory is kept of what is demanded by our contemporaries. Anniversaries are a form of historical memory correction.
Keywords: Grand Duchy of Lithuania, historical anniversaries, commemoration.

SOCIAL NORMS AND VALUES IN FUNCTION OF COMMUNICATION

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ABSTRACT
The study aims to analyze the importance of social norms and values in the communicative process as well as their relation to context, culture and identity. Communicating means recognizing that people think, act, and live differently and that only the meaningful communicated message realizes the communication bridge between them. Social norms are pillars elements in communication, related to sociocultural factors of society, therefore it cannot be perceived separately from the context in which it is used. Values of man affects the communication process, as it depends on the realization of meaningful communication.The research question posed is: How important are Social Norms and Values in the communicative process?The hypothesis of this research is: Social norms and values are two essential elements in communication, as one can find different communication situations that will have to be solved despite changes in human cultures and identities. The study consists of addressing the Social norms and values, viewed in terms of the importance they have in enabling the transmission of meaningful message from the messenger to the message receiver and vice versa, based on some concrete examples of Albanian daily life. .
Keywords: social norms, values communication, culture, education.

TÜRK İLTİSAQİ DİLLƏRİN AMORF, FLEKTİV DILLƏRDƏN QƏDİMLİYİNİ GÖSTƏRƏN TARİXİ DİL FAKTLARI

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ABSTRACT
Məqalədə mənbələr əsasında Türk dillərinin tarixi araşdırılmış və yeni elmi nəticələr əldə edilmişdir. Türk dillərinin tarixi xristian siyasəti ilə IX-XI əsrə aid edilsə də bu xalqları dil tarixi tam olaraq araşdırılmamışdır. Bu mövzu dövrümüzə qədər tədqiq olunmamış, bəzi tədqiqatlarda səthi yer almışdır. Məqalədə m.ö. minilliklərə aid mənbələrə istinadən araşdırmalar İltisaqi-Türk dillərini ən azı 10 minillik bir dövrü əhatə etdiyi sübut olunur. İstənilən bir xalq dilinin tarixi təkamülü siyasi proseslər nəzərə alınmaqla ən azı 4 minillik bir tarixi dövrü əhatə edir. Azərbaycan, Türkiyə, Orta Asiya türklərinin dilinin antik müəlliflərin məlumatlarına əsasən müqayisədə m.ö. VIII minillikdə ümumişlək dil olduğu və türklərdə m.ö. VI minillikdə əlifbanın mövcud olduğu tam sübut olunur. Tədqiqatda bu istiqamətdə bəzi fikirlər az da olsa nəzərə alınsa da, bu əlifbanın 10 minillik tarixi təsdiq olunmamışdır. Tədqiqat zamanı coğrafi-Toponimik adların və müasir dil ifadə üslublarına istinadən bu dillərin qədimliyi tarixi faktlarla sübut olunmuş, ilk əlifbanın türklərə aidliyinə dair yeni elmi nəticələr əldə edilmişdir.
Açar sözlər:Türk dilləri, xristian siyasəti, ilk Türk əlifbası, toponimik adlar, qədim mənbələr.

ANALYSIS OF EMPLOYMENT AND UNEMPLOYMENT IN THE REGIONS OF KAZAKHSTAN

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ABSTRACT
The relevance of the study of employment and unemployment in the regions of Kazakhstan is due to the need to develop and implement an effective state policy in the field of employment, especially in the context of post-pandemic economic recovery. Understanding the specifics of regional labor markets, identification of key problems.This is a study of employment and unemployment in the regions of Kazakhstan for the period 2018-2022. The article analyzes such aspects as unemployment, the level of activity of women and men in private business, the level of unemployment among youth (15-28 years), and also the level of long-term unemployment. Based on the analysis, recommendations for further development of the regions of Kazakhstan, stimulation of domestic scientific research and development, development of youth policy, development and stimulation of interregional cooperation. The proposed proposals are aimed at accelerating the pace of economic development and promoting sustainable economic growth in the country.
Keywords: employment, unemployment, labor market, regional development, economic growth, regional economy, state policy.

VERTICAL DYNAMICS OF COPEPODS IN THE TROPICAL ESTUARY AND RIVER ENVIRONMENTS

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ABSTRACT
Copepods are very important components in almost all aquatic environments, which comprise the major portion of the zooplankton biomass. In many aquatic systems, they may account nearly 90% of total zooplankton abundance. Copepods feed on various microbes, planktonic algae, and microscopic suspended non-living organic particles. They are also used food for many higher animals. Thus, they make a very important trophic link between lower and higher animals. Many studies are focused on the spatial and temporal variation of copepods, but study focusing on vertical dynamics of copepods associated with various environmental parameters is still lacking particularly in tropical estuaries. Therefore, a 12-month study was conducted at the Kuantan river and it's estuary. Qualitative and quantitative copepods data were collected monthly from 0.5 m below the water surface and 0.5 m above the bottom concurrent with a series of environmental variables. Data were analyzed both univariate and multivariate statistics (redundancy analysis, RDA). Totally 32 species of copepods on 7 groups (families) were found. The abundance of total copepod was higher in the estuarine water than in the river water. RDA indicated that water temperature, salinity and phytoplankton density were the most important factors affecting the density of copepods. Salinity positively influenced cyclopoid and calanoid copepods, while these copepod groups were negatively influenced by the water temperature. The density of harpacticoid copepods was higher in water near the bottom compared to the surface water. The abundance of phytoplankton positively influenced the density of the harpacticoid copepods in water near the bottom. The remaining measured environmental parameters did not influence significantly the abundance of observed copepods. The observed results need to be regularly investigated for better understanding the ecology of various groups of copepods in relation to changing climate.
Keywords: Phytoplankton; Salinity, Water temperature, Copepods, Redundancy analysis, Estuary

ESP STUDENTS' ATTITUDES TOWARDS USING ONLINE DICTIONARIES AND AI-BASED TOOLS IN LANGUAGE LEARNING

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ABSTRACT
The importance of using dictionaries in learning a foreign language is indisputable. The emergence of online dictionaries and artificial intelligence (AI) has noticeably influenced the way students learn a foreign language and provides fertile ground for implementing AI in education (AIEd). This paper aimed to examine the attitudes and experiences of English for Specific Purposes students in the use of online dictionaries and AI-based tools. The students were anonymously surveyed during the winter semester of the academic 2023/2024 year on the types and frequency, reasons for using online dictionaries, advantages and disadvantages of using online dictionaries as well as potential suggestions for improving online dictionaries. The also provided their opinion of and experience in AI tools in learning a foreign language and translation. The findings suggest that the students prefer using bilingual online dictionaries used for checking the meaning of unknown words. They heavily rely on Google Translate, which is the most convenient option for them. The students recognize the potential of AIEd; however, they believe AI tools should only be used as a supplementary material in language learning. On the other hand, AI-based translation tools can be utilized as primary translation tools. The study sheds light on the characteristic behavior of ESP students regarding their online dictionary and AI-based tools use for language learning and translating and points to the need of developing students' digital competence in the realm of online dictionary use as well as encourage them to embrace the technology full potential.
Keywords: ESP students, attitudes, experience, online dictionaries, AI-based tools

WHAT DO STUDENTS THINK ABOUT THE IDEAL SCHOOL?

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ABSTRACT
This research proposes a reflection on the role of schools in the face of contemporary challenges that reflect the demands and complexities of today's society. It highlights change and innovation as essential elements for its transformation, as well as the promotion of an education that prepares students to be aware global citizens, understanding global issues and developing intercultural skills. The school must now refocus and reoccupy the place it has lost. We cannot resign ourselves to a school stuck in time. The future of the new generations depends on school, on education so that it can form ethically and culturally evolved citizens who can build cohesive societies in the future, acting on global problems and making the world fairer, more supportive and more humane.Through drawings made by 120 students aged between 7 and 10, this research aimed to understand how they see school and to gather contributions that can support their transformation process. The study, which was qualitative, adopted a naturalistic and interpretative approach, using participant observation and document analysis as data collection methods. The results obtained indicate the need for a (re)formulation of the school to face contemporary challenges, which include: i) integrating technology into the educational process, ensuring that it is an effective tool for learning and not a distraction; ii) promoting an inclusive environment that meets the needs of all students; iii) adapting pedagogical practices to engage students effectively, incorporating innovative teaching methods and active learning strategies; iv) offering an education that prepares students for the challenges of the constantly evolving job market; v) making school spaces more comfortable. These were some of the suggestions made by the children, which are in line with current literature on this subject.
Keywords: School, drawing, students, transformation.

MICROBIOLOGICAL AND NUTRITIONAL QUALITY OF SOYBEAN CURD AND FRIED FISH FROM SELECTED MARKETS WITHIN ILORIN METROPOLIS, NIGERIA

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ABSTRACT
Soybean curd (Beske) and fried fish are major proteineous food consumed by many Nigerians of the lower class, which are mostly sold in open spaces such as market, road side and sometimes sold by hawkers. This study examined the microbiological and nutritional composition of fried fish and soybean curd purchased from selected markets in Ilorin (Kulende, Ipata and Oja Oba). The microorganisms were isolated using standard microbiological procedures. The bacterial isolates were identified using biochemical tests while fungal isolates were identified using colonial and microscopic characteristics. The proximate composition were obtained using standard analytical methods. Five bacteria and 3 fungi were isolated namely *Staphylococcus* sp., *Escherichia coli, Bacillus* sp., *Salmonella* sp., *Shigella* sp., *Saccharomyces cerevisiae, Aspergillus niger* and *Penicillium* sp. The total bacteriological count from all the samples ranged from 15.3±1.53 - 91.0±3.1 cfu/ml and the total fungal count ranged from 8.0±1.52 - 32.3±0.58 cfu/g. The proximate nutrition result revealed that the moisture, ash, protein, crude fiber, fat and carbohydrates content ranged from 9.10 – 25.5 %, 3.20 – 16.70 %, 0.2 - 5.2 %, 9.5 – 30.2 % and 7.4 – 34.4 % respectively. The fried fish and soybean curd from selected market in Ilorin, Kwara state contain unacceptable levels of microorganisms. The nutritional analysis from this work shows the fried fish and soybean contain high amount of protein and fat.
Keywords: fried fish, soybean curd, microbial analysis, nutritional analysis, markets

SEQUENCE CHARACTERISTICS COMPARISON OF CHLOROPLAST GENES IN REFERENCE TO PHYLOGENETIC STUDY

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ABSTRACT
The advent of molecular data has revolutionized the field of plant systematics and has led to new insights into phylogenetic relationships at all taxonomic levels for various plant species. For such molecular phylogenetic studies till now many of the nuclear genes as well as chloroplast genes are explored. In this study two chloroplast genes have been studied i.e. *rbcL* and *matK*. These two genes were targeted and amplified and then sequenced from seven different species of *Solanum* from Meghalaya. The sequences obtained were then aligned and various characteristics were studied like % conserved sites, % variable sites, GC%, indels, parsimony informative sites, transitions, transversions, RI and CI etc. These are some of the basic characteristics which are utilised for phylogenetic study. So a comparative study has been done between the two respective genes in relation to the various sequence characteristics.
Keywods: rbcL, matK, Solanum, phylogenetic study

PEDAGOGICAL IMPLEMENTATION OF MULTI-FACTOR AUTHENTICATION ON INFORMATION STORAGE AND RETRIEVAL SYSTEMS: A SURVEY ON EDUCATIONAL DEVELOPMENT

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ABSTRACT
The development and incorporation of internet technology into education sector has indeed enhanced and safeguarded intellectual properties in academia. The implementation of multi-factor authentication (MFA) on information storage and retrieval is increasingly having a far reaching impact on learning environment and as well fostering the security of academic community against cyber threats. Smith et al. (2018) noted that incorporation of MFA into academia aligns with modern educational paradigms and has the potentials that can prepare students for the evoking digital skills. This paper is a descriptive survey on the implementation and application of multi-factor authentication (MFA) on information storage and retrieval systems. The paper evaluates the implications for implementing MFA in information management systems in the education sector. Some of the benefits of using MFA in information storage and retrieval systems were highlighted in the paper discussion. In order to collect some information considered important for this paper discussion, drafted questions were administered to respondents using online Google form questionnaire instrument. The information gathered were collated and subjected to reliability analysis. Conclusively, recommendations were made.
Keywords: Multi-Factor Authentication (MFA), Information Storage and Retrieval Systems.

ŠKVER (BOAT LAUNCH) AS A POTENTIAL TOURIST OFFER

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ABSTRACT
The paper analyzes the potential possibility of including the local boat launch ("škver") in the tourist offer of the city of Zadar and other local self-government units in Dalmatia. The paper features field research conducted among domestic and foreign tourists to determine their interest in this type of tourist service. The research results indicate that Zadar's tourist offer should include a visit to a small "škver" (boat launch) where the local population maintains their boats in a traditional way and where tourists could meet the various traditional crafts necessary for boat maintenance, but also feel the ambience of Dalmatia and the Mediterranean in a specific and authentic way.
Keywords: Dalmatia, boat launch ("škver"), Mediterranean, tourist offer, tourism, Zadar.

THE MECHANICAL PERFORMANCE OF A LOW-CARBON ASPHALT MIXTURE WITH BAMBOO FIBER

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ABSTRACT

The use of fiber-reinforced asphalt mixtures can improve the long-term durability and resistance to cracking of asphalt pavement. Plant fibers such as bamboo fiber, corn straw fiber, bagasse fiber, cotton straw fiber were studied and used in road engineering due to their environmentally friendly and renewable characteristics. Bamboo is a renewable material with a short growth cycle. Applying bamboo product waste, specifically bamboo residue fibers, to asphalt mixtures can effectively inhibit the generation and development of microcracks in asphalt pavement surfaces. However, the inherent characteristics of bamboo fibers make them prone to agglomeration within asphalt mixtures, forming stress-weakened zones that compromise the performance of the asphalt mix. The objective of this study is to characterize the mechanical performance of bamboo fiber modified asphalt binder and mixture under various fiber surface treatment. To enhance the dispersion uniformity of bamboo fibers in asphalt mixtures, this study selected three commonly used pretreatment methods for plant fibers used in road construction: heat treatment, alkali treatment, and silane coupling agent treatment. Bamboo fibers treated with these methods were then added to asphalt and asphalt mixtures to analyze their effects on asphalt and asphalt mixture performance, and to optimize the best pretreatment methods for road-use bamboo fibers. In this study, the high and low-temperature rheological properties of pretreated bamboo fiber asphalt were tested using Dynamic Shear Rheometer (DSR) and Bending Beam Rheometer (BBR). Additionally, the asphalt mixture's performance was evaluated through rutting and beam bending tests to assess high-temperature stability and low-temperature stability, respectively. The moisture susceptibility of fiber asphalt mixture was examined using Marshall stability and freeze-thaw split tests. Furthermore, the durability of bamboo fiber asphalt mixtures was assessed from three perspectives: aging durability, freeze-thaw cycle durability, and fatigue durability. By comprehensively evaluating fiber asphalt adhesion, fiber asphalt slurry rheological properties, fiber dispersion efficiency, as well as road performance and durability of pretreated bamboo fiber asphalt mixtures, the three bamboo fiber pretreatment methods were rigorously evaluated, and suitable methods for road use were recommended. The findings of this research not only contribute to mitigating environmental pollution resulting from the open burning of bamboo residue but also effectively enhance the service life of asphalt pavements, thereby playing a crucial role in realizing low-carbon pavement material

STUDY ON SALT TOLERANCE OF FUNGAL SPECIES ISOLATED FROM PICKLES

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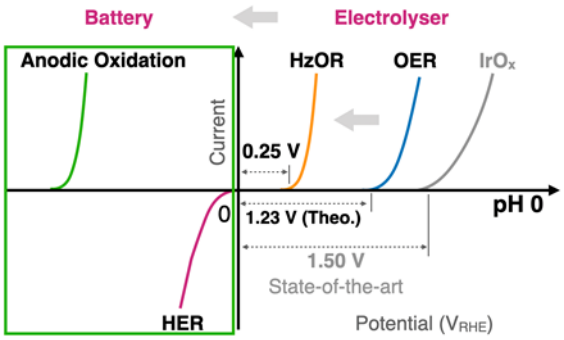
ABSTRACT
Pickle, a traditional relish consisting of vegetables or fruit preserved in high salt content. The high salt content is found to control the growth of microbes which includes bacteria and fungi. However, few of the marketed pickles are found to be contaminated with microbes. In this study, we collected the pickle samples from the market of Chennai, India. A total of 5 pickle samples were studied for the contamination of fungi. Eight different fungal species were isolated which includes, *Aspergillus niger, Aspergillus japonicus, Aspergillus flavus, Rhizopus stolonifer, Absidia corymbifera, Paecilomyces variotii* and *Aspergillus tamarii* as a contaminant. Subsequently, we conducted growth assays to assess their response to different salt concentrations (11%,13%,17%,19%, 21%). Our results revealed significant variations in salt tolerance among the fungal species isolated from different pickle varieties. Some species exhibited high tolerance to elevated salt levels, while others displayed sensitivity. This research highlights the adaptability of fungi to diverse pickle environments and provides insights into microbial ecology in food preservation. Understanding the salt tolerance of fungi in pickles is crucial for improving the safety and quality of pickled products.
Keywords: Pickles, Fungi, Microbial diversity, Salt concentration, Growth assay, Food preservation.

ELECTROCHEMICAL HYDROGEN PRODUCTION: FROM CATALYSTS TO DEVICES

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ABSTRACT

Catalytic electrosynthesis has surfaced as a pivotal technique in the production of high-value fuels and chemicals, such as hydrogen and ammonia. These are traditionally synthesized via conventional methods, which are often associated with high energy consumption and substantial greenhouse gas emissions. However, the current state of electrosynthesis is plagued by large overpotentials and high energy inputs, primarily due to sluggish reaction kinetics and poor selectivity.In this presentation, we will illustrate how the efficiency of electrosynthesis can be significantly improved through strategic catalyst and electrolyzer design. We will delve into specific instances of the acidic Oxygen Evolution Reaction (OER), discussing how strategies such as electronic structure modification can substantially enhance the performance of acidic OER electrocatalysts. Furthermore, we will showcase examples of how traditional electrolysers can be transformed from electricity-consuming units into electricity-generating systems through half-reaction coupling and device optimization.



A BINARY CORONAVIRUS OPTIMIZATION FOR MICROARRAY GENE SELECTION

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ABSTRACT
Cancer diagnosis is one the important field in science and medical diagnosis. One of the most common approach for cancer diagnosis is DNA microarray and it is a very complicated approach in cancer diagnosis because it is composed of many thousands of genes (features) that's why the analysis and diagnosis of cancer are very complex. To avoid this problem, feature selection/gene selection becomes an essential step in cancer diagnosis. In this approach, we propose to use a new optimization approach called "Coronavirus Optimization Algorithm" and a binary version of this algorithm is proposed. In addition, a new objective function is proposed which is based on two terms. The first one is the correlation between the genes and the second one is the classification accuracy rate generated by Support vector machine. The proposed approach will be applied in four well-known data set: colon cancer, lung cancer, ovarian cancer and Leukemia. Experimentation will be conducted in terms of classification accuracy rate, sensitivity, specificity and computational time.
Keywords: Gene selection, Optimization, Cancer diagnosis, Classification, Coronavirus optimization.

TUNGSTEN OXIDE NANOWALL THIN FILM DEPOSITED THROUGH HOT FILAMENT CHEMICAL VAPOR DEPOSITION FOR ELECTROCHEMICAL DETECTION OF METHYLAMINE

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ABSTRACT:
This work describes the growth of well-defined tungsten oxide (WO_3) nanowalls (NWs) thin films through a controlled hot filament chemical vapor deposition (HFCVD) process and utilizes as sensor electrode for the electrochemical detection of methylamine chemical. For the thin film growth by HFCVD, the temperature of tungsten (W) wire was held constant at 1450 ºC for the formation of WO_3 thin film in which the gasification was performed followed by heating of W wire using varied substrate temperatures ranging from 350 ºC to 450 ºC to find the optimized growth temperature. At 400ºC, well-defined and extremely dense WO_3 nanowalls like structures were developed on Si substrate. Structural, crystallographic, and compositional characterizations confirmed that the deposited WO_3 thin films possessed monoclinic crystal structures and high crystal quality. For electrochemical sensing applications, the deposited WO_3 NWs thin film was used as electrode by measuring the cyclic voltammetry (CV) and linear sweep analysis in 0.1 M phosphate buffer solution (PBS, pH=7) with a wide concentration range of 20 µM ~ 1 mM. The fabricated electrochemical sensor achieved a high sensitivity of ~196.3 µA mM^{-1} cm^{-2} with the limit of detection (LOD) of ~12 µM in 10 s quick response time. This study shows that the HFCVD grown nanostructured thin film can offer the promising detection of methylamine chemical with considerable stability and reproducibility.
Keywords: WO_3; HFCVD; Nano-walls; Methylamine Electrochemical sensor; Cyclic voltammetry; Linear sweep voltammetry

SYNGAMOSIS IN OF PARTRIDGES (PERDIX PERDIX) IN BELGRADE AREA

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ABSTRACT
The area of Belgrade consists of two different natural units: the Pannonia Plain is to the north and Šumadija, which is predominantly hilly, to the south of the Sava and Danube. In the peripheral area of the city there are numerous forests and arable land which are also hunting grounds, of which there are 15 in the Belgrade area. Of the big game, we meet roe deer, wild boar, and fallow deer and of the small game, we find rabbit, pheasant, partridge, quail, wild goose and wild duck. Partridge (Perdix perdix) is a species of bird from the pheasant family (Phasianidae). It is quite common on the plains hunting grounds around Belgrade. Diseases of parasitic etiology represent a major health problem for partridges. Among them, one of the most significant infections is caused by gapeworm *Syngamus trachea*. Infection with *S. trachea* can occur either directly by the ingestion of eggs or third stage larvae, or indirectly, by the ingestion of an infected invertebrate paratenic host, most commonly the earthworm (*Lumbricus terretsris* and *Eisenia foetida*). The growth of the adult worms in the trachea results in the obstruction of its lumen, causing more or less severe signs. Heavy infections cause breath with open mouth, head shaking neck stretching, cough, sneeze and the infected birds produce a hissing noise, as an attempt to dislodge the parasites. Besides, all these symptoms represent the most typical sign of syngamosis, briefly described as "gaping". Young birds are usually most severely affected. Another sign that may be indicative of syngamosis is the presence of anemic wattles, as a result of the net blood loss caused by the adult worms, which are bloodsuckers. During our examination performed in period 2018-2020 sygmamosis we established at 14.32% of all hunted partridges.
Keywords: partridge, Perdix perdix, Syngamus trachea

SYNTHESIS OF CARBON STRUCTURED BIO-BASED NANOFLUIDS FOR VARIOUS APPLICATIONS

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ABSTRACT:
The traditional fluids commonly used in heat transfer systems exhibit lower thermal efficiency. Extensive research has aimed at improving heat transfer performance through adjustments in process parameters, surface materials, and heat exchange fluids. Recent studies have concentrated on developing more effective heat exchange fluids by incorporating thermally conductive metal oxides, carbon-based nanostructures, and composite particles into conventional liquids. In this study, eco-friendly covalent functionalization methods were employed instead of using conventional hazardous acid processes. These methods significantly enhanced thermal properties and facilitated convective heat transfer improvement with minimal frictional pressure losses. Single pipe heat exchangers and annular flow passage heat exchangers served as experimental setups to assess heat transfer performance.The synthesis method avoided toxic and corrosive acids. Graphene nanoplatelets (GNPs) and multi-walled carbon nanotubes (MWCNTs) underwent covalent functionalization using substances like clove buds and Gallic acid through a one-pot method. The functionalized GNPs and MWCNTs were then dispersed in DI water to create clove-treated GNP (CGNP), gallic acid-treated GNP, gallic acid-treated MWCNT nanofluids, etc., through radical reactions. These synthesized nanofluids maintained various particle concentrations (0.025, 0.075, and 0.1 wt. %). The efficacy of the covalent functionalization method was evaluated using standard characterization techniques.CGNP and CMWCNTs at 0.1 and 0.175% wt. concentration respectively showed a maximum augmentation of thermal conductivity by 22.9 and 20.2% compared to water. Heat transfer enhancements for CGNP and CMWCNTs were 41.3% (0.1% wt.) and 26.4% (0.175% wt.) respectively over water data at Re 8000. Ansys computational fluid dynamics (CFD) simulations of water-based CGNP nanofluids aligned closely with experimental results, with an average relative deviation of about 10%. Overall, the application of various synthesized carbonstructured nanofluids have notably improved heat exchanger performance.

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NANOPARTICLE-MEDIATED GENE SILENCING STRATEGIES FOR RESHAPING TUMOR IMMUNOSUPPRESSIVE MICROENVIRONMENT

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ABSTRACT
Cancer immunotherapy has significantly changed the way we approach cancer treatment. Nevertheless, the effectiveness of this therapy is often compromised by the immunosuppressive nature of the tumor microenvironment (TME), which results in suboptimal clinical outcomes. The critical role of the TME in cancer progression has shifted the research focus from solely targeting tumor cells to understanding the intricate tumor ecosystem that supports tumor growth and spread. Tumor cells have developed various mechanisms to escape immune detection, notably through the proliferation of immunosuppressive cells such as regulatory T lymphocytes (Tregs), myeloid-derived suppressor cells (MDSCs), type-2 tumor-associated macrophages (TAM2), and cancer-associated fibroblasts (CAFs). These cells significantly hinder both innate and adaptive anticancer immune responses. There is increasing interest in the development of gene-silencing techniques aimed at these immunosuppressive cells. These approaches attempt to inhibit genes responsible for the immunosuppressive TME, targeting them at the mRNA level (via siRNAs and antisense oligonucleotides) or the DNA level (using CRISPR/Cas systems to edit mutated genes). Nonetheless, the success of these strategies is often limited by the stability and delivery efficiency of the therapeutic genes. Combining nanotechnology with gene-silencing presents an innovative avenue for effectively delivering these therapeutic agents to modify the TME and enhance the efficacy of immunotherapy. This study seeks to deepen the understanding of the immunosuppressive TME, pinpoint the challenges faced by gene-silencing techniques, and examine how nanoparticle-based delivery systems could address these challenges.
Keywords: Nanotechnology, TME, siRNA, CRISPR/Cas.

THE CONTRIBUTIONS OF MUSTAFA KEMAL ATATÜRK, THE FOUNDER OF THE REPUBLIC OF TURKEY, TO THE EDUCATION SYSTEM

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ABSTRACT
The founder of the Republic of Turkey, whose centenary anniversary is celebrated this year, was Mustafa Kemal Atatürk, a man of intellectual knowledge, capable army chief, reformist, patron of science and culture. In addition to being a capable state politician, he appealed to the people as a genius who always cared about knowledge and science, saying "One day, if what I say is the opposite of science, choose it." It seems that the youth of modern Turkey was inspired by such a person's ideas, outlook, and emotions. Even after the declaration of the republic, it was one of the main criteria to find out the problems in the field of education, to find their solutions and to develop the education system. In addition to eliminating the errors and hereditary principle left in the education system from the Ottoman era, there were also problems of lack of funds and personnel in this field. In the academic year 1923-1924, the demographic statistics of Turkey were 11-12 million people. 1/10 of this population was the intelligentsia. The most deplorable situation was the state of women's education. Only 3% of them were literate. One of the factors that led to the lack of personnel was the martyrdom of a number of teachers in the First World War, as well as in the War of Independence. Other reasons were the lack of modern equipment and educational program for the professional formation of current teachers, lack of unified administrative management. While studying at the university, Mustafa Kemal Atatürk made certain observations about the state of Turkish education and began to think about how to eliminate the shortcomings he saw. He put forward the basic principles of the education of the Republic to be established during the years of the freedom struggle, and a number of measures were implemented in the direction of these principles. One of the most important steps taken in this regard was the First Education Congress held in Ankara on July 15-21, 1921. The ideas put forward by Atatürk in this congress were one of the biggest proofs of his faith in education and teachers. Based on the results obtained at this congress, the foundations of post-Republic education reforms were laid. The ideal of education of Atatürk, the owner of deep erudition, is based on his 6 axes: republicanism, nationalism, populism, statehood, secularism and revolutionary principles. These principles have also been included in school programs since 1936. On January 31, 1928, the Turkish Education Society (Turkish Education Association) was founded on Atatürk's special initiative. The main goal of this institution was the education of highly talented and hard-working students within the country and abroad. With the law "Tawhid-i Tadrisat Qanunu" ("Law on Educational Organization") adopted on March 3, 1924, all education and training in the country institutions were subordinated to the Ministry of Education, the activities of foreign schools were regulated, Turkish, History and Geography subjects were required to be taught in Turkish, primary school was made free and compulsory. One of the most radical reforms implemented at this time was the Alphabet reform. The first step taken in this direction, on May 28, 1928, the first Language Council was established to deal with the alphabet. As a result, he made the Arabic alphabet

instead of the Turkish alphabet. This step was the product of Atatürk's special initiative. With the entry into force of the "Law on Turkish Letters" dated November 1928, from December 1928, all official and private Turkish newspapers and magazines began to be published in new Turkish letters. In addition, National Schools were opened on January 1, 1929. First, he set himself the goal of teaching the people to read and write. At the next stage, history and language studies with national characteristics were started. Another development in education took place in higher education. For this purpose, the Faculty of Law was opened in Ankara in 1925, Gazi Education Institute in 1926, Higher Agricultural School in 1930 and Istanbul University. Thus, as a result of the care he gave to education for about 20 years and the reforms he carried out in this field, an education system combining national, secular and modern elements was established in Turkey.

Keywords: Mustafa Kemal Atatürk, The education system, "Tawhid-i Tadrisat Qanunu", Alphabet reform.

GLASS IONOMER SEALANTS AND RESINOUS SEALANTS IN THE PERMANENT DENTITION

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ABSTRACT
Dental caries is a disease that occurs as a result of the interaction of acidogenic bacteria found in the biofilm of dental plaque, fermentable carbohydrates and dental structures. The development of carious lesions is a dynamic process that can progress, stop or regress. It mainly begins on the occlusal surface of the teeth as a result of the presence of retentive spaces such as fissures and pits, which are the causes of the accumulation of bacterial plaque. To prevent the development of carious lesions, it is suggested to seal these spaces with sealants. Purpose ; The purpose of the paper is to evaluate the effectiveness of resin-based and glass ionomer sealants in the prevention and inhibition of carious lesions in permanent teeth. Materials & Methods: To find literature of interest for this work, a search was carried out in various electronic databases (Pubmed, Medline, Google Scholar) using suitable search terms. These articles were selected and studied. Results: A total of 19 articles were identified. The effectiveness of sealants was evaluated compared to not using them. The effectiveness of these sealants in preventing the appearance of primary carious lesions was also demonstrated. Conclusions: Research in the published literature proves that more studies are needed on the data on the prevalence of caries and the use of sealants in the prevention of carious disease.
Keywords: Dental caries, Pubmed, Medline, Google Scholar

EXPLORING THE COMPLEMENTARITY OF FINTECH AND ETHICAL BANKING

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ABSTRACT
From the Global Financial Crisis (GFC) in 2007 two important trends in banking development have emerged. The first trend refers to the launching of Bitcoin and distributed ledger technology that opened the doors to decentralized finance (DeFi), and thereby threatening to disintermediate banks in the banking value chain. The second trend relates to the increased visibility of the phenomenon of ethical banking that highlights the importance of social responsibility, transparency, and accountability. In general, the GFC has eroded the public trust in traditional and conventional banking institutions due to widespread unethical practices, such as subprime lending, predatory lending, excessive risk-taking, and opaque financial products. Furthermore, due to the prioritization of short-term profits over long-term benefits for society, environment and of course, for shareholders. Even though these two trends may seem to lead banking into divergent pathways, one might ask can the fintech companies contribute to building a more inclusive, resilient, and sustainable financial system?
The aim of this study is to explore the intersection of fintech and ethical banking, by analyzing ethical banking and its purpose, fintech development and its impact on conventional and ethical banking and, finally by finding the intersection between both. The purpose of this research will be achieved by using literature overview on ethical banking and fintech, and empirical evidence and case studies on ethical banking and fintech practices.
Keywords: sustainable banking, fintech, sustainable finance
JEL codes: G20, O14, M14

EFFECT OF SALINITY AND WATER STRESS ON TOMATO SEEDS AT GERMINATION STAGE

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ABSTRACT
Climate change has devastating effects on plant growth, and productivity. Throughout ontogenesis, plants undergo various abiotic stress, such as water and salinity, which can result in crop losses ranging from 20% to 50%, making them vulnerable in terms of survival. The present study investigated the effects of salt and water stress, as well as their interaction on *Solanum Lycoperscum* L. at germination stage. Eleven concentrations of imbibition solution ranging from 0 to 10 g/l NaCl for salt stress and from 0 to 30% polyethylene glycol (PEG) for water stress were studied. Daily germination was recorded, radicle length was measured from the third to the last day of germination, seedling fresh and dry weights were measured at the 6 day of experience. It was observed that seed germination decreased as the concentrations of NaCl and PEG in the imbibition solution increased. Furthermore, germination was significantly inhibited at high concentrations of NaCl starting from 5 g/l for salt stress and 10% PEG for water stress. For the concentrations less than or equal to 5 g/L of NaCl, the inhibitory effect observed is osmotic. Because the reductions in germination rates are only about 20% compared to the control. On the other hand, for the concentrations more than 5 g/ L, NaCl inhibited the germination by its toxic effects, following an excessive accumulation Na^+ and Cl^- ions at the embryonic cells. Root length was adversely affected by NaCl and PEG. However, in the case of water stress, root length increased when exposed to concentrations of PEG ranging from 1% to 5%, compared to the control (0% PEG). Furthermore, salt and water stress led to a decrease in tissue water content, with reductions of 42.48% and 47.90% observed at concentrations of 7 g/l NaCl and 20% PEG, respectively. Moreover, the combined impact of salt at 1 g/l and 2 g/l and water stress at 5% and 10% exhibited a synergistic effect, resulting in delays and inhibition

of seed germination. Overall, this study highlights how water and salt stress, can significantly reduce tomato seed germination parameters.
Keyword: Salt stress, Water stress, Germination, Water content, Solanum Lycopersicon L.

ANALYSIS OF PEDAGOGICAL STANDARDS: THE ONGOING EVOLUTION OF TEACHER TRAINING

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ABSTRACT
Due to the problem of high drop-out rates in secondary schools, many efforts have been made to improve the quality and effectiveness of teacher qualification courses through in-service training. Our main objective is to facilitate teacher participation in induction and qualification programs. To this end, we collected data using a comprehensive questionnaire covering both factors (induction and qualification). The questionnaire has high reliability (Cronbach's alpha = 0.777). Notre échantillon était composé de 105 enseignants (ratio équilibré entre les sexes) avec un âge moyen de 35,83 ± 1,08 ans. Les résultats ont montré que 78,1 % des enseignants ont confirmé qu'ils participaient activement à un programme d'introduction à la formation continue et 18,1 % des participants ont indiqué qu'ils participaient actuellement à un programme d'accréditation. Il existe une forte corrélation entre les deux programmes. Cependant, 72,4 % n'avaient jamais assisté à une conférence ou à un atelier. Cette situation exige que les personnes responsables concernées intensifient leurs efforts et en même temps fournissent des facilités de participation pour améliorer la qualité des formateurs et des stagiaires.
Keywords: Analysis Of Pedagogical Standards

METAGENOMIC INSIGHTS INTO THE INOCULUM EFFECT ON MICROBIAL COMMUNITY DURING ANAEROBIC DIGESTION OF CATTLE MANURE

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ABSTRACT
Establishing a connection between the characteristics of microbial ecology and system functionality is essential for optimizing operational strategies and facilitating preferred microbial pathways to achieve efficient and stable AD systems. In the present study, we

conducted a direct comparison of community networks between two digesters: one containing only the substrate (cattle manure) (Digester S), and the other (Digester F) was enriched with an inoculum. This research aimed to analyze taxonomic and functional change in the digester microbiome using a 16S RNA sequencing approach. The bacterial richness, diversity, and evenness were higher in digester F. The results showed that the biogas yield (BY) in digester F showed significant correlations with *Firmicutes/Bacillota (Clostridium, Enterococcus, Streptococcus, Ruminococcaceae, Mogibacterium,* and *Turicibacter), Actinobacteria (Corynebacterium)*, and *Bacteroidetes (Bacteroides, Paludibacter)*. Conversely, in digester S, BY was significantly and positively correlated with the abundance of *Actinobacteria (Rhodococcus)* and *Proteobacteria (Moraxella, Oxalobacter)*. This study provides evidence of the changes in microbial community structure in a short space of time, and the functional strategy that the most representative microorganisms in the consortia used to carry out the process.

Keywords: Anaerobic digestion; correlation analysis; metagenomic approach; microbial abundance; process parameter; digestion performance.

RECOVERY OF ZINC FROM COLD FILTER CAKE WASTE RESIDUE OF ZINC PLANT BY HYDROMETALLURGICAL ROUTE

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ABSTRACT
In the present paper zinc leaching from zinc plant residue by sulphuric acid was examined. In this study. This waste containing 44.5% Zn, 15.2% Cd, and 5.4% Ni and it was considered for valuable metals extraction. Particle size, reaction temperature, acid concentration, solid/liquid ratio, reaction time, and stirrer speed are effective parameters in increasing the amount of leaching. In this research, the effect of reaction time, reaction temperature, solid/liquid ratio and concentration of sulfuric acid on the recovery of zinc from zinc filter cake was investigated. The concentration of zinc in the solution was observed to increase with an increase of reaction time, acid concentration and temperature. Decreasing of solid/liquid ratio was also beneficial for zinc recovery. The best conditions for this process were obtained after 45 minutes of treatment at 25°C, H2SO4 (35% (v/v)) and with solid/liquid ratio of (30%(s/v)). The stirring speed used was 600 rpm during the reaction. XRD and SEM analyses of the residues obtained after leaching showed that the zinc containing phase had been decomposed in the leaching residues. The results indicated that it is possible to use this waste as a secondary resource for zinc recovery.
Keywords: XRD and SEM analyses

THE IMPACT OF AGRICULTURE SECTOR ON THE ECONOMIC DEVELOPMENT OF WESTERN BALKAN COUNTRIES

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ABSTRACT
Agriculture sector serves as a vital economic engine, providing livelihoods for a significant portion of the population and contributing substantially to the GDP growth in many countries. Thus, this research article examines the effects of agricultural activities on economic growth and employment patterns for the Western Balkan countries. Furthermore, it explores the interplay between agricultural policies, market dynamics, and socio-economic factors in shaping the trajectory of agricultural development and its impact on the economies of these countries. A panel regression analysis is used to investigate the relationship between agriculture and economic development covering the time span 2002-2022. The findings suggest a nuanced relationship between agriculture and economic development in the Western Balkans. While agricultural value added contribute positively to GDP growth, the sector's influence on employment varies across countries and over time. Furthermore, we identify significant heterogeneity in the effectiveness of agricultural policies and investments in fostering sustainable economic development within the region. The empirical evidence of this research offers valuable insights for policymakers seeking to promote sustainable growth in the region's agricultural sector.
Keywords: Agriculture sector, GDP growth, employment, Western Balkan

EXPLORING THE ANTIDIABETIC POTENTIAL OF RUMEX OBTUSIFOLIUS: AN IN SILICO APPROACH FOR BINDING AFFINITY COMPUTATION AND ADME/TOX PREDICTION

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ABSTRACT
Diabetes mellitus is a growing global health concern demanding novel therapeutic options. This study investigates the potential of *Rumex obtusifolius* (bitter dock) as an antidiabetic agent using in silico methods. PyRx software was employed for virtual screening to identify compounds within the plant that may inhibit key diabetes-related enzymes (e.g., cortisone reductase, GFAT/GFPT, PTP1B, SIRT6). SwissADME was then used to predict the absorption, distribution, metabolism, and excretion (ADME) properties and drug likeness of these candidate compounds. Our results revealed promising interactions between *Rumex obtusifolius* compounds and the target enzymes, suggesting potential for their inhibition. This in silico approach provides preliminary evidence for the antidiabetic potential of *Rumex obtusifolius*, warranting further in vitro and in vivo studies. This research highlights the value of computational methods in exploring plant-based diabetic therapies.
Keywords: *Rumex obtusifolius*, virtual screening, PyRx, SwissADME, antidiabetic

LIP BALM FORMULATION BASED ON ANTHOCYANIN AS NATURAL COLORING FROM EXTRACTS OF BEETROOT (*Beta vulgaris l.)*, BOUGAINVILLEA FLOWERS (*bougainvillea sp.*) AND RED ROSE FLOWER (*rosa damascena mill*)

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ABSTRACT
This study explores the development of a lip balm formulation utilizing anthocyanins, natural pigments found in beetroot (*Beta vulgaris* L.), bougainvillea flowers (Bougainvillea sp.), and red rose flowers (*Rosa damascena* Mill), as a sustainable alternative to synthetic colors. Anthocyanins offer vibrant hues while potentially providing antioxidant benefits. The research investigates the extraction methods for anthocyanins from these plant sources and their subsequent incorporation into a lip balm base. This research aims to contribute to the growing interest in natural cosmetics by demonstrating the feasibility of using anthocyanins for effective and safe lip balm coloration. The formulation was conducted and evaluated for color intensity, stability, pH, melting point, and other essential characteristics for a functional and appealing lip balm including organoleptic study. The successful development of this formulation could pave the way for commercially viable natural lip balms with vibrant colors derived from plant sources.
Keywords: lip balm, beetroot, bougainvillea, red rose, anthocyanin,

DEVELOPMENT OF A MULTIFUNCTIONAL NATURAL EYESHADOW COMPACT POWDER WITH ROSE, BOUGAINVILLEA FLOWER, AND BEETROOT EXTRACTS FOR COLOR COSMETICS AND POTENTIAL SKINCARE BENEFITS

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ABSTRACT
This study explores the development of natural eyeshadow compact powder utilizing pigment extracts from rose, bougainvillea flower, and beetroot. Conventional eyeshadows often rely on synthetic colorants, which may raise concerns about potential skin irritation. This research investigates the feasibility of using natural alternatives derived from readily available botanical sources. Rose, bougainvillea flower, and beetroot were chosen for their reported color properties and potential biocompatibility. Ethanol extraction was employed to isolate pigments from each plant material. The extracted pigments were then incorporated into a compact powder formulation alongside suitable cosmetic binders and bulking agents. The formulated eyeshadow powders were subjected to various evaluations, including characterization of their color profile, stability, texture, and organoleptic properties. The findings of this study will contribute to the development of natural and potentially less irritating cosmetic options for consumers. By exploring the use of these plant-based colorants, the research aims to broaden the scope of natural ingredients available for eyeshadow formulation.
Keywords: eyeshadow compact powder, rose, bougainvillea, beetroot, color cosmetic

BETWEEN WORLDS: A CRITICAL EXAMINATION OF REPRESENTATIONS OF WEST AND NON-WEST IN NADIA HASHIMI'S 'A HOUSE WITHOUT WINDOWS'

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ABSTRACT
In Edward Said's seminal work, 'Orientalism,' he introduces the concept of the 'West' and 'Orient' as constructed binaries, where the West is often portrayed as modern, rational, and superior, while the Orient, or non-Western world, is depicted as exotic, primitive, and in need of civilization. This binary, according to Said, is not just a geographical distinction but a deeply ingrained framework through which the West has historically defined itself in opposition to the 'Other,' perpetuating stereotypes and power imbalances. In 'A House Without Windows' by Nadia Hashimi, this constructed binary of the West and non-West is reflected in the representations of Western characters and the contrasting portrayal of Afghan culture. The novel presents the West, symbolized primarily by characters like Yusuf and his family, as superior and modern. Yusuf's career as a lawyer in the West represents success and advancement, contrasting sharply with the traditional Afghan village life depicted in the story. Hashimi's narrative emphasizes the allure and perceived superiority of the West through Yusuf's character, highlighting the opportunities and freedoms that seem unattainable in Afghanistan. The Western world in the novel is depicted as a place of progress and enlightenment, where individuals have the agency to shape their destinies. This portrayal aligns with Said's notion of the West as the 'civilized' and 'modern' counterpart to the 'backward' Orient. Conversely, Afghanistan and its traditional culture are presented as stagnant and oppressive, especially concerning women's rights and societal norms. Through characters like Zeba, readers witness the constraints of Afghan traditions, including the restrictions imposed by patriarchal values. The title, 'A House Without Windows,' metaphorically underscores the confinement and lack of visibility experienced by Afghan women within this traditional society. This critical analysis aims to explore how Nadia Hashimi's 'A House Without Windows' reinforces the constructed binary of West and non-West, portraying the West as superior and modern while depicting Afghanistan as stagnant and in need of progress. By examining the characters' interactions with Western and Afghan cultures, as well as the thematic exploration of tradition and modernity, this study seeks to highlight the novel's reinforcement of Western superiority in the context of Afghan society.
Keywords: West and non-west binary, Afghan traditions, superiority, women's rights

THE PROTECTIVE EFFECT OF VENLAFAXINE ON HYDROGEN PEROXIDE-INDUCED CYTOTOXICITY IN C6 GLIOMA CELLS

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ABSTRACT
Aim: Neurodegeneration is the progressive loss and structural deterioration of neuronal cells. Oxidative stress plays a role in the emergence of neurodegenerative diseases due to damage to neurons. Hydrogen peroxide (H_2O_2) superoxide radical it is formed by dismutation and causes oxidative stress. Venlafaxine, a serotonin and noradrenaline reuptake inhibitor, it is a drug that increases both serotonin and noradrenaline in the synaptic gap. The present study aimed to investigate the effect of venlafaxine on H_2O_2-induced cytotoxicity in C6 glioma cells. Materials and Methods: For the study, four groups were formed from glioma cells as control, venlafaxine at different concentrations (25, 50 and 100 µM), H_2O_2 (0,5 mM), and Venlafaxine+H_2O_2. In the study, TNF-α, IL-1β, NO and iNOS levels in the C6 glioma cells were determined. Results: H_2O_2-treated caused cytotoxicity in C6 glioma cell line; when venlafaxine 25, 50 and 100 µM doses were evaluated in terms of cell viability, it was observed that the 100 µM Venlafaxine applied group significantly increased cell viability compared to the other groups. When we look at the levels of TNF-α and IL-1β, which are inflammatory cytokines, it is observed that there is an increase in the H_2O_2 applied group and a significant decrease in the 100 µM Venlafaxine applied group. It is seen that NO and iNOS levels increased in the H_2O_2 applied group compared to the other groups. On the other hand, no statistical significance was found in the control, Venlafaxine and Venlafaxine+H_2O_2 groups.Conclusion: As a result, it was determined that venlafaxine treatment showed a protective effect in the H_2O_2-induced neural cytotoxicity model in C6 glioma cells.
Keywords: Cytotoxicity; C6 glioma cell; Venlafaxine; Hydrogen Peroxide

SU VE KANALİZASYON İDARELERİNDE ENERJİ TÜKETİMİNİN AZALTILMASI: MALATYA ÖRNEĞİ

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Özet
Enerji tüketiminin tüm kullanım alanlarında azaltılması ülkelerin öncelikli kalkınma hedefleri arasındadır. Değişen çevre koşulları ve iklim şartları enerji ihtiyacının karşılanması noktasında ülkeleri çıkmaza sokmaktadır. Hızla artan enerji talebinin karşılanmasında enerjinin düşük maliyetli, sürdürülebilir ve güvenilir olması gerekmektedir. Enerji bütün sektörlerin vazgeçilmez girdisi olduğundan bu alanda yapılacak iyileştirmeler tüm kullanıcıları doğrudan etkilemektedir. Bu sektörlerden birisi olan Su ve Kanalizasyon İdarelerinde de enerji tüketiminin azaltılması için operasyonel uygulamalara ihtiyaç vardır. Su temin, dağıtım ve su/atık su arıtma sistemleri de, Su ve Kanalizasyon İdareleri tarafından işletilen ve en fazla enerji tüketen tesisler olup, idarenin toplam enerji giderlerinin önemli bir kısmını oluşturmaktadır. Enerji fiyatları arttıkça idareler, yüksek maliyetlere yanıt olarak operasyonları dengeleme ihtiyacıyla karşı karşıya kalırlar. Artan maliyetlerle mücadele etmenin anahtarı, tüm su yönetim sistemlerinde enerji verimliliğini artırma konusundaki boşlukları anlayarak bilinçli bir karar vermektir. Bu çalışmanın amacı Malatya Su ve Kanalizasyon İdaresinin öncelikli olarak içme suyu temin sistemlerinde enerji tüketiminin azaltılması amacıyla kullanılabilecek yöntemleri incelemek ve enerji tasarrufu sağlayacak öneriler sunmaktır. Öncelikle, içme suyu temin sistemlerinde enerji tüketiminin azaltılması amacıyla kullanılabilecek yöntemler irdelenmiştir. Malatya su temin sistemleri tanıtılmış, mevcut sistemin enerji tüketiminin azaltılması ve enerji verimliliğinin artırılması amacıyla yapılan çalışmalar belirlenmiştir. Ayrıca, Malatya içme suyu temin sisteminde enerji tüketiminin azaltılmasına yönelik öneriler sunulmuştur. Bu çalışmanın ülkemizdeki kentsel su temini sistemlerinde enerji verimliliği tedbirlerinin uygulanmasına ve yaygınlaştırılmasına önemli katkı sağlaması beklenmektedir.
Anahtar Kelimeler: İçme Suyu Temin Sistemi, Enerji Tüketimi, Enerji Verimliliği, Kaptaj, Malatya

REDUCING ENERGY CONSUMPTION IN WATER AND SEWERAGE ADMINISTRATIONS: MALATYA EXAMPLE

ABSTRACT
Reducing energy use across all sectors is one of the main development priorities for nations. Countries face challenges in achieving their energy demands due to changing environmental and climatic conditions. In order to meet the rapidly increasing energy demand, energy must be low-cost, sustainable and reliable. Since energy is an indispensable input for all sectors, improvements in this field will directly affect all users. One of these sectors is the Water and Sewerage Administrations, which requires operational methods to reduce energy use. Water supply, distribution and water/wastewater treatment systems are the facilities operated by Water and Sewerage Administrations that consume the most energy and constitute a significant portion of an administration's total energy expenses. As energy prices rise, administrations face the need to balance operations in response to higher costs. The key to combating rising expenses is to make an informed decision by identifying gaps in improving energy efficiency across all water management systems. The focus of this study is to examine the methods that can be used to reduce energy consumption in Malatya Water and Sewerage Administration's drinking water supply systems and to offer suggestions that will save energy. First, techniques for reducing energy use in drinking water supply systems are examined. Malatya water supply systems were introduced and the studies carried out to reduce the energy consumption of the current system and increase the energy efficiency were determined. Additionally, suggestions are presented to reduce energy consumption in the Malatya drinking water supply system. It is expected that this study will make a significant contribution to the implementation and dissemination of energy efficiency measures in urban water supply systems in our country.
Keywords: Drinking Water Supply System, Energy Consumption, Energy Efficiency, Catchment, Malatya.

SUÇA SÜRÜKLENEN ÇOCUKLAR İÇİN CEZA VE ÖDÜL OLMADAN DİSİPLİN SAĞLANMASI

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ÖZET
Çalışmamızda, çocuk ve suçluluk sorununun toplumsal etkileşimi ve yaklaşımının yanısıra herkesin bildiği ve her ebeveynin çocukları üzerinde kurmaya çalıştığı ödül ve ceza dengesini konu alacağız.Çocuklarımız esasında dünyaya gelen her insan gibi tertemiz olan varlıklar olup, ancak büyüdükçe çevre, aile, eğitim ve toplum içindeki etkileşimler ile her an gelişmektedirler. Malumunuzdur ki, çocukları iyi ya da kötü olarak belirleyen sebeplerden biri yaşantılarıdır. Suç ise kişisel durumu aşarak kamusal alana girmekte ve yasaklanmış olan kural ya da yasaları çiğneyerek, buna bağlı olarak meşru yaptırım ve cezaların uygulanan kamusal güçlerin ve otoritenin müdahalesine sebep olan tüm bu fiiller her şeyin özeti niteliğindedir.Disiplin esasında negatif ve olumsuz bir yöntem gibi anlaşılmakla birlikte, çocuğu çok sert ve katı kurallarla yönlendirmek, yeterince sevgi ve şefkatin olmadığı, esnekliğe imkân verilmeyen bir yöntem olarak algılanmaktadır. Ve bu sebeple bir çok ebeveyn disiplini bu şekilde sağlayacağını düşünürken çoğu da bu yöntemi çok sert bulduğu için disiplin uygulamamayı tercih etmektedir. Hal böyle olunca, disiplin çocuğun doğru ve uygun davranışları öğrenmesi, iç denetim ve içselleştirilmiş bir sorumluluk bilinci kazanmasına yönlenmekten çıkıp askeri bir nizam mekanizması şekline dönüşmekte ya da hiç uygulanması tercih edilmemektedir. Doğru ve etkili disiplin ile gerçekleşen bunun yanısıra, ceza ve ödül uygulamalarının yerinde ve zamanında uygulandığı, aşırı sertlik, çocuğu aşağılama ve şiddet içermeyen bir yöntem olmakla birlikte işin özünde mutlaka ve mutlaka olmaz ise olmaz olan sevgi, saygı ve güven ilişkisi üzerine inşa edilen, çocuğun ihtiyacına cevap verebilen sağlıklı davranışlarda bulunabilen ebeveynlerin bilinçli olabilmelerinden geçmektedir.
Anahtar kelimeler: Disiplin, Ceza, Ödül, Suç, Çocuk.

PROVIDING DISCIPLINE FOR CHILDREN WHO ARE DRIVEN INTO CRIME WITHOUT PUNISHMENT OR REWARD

ABSTRACT
In our study, we will focus on the social interaction and approach to the problem of children and guilt, as well as the balance of reward and punishment that everyone knows and that every parent tries to establish on their children.Our children are essentially pure beings like every human being born, but as they grow, they develop at every moment through interactions within the environment, family, education and society. As you know, one of the reasons that determine children as good or bad is their experiences. Crime, on the other hand, goes beyond the personal situation and enters the public sphere, and all these acts that violate the prohibited rules or laws and cause the intervention of public powers and authority, where legitimate sanctions and punishments are applied, are the summary of everything.Although discipline is essentially understood as a negative and unfavorable method, directing the child with very harsh and strict rules is perceived as a method that does not have enough love and compassion and does not allow flexibility. And for this reason, while many parents think that they will provide discipline in this way, most of them prefer not to discipline because they find this method too harsh. In this case, discipline ceases to be aimed at helping the child learn correct and appropriate behavior, gain internal control and an internalized awareness of responsibility, and turns into a military order mechanism, or it is not preferred to be implemented at all. In addition to this, which is achieved with correct and effective discipline, it is a method in which punishment and reward practices are applied appropriately and on time, and it is a method that does not include excessive harshness, humiliation and violence against the child. It depends on the awareness of parents who can respond to their needs and engage in healthy behaviors.
Keywords: Discipline, Punishment, Reward, Crime, Child.

GİYİLEBİLİR SAĞLIK TEKNOLOJİLERİNİN YAŞLILARIN YAŞAM KALİTESİNİ ETKİSİ

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ÖZET
Giyilebilir teknolojilerinin etkilediği alanlardan biri olan sağlık konusu üzerine literatür incelendiğinde bu teknolojilerin özellikle yaşlı ve yalnız yaşayan bireylerin hem yaşam kalitesini hem de süresini arttırdığını bilinmektedir. Günümüzde artan dijitalleşme sağlık sektöründe de etkilerini göstermeye devam etmektedir. Artık sağlık alanında pek çok süreç de dijital ve akıllı ortamlara taşınmaktadır. Bu teknolojilerden en önemlilerinden biri de giyilebilir sağlık teknolojileridir. Giyilebilir sağlık teknolojileri; bireylerin, aile veya sağlık uzmanı yardımı olmaksızın, hareketliliğini, gücünü ve ritüellerini yerine getirebilme düzeyini değerlendirmek, hastaların yapamadıkları fonksiyonel motor görevleri yerine getirmek amacıyla küçük sensörlerin cihazlara veya giysilere entegre edilmesidir. Giyilebilir cihazların doğrudan bağlantı kurduğu akıllı telefonlar aracılığı ile ilgili kişilere anlık veri akışı sağlayarak uzaktan takip imkânı sunan Giyilebilir cihazın sağladığı veriler mobil uygulama tarafından işlenerek ihtiyaç duyulan sonuçlar, programda kullanıcıya yansıtılarak kullanıcı sürekli olarak bilgilendirilmektedir. Giyilebilir sağlık teknolojilerinin pek çok faydası bulunmaktadır. Bunlardan bazıları; tedaviden önce koruma sağlanması, tedavinin hızlıca başlatılması, hasta yatış süresinin kısaltılması, rehabilitasyon takibi, sağlıklı yaşam takibi, riskli hasta takibinin sağlanması şeklinde sıralanabilmektedir. Böylelikle insanlar için daha konforlu hayat sürmelerine yardımcı olunur, sağlık harcamalarının azalması sağlanır, olumlu psikolojik etkileri bulunmaktadır. Giyilebilir cihazlar içerisinde akıllı saat ve bileklikler, kontak lensler, engelli bireyler için işitme cihazları gibi pek çok ürün bulunmaktadır. Bu teknolojiler günümüzde yaygın olarak kullanılmaktadır. Kan basıncı, solunum, vücut sıcaklığı ve nabız gibi parametreleri değerlendirmede, çeşitli kan değerlerinin ölçümünde, uyku düzeninin takibinde kullanılmaktadır. Kandaki stres seviyesini belirlemek için kullanılan bantlar bulunmaktadır.Özellikle bu teknolojilerin yalnız yaşayan yaşlı kişilerin takibinde kullanılması açısından da önemli bir fonksiyon içerdiği, "Giyilebilir sağlık teknolojileri özellikle yalnız yaşayan yaşlı kişilerin 7/24 takip edilmeleri sağlanmaktadır. Akıllı giysiler kolay ulaşılabilir hale gelip ucuzladıkça günlük hayatta da daha sık ve kolaylıkla kullanılmaya başlanmıştır. Böylece bu teknoloji kullanıcıların hayatında büyük kolaylıklar sağlamaya başlamıştır. Giyilebilir sağlık teknolojileri pazarına olan talep tüm dünyada giderek artmaktadır ve bu alanda her geçen gün yeni ürünler ve teknolojiler üretilmektedir.
Anahtar Kelimeler: Giyilebilir teknoloji, yaşlı, sağlık

THE IMPACT OF WEARABLE HEALTH TECHNOLOGIES ON THE QUALITY OF LIFE OF THE ELDERLY

Abrasct
When the literature on health, which is one of the areas affected by wearable technologies, is examined, it is known that these technologies increase both the quality and duration of life, especially for the elderly and individuals living alone. Today, increasing digitalization continues to show its effects in the healthcare sector. Many processes in the field of healthcare are now being moved to digital and smart environments. One of the most important of these technologies is wearable health technologies. Wearable health technologies: It is the integration of small sensors into devices or clothing in order to evaluate the mobility, strength and ability of individuals to perform rituals without the help of family or healthcare professionals, and to perform functional motor tasks that patients cannot perform. The data provided by the wearable device, which provides remote monitoring by providing instant data flow to the relevant people through smart phones to which the wearable devices are directly connected, is processed by the mobile application and the required results are reflected to the user in the program and the user is constantly informed. Wearable health technologies have many benefits. Some of those; These can be listed as providing protection before treatment, starting treatment quickly, shortening patient hospitalization time, rehabilitation follow-up, healthy life follow-up, and ensuring risky patient follow-up. In this way, people are helped to live more comfortable lives, reduce their health expenses, and have positive psychological effects. There are many wearable devices such as smart watches and bracelets, contact lenses, and hearing aids for disabled individuals. These technologies are widely used today. It is used to evaluate parameters such as blood pressure, respiration, body temperature and pulse, measure various blood values, and monitor sleep patterns. There are bands used to determine the stress level in the blood.These technologies have an important function in terms of being used in monitoring elderly people living alone. "Wearable health technologies enable elderly people living alone to be monitored 24/7. As smart clothes become more accessible and cheaper, they begin to be used more frequently and easily in daily life. Thus, this technology has begun to provide great convenience in the lives of users. The demand for the wearable health technologies market is increasing all over the world, and new products and technologies are being produced in this field every day.
Keywords: Wearable technology, elderly, health

BİYOMİMETİK LİDERLİK

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Özet
Son yıllarda yaşanan gelişmelerin ışığında örgütlerde çalışan yöneticiler etkili liderliğe daha fazla ihtiyaç duymaktadır. Bu ihtiyaca karşılık biyomimetik liderlik yeni bir liderlik modeli olarak ortaya çıkmıştır. İnsanoğlu, varoluşsal olarak binlerce yıldır dogay1a taklit ederek yaşamını sürdürmeye devam etmiştir. Doğayı taklit ederek yapılar tasarlamış ve icatlar yapmışlardır. Biyomimikri (biomimicry) ya da biyomimetik doğadaki modelleri inceleyerek, tasarımda tabiattan ilham alarak insanların problemlerine çözüm getirmeyi amaçlayan bir disiplindir. Çeşitli bilim ve uygulama alanlarında araştırmacılar örnek aldıkları doğa modellerini araştırmakta ve bu modelleri çalışma alanlarına özgü uygulamalarda kullanmaktadır. Bu kapsamda doğayı taklit ederek yeni iş sistemleri geliştirmesi beklenen örgütlerde ihtiyaç duyulan liderlik modeli biyomimetik liderliktir. Biyomimetik liderlik, yönü doğa olan, gözlemler ve farkındalıklar ile doğa ile uyumlu iş modelleri geliştiren, bu modelleme süreçlerinde çalışanları etkisi altına alan, bütüncül bakış açısı ile farkındalığı yüksek ve yönetim kabiliyeti gelişmiş liderlerin özelliklerini kapsayan bir yönetim tarzını ifade eder. Birçok disiplinin aksine biyomimetik bakış açısı, örgütsel davranış, yönetim organizasyon ve stratejik yönetim alanlarında henüz yeni kavramlardır. Bu yeni kavramın alan yazındaki yansımalarını ortaya koyabilmek için hem organizasyon hem de liderlik alan yazınında biyomimetik yaklaşımının incelenmesi gerekmektedir.
Anahtar Kelimeler: Biyomimikri, biyomimetik, Biyomimetik organizasyon, biyomimetik liderlik.

BIOMIMETIC LEADERSHIP

ABSTRACT
3In light of the developments in recent years, managers working in organizations need effective leadership more. In response to this need, biomimetic leadership has emerged as a new leadership model. Human beings have continued to survive existentially by imitating nature for thousands of years. They designed structures and made inventions by imitating nature. Biomimicry or biomimetics is a discipline that aims to find solutions to people's problems by examining models in nature and taking inspiration from nature in design. Researchers in various fields of science and application investigate the natural models they take as examples and use these models in applications specific to their fields of study. In this context, the leadership model needed in organizations that are expected to develop new business systems by imitating nature is biomimetic leadership. Biomimetic leadership refers to a management style that focuses on nature, develops business models compatible with nature through observations and awareness, influences employees in these modeling processes, and includes the characteristics of leaders with high awareness and advanced management skills with a holistic perspective. Unlike many disciplines, the biomimetic perspective is still a new concept in the fields of organizational behavior, management organization and strategic management. In order to reveal the reflections of this new concept in the literature, the biomimetic approach needs to be examined in both the organization and leadership literature.
Keywords: Biomimicry, biomimetics, Biomimetic organization, biomimetic leadership.

DEFNE (laurus nobilis l.) ESANSİYEL YAĞLARININ VETERİNER HEKİMLİKTE KULLANIMI VE BİYOKİMYASAL ETKİLERİ
DERLEME

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ÖZET
Son yıllarda, polifenoller gibi doğal bileşiklerle güçlendirilmiş ürünlere yönelik talepte kayda değer bir artış olmuştur. Yaygın olarak defne olarak adlandırılan Laurus nobilis L., bilimsel olarak kanıtlanabilir sağlık yararları ile desteklenen geleneksel mutfak uygulamalarında ve beşeri tıbbında kapsamlı kullanımı ile tanınan, yaprak dökmeyen bir Akdeniz bitkisidir. Bu bitkiden elde edilen yaprak ekstraktlarının biyoaktivitesi bulunan flavonoidler, fenolik asitler, tanenler (proantosiyanidinler) ve lignanları kapsayan zengin fenolik içeriğinden kaynaklanmaktadır. Bu araştırma defnenin (Laurus nobilis L.) veterinerlikte kullanımını incelemekte ve hayvan fizyolojisi üzerindeki biyokimyasal etkilerini tanımlamaktadır. Defne bitkisinden elde edilen uçucu yağlar, antioksidan, antiseptik ve anti-enflamatuar nitelikler de dahil olmak üzere çok yönlü özellikleriyle tanınmakta ve böylece veteriner hekimlik alanında potansiyel uygulanabilirliği barındırmaktadır. Defne uçucu yağında bulunan 1,8-*sineol*, α-*terpinenil asetat*, *sabinen*, α-*pinen*, *linalol*, *metilöjenol* ve β-*pinen* gibi kayda değer bileşenler, canlı organizmalarda farklı biyokimyasal tepkiler oluştur. Bu derlemede, defne esansiyel yağlarının veteriner hekimlikte kullanımına ilişkin mevcut bilimsel çalışmaların kapsamlı bir incelemesini ve aynı zamanda biyokimyasal etkilerini değerlendirmektedir. Ayrıca, hayvan refahı üzerinde beklenen sonuçların yanı sıra, defne esansiyel yağlarının veteriner hekimlikte kullanılabileceği yöntemi tanımlayan ileriye dönük araştırmalar için kaynak niteliğinde olacağı düşünülmektedir. Son olarak, defne esansiyel yağlarının antimikrobiyal, antioksidatif ve anti-enflamatuar özelliklerine yönelik değerlendirmelerin, makul toksikolojik kaygılarla yan yana getirilerek genişletilmesi gerekmektedir. Bu nedenle, defne esansiyel yağlarının veterinerlik alanlarında yararlı ve etkili bir şekilde uygulanmasını ayrıca potansiyel yan etkilerinin araştırılması ileride yapılacak çalışmalara kaynak niteliğinde olması beklenmektedir.
Anahtar Kelimeler: Defne, *Laurus nobilis* L., Flavonoidler, Veteriner Hekimliği, Biyokimya

THE USE AND BIOCHEMICAL EFFECTS OF LAUREL (*laurus nobilis* l.) ESSENTIAL OILS IN VETERINARY MEDICINE: COMPREHENSIVE REVIEW

ABSTRACT
In recent years, there has been a notable increase in demand for products fortified with natural compounds such as polyphenols. *Laurus nobilis* L., commonly called laurel, is an evergreen Mediterranean plant recognized for its extensive use in traditional culinary practices and human medicine, supported by scientifically demonstrable health benefits. The bioactivity of leaf extracts from this plant is due to its rich phenolic content including flavonoids, phenolic acids, tannins (proanthocyanidins) and lignans. This research examines the veterinary use of laurel (Laurus nobilis L.) and describes its biochemical effects on animal physiology. Essential oils from the laurel plant are recognized for their versatile properties, including antioxidant, antiseptic and anti-inflammatory qualities, and thus have potential applicability in veterinary medicine. Notable constituents in laurel essential oil, such as 1,8-cineole, α-terpinenyl acetate, sabinene, α-pinene, linalool, methyleugenol and β-pinene, induce different biochemical responses in living organisms. This review provides a comprehensive review of the available scientific studies on the use of laurel essential oils in veterinary medicine and also evaluates their biochemical effects. It is also expected to serve as a resource for prospective research defining the method by which laurel essential oils can be used in veterinary medicine, as well as the expected consequences on animal welfare. Finally, evaluations of the antimicrobial, antioxidative and anti-inflammatory properties of laurel essential oils need to be expanded by juxtaposing them with reasonable toxicological concerns. Therefore, it is expected that the useful and effective application of laurel essential oils in veterinary fields as well as the investigation of their potential side effects will serve as a resource for future studies.
Keywords: Bay, Laurus nobilis L., Flavonoids, Veterinary Medicine, Biochemistry

GIDA TAĞŞİŞİ TESPİTİNDE RAMAN VE FTIR SPEKTROSKOPİSİ UYGULAMALARI

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ÖZET
Gıda ürünleri uzun ve karmaşık prosese ve tedarik zincirlerine sahiptir. Bu durum, ürünleri tağşişlere karşı daha savunmasız hale getirmektedir. Gıda ürünlerinde kalitenin ve tüketici memnuniyetini koruması ve ekonomik sahtekarlığın önlemesi için gıda spesifikasyonunun belirlenmesi önemlidir. Gıda ve tarım ürünlerinin tağşişindeki artan eğilim, ojinallik tespiti için mevcut yöntemlere alternatif olarak yeni analitik yöntemlerin geliştirilmesine sebep olmuştur. Mevcut analitik yöntemler pahalı ve zaman alıcı olup, uzun ve zahmetli örnek hazırlama prosedürü gibi dezavantajlara sahiptir. Bu çalışmada, tağşiş tespitinde kullanılan yöntemlere alternatif olma potansiyeli olan ve ürün kalitesini sağlamak için hızlı ve güvenilir olduğu düşünülen spektroskopik yöntemler ele alınmıştır. Çalışmada, gıda kalitesi ve tağşişinin tespiti için Fourier dönüşümü kızılötesi spektroskopisi - zayıflatılmış Toplam Yansıma (FTIR-ATR) ve Raman spektroskopik tekniklerinin uygulamaları ve sınırlamaları sunulmuştur. Bu tekniklerin endüstrideki önemi gösterilmiştir. Ayrıca spektroskopik verilerin kemometrik teknikler ile nasıl birleştirildiği tartışılmış ve tarımsal gıda ürünlerinin kalite tahmini ve sınıflandırılması için veri analizi hakkında değerlendirme yapılmıştır. Tarımsal ve hayvansal gıda alanlardaki FTIR-ATR ve Raman spektral verilerinin yorumlanması için de kemometrinin önemi ve avantajları sunulmuştur. Gıda tağşişi tespitinde kullanılan mevcut yöntemler (yüksek performanslı sıvı kromatografisi (HPLC), gaz kromatografisi (GC), kütle spektrometresi, immünolojik testler, elektroforetik teknikler, DNA tanımlamasına dayalı polimeraz zincir reaksiyonu gibi) sahip oldukları dezavantajlardan dolayı rutin kullanım için uygun değildir. Bu nedenle, FTIR-ATR ve Raman spektroskopisi, tarımsal ve hayvansal gıda sektöründe tağşiş için invazif olmayan, hassas, kolay ve hızlı analitik teknikler olarak kabul edilmiştir. Sonuç olarak, incelenen teknikler, gıda kalitesi ve tağşiş analizi ihtiyacını karşılama potansiyeline sahiptir, ancak tek başına yeterli olmayıp, kemometrik yöntemler ile birleştirilmeye ihtiyaç duyulmaktadır.
Anahtar Kelimeler: Tağşiş, FTIR-ATR, Raman, Kemometrik yöntem

THE APPLICATIONS OF RAMAN AND FTIR SPECTROSCOPY IN FOOD ADULTERATION DETECTION

ABSTRACT
Food products have long and complex processes and supply chains. This makes them more undefended to adulteration. So it is important to determine the food specification in order to maintain quality and consumer satisfaction in food products and to prevent economic fraud. The increasing trend in the adulteration of food and agricultural products has led to the development of new analytical methods as an alternative to existing methods for originality detection. Existing analytical methods are expensive and time consuming and have disadvantages such as long and laborious sample preparation procedure. In this study, spectroscopic methods, which have the potential to be an alternative to the methods used in adulteration detection and are considered to be fast and reliable to ensure product quality, are discussed. In this study, the applications and limitations of Fourier transform infrared spectroscopy - Attenuated Total Reflectance (FTIR-ATR) and Raman spectroscopic techniques for food quality and adulteration detection are presented. The importance of these techniques in industry is shown. Furthermore, how spectroscopic data are combined with chemometric techniques is discussed and data analysis for quality prediction and classification of agri-food products is evaluated. The importance and advantages of chemometrics for the interpretation of FTIR-ATR and Raman spectral data in agricultural and animal food fields are also presented. Existing methods for the detection of food adulteration (high performance liquid chromatography (HPLC), gas chromatography (GC), mass spectrometry, immunological tests, electrophoretic techniques, polymerase chain reaction based on DNA identification) are not suitable for routine use due to their disadvantages. Therefore, FTIR-ATR and Raman spectroscopy have been recognised as non-invasive, sensitive, easy and rapid analytical techniques for adulteration in the agricultural and animal food sector. In conclusion, the techniques studied have the potential to fulfil the need for food quality and adulteration analysis, but they are not sufficient alone and need to be combined with chemometric methods.
Keywords: Adulteration, FTIR-ATR, Raman, Chemometric Method

YOZGAT İLİ MEYVECİLİĞİNİN İKLİM ŞARTLARI BAKIMINDAN EKONOMİK AÇIDAN İNCELENMESİ

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Özet
Meyvecilik bahçe bitkileri ürünleri içerisinde bulunan önemli üretim kollarından birisidir. Yozgat ili ılıman iklim bölgelerinden olup kış ayında soğuk bir iklim sergilemektedir. Bu ilimizde kiraz, elma, armut gibi ılıman iklim meyve ağaçları yetiştiriciliği yapılmakta olup farklı iklim şartları yetiştiriciliği sınırlandırmaktadır. Yozgat meyvecilik potansiyeli yüksek olmasına rağmen sahip olduğu bazı özellikler sebebiyle bu konuda dezavantajlı bir durumda bulunmaktadır. Ilıman iklim meyve ağaçları düşük sıcaklığa dayanıklı olduğu bilinmesine rağmen çiçeklenme döneminde hava sıcaklığının -3^{o}C'nin altına düşmesi durumunda çiçeklerde zararlanma hatta çiçeklerin dökülmesi gerçekleşmektedir. Ayrıca Yozgat ilinde şiddetli rüzgarlar, yaz ayında yüksek sıcaklıklar gibi sert olan iklim şartları da meyve yetiştiriciliğini zorlamaktadır. Çiçeklenme zamanında havanın sisli olması tozlanma için ihtiyaç duyulan böceklerin faaliyetini azaltarak çiçeklerin tozlanmasını dolayısıyla da meyve tutumunu azaltmaktadır. Bu nedenle üreticilerin çevre kaynaklı uğrayacağı olası zararları en aza indirmek için bölgenin iklim koşullarını bilerek hareket etmelidir. Devlet destekli tarım sigortaları sistemi TARSİM doğal afetlere maruz kalan üreticilerin gelirlerini garanti altına almasını ve üretimlerine devam edebilmesini mümkün kılmaktadır. Bu konuda yetiştiriciliğin yapılacağı bölgenin son yıllardaki iklim şartları incelenmeli ve bu şartlara uygun tür ve çeşitlerin seçilmesi gerekmektedir. Don riskinin olduğu yerlere geç çiçek açan meyve türleri önerilebilir. Devlet destekli bitkisel ürün sigortasında teminat kapsamında dolu, fırtına, hortum, yangın, deprem, sel ve su baskınları gibi birçok riskler bulunmaktadır. Yaptığımız bu çalışmada Yozgat ilinin son yıllardaki iklim şartları göz önüne alınarak meyve yetiştiriciliğinin durumu ve TARSİM uygulamaları incelenmiştir. Ayrıca, Yozgat ilindeki meyveciliğin genel durumu ve yetiştiricilikte farklı iklim şartlarına karşı alınabilecek önlemler sunulmuştur.
Anahtar Kelimeler: Ekonomi, TARSİM, İklim şartları, Meyvecilik, Yozgat

ECONOMIC INVESTIGATION OF FRUIT GROWING IN YOZGAT PROVINCE IN TERMS OF CLIMATE CONDITIONS

abrasct
Fruit growing is one of the important production branches among horticultural products. Yozgat province is one of the temperate climate regions and exhibits a cold climate in winter. In this province, temperate climate fruit trees such as cherries, apples and pears are grown, but different climatic conditions limit their cultivation. Although Yozgat has a high fruit growing potential, it is at a disadvantage in this regard due to some of its characteristics. Although it is known that temperate climate fruit trees are resistant to low temperatures, if the air temperature drops below -3ºC during the flowering period, the flowers may be damaged or even fall off. In addition, harsh climatic conditions in Yozgat province, such as strong winds and high temperatures in summer, make fruit cultivation difficult. Foggy weather during flowering reduces the activity of insects needed for pollination, thus reducing the pollination of flowers and thus fruit set. For this reason, producers should act knowing the climatic conditions of the region in order to tolerate possible environmental damages. The state-sponsored agricultural insurance system TARSİM enables producers exposed to natural disasters to guarantee their income and continue their production. In this regard, the climatic conditions of the region where cultivation will take place in recent years should be examined and species and varieties suitable for these conditions should be selected. Late blooming fruit types can be recommended in places where there is a risk of frost. There are many risks such as hail, storm, tornado, fire, earthquake, floods within the scope of coverage in state-subsidised crop insurance. In this study, the situation of fruit growing and TARSIM applications were analysed by considering the climatic conditions of Yozgat province in recent years. In addition, the general situation of fruit growing in Yozgat province and the precautions that can be taken against different climatic conditions in cultivation are presented.
Keywords: Economy, Agricultural insurance, Climate conditions, Fruit Growing, Yozgat

KIRSAL KALKINMADA KADININ ROLÜ; YOZGAT/TÜRKİYE ÖRNEĞİ

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Özet
Toplumda kadının rolü, sadece ekonomik açıdan değil, toplumsal ve kültürel açıdan da son derece önemlidir. Kırsal bölgelerde ise genellikle kadınlar, tarım, hayvancılık, el sanatları ve küçük ölçekli işletmeler gibi sektörlerde çalışarak aile gelirine katkıda bulunmaktadırlar. Kadınlar, tarım ve hayvancılık gibi geleneksel faaliyetlerde sıkça yer alırken aynı zamanda sürdürülebilir tarım uygulamalarını destekleyerek çevresel korumaya katkıda bulunmaktadır. Ayrıca, kırsal toplumların sosyal dokusunun korunmasında ve toplumsal dayanışmanın güçlendirilmesinde önemli bir rol oynamaktadır. Türkiye'de kadınlar, kooperatifleşmede erkeklere göre daha etkin rol almaktadır. Bunun yanı sıra kırsal kalkınma projelerinde liderlik rolleri üstlenerek yerel düzeyde karar alma süreçlerine katılır ve kalkınma politikalarının şekillendirilmesinde etkin bir rol oynamaktadır. Gelişmekte olan ülkelerde olduğu gibi Türkiye'de kadınlar, kırsal kalkınmada karşılaştıkları pek çok zorlukla da mücadele etmek zorundadırlar. Eğitim eksikliği, erişim sıkıntıları, kaynak yetersizliği ve cinsiyete dayalı ayrımcılık gibi engellerle karşılaşmaktadırlar. Bu nedenle, kadınların kırsal kalkınmada daha fazla desteklenmesi ve güçlendirilmesi önemlidir. Kadınların potansiyellerini tam olarak ortaya çıkarabilmeleri için eğitim, finansal destek, erişim sağlanması ve cinsiyet eşitliği konularında yapılan çalışmaların önemi büyüktür. Bu şekilde kadınlar, kırsal kalkınmanın sürdürülebilirliği ve başarısı için kritik bir faktör haline gelirler. Bu çalışmada Yozgat ili genelinde kadın çiftçi sayısı değerlendirilirmiş ve örnek kadın çiftçi girişimleri, kadın kooperatifleri ve tarıma dayalı örnek uygulamalar irdelenmiştir.
Anahtar kelimeler: Kadın, Çiftçi, Tarım sektörü, Toplumsal dayanışma

WOMEN'S ROLE IN RURAL DEVELOPMENT; YOZGAT/TÜRKİYE EXAMPLE

ABSTRACT
The role of women in society is important not only in economic terms but also in social and cultural terms. In rural areas, women contribute to family income by working in agriculture, animal husbandry, handicrafts, and small-scale enterprises. While women are frequently involved in traditional activities such as agriculture and animal husbandry, they also contribute to environmental protection by supporting sustainable agricultural practices. They also play an important role in maintaining the social fabric of rural communities and strengthening social solidarity. In Turkey, women play a more active role in co-operatives than men. They also assume leadership roles in rural development projects, participate in decision-making processes at the local level, and play an active role in shaping development policies. As in developing countries, women in Turkey struggle with many challenges in rural development. They face obstacles such as lack of education, access problems, lack of resources, and gender-based discrimination. Therefore, it is important to further support and empower women in rural development. For women to realize their full potential, they must work on education, financial support, access, and gender equality. In this way, women become a critical factor for the sustainability and success of rural development. In this study, the number of women farmers in Yozgat province was evaluated and sample women farmer initiatives, women's co-operatives, and agricultural practices were examined.
Keywords: Women, Farmer, Agricultural sector, Social solidarity

MALATYA SON YÜZYIL KENTLEŞME TARİHİ

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ÖZET
Kentler, tarih boyunca insanların sosyo-ekonomik düzeylerini yansıtan yaşam alanları olmuşlardır. Tarih boyunca yaşanan değişim ve gelişmeler sonucunda insanlarla birlikte kentler de değişip gelişmeye başlamıştır. Kentleşme kavramı, bu değişim ve gelişme noktasında karşımıza çıkmıştır. Kentleşmeyi basit bir kavram olarak ele alırsak nüfus artışı ile karşımıza çıktığını söylemek mümkün olmaktadır. Fakat kentleşmeyi sadece nüfus üzerinden değerlendirmek kavramı bir hayli eksik bırakacaktır. Bu nedenle kentleşme kavramını, kentte bulunan halkın toplumsal, ekonomik ve sosyal değişimlere uyum sağlamasıyla birlikte kentte meydana gelen değişimlerdir şeklinde tanımlamak daha doğru olacaktır.Bu çalışmada kentleşme kavramı üzerinden Malatya'yı incelenecektir. Malatya, ön tarihi Paleolitik çağa kadar inen, tarih boyunca çeşitli medeniyetlere ev sahipliği yapmış ve tarihsel süreç boyunca hem kervan yolları üzerinde yer alması hem de Mezopotamya ve İç Anadolu'yu birbirine bağlayan bir kesişim noktası niteliğinde olması sayesinde zengin bir kültüre olan sahip bir kenttir. Bu kültürel zenginlik, Malatya'nın bereketli, sulak topraklar ile birleşince karşımıza -özellikle son yüzyılda- kentleşme açısından büyük yol almış bir Malatya kentinin çıkmasını sağlamıştır.Çalışma kapsamında Malatya'nın tarihi, doğal yapısı, ekonomik ve demografik özellikleri; Malatya için yapılan şehir planları, Malatya kentine yapılan yatırımlar incelenmiş; Malatya'nın kentsel gelişim süreci, Malatya kentinde zaman içerisinde gelişen kentleşme için kırılma noktaları belirlenerek makroform gelişim süreci oluşturulmuştur. Tarihi serüveni Cafer Höyük ile Paleolitik çağdan başlayan Malatya'da kentleşme, cumhuriyet sonrası kamudan büyük yatırımlar alması ve bu sayede sosyal ve kültürel açıdan gelişmesini etkilemesiyle hız kazanmış ve günümüzdeki şeklini almıştır. Malatya'nın kentsel gelişimi incelenirken 2023 Kahramanmaraş-Pazarcık depremi sonrası Malatya'nın kent merkezi üzerindeki değişim de incelenmiştir. Kent merkezinde deprem sırasında oluşan yıkımların ve deprem sonrasında -yapıların ağır hasarlı olması nedeniyle- yapılan yıkım çalışmalarının sonunda kent merkezi olan Çarşı Bölgesinin yeniden oluşturulması için Malatya Belediyesi tarafınca öneri plan ve tasarımlar oluşturulmuş. Oluşturulan öneri plan ve öneri tasarım bu çalışma kapsamında incelenmiş; gerekli görülen noktalarda eleştiri ve öneriler sunulmuştur.
Anahtar Kelimeler: Malatya, kentleşme, kentsel gelişim, deprem

URBANIZATION HISTORY OF MALATYA IN THE LAST CENTURY

ABSTRACT
Urbanization is not only the increase of population but also the concept of the changes that occur in the city with the adaptation of the people in the city to social and economic changes. In this study, Malatya will be examined through the concept of urbanization. Malatya, the prehistory of which descends until the Paleolithic age, has a rich culture that has hosted various civilizations and has been both on the caravan roads throughout the historical process and as an intersection point connecting Mesopotamia and Central Anatolia. This cultural wealth, combined with the fertile, wet lands of Malatya, led to the emergence of a Malatya city, which - especially in the last century - has taken a great path in terms of urbanization.In this study, the history, natural structure, economic and demographic characteristics of Malatya; city plans for Malatya, investments in Malatya city were examined; macroform development process was established by determining breakpoints for urbanization that developed over time. The urbanization of Malatya, which started from the Paleolithic age with Cafer Hoyuk gained momentum by taking large investments from the post-republic and thus affecting its development socially and culturally and took its present form.While examining the urban development of Malatya, the change in the city center of Malatya after the 2023 Kahramanmaras-Pazarcık earthquake was also examined. Suggestion plans and designs have been created by Malatya Municipality for the reconstruction of the Bazaar Region, which is the city center at the end of the demolition works carried out in the city center during the earthquake and after the earthquake - due to the heavy damage of the structures. The proposed plan and proposal design were examined; within the scope of this study; criticism and suggestions were presented at required points.
Keywords: Malatya, urbanization, urban development, earthquake

KÜÇÜK VERİ SETLERİNİN KÜMELENME VE PERFORMANS ANALİZLERİ

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Özet
Makine öğrenimi teknikleri ile gerçekleştirilen analizlerde kullanılan veri setlerinin içerdiği veri miktarı arttıkça, uygulanan yöntemlerin performansları da artmaktadır. Ancak yeterli miktarda veriye sahip olmayan veri setlerinin makine öğrenimi analizlerinde başarılı sonuçlar elde edilememektedir. Özellikle fazla miktarda veriye ulaşım imkanı sınırlı olan nadir hastalıklar, niş ürünler, ülke veya şehir kümelenmeleri gibi analizler az miktarda veri ile analiz yapılması gereken durumlardır. Literatürde gerçekleştirilen çalışmaların büyük bir çoğunluğunun yüksek miktarda veri analizini konu aldığı, yetersiz veri miktarına sahip veri setlerinin analizlerinin ihmal edildiği görülmektedir. Bazı çalışmalarda küçük veri setlerinin analizlerinde geleneksel yaklaşımlar kullanılsa da, bu çalışmalarda tatmin edici sonuçlara ulaşılamadığı görülmektedir. Bu kapsamda küçük veri setleri ile yüksek performansa sahip makine öğrenimi tabanlı analizlerin gerçekleştirilmesi önem arz etmektedir. Bu çalışmada, SGK tarafından yayınlanan 2022 yılına ait Türkiye'de illere göre iş kazası gerçekleşme değerleri temel alınarak 81 öğeye sahip bir veri seti oluşturulmuştur. Oluşturulan veri seti ile 3, 4, 5 ve 6 küme oluşacak şekilde kümeleme analizleri gerçekleştirilmiştir. Kümeleme analizlerinde literatürde yaygın olarak kullanılan K-Means, Hiyerarşik, Fuzzy C-Means algoritmalarının yanı sıra yetersiz veri ile başarılı sonuçlar veren Gri İlişkisel kümeleme yöntemi kullanılmıştır. Analiz sonuçları ile oluşan kümelerin performans değerleri, içsel doğrulama yöntemleri olan Silhouette indeks, Calinski-Harabasz indeks ve Dunn indeks kullanılarak hesaplanmıştır. Doğrulama ölçütleri sonuçlarına göre tüm küme sayılarında en düşük performans Fuzzy C-Means yöntemi ile elde edilmiştir. Kümeleme yöntemlerindeki en yüksek performansın ise tüm küme sayılarında Gri ilişkisel kümeleme ile gerçekleştiği gözlenmiştir. Gri ilişkisel kümelemenin en yüksek performansı ise k=6 durumundadır. Diğer taraftan, küme sayılarına göre Gri ilişkisel kümeleme haricindeki diğer kümeleme yöntemlerinde ciddi performans dalgalanmaları olduğu gözlenmiştir. Araştırma sonuçlarına göre; küçük veri setlerinin kümelenmesinde Gri ilişkisel kümeleme yönteminin daha yüksek performansa sahip olduğu ve yöntemin diğer kümeleme yöntemlerine göre daha kararlı sonuçlar ortaya koyduğu tespit edilmiştir.
Anahtar kelimeler: Makine öğrenimi, Kümeleme, Yetersiz veri, Gri ilişkisel kümeleme

CLUSTERING AND PERFORMANCE ANALYSIS OF SMALL DATASETS

ABSTRACT
In analysis carrying out with machine learning techniques, high performance of the analysis depend on the large amount of data. However, successful results cannot be obtained in machine learning methods in data sets having insufficient data. Particularly, analyses such as rare diseases, niche products, country or city clustering, which have limited access to large amounts of data, are situations where analysis must be done with a small amount of data. It is seen that the majority of the studies carried out in the literature focus on the analysis of large amounts of data, and the analyses of data sets with insufficient data are neglected. Although traditional approaches are used in the analysis of small data sets in some studies, satisfactory results cannot be achieved in these studies. In this context, it is important to perform high-performance machine learning-based analyses with small data sets. In this study, a data set with 81 items was created based on work accident occurrence values by province in Turkey for 2022, published by SGK. Clustering analyses were performed with the created data set, resulting in 3, 4, 5 and 6 clusters. In cluster analysis, K-Means, Hierarchical, Fuzzy C-Means algorithms, which are widely used in the literature, as well as the Grey relational clustering method, which gives successful results with insufficient data, were applied. The performance values of the clusters were calculated using the internal validation methods such as Silhouette index and Calinski-Harabasz index. According to the validation results, the lowest performance in all cluster numbers was obtained with the Fuzzy C-Means. It was observed that the highest performance in clustering methods was achieved with Grey relational clustering in all cluster numbers. The highest performance of grey relational clustering is at k = 6. On the other hand, it has been observed that there are serious performance fluctuations in clustering methods except Grey relational clustering. According to the research results; It has been determined that the Grey relational clustering method has higher performance in small data sets and that the method produces more stable results than other clustering methods.
Keywords: Machine learning, Clustering, Insufficient data, Grey relational clustering

6 ŞUBAT DEPREMİ SONRASI KAHRAMANMARAŞ İLİ HAVA KİRLİLİĞİNDEKİ ARTIŞIN DEĞERLENDİRİLMESİ VE ÖNERİLER

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ÖZET
AMAÇ: Bu çalışmada 6 Şubat 2023 depreminin Kahramanmaraş merkezinin hava kirliliğinin önceki yıllara göre olan değişimini incelemek istedik. MATERYEL-METOD: Çevre ve Şehircilik Bakanlığının https://sim.csb.gov.tr/SERVICES/airquality açık erişimli sitesindeki hava kontrol raporlarından yararlanılmıştır. 2019'dan 2024'e dek 10 Şubat tarihli hava raporlarına bakılmıştır. Raporlardaki PM10, SO2 ve Hava Kalite İndeksi (HKİ) verileri kaydedilerek yıllar arasındaki farklar gözlenmiştir. BULGULAR: Hava izlem sonuçlarına göre 2019 ve 2022 yıllarında PM10 ortalaması 55,5 ±46,4 µg/m³, SO2 ortalama 19±14,6 µg/m³ ve HKİ ortalaması 44±22,6 bulunmuştur. 2023 ölçümleri ise PM10= 141 µg/m³, S02=14 µg/m³ ve HKİ =151,1 olarak raporlanmıştır. 2024 yılı değeri ise PM10= 27 µg/m³, S02=6 µg/m³ ve HKİ =55 olarak belirtilmiştir. Bu sonuçlara göre 6 Şubat depremleri sonrası önceki yıllara göre HKİ ve PM10 değerlerinde ciddi bir artış söz konusudur. Ancak depremden 1 yıl sonraki değerler önceki yılların ortalamasına yaklaşmıştır. TARTIŞMA VE SONUÇ: Çevre sorunları içerisinde önemli bir unsur olan hava kirliliği, atmosferde toz, gaz, su buharı, duman ve koku şeklinde bulunabilecek olan kirletici faktörlerin çeşitli nedenlerle artarak insanlara, diğer canlılara ve cansız varlıklara zarar verici düzeye yükselmesi olarak tanımlanabilir. Havadaki kirleticiler belli bir miktarı aştığında canlı ve cansız varlıklar için zararlı hale gelmektedir. Bu kirleticilerin hangi miktardan sonra zararlı olacağı, yapılan ölçümlerle belirlenmekte ve sınır değerler (kirlilik standartları) konularak bu değerlerin aşılmamasına yönelik politikalar uygulanmaktadır. Önceki yıllara göre 6 Şubat depremleri sonrası hava kirliliğinde ciddi bir artış olmuştur. Öncelikle kronik solunum yolları hastalıkları olanlar olmak üzere sağlık politikalarının düzenlenmesinde deprem sonrası oluşan kirliliğinin azaltılması için büyük çaplı çalışmalar gerekmektedir.
Anahtar Kelimeler: hava kirliliği, deprem, hava kalite indeksi.

AFTER THE 6 FEBRUARY EARTHQUAKE, EVALUATION OF THE INCREASE IN AIR POLLUTION IN KAHRAMANMARAS PROVINCE AND RECOMMENDATIONS

ABSTRACT

OBJECTIVE: In this study, we wanted to examine the changes in air pollution in the centre of Kahramanmaras after the 6 February 2023 earthquake compared to previous years. MATERIAL-METHOD: Air control reports from the open access website of the Ministry of Environment and Urbanisation https://sim.csb.gov.tr/SERVICES/airquality were used. Air reports dated 10 February from 2019 to 2024 were examined. PM10, SO2 and Air Quality Index (AQI) data in the reports were recorded and differences between years were observed. RESULTS: According to the air monitoring results, in 2019 and 2022, PM10 average was 55.5 ± 46.4 µg/m³, SO2 average was 19 ± 14.6 µg/m³ and AQI average was 44 ± 22.6. 2023 measurements were reported as PM10= 141 µg/m³, S02=14 µg/m³ and HHI =151.1. The value for 2024 was reported as PM10= 27 µg/m³, S02=6 µg/m³ and AQI =55. According to these results, there is a significant increase in AQI and PM10 values after the 6 February earthquakes compared to previous years. However, the values 1 year after the earthquake approached the average of the previous years. DISCUSSION AND CONCLUSION: Air pollution, which is an important element in environmental problems, can be defined as the increase of pollutant factors that can be found in the atmosphere in the form of dust, gas, water vapour, smoke and odour to a level that is harmful to humans, other living things and inanimate beings. When pollutants in the air exceed a certain amount, they become harmful to living and non-living beings. The amount at which these pollutants become harmful is determined by measurements and policies are implemented to ensure that these values are not exceeded by setting limit values (pollution standards). Compared to previous years, there has been a serious increase in air pollution after the 6 February earthquakes. Large-scale studies are required to reduce post-earthquake pollution in the organisation of health policies, especially for those with chronic respiratory diseases.

Keywords: air pollution, earthquake, air quality index

FORECASTINGS OF AGRICULTURAL AND FOREST AREAS IN TURKEY THROUGH THE ARIMA METHOD BASED ON AGRO-ECOLOGICAL ECONOMY PRINCIPLE FOR THE YEAR 2028

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ABSTRACT
This study aims to assess the evolution of agricultural and forest areas in Turkey from 1988 to the present and employ the AutoRegressive Integrated Moving Average (ARIMA) method to predict future scenarios. Emphasizing Turkey's vast and diverse agricultural regions, the research underscores the pivotal role of agriculture as a significant component of the economy. Various regions with distinct climates and topographies allow farmers to cultivate a diverse array of crops, utilizing both traditional and modern agricultural technologies. The agricultural sector serves as a crucial source of employment throughout the country.Furthermore, the study highlights that Turkey hosts forest areas supporting rich biodiversity, yet faces the threat of deforestation due to increasing urbanization, industrialization, and agricultural activities. Deforestation is acknowledged as a potential driver of biodiversity loss and environmental imbalance. Turkey endeavors to combat this issue by implementing sustainable forest management policies and supporting afforestation projects.In evaluating the changes in agricultural and forest areas over the years, the study employs the ARIMA method to forecast future conditions. Additionally, the results derived from the principles of Agro-ecological Economics will be assessed to make predictions for the year 2028. This research aims to contribute significantly to the sustainable management of agricultural and forest areas.
Keywords: Forest Areas, Forecasts, Agro-Ecological Economics

POPÜLASYON GENETEĞİ ARAŞTIRMALARINDA NETWORK ANALİZİ YAKLAŞIMI

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Özet
Popülasyonların gensel verilerinin analizi amacıyla kullanılan yöntemler arasında yer alan "*Network analizi*" araştırıcılara önemli bilgiler sağlamaktadır. Genetik verilere dayalı ağ analizi kullanan çalışmalar antropolojik, paleoiklimsel, arkeolojik ve filocoğrafik araştırmalar için oldukça sık kullanılır. İlgili popülasyonun nüfussal gelişim süreci, olası mutasyon dağılımı, popülasyon içi gensel bağlantı parametreleri gibi özelliklerinin yorumlanmasını sağlaması Network analizi yazılımlarının önemli yararları arasındadır. Network yazılımındaki (rho) değeri, mutasyon birimleri cinsinden bir atasal haplotipin yaşını hesaplar. Bu mutasyon yaşı daha sonra mutasyon oranı ile çarpılarak yıllara dönüştürülür (np 16,090-16,365 aralığında insan mtDNA'sı için 20,180 yılda 1 mutasyon). Mutasyon oranı göz önüne alındığında belirli bir "atasal" haplotipin yaşını tahmin etmek için atasal haplotipe olan tüm mesafelerin aritmetik ortalaması alınır. Bu yöntem "rho" tahmini olarak bilinir. Bu çalışmada model olarak seçilen beta globin gen ailesi haplotipleri, Network yazılımı kullanılarak analiz edilmiş ve elde edilen sonuçlar sunulmuştur. Denizli bölgesinde yapılan ve sonuçları yayınlanmış olan çalışmalardan elde edilen haplotip verileri karşılaştırmalı olarak analiz edilmiştir. Yayınlanan haplotip verileri, yedi polimorfik odak (HincII 5′ to ε, HindIII 5′ to Gγ, HindIII in IVS-II 5′ to Aγ, HincII in ψβ, HincII 3′ to ψβ, AvaII β, and HinfI 3′ to β) için polimeraz zincir reaksiyonu-restriksiyon parça uzunluğu polimorfizmi (PCR-RFLP) yöntemi kullanılarak elde edilmiştir. Elde edilen RFLP sonuçları Arlequin ver. 3.5 yazılımı kullanılarak tanımlanmıştır. Analiz sonuçlarına göre Denizli popülasyonunda beta globin gen ailesi haplotipleri kullanılarak yapılan Network analizinde farklı mutasyonlarla ilişkili alt haplotiplerin olası oluşum zamanları hesaplanmıştır. Bu hesaplar doğrultusunda mutasyonların tarihsel göç yolları ile olan ilişkisi tartışılmıştır. Buna göre bölgede tespit edilen Hb S mutasyonunun tarihsel ipek yolu göçlerinden (2000 ybp) bağımsız olarak şekilde yaklaşık 26.000 yıl önce bölgeye ulaştığı öngörülmektedir.
Anahtar Kelimeler: haplotip, beta-globin gene ailesi, filogenetik network analizi, zaman tahmini

NETWORK ANALYSIS APPROACH IN POPULATION GENETICS RESEARCH

ABSTRACT
"Network analysis", one of the methods used to analyze the genetic data of populations, provides important information to researchers. Studies using network analysis based on genetic data are frequently used for anthropological, paleoclimatic, archaeological and phylogeographic research. Among the important benefits of network analysis software are the interpretation of the population development process of the relevant population, possible mutation distribution, intra-population genetic linkage parameters. The ρ (rho) value in Network software measures the age of an ancestral node in mutational units. This mutation age is then converted into years by multiplying it by the mutation rate (1 mutation per 20,180 years for human mtDNA in the stretch np 16,090–16,365). To estimate the age of a particular "root" haplotype given the mutation rate, all available descendant individual sequences are considered, and the arithmetic mean over all distances to the root haplotype is taken. This method is known as "*rho*" estimation. In this study, the beta globin gene family haplotypes selected as a model were analyzed using Network software and the results obtained were presented. Haplotype data obtained from published studies in Denizli region were analyzed comparatively. The published haplotype data were obtained using the polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) procedure for seven polymorphic loci (HincII 5′ to ε, HindIII 5′ to Gγ, HindIII in IVS-II 5′ to Aγ, HincII in ψβ, HincII 3′ to ψβ, AvaII β, and HinfI 3′ to β). RFLP data analysis was conducted using Arlequin ver. 3.5 software to determine the haplotypes in the Denizli region. According to the results of the analysis, the possible formation times of sub-haplotypes associated with different mutations were calculated in the Network analysis using beta globin gene family haplotypes in Denizli population. In line with these calculations, the relationship of mutations with historical migration routes was discussed. These results indicate that the Hb S mutation arrived in the Mediterranean region long before the Silk Road migrations. Historically, the Silk Road migrations date back to approximately 2000 ybp.
Keywords: haplotype, β-globin gene cluster, phylogenetic network analysis, time estimate

SURİYELİ GÖÇÜNÜN BELEDİYE HİZMETLERİNE OLAN ETKİSİ

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ÖZET
İnsanların bir yerden başka bir yere, çeşitli zorluklar sebebiyle ve daha iyi yaşam koşullarına sahip olabilmek amacıyla yaptığı göçler, kişilere bağlı olduğu kadar da doğal bir süreçtir. Çeşitli saldırılardan, maddi ve manevi baskılardan, kitlesel katliamlardan, toplumdan dışlanmaktan, ekonomik kaygılardan ve coğrafi şartların olumsuzluklarından dolayı insanlar yıllarca, yaşadığı topraklardan göç etmek zorunda kalmışlardır. Göç süreçleri, bütün toplumda etkisi görülen travmalara, fakirliklere, toplumsal şiddet olayları ve çatışmalara, bütün toplumu derinden sarsan ekonomik krizlere ve yaygın hastalıklara sebep olabilmektedir. Bütün bu göçler sonucunda yerleşilen yerlerde ki belediye yönetimleri, göç sürecinin kontrollü ve plan dâhilinde yürütülebilmesi amacıyla çok büyük çaba göstermiştir. Son yıllarda göçlerin yönetilmesi sürecinde, merkezi hükümetlerden daha ziyade yerel yönetimler ön plana çıkmaktadır. Birleşmiş Milletlerin 2016 yılında onayladığı sürdürülebilir kalkınma amaçları ve yine 2016 yılında yürürlüğe giren Avrupa Birliği Türkiye Mülteci Mutabakatı, dünya da ve Türkiye de yerel yönetimlerin göç sürecinde daha etkin rol oynadığını ve oynaması gerektiğini ileri sürülmüştür. Belediyeler göçün sonucunda ortaya çıkan konut sıkıntısı, ulaşım problemleri ve alt yapı sorunlarıyla mücadele etmek zorunda kalmaktadır. Bütün bunları yaparken belediyenin kısıtlı bütçesinden kaynak aktarmaktadırlar. Yetersiz bütçe ve kısıtlı imkânlarla süreci yönetmeye çalışan belediyeler, kentte yaşayan yoksul vatandaşlara ilaveten son yıllar da Suriyeli sığınmacılara da yardım etmeye başlamıştırlar. Bu durum, yerel halkın Suriyeli sığınmacılara yönelik olumsuz düşüncelerini daha da arttırmaktadır. Türkiye de en çok Adana, Gaziantep, Hatay, Kilis, Mersin illerinde yaşayan Suriyeli göçmenler, büyükşehir belediyelerinin ciddi harcamalar yapmasına neden olmaktadır. TÜİK verilerine göre Temmuz 2020 tarihi itibarıyla, Adana 247.671 Suriyelinin bulunduğu, Gaziantep'te 448.917 Suriyeli bulunduğu, Hatay da 433.235 Suriyelinin bulunduğu, Kilis'te 116.289 Suriyeli bulunmakta olup yerli nüfusa göre oranının %81,40 olduğu, Mersin'de 213.846 Suriyelinin ikamet etmekte olduğu belirtilmiştir. Çalışmanın amacı; belediyelerin Suriyelilerin göçüyle ortaya çıkan sorunlar sarmalına ilişkin olarak neler yapabileceklerini değerlendirmek, problemlerin çözümüne ilişkin yöntemleri irdeleyerek incelemektir. Suriyeli göçünün, özellikle ismen belirtmiş olduğumuz iller de ciddi bütçe problemlerine ve çözülmesi gereken teknik sorunlara sebep olduğunun anlaşılması bakımından alana katkısı olacaktır. Çalışmada belediyelerce Suriyeli göçünün önetilmesine ilişkin kanunlar, ilgili mevzuatlar, konuya ilişkin yazılı eserler, internet kaynakları irdelenerek, literatür taraması uygulanmıştır.
Anahtar Kelimeler: Suriyeli göçü, belediyeler, alt yapı

THE EFFECT OF SYRIAN MIGRATION ON MUNICIPAL SERVICES

ABSTRACT
Migration of people from one place to another due to various difficulties and in order to have better living conditions is a natural process as much as it depends on individuals. People have had to migrate from the lands they lived in for years due to various attacks, material and moral pressures, mass murders, social exclusion, economic concerns and adverse geographical conditions. Migration processes can cause traumas, poverty, social violence and conflicts that affect the whole society, economic crises that deeply shake the whole society, and widespread diseases. As a result of all these migrations, the municipal governments in the places settled have made great efforts to carry out the migration process in a controlled and planned manner. In recent years, local governments rather than central governments have come to the fore in the process of managing migration. The sustainable development goals approved by the United Nations in 2016 and the European Union-Turkey Refugee Agreement, which came into force in 2016, have suggested that local governments in the world and in Turkey play and should play a more active role in the migration process. Municipalities have to struggle with the housing shortage, transportation problems and infrastructure problems that arise as a result of migration. While doing all these, they allocate resources from the municipality's limited budget. Municipalities, trying to manage the process with insufficient budget and limited resources, have started to help Syrian refugees in recent years, in addition to poor citizens living in the city. This situation further increases the negative thoughts of the local people towards Syrian refugees. Syrian immigrants living mostly in the provinces of Adana, Gaziantep, Hatay, Kilis and Mersin in Turkey cause metropolitan municipalities to incur serious expenses. According to TÜİK data, as of July 2020, there are 247,671 Syrians in Adana, 448,917 Syrians in Gaziantep, 433,235 Syrians in Hatay, 116,289 Syrians in Kilis, the rate of which is 81.40% compared to the local population, and 213,846 Syrians residing in Mersin. It is stated that. Purpose of the study; The aim is to evaluate what municipalities can do regarding the spiral of problems arising from the migration of Syrians and to examine the methods of solving the problems. It will contribute to the field in terms of understanding that Syrian migration causes serious budget problems and technical problems that need to be solved, especially in the provinces we have mentioned by name. In the study, a literature review was conducted by examining the laws regarding the promotion of Syrian migration by municipalities, relevant legislation, written works on the subject, and internet resources.
Keywords: Syrian migration, municipalities, infrastructure

THE EXTENSION OF TEMPORAL GAUGE AND POLE TREATMENTS IN GREEN FUNCTIONS

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ABSTRACT
The most basic assumption in the construction of Yang-Mills theories is that the Lagrange density is invariant under local gauge transformations. The existence of this symmetry poses a number of difficulties in the quantization of gauge fields. These difficulties can be resolved using the Faddeev-Popov method. The reason for these difficulties is that in path integral calculations, integration is made over non-physical degrees of freedom. These difficulties are resolved by eliminating non-physical degrees of freedom using the gauge condition. The aim of the present work is to investigate the Yang-Mills field quantization procedure in noncovariant gauges. Noncovariant gauges have some advantages, such as decoupling ghost fields in loop calculations, and also possess disadvantages such as loop calculations becoming more complicated. Additionally, gluon Green functions have poles in the form $1/(n\cdot k)$ in these gauges. How to operate with poles of the form $1/(n\cdot k)$ in gluon Green functions is described with various recipes in the literature. In this work, we use the method proposed by Veliev, Karnaukhov and Fainberg to eliminate poles and obtain pole-free gluon propagator. In this method, by extension of the gauge condition, a pole-free propagator is obtained after the standard quantization procedure. Our objective is to study the quantization procedure in an extended temporal gauge $\left(n_\mu + \varepsilon^2 k_\mu/(n\cdot k)\right)A^a_\mu = 0$, which transforms to the standard temporal-gauge condition in the limit $\varepsilon \to 0$. After the standard quantization procedure we obtain pole-free Green functions.
Keywords: Gluon Green Functions, Temporal gauge, Pole treatment

ORTAOKUL ÖĞRENCİLERİNİN ÇEVRE EĞİTİMİ KAVRAMINA YÖNELİK METAFORİK ALGILARI

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Özet
Yapılan çalışmada, katılımcı öğrencilerin "çevre eğitimine" yönelik sahip oldukları metaforik algıların belirlenmesi amaçlanmıştır. Araştırmada, nitel araştırma türlerinden biri olan olgu bilim deseni tercih edilmiştir. Araştırmanın ortaokul kademesindeki öğrencilerin çevre eğitimi kavramına yönelik metaforlar oluşturarak düşüncelerini ifade etmeleri açısından önem taşıdığı düşünülmektedir. Yapılan araştırmanın örneklem grubunu, 2023 - 2024 Eğitim - Öğretim yılının bahar döneminde Van Milli Eğitim Müdürlüğü' ne bağlı Tev - İfakat Yavuz ortaokulunda öğrenim gören toplam 200 öğrenci oluşturmaktadır. 25 katılımcı öğrencinin oluşturdukları metaforlar uygun görülmediğinden değerlendirmeye alınmamıştır. Katılımcı öğrenciler için *"Çevre eğitimi denildiğinde aklıma……gelmektedir; çünkü…."* ifadesi soru olarak belirlenmiş ve belirtilen boşlukları tamamen kendi fikirleri doğrultusunda doldurmaları sağlanmıştır. Bu doğrultuda elde edilen verilerin analizi betimsel analiz yöntemiyle değerlendirilmiştir. Katılımcı öğrencilerden elde edilen verilerin değerlendirilmesi sonucunda toplamda 78 metafor elde edilmiştir. Bu metaforlar ortak özelliklerine göre 12 farklı metafor kategorisi altında sınıflandırılmıştır. Araştırma sonucunda elde edilen bulgular doğrultusunda katılımcı öğrencilerin çevre eğitimine ilişkin metaforlardan ziyade çevre kavramının ne olduğuna yoğunlaştıkları ve bununla ilgili metaforları daha çok ön planda tuttukları gözlemlenmiştir. Bunun yanında katılımcıların öğrenme ortamlarında çevre eğitiminden ziyade çevre kavramının ne olduğunu anlamalarına ve farklı iki kavram olduklarını belirleyebilmelerine yönelik eğitsel faaliyetlerin arttırılması, bu iki kavram arasındaki farklılığı bilmeleri, çevre kavramına yönelik öğrenci farkındalıklarının sınıf içi ve sınıf dışı öğrenme etkinlikleri ile arttırılması, vb. yönde birtakım önerilerde bulunulmuştur.
Anahtar Kelimeler: Fen Eğitimi, Çevre eğitimi, Çevre, Metafor.

METAPHORICAL PERCEPTIONS OF SECONDARY SCHOOL STUDENTS TOWARDS THE CONCEPT OF ENVIRONMENTAL EDUCATION

Abrasct
The study aimed to determine the metaphorical perceptions of participating students towards "environmental education". In the research, phenomenology pattern, which is one of the qualitative research types, was preferred. It is thought that the research is important in terms of secondary school students expressing their thoughts by creating metaphors for the concept of environmental education. The sample group of the research consists of a total of 200 students studying at Tev - İfakat Yavuz secondary school affiliated with the Van Directorate of National Education in the spring semester of the 2023 - 2024 academic year. The metaphors created by 25 participating students were not evaluated because they were not deemed appropriate. For the participating students, *"When environmental education is mentioned, …… comes to my mind; Because…."* The statement was determined as a question and they were allowed to fill in the blanks completely in line with their own ideas. In this regard, the analysis of the data obtained was evaluated using the descriptive analysis method. As a result of evaluating the data obtained from the participating students, a total of 78 metaphors were obtained. These metaphors are classified under 12 different metaphor categories according to their common features. In line with the findings obtained as a result of the research, it was observed that the participating students focused on the concept of environment rather than metaphors related to environmental education and prioritized metaphors related to it. In addition, increasing educational activities for participants to understand what the concept of environment is rather than environmental education in learning environments and to determine that they are two different concepts, knowing the difference between these two concepts, increasing student awareness of the concept of environment through in-class and out-of-class learning activities, etc. Some suggestions have been made in this direction.
Keywords: Science Education, Environmental education, Environment, Metaphor.

OMEGA-3 YAĞ ASİTLERİNİN YAŞLILIK DÖNEMİNDEKİ SARKOPENİ ÜZERİNE ETKİSİ

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ÖZET
Yeterli beslenme ve düzenli egzersizin kas protein sentezini pozitif yönde etkilediği ve kas kütlesi kayıplarını önlediği bilinmektedir. Kas kütlesi ve kas gücü zayıflığı sarkopeninin belirgin özellikleri arasındadır. Yaşlı bireylerde en önemli sağlık sorunlarından biri olan sarkopeni; demans, bilişsel bozukluk, azalmış yaşam kalitesi ve mortalite ile ilişkilendirilmiştir. Yaşlanmaya bağlı olarak ortaya çıkabilen kronik düşük dereceli inflamasyon da sarkopeniye neden olabilmektedir. Çoklu doymamış yağ asitlerinden olan eikosapentaenoik asit (EPA), dokosaheksaenoik asit (DHA) ve α-linolenik asit (ALA) gibi omega-3 yağ asitleri, kas protein sentezini artırma ve antiinflamatuar özellikleri sayesinde sarkopeni için potansiyel bir tedavi seçeneği olarak incelenmektedir. Ringa balığı, somon, sardalya ve uskumru gibi hayvansal kaynaklar insanlar için birincil EPA ve DHA kaynakları olarak kabul edilmektedir. Bunun sebebi birçok balığın besin kaynağının EPA ve DHA açısından zengin algler, balıklar ve istiridye gibi omurgasız deniz ürünleri olmasıdır. Omega-3 yağ asitleri esansiyel oldukları için dışarıdan alınmaları zorunludur. İnsanlarda düşük düzeyde ve yetersiz olmakla birlikte, dışarıdan alınan ALA'nın vücutta EPA ve DHA'ya dönüşümü (sırasıyla %8 ve %1) karaciğerde gerçekleştirilmektedir. Zengin ALA kaynakları ise ceviz, keten, kolza ve Chia gibi yağlı tohumlar ve alglerdir. Özellikle Akdeniz, DASH ve Nordik tipi diyetler Omega-3 bakımından zengin içeriğe sahiptirler. Ayrıca takviye olarak alınan Omega-3 yağ asitlerinin kas protein döngüsünü iyileştirdiği, yaşlı bireylerde özellikle direnç egzersizleriyle birlikte kullanıldığında kas kütlesi ve gücünü pozitif yönde etkilediği bilinmektedir. Bu kapsamda dünya genelinde olduğu gibi ülkemizde de artan yaşlı nüfus için önemli risk faktörlerinden biri olan sarkopeniyi önlemede alternatif ve düşük maliyetli bir uygulama olan omega-3 yağ asitlerinin tüketiminin artırılması önerilebilir. Ancak bu ürünlerin kaynağına ve kullanım dozuna bağlı olarak insan vücudunda metil civa birikimine neden olup nörotoksik etkiye yol açabileceği de unutulmamalıdır. Tüm bu nedenlerden yola çıkarak bu derlemede omega-3 yağ asitlerinin yaşlılığa bağlı sarkopeniyi önleme potansiyeline yönelik etki mekanizmalarının incelenmesi amaçlanmıştır.
Anahtar Kelimeler: Sarkopeni, EPA, DHA, Kas Proteini, Yaşlılık

EFFECT OF OMEGA-3 FATTY ACIDS ON SARCOPENIA IN OLD AGING

ABSTRACT
It is known that adequate nutrition and regular exercise positively affect muscle protein synthesis and prevent muscle mass loss. Weakness of muscle mass and muscle strength are among the distinctive features of sarcopenia. Sarcopenia, one of the most important health problems in elderly individuals; It has been associated with dementia, cognitive impairment, reduced quality of life and mortality. Chronic low-grade inflammation that may occur due to aging can also cause sarcopenia. Omega-3 fatty acids such as eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA) and α-linolenic acid (ALA), which are polyunsaturated fatty acids, are being examined as a potential treatment option for sarcopenia thanks to their increasing muscle protein synthesis and anti-inflammatory properties. Animal sources such as herring, salmon, sardines and mackerel are considered primary sources of EPA and DHA for humans. This is because the food source of many fish is algae, fish, and invertebrate seafood such as oysters, which are rich in EPA and DHA. Since omega-3 fatty acids are essential, they must be taken externally. Although it is low and insufficient in humans, the conversion of externally taken ALA into EPA and DHA in the body (8% and 1%, respectively) is carried out in the liver. Rich sources of ALA are oilseeds and algae such as walnuts, flax, rapeseed and Chia. Especially Mediterranean, DASH and Nordic diets are rich in Omega-3. It is also known that Omega-3 fatty acids taken as supplements improve muscle protein turnover and positively affect muscle mass and strength in elderly individuals, especially when used with resistance exercises. In this context, increasing the consumption of omega-3 fatty acids, which is an alternative and low-cost practice, can be recommended to prevent sarcopenia, which is one of the important risk factors for the increasing elderly population in our country, as well as around the world. However, it should not be forgotten that these products may cause methylmercury accumulation in the human body and cause neurotoxic effects, depending on the source and dosage of use. Based on all these reasons, this review aims to examine the mechanisms of action of omega-3 fatty acids for their potential to prevent age-related sarcopenia.
Keywords: Sarcopenia, EPA, DHA, Muscle Protein, Aging

DİŞ HEKİMLİĞİNDE KULLANILAN İNTRAORAL TARAYICILAR

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Özet
Diş hekimliğinde protetik tedavilerin en önemli aşamalarından biri ölçü aşamasıdır. Geleneksel olarak kullanılan birçok ölçü materyalleri çoğu vakada kullanışlı olsa da gerek zaman yönetimi hususunda gerek de hasta konforunun sağlanması açısından pek çok dezavantajları mevcuttur. Günümüzde dijital sistemlerin diş hekimliğine girmesiyle Cad-Cam (bilgisayar destekli tasarım ve dizayn) sistemlerin kullanılanımı gün geçtikçe artmaktadır. Diş hekimliğinde kullanılan üç boyutlu tarayıcılar; intraoral ve ekstraoral olmak üzere iki ana grup altında sınıflandırılabilir. Ekstraoral tarayıcılar model ve day tarayıcıları olmak üzere iki ana bölüme ayrılabilir.İntraoral tarayıcılar, kendi içinde birçok farklı sistem bulundurmasıyla birlikte pahalı cihazlar olması neticesinde her birinin kendi içinde tam bir netlik içinde kıyaslanması çoğu zaman mümkün olmamaktadır. Farklı modellerin piyasalara sürülmesiyle birlikte birçok yeniliklerin de meydana gelmesini sağlamıştır. Bu sayede her seferinde bir önceki intraoral tarayıcı modellerinin limitasyonu bir sonrakiyle geliştirilmeye çalışılmıştır ve diş hekimlerinin intraoral tarayıcıları klinik uygulamada daha sık kullanmasıyla birlikte daha fazla deneyim elde ederek bu gelişime katkıda bulunmuştur. Fakat bununla birlikte özellikle klinik uygulamalarda fark edilen intraoral tarayıcılarda önemli bir dezavantaj olarak görülen ark boyunda artışla beraber karmaşık yapıların sayısının artması tarayıcıların net sonuç vermesini kısıtlamaktadır ve bu dezavantajlı durumla ilgili çalışmaların da hala devam edeceği öngörülmektedir.Özellikle dijital intraoral tarayıcıların her birinin farklı endikasyonlardaki tarama etkinliği de farklı olabilir. Örneğin tam kuron-köprü, indirekt preparasyonlar, implant üstü tam ark veya tek bir kronun dijital olarak taranması arasında karşılaştırmaların yapıldığı çalışmalar ile avantaj ve dezavantajları hususundaki araştırmalar halen devam etmektedir.Bu derlemenin amacı, intraoral tarayıcıların çeşitli avantajları ve dezavantajları ile imitasyonlarını ve intraoral dijital tarayıcıların geleneksel yöntemlere göre olan farklılıklarını değerlendirerek klinisyenlere bilgi vermektir.
Anahtar kelimeler: İntraoral tarayıcılar, dijital diş hekimliği, geleneksel diş hekimliği

INTRAORAL SCANNERS USED IN DENTISTRY

ABSTRACT
One of the most important stages of prosthetic treatment in dentistry is the impression stage. Although many traditionally used impression materials are useful in most cases, they have many disadvantages in terms of time application and patient comfort. Today, with the introduction of digital systems into dentistry, the use of Cad-Cam systems is increasing day by day.3D scanners used in dentistry can be classified into two main groups: intraoral and extraoral. Extraoral scanners can be divided into two main sections as model and day scanners.Although intraoral scanners have many different systems within themselves, it is often not possible to compare each of them with their digital accuracy as a result of being expensive devices. The introduction of different models to the market has led to many innovations. In this way, each time the limitations of the previous intraoral scanner models have been tried to be improved with the next one, and dentists have contributed to this development by gaining more experience as they use intraoral scanners more frequently in clinical practice. However, the increase in the number of complex structures with the increase in the dental arc, which is seen as an important disadvantage of intraoral scanners, which is especially noticed in clinical applications, limits the clear results of the scanners and it is predicted that studies on this disadvantageous situation will continue.In particular, the scanning efficiency of each digital intraoral scanner in different indications may be different. Studies comparing full crown-bridge, indirect preparations, full arch or a single implant supported crown and research on their advantages and disadvantages are still ongoing.The aim of this review is to inform clinicians by evaluating the various advantages, disadvantages and limitations of intraoral scanners and the differences of intraoral digital scanners compared to conventional methods.
Keywords: Intraoral scanners, digital dentistry, traditional dentistry

SANAL ARTİKÜLATÖRLERİN PROTETİK DİŞ HEKİMLİĞİNDE KULLANIMI

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Özet
Artikülatörler, protetik rehabilitasyonun tanı ve tedavi planlamalarındaki aşamalarda çenelerin birbirine göre ilişkilerinin kaydedilmesinde önemli bir araç olarak diş hekimliğinde kullanılmaktadır. Diş hekimliğinde teknolojik gelişmelerin ilerlemesiyle birlikte mekanik artikülatörlere alternatif olarak sanal artikülatörler son dönemlerde oldukça popüler hale gelmiştir. Özellikle CAD/CAM sistemlerinin varlığıyla birlikte dijital kayıtların alınması ve verilerin sanal ortamda değerlendirilmesi sanal artikülatörlerin kullanımında önemli etki yapmıştır. Sanal artikülatörlerin önemli avantajları arasında hastaların statik ve dinamik oklüzal ilişkilerinin değerlendirilmesiyle beraber bu verilerin görselleştirilmesi vardır. Protetik diş tedavisinde, sanal artikülatörlerin, özellikle dikey boyut değişikliği olan komplex vakalarda mekanik artikülatörlerle beraber kullanılması gerektiği de düşünülmelidir.Sanal artikülatörlerin tamamen ayarlanabilir ve matematiksel olarak simüle edilmiş olarak iki tipi vardır. Tamamen ayarlanabilir tipinde kullanım alanı daha çok mandibular hareket esnasında okluzal düzlemin morfolojisinin değerlendirilmesiyle birlikte karmaşık vakalardaki çatışmaları engellemektir. Matematiksel olarak simüle edilmiş tipi ise alt çene hareketlerini yeniden üretmek için ek ayarların yapılmasını gerektiren ortalama değerli bir artikülatördür.Sanal artikülatörlerin uygulama aşamaları direkt veya indirekt olarak ikiye ayrılmaktadır. Direkt iş akışında ilk adım, ağız içi tarayıcı aracılığıyla arkların dijital olarak taranmasını ve ardından bu verilerin analog adımlar kullanılmadan sanal artikülatöre aktarılmasını içermektedir. İndirekt iş akışı ise, arkların analog ölçülerinin alınmasını ve bir mekanik artikülatöre monte edilen modellerin bir masaüstü laboratuvar tarayıcısı aracılığıyla dijital olarak taranmasını ardından bu verilerin sanal artikülatöre aktarılmasını içermektedir. Genel sanal artikülatör uygulamaları arkların ölçüsünün alınması, oklüzal kayıt, maksillanın kafatasına göre pozisyonunun aktarılması ve sanal uygulamalardan oluşur.Bu derlemenin amacı, protez tedavisinin iş akışında geleneksel yöntemlere göre kolaylık sağlayan sanal artikülatörlerin son dönemdeki gelişmelerini, uygulamalarını, sınırlamalarını ve kullanım alanlarını değerlendirmektir.
Anahtar kelimeler: Sanal artikülatör, dijital kayıt, sanal uygulamalar

THE USE OF VIRTUAL ARTICULATORS IN PROSTHODONTICS

ABSTRACT
Articulators are used in in the diagnostic and treatment planning stages of prosthetic dentistry as an important instrument for recording the relationship of the maxilla and mandible. Virtual articulators have recently become very popular as an alternative to mechanical articulators. With CAD/CAM systems, taking digital records and evaluating the data in a virtual environment has had a significant impact on the use of virtual articulators. Important advantages of virtual articulators include the assessment of patients' static and dynamic occlusal relationships and the visualization of these data. In prosthodontics, the virtual articulator should be considered as an additional tool to the mechanical articulator, especially in complex cases.There are two types of virtual articulators available, fully adjustable and mathematically simulated. The fully adjustable type is mainly used to avoid conflicts in complex cases by assessing the morphology of the occlusal plane during mandibular movement. The mathematically simulated type is an average-value articulator that requires additional adjustments to reproduce mandibular movements.The assembly stages of virtual articulators are divided into direct and indirect. In the direct workflow, it involves digital scanning of the arches through an intraoral scanner and then transferring data to the virtual articulator without the use of analog steps. The indirect workflow involves taking analog measurements of the arcs and digitally scanning the models mounted on a mechanical articulator using a desktop lab scanner, then transferring the data to a virtual articulator. General virtual articulator applications consist of measuring arches, occlusal registration, transferring the position of the maxilla relative to the skull and virtual applications.The aim of this review is to evaluate the developments, applications, limitations and usage areas of virtual articulators that provide convenience in prosthodontics with a compare with traditional methods.
Keywords: Virtual articulator, digital recording, virtual tool

ÖĞRETMEN ADAYLARININ EMPATİK EĞİLİMLERİNİN İNCELENMESİ: AKDENİZ BÖLGESİ ÖRNEĞİ

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Özet
Bu çalışmanın amacı, öğretmen adaylarının empatik eğilim düzeylerinin çeşitli değişkenler altında incelenmesidir. Araştırmanın çalışma grubunu Süleyman Demirel, Mehmet Akif Ersoy ve Akdeniz Üniversitelerinden 210 kadın 197 erkek olmak üzere toplam 407 öğretmen adayı oluşturmaktadır. Öğretmen adaylarının empatik eğilimlerinin belirlenmesinde Koçak ve ark., (2013) tarafından geliştirilen "Empatik Yönelimler Ölçeği" kullanılmıştır. Ayrıca araştırmacı tarafından öğretmen adaylarının; cinsiyet, sınıf, öğrenim gördüğü lisans programı, ailede öğretmen bulunma durumu, ailede kendi dışında öğrenci bulunma durumu ve eğitmenlik geçmişi olup olmadığına dair sorulardan oluşan sosyodemografik bilgi formu hazırlanmış ve uygulanmıştır. Toplanan veriler incelendiğinde ölçeğin Cronbachs' Alpha katsayısı 0.702 olduğu, bunun yanında Empatik Beceri boyutunun 0.860, Anti-Empatik Tutum boyutunun 0.888, Empatik Ortam boyutunun 0.850 güvenilirlik kat sayılarında olduğu görülmüştür. Elde edilen verilerin normal dağılmadığı tespit edilmiş ve buna bağlı olarak karşılaştırmalar için non-parametrik testler kullanılmıştır. Araştırma bulgularında öğretmen adaylarının empatik eğilimlerinin genel olarak yüksek olduğu ayrıca kadınlarda ve ailesinde öğretmen bulunanlarda empatik eğilimin daha yüksek olduğu, bunun yanında öğretmen adaylarının öğrenim görmüş oldukları öğretmenlik programına göre empatik eğilim düzeylerinin değişkenlik gösterdiği tespit edilmiştir. Ancak ailede öğrenci kardeş bulunmasının, eğitmenlik tecrübesi bulunmasının ve sınıf düzeyinin empatik eğilime etki etmediği görülmüştür. Sonuç olarak öğretmen adaylarında empatik eğilimin çeşitli demografik gruplara dayalı farklılar gösterdiği ve bazılarının literatür ile paralel olduğu ancak yeni irdelemeler yapılmasına muhtaç olduğu kanaatine varılmıştır.
Anahtar Kelimeler: Öğretmen adayı, Empatik eğilim, Empatik yönelim

INVESTIGATION OF THE EMPATHIC TENDENCIES OF TEACHER CANDIDATES: AN EXAMPLE OF THE MEDITERRANEAN REGION

ABSTRACT
The aim of this study is to examine the empathic tendency levels of teacher candidates under various variables. The study group of the research consists of a total of 407 teacher candidates, 210 women and 197 men, from Süleyman Demirel, Mehmet Akif Ersoy and Akdeniz Universities. The "Empathic Tendencies Scale" developed by Koçak et al., (2013) was used to determine the empathic tendencies of teacher candidates. In addition, by the researcher, teacher candidates; A sociodemographic information form consisting of questions about gender, grade, undergraduate program, presence of a teacher in the family, existing students other than one's in the family, and teaching experince was prepared and applied. When the collected data were examined, it was seen that the Cronbachs' Alpha coefficient of the scale was 0.702, while the reliability coefficient of the Empathic Skills dimension was 0.860, the Anti-Empathic Attitude dimension was 0.888, and the Empathic Environment dimension was 0.850. It was determined that the data obtained were not normally distributed and accordingly, non-parametric tests were used for comparisons.In the research findings, it was determined that the empathic tendencies of teacher candidates were generally high, and that the empathic tendency was higher in women and those who had a teacher in their family, and that the empathic tendency levels of teacher candidates varied depending on the teaching program in which they studied. However, it was observed that having a student sibling in the family, having teaching experience, and grade level did not affect the empathic tendency. As a result, it has been concluded that empathic liberation in teacher candidates varies depending on various demographic groups and that some of them are parallel to the literature, but it was determined that more investigations are required.
Keywords: Teacher candidate, Empathic tendency, Empathic orientation

TEACHING PROBABILITIES WITH COUNTERINTUITIVE PROBLEMS

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ABSTRACT
It is widely documented in the literature that the study of probability theory, at the secondary and higher education level, focuses with great emphasis on the application of algorithms (Batanero et al., 1998), and that this approach does not contribute for the development of probabilistic reasoning, it does not prepare students to solve non-routine problems, therefore, it does not prepare students to make decisions in situations of uncertainty.Several studies have highlighted the difficulties that students (of all educational levels and age groups) face when dealing with probabilistic problems that conflict with their intuition, and the need for specific treatment of these difficulties with the resolution of problems that involve counterintuitive situations. The use of counterintuitive problems when teaching probabilities is a constructivist pedagogical strategy that allows the approach to situations with a high incidence of errors to be done in a challenging and motivating way (Contreras et al., 2011, Leviatán, 2002). This strategy is intended to encourage students to reflect on their thought processes, contributing to the development of mathematical ABSTRACTion skills. However, for this strategy to contribute decisively to improving students' probabilistic intuition, problem solving must be complemented with discussion and in-depth analysis of the reasoning necessary for successful resolution, but also of the reasons for errors made.An interesting problem to challenge students' probabilistic intuition is the “Bertrand Box”, due to its simplicity and challenging nature. Both in its original version and in more complex variants of the "Bertrand Box" problem, such as the “Monty Hall” problem, the (reduced) probabilistic intuition of the human being leads us to ignore or misinterpret the additional information we have. This work addresses the advantages of the “Bertrand Box” and “Monty Hall” problems as teaching tools.
Keywords: Bertand Box Problem, Counterintuitive problems, Intuition, Uncertainty.

BİLGİ SİSTEMLERİ VE SÜRDÜRÜLEBİLİRLİĞİN KESİŞTİĞİ NOKTADAKİ GÜNCEL TRENDLERİN KEŞFİ

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ÖZET
Bilgi sistemleri, firmaların bilgi ve iletişim teknolojisinin entegrasyonundan oluşurken, aynı zamanda iş süreçlerinin desteklenmesinde insan faktörünün teknolojiyle iç içe olmasını da destekler. Küresel rekabet ortamında, çevresel belirsizlikler ve müşterilerin değişen gereksinimleri karşısında firmaların hızlı ve çevik olabilmesiyle sürdürülebilir bir avantaj elde etmelerinde bilgi sistemlerinin ektisi oldukça fazladır. Aynı zamanda birçok firma, çevresel ve sosyal açıdan da avantajlı durumda olabilmek için bilgi sistemlerini yoğun bir biçimde bünyelerine kazandırmaktadır. Sürdürülebilirlik amacı taşıyan firmaların tedarik zinciri sistemleri ve operasyonlarının performans artışında da bilgi sistemlerinin önemli bir rolü vardır. Bu nedenle bu çalışma, bilgi sistemi alanında sürdürülebilirlik üzerine yapılmış mevcut çalışmaları inceleyerek hangi bakış açısı çerçevesinde ele alındığını ortaya koymaktadır. Bunun sonucunda sürdürülebilir rekabet avantajı, çevresel sürdürülebilirlik ve çevrimiçi sosyal topluluklar gibi ana araştırma alanları tespit edilmiştir. Ayrıca, gelişmekte olan ülkelerde bilgi sistemleri' nin rolü ve sürdürülebilir bilgi altyapıları gibi yeni alanlar da belirlenmiştir. Bunlarla birlikte, her bir alanın bilgi yapısını ortaya koymakta ve firmaların rekabet avantajları ile çevresel sürdürülebilirlik arasındaki ilişkiyi aydınlatmaktadır.Çalışmanın bulguları, sürdürülebilir rekabet gücünün artırılmasında bilgi sistemi ve kurumsal kaynaklar arasındaki sinerjinin önemini ortaya koymuştur. Bununla birlikte, çevresel zorlukları ele alırken rekabet avantajını güçlendiren yeşil bilgi sistemi girişimlerinin ikili faydalarını vurgulamaktadır. Çalışma ayrıca, çevrimiçi sosyal toplulukların sürdürülebilirliğini etkileyen faktörleri araştırmakta ve bu toplulukların üyelik dinamikleri ile iletişim kalıplarına da yer vermektedir.Genel olarak, bilgi sistemi literatürü Üçlü Sonuç Teorisinin ilkeleriyle uyum göstermekte ve toplum, ekonomi ve çevre üzerine odaklanmaktadır. Bu çalışma, sürdürülebilirlik temelli hedeflerin ilerletilmesinde bilgi sistemleri' nin rolünün anlaşılmasına katkıda bulunmaktadır.
Anahtar Kelimeler: Bilgi Sistemleri, Sürdürülebilir Rekabet Avantajı, Sürdürülebilirlik

EXPLORATION OF CURRENT TRENDS AT THE INTERSECTION OF INFORMATION SYSTEMS AND SUSTAINABILITY

ABSTRACT
While information systems consist of the integration of companies information and communication technology, they also support the intertwining of the human factor with technology in supporting business processes. In a global competitive environment, information systems have a great impact on companies gaining a sustainable advantage by being fast and agile in the face of environmental uncertainties and changing needs of customers. At the same time, many companies intensively incorporate information systems in order to be advantageous in environmental and social terms. Information systems also play an important role in increasing the performance of supply chain systems and operations of companies related to sustainability. For this reason, this study examines existing studies on sustainability in the field of information systems and reveals the perspective from which they are discussed. As a result, main research areas such as sustainable competitive advantage, environmental sustainability and online social communities have been identified. Additionally, new areas such as the role of information systems and sustainable information infrastructures in developing countries have also been identified. In addition, it reveals the knowledge structure of each field and illuminates the relationship between companies' competitive advantages and environmental sustainability.
The findings of the study revealed the importance of the synergy between the information system and corporate resources in increasing sustainable competitiveness. However, it highlights the dual benefits of green information system initiatives that strengthen competitive advantage while addressing environmental challenges. The study also investigates the factors affecting the sustainability of online social communities and includes the membership dynamics and communication patterns of these communities.In general, the information systems literature aligns with the principles of the Triple Bottom Line Theory and focuses on society, economy, and environment. This study contributes to the understanding of the role of information systems in advancing sustainability-based goals.
Keywords: Information Systems, Sustainable Competitive Advantage, Sustainability

SÜRDÜRÜLEBİLİR TEDARİK ZİNCİRİ YÖNETİMİNDE DİJİTAL DÖNÜŞÜMÜN ROLÜ: STRATEJİLER, FIRSATLAR VE ZORLUKLAR

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ÖZET
Sürdürülebilir tedarik zinciri yönetimi (STZY), işletmelerin çevresel, ekonomik ve toplumsal etkileri en aza indirgemeyi amaçlayan bir stratejik yaklaşımdır. Son yıllarda, bu yaklaşımın önemi artmış ve işletmelerin sürdürülebilirlik performansı, rekabet avantajı ve kurumsal itibar açısından kritik hale gelmiştir. Ancak, geleneksel tedarik zinciri yönetimi yaklaşımları, giderek artan talepleri karşılayamamakta ve sürdürülebilirlik hedeflerine ulaşmada yetersiz kalmaktadır. Bu noktada dijital dönüşüm kavramı önem kazanmaya başlamıştır. Dijital dönüşüm, işletmelerin iş süreçlerini ve operasyonlarını dijital teknolojilerle optimize etme sürecidir. Bu süreç, veri analitiği, yapay zekâ, otomasyon, bulut bilişim ve nesnelerin interneti gibi teknolojilerin kullanımını içermektedir. Sürdürülebilir tedarik zinciri yönetiminde dijital dönüşüm, tedarik zinciri süreçlerinin verimliliğini artırmak, atıkları azaltmak, çevresel etkileri minimize etmek ve toplumsal sorumluluğu artırmak için kritik bir öneme sahiptir. Dijital dönüşüm stratejileri arasında entegre veri yönetimi, otomasyon, yapay zeka ve izlenebilirlik gibi anahtar unsurlar bulunmaktadır. Entegre veri yönetimi ve dijital platformlar, tedarik zinciri paydaşları arasında veri paylaşımını kolaylaştırırken, otomasyon ve yapay zekâ, süreçlerin daha verimli bir şekilde yönetilmesine olanak tanımaktadır. İzlenebilirlik ve şeffaflık ise, tedarik zinciri boyunca ürünlerin hareketlerinin izlenmesini ve çevresel, ekonomik ve sosyal etkilerin takip edilmesini sağlamaktadır. Bununla birlikte, dijital dönüşümün başarılı bir şekilde uygulanması, teknik ve organizasyonel zorlukların üstesinden gelinmesini gerektirmektedir. Yüksek maliyetler, gelişmiş teknolojik altyapıya erişim eksikliği, veri güvenliği ve mahremiyeti ile ilgili endişeler ve yetkinlik eksiklikleri gibi engeller, özellikle küçük ve orta ölçekli işletmeler için önemli zorluklar arasında yer almaktadır. Ayrıca, dijital dönüşüm sürecinde çalışanların ve yöneticilerin teknolojik adaptasyonuna dair dirençler, bu sürecin etkinliğini sınırlayabilmektedir. Sonuç olarak, dijital dönüşüm, sürdürülebilir tedarik zincirlerinin geliştirilmesinde ve yönetilmesinde hayati bir rol oynayabilmekte; ancak bu potansiyelin tam olarak gerçekleştirilmesi, karşılaşılan zorlukların aşılması ve tüm tedarik zinciri boyunca entegre bir yaklaşımın benimsenmesi ile mümkündür. Bu çalışma STZY'de dijital dönüşümün uygulanmasına ilişkin stratejik fırsatları ve zorlukları tartışarak, bu alanda gelecekteki araştırmalar için bir çerçeve sunmayı hedeflemektedir. Ayrıca bu çalışma, dijital teknolojilerin, özellikle gelişmekte olan ekonomilerdeki tedarik zincirlerinin sürdürülebilirliğini nasıl iyileştirebileceğine dair bakış açısı kazandırmayı ve bu teknolojilerin etkin bir şekilde kullanılmasına yönelik stratejik planlamalara temel oluşturmayı hedeflemektedir.
Anahtar Kelimeler: Sürdürülebilirlik, Sürdürülebilir Tedarik Zinciri Yönetimi, Dijital Dönüşüm.

THE ROLE OF DIGITAL TRANSFORMATION IN SUSTAINABLE SUPPLY CHAIN MANAGEMENT: STRATEGIES, OPPORTUNITIES AND CHALLENGES

ABSTRACT
Sustainable supply chain management (SSCM) is a strategic approach that aims to minimize the environmental, economic and social impacts of businesses. In recent years, the importance of this approach has increased and it has become critical in terms of sustainability performance, competitive advantage and corporate reputation of businesses. However, traditional supply chain management approaches cannot meet increasing demands and are insufficient to achieve sustainability goals. At this point, the concept of digital transformation has started to gain importance. Digital transformation is the process of optimizing business processes and operations of businesses with digital technologies. This process includes the use of technologies such as data analytics, artificial intelligence, automation, cloud computing and the internet of things. Digital transformation in sustainable supply chain management is of critical importance to increase the efficiency of supply chain processes, reduce waste, minimize environmental impacts and increase social responsibility. Digital transformation strategies include key elements such as integrated data management, automation, artificial intelligence and traceability. Integrated data management and digital platforms facilitate data sharing among supply chain stakeholders, while automation and artificial intelligence enable processes to be managed more efficiently. Traceability and transparency enable monitoring the movements of products throughout the supply chain and tracking environmental, economic and social impacts. However, successful implementation of digital transformation requires overcoming technical and organizational challenges. Obstacles such as high costs, lack of access to advanced technological infrastructure, concerns about data security and privacy, and lack of competencies are among the significant challenges, especially for small and medium-sized enterprises. In addition, resistance to technological adaptation of employees and managers during the digital transformation process can limit the effectiveness of this process. As a result, digital transformation can play a vital role in developing and managing sustainable supply chains; However, fully realizing this potential is possible by overcoming the difficulties encountered and adopting an integrated approach throughout the entire supply chain. This study aims to provide a framework for future research in this field by discussing the strategic opportunities and challenges regarding the implementation of digital transformation in SSCM. In addition, this study aims to provide perspective on how digital technologies can improve the sustainability of supply chains, especially in developing economies, and to provide a basis for strategic planning for the effective use of these technologies
Keywords: Sustainability, Sustainable Supply Chain Management, Digital Transformation.

NET SIFIR ENERJİLİ BİNA KAVRAMININ GÖMÜLÜ ENERJİ KAVRAMI ÜZERİNDEN İRDELENMESİ

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Özet
Artan fosil yakıt kullanımı, kaynakların hızla tükenmesine ve CO2 gazı salınımının hızla artmasına neden olmaktadır. Tükenen fosil yakıt kaynakları ve enerji talebindeki artışı alternatif enerji kaynaklarına ve enerji tüketiminde verim öncelikli hedefleri ön plana çıkartmaktadır. Artan CO2 miktarı dünyanın git gide ısınmasına ve küresel ısınmanın etkilerini daha çok hissetmemize, buzulların daha hızlı erimesine ve dünyanın dengesinin bozulmasına neden olmaktadır.Çağımızın en büyük sorunlarından birisi olan küresel ısınma ve bunun neden olduğu sıcaklık artışı ile mücadele edebilmek için yüksek enerji tüketimini ve CO2 salınımını azaltmak ve verimliliği artırmak gerekir. Fayda/Maliyet oranı göz önünde bulundurulduğunda binalar, CO2 salınımını düşürmek için en verimli alanlardan birisidir (İş Dünyası ve Sürdürülebilir Kalkınma Derneği, 2009). Dünyada binalar, küresel enerji tüketiminin yaklaşık %35'ini oluşturmaktadır (United Nations Environment Programme, 2020). Bu binalar ve bunların üretim, işletim sürecinde ortaya çıkan CO2 de dünyadaki CO2 salınımının yaklaşık %38'ine karşılık gelmektedir (UNEP, 2020).Günümüzde hala verimsiz enerji tüketimi yüksek binalar inşa edilmeye devam etmektedir. Gelecekte bina stoğumuzun çoğunluğunu oluşturacak olan bu binalar, CO2 salınımını arttırmaya devam edecektir. Bu bağlamda binaların çevreye verdiği zararları azaltmak, enerji tüketimini düşürmek, yenilenebilir enerji kaynaklarını kullanmak, atıkları yönetmek, CO2 salınımını düşürmek ve gelecek nesiller için daha sağlıklı, verimli, yaşanabilir kentler bırakmak için yapımı veya dönüştürülmesi sırasında daha az enerji tüketilen ve yaşamaları boyunca enerji tüketmeden kendi kendine yetebilen binalar Net Sıfır Enerjili Bina konsepti kaçınılmaz olmaktadır. Net Sıfır Enerjili Binaların genel konsepti, binanın tüm enerji ihtiyacını yerel olarak düşük maliyette çevreyi kirletmeden yenilenebilir enerji kaynaklarından karşılamasıdır (Torcellini vd., 2006). Net Sıfır Enerjili Bina konsepti genellikle operasyonel enerjilerin (binanın gün içinde tükettiği enerjiler) dengelenmesi yönünden tanımlanmış ve değerlendirilmiştir. Günümüzde gelişen teknoloji ve sürdürülebilirlik kavramının popülerliğinin artmasıyla birlikte binalarda operasyonel enerjilerin azaltılması için birçok pasif ve aktif sistem geliştirilmiştir. Azaltılan Operasyonel enerjilerin sonucunda binaların yaşamları boyunca tükettiği enerji oranında gömülü enerjinin yüzdesinin arttırmıştır. Bu bağlamda dünyadaki mevcut yapı stoğu ve Net Sıfır Enerjili Bina konsepti Gömülü Enerji (Embodied Energy) kavramı ara kesitinde daha çok irdelenmelidir. Mevcut yapı stoğunun dönüştürülmesi ve yeniden işlevlendirilmesi Gömülü Enerji (Embodied Energy) açısından değerlendirildiğinde, yeni inşa edilecek binalara göre daha çevreci bir konsept oluşturmaktadır. Sonuç olarak sürdürülebilirlik açısından, Binaların Yaşam Döngüsünde ve Net sıfır Enerjili Bina Kavramında Gömülü Enerji (Embodied Energy) önemli bir kriter olma potansiyeline sahiptir.
Anahtar Kelimeler: Net Sıfır Enerjili Bina, Gömülü Enerji, Sürdürülebilir Mimarlık, Operasyonel Enerji

EXAMINING THE CONCEPT OF NET ZERO ENERGY BUILDING THROUGH THE CONCEPT OF EMBODIED ENERGY

ABSTRACT
Increasing use of fossil fuels leads to rapid depletion of resources and a consequent surge in CO2 emissions. Depletion of fossil fuel sources and the rising energy demand underscore the need for alternative energy sources and prioritization of efficiency in energy consumption. The escalating CO2 levels contribute to global warming, resulting in accelerated glacier melting and disruption of the Earth's balance.One of the most pressing issues of our time is global warming and the associated temperature rise, necessitating the reduction of high energy consumption and CO2 emissions, and the enhancement of efficiency. When considering the cost-benefit ratio, buildings emerge as one of the most efficient areas for reducing CO2 emissions (Business and Sustainable Development Association, 2009).Globally, buildings account for approximately 35% of energy consumption (United Nations Environment Programme, 2020). Moreover, the CO2 emissions from these buildings, including their production and operation processes, correspond to roughly 38% of global CO2 emissions (UNEP, 2020). Despite ongoing construction of inefficient, energy-intensive buildings, transitioning to Net Zero Energy Buildings (NZEBs) is inevitable to mitigate environmental damage, reduce energy consumption, utilize renewable energy sources, manage waste, decrease CO2 emissions, and leave behind healthier, more efficient, livable cities for future generations.The overarching concept of Net Zero Energy Buildings entails meeting all energy needs locally, from renewable energy sources, at low costs and without polluting the environment (Torcellini et al., 2006). Primarily, NZEBs are defined and evaluated concerning the balancing of operational energies (the energies consumed by the building throughout the day). With advancing technology and increasing popularity of sustainability, numerous passive and active systems have been developed to reduce operational energies. The reduction in operational energies consequently increases the proportion of embodied energy consumed over the lifespan of buildings.In this context, it is imperative to scrutinize the concept of Embodied Energy (EE) concerning the global building stock and NZEBs. Evaluating the transformation and repurposing of existing building stocks from the perspective of EE suggests a more environmentally friendly concept compared to the construction of new buildings. Consequently, in terms of sustainability, Embodied Energy holds significant potential as a criterion in the life cycle of buildings and the concept of Net Zero Energy Buildings.
Keywords: Net Zero Energy Building, Embodied Energy, Sustainable Architecture, Operational Energy

TÜRK VE YUNAN KAHVESİNİN GASTRONOMİK YÖNDEN KARŞILAŞTIRILMASI

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Özet
Yunanistan'da son 50-60 yıldır "Yunan kahvesi" olarak isimlendirilen kahve, daha önce "Türk kahvesi" olarak anılmaktaydı, fakat iki ülkenin yaşadığı siyasi gerginlikler, "Türk kahvesi" yerine "Yunan kahvesi" olarak anılmasına sebebiyet vermiştir. Tarihsel olarak 1700'lü yılların başında Türk kahvesi, Osmanlı Dönemi'nde Yunanlara tanıtılmıştır. Yunan kahvesi Yunanistan'da en çok tüketilen içeceklerden biridir, ancak Yunanistan'daki genç nesil Yunan kahvesine daha az rağbet etmektedir. Kaynatma, demleme, damlama ve basınçlı perkolasyon yöntemleri dünyada kabul gören dört temel kahve yöntemidir. Kaynatma yöntemi, Orta Doğu ülkeleri başta olmak üzere pek çok ülkede kullanılan yaygın bir yöntemdir. Telvesi fincanda bırakılan kahve çeşidi dünyanın birçok yerinde "Türk kahvesi" olarak anılmaktadır. UNESCO tarafından 2013 senesinde Türk kahvesi, Somut Olmayan Kültürel Miras olarak onaylanmıştır. Bu kahveyi Kıbrıs, Yunan, Bulgar kahvesi gibi farklı isimlerle diğer ülkelerde de görebilmemiz mümkündür. Yunan kahvesi, toz şeker ve öğütülmüş kahve çekirdeklerinin Türk kahvesi gibi kaynatılması ile yapılan bir kahve çeşididir. Karışım kabarmaya ve cezvede baloncuklar oluşmaya başladığında ateşten alınmaktadır. Daha sonra kahve bir süre dinlendirilmektedir ve tekrar kaynatılmaktadır. Bu teknik, kahve yapım sanatının bir parçası olarak görülmektedir ve Türk kahvesinin üretimi ile aynıdır. Türk kahvesi, Yunan kahvesine nazaran daha yoğun ve acı bir lezzete sahiptir. Yunan kahvesi, Türk kahvesinde olduğu gibi lokumla ya da farklı olarak kaşık tatlısıyla (politiko) ikram edilmektedir. Yunanistan'daki kahve geleneğinde, kahvehaneler erkek egemen bir alandı. Kadınlar kahve yapmayı ve sunmayı bilse de kahvehanelere girmeleri yasaktı. Bu nedenle kahve sunumu ve yapımı erkeklerin sorumluluğundaydı. Osmanlı'daki gibi kahvehaneler, Yunanistan'da da sosyalleşme ve sohbet etme alanlarıydı. Yapılan bu çalışmada Türk ve Yunan kahvesindeki farklılıkların ve benzerliklerin gastronomik yönden ortaya konulması amaçlanmıştır. Kendi bilgimiz dahilinde, daha önce bu konu hakkında kapsamlı bir çalışmaya rastlanılmadığından yapılan bu çalışma literatüre katkı sağlayacaktır.
Anahtar Kelimeler: Türk kahvesi, Yunan kahvesi, kültür, gastronomi

GASTRONOMICAL COMPARISON OF TURKISH AND GREEK COFFEE

ABSTRACT
Coffee, which has been called “Greek coffee” in Greece for the last 50-60 years, was previously called “Turkish coffee”, but the political tensions between the two countries causedit to be called “Greek coffee” instead of “Turkish coffee”. Historically in the early 1700s, Turkish coffee was introduced to the Greeks during the Ottoman Period. Greek coffee is one of the most consumed beverages in Greece, but the younger generation in Greece is less in demand for Greek coffee. Boiling, brewing, dripping and pressure percolation methods are the four basic coffee methods accepted in the world. The boiling method is a common method used in many countries, especially in the Middle East countries. The type of coffee whose grounds (telve in Turkish) are left in the cup is referred to as "Turkish coffee" in many parts of the world. Turkish coffee was approved as an Intangible Cultural Heritage by UNESCO in 2013. It ispossible to see this coffee in other countries with different names such as Cyprus, Greek, Bulgarian coffee etc. Greek coffee is a type of coffee made by boiling granulated sugar and ground coffee beans like Turkish coffee. When the mixture begins to swell and bubbles beginto form in the coffee pot, it is removed from the fire. Then the coffee is rested for a while and boiled again. This technique is seen as a part of the art of coffee making and is the same as theproduction of Turkish coffee. Turkish coffee has a more intense and bitter flavor than Greek coffee. Greek coffee is served with Turkish delight, as in Turkish coffee, or with spoon dessert(politiko). In the coffee tradition in Greece, coffeehouses were a male-dominated area. Although women knew how to make and serve coffee, they were forbidden to enter coffee houses. Therefore, the presentation and making of coffee was the responsibility of men. As inthe Ottoman Empire, coffeehouses were places for socializing and chatting in Greece. In thisstudy, it is aimed to reveal the differences and similarities in Turkish and Greek coffee from agastronomic point of view. To the best of our knowledge, there has been no comprehensive study on this subject before, so this study will contribute to the literature.
Keywords: Turkish coffee, Greek coffee, culture, gastronomy

PERVELANCE OF erm (C) RESISTANCE GENES EXPRESSION IN Staphylococcus aureus IN COMPARISON TO Lactobacilli

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ABSTRACT
Antimicrobial resistance is an alarming health problem all over the world. Antibiotic resistant bacterial strains are pathogenic and are becoming immune modulator. Studies revealed that antibiotic-resistant strains are concerned with massive and irrational use of antibiotics. Studies also revealed that increase resistance bacterial strains have become "nightmare bacteria" so as to "pose a disastrous threat" all over the world. Lactobacilli are the key player in transferring the virulence factors and equally contributing in spreading the resistant genes to other bacterial population through horizontal gene transfer (HGT). In this study we identified the function of lactobacilli in shifting the erm(C) genes to Staphylococcus aureus. The population of the study consist of the patients those who made excessive use of antibiotics. Clinical samples were collected from human patient and cultured on mannitol salt agar medium and sensitivity assay was performed through disc method. Samples were subjected to isolation of g-DNA and amplification of bacterial DNA through PCR followed by Gel electrophoresis and q-RT-PCR for gene expression analysis. erm(C) is the resistance gene of against erythromycin and high expression of this gene ($P \leq 0.03$) found in Staphylococcus aureus with comparison to lactobacillus. It is indicated that erythromycin becomes resistant in Staphylococcus aureus and therapeutic response reduced.
Keywords: erm(C), horizontal gene transfer

SELECTED PHYSICAL, MECHANICAL AND CHEMICAL PROPERTIES OF FRESH FRUIT BUNCHES FOR PROCESSING OF PALM OIL

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ABSTRACT
A deeper understanding of their engineering characteristics to enable the design of machinery, procedures, and handling activities for optimal productivity and the best possible quality in the finished goods. A few specific physical, chemical, and mechanical characteristics of fresh fruit bunches are examined in this study. At an 85% wet basis moisture content, the properties were determined. Fresh palm fruit's selected mechanical, chemical, and physical characteristics were determined. Using standard formulas and equations, one hundred fresh fruit bunch samples were used to ascertain a few of the physical characteristics of the fruit bunches. While the chemical properties were ascertained using suggested standard equations and formulae, the fresh fruit bunches were tested for their strength properties under compression when loaded under an INSTRON Universal Testing Machine. Using the Microsoft Excel program, statistical analysis was performed on the collected data. The average length, breadth, thickness, geometric mean, sphericity, surface area, true mass, true volume and true density mean for palm fruits were 3.35±0.48 cm, 1.92±0.32 cm, 2.24±0.33 cm, 2.42±0.25 cm, 0.73±0.08 cm, 18.61±3.62 cm^2, 7.99±1.81 g, 7.01±1.72 cm^3, 1.17±0.24 g/cm^3 respectively. The average static coefficient of frictions for palm fruits were 0.46±0.13, 0.64±0.18, 0.57±0.21 and 0.59±0.22 while the average angle of reposes was 24.48±6.08, 31.62±9.14, 29.26±6.80, and 29.91±9.11 on wood, mild steel, glass and stainless-steel surface respectively. The energy at break, force at break, deformation at break, strain at break, and stress at break for the palm fruits were 6.87±0.95 J, 2.22±0.80 kN, 14.58±3.02 mm, 0.36±0.08 mm/mm and 123.46±44.31 MPa respectively. The moisture, ash, fat, crude fibre, crude protein, and carbohydrate contents (proximate composition) of the palm fruits were 22.80±0.02 %, 0.52±0.01 %, 46.47±0.06 %, 18.66±0.01 %, 2.4±0.21 %, and 9.14±0.30 % respectively. The sodium, potassium, calcium, magnesium, iron, phosphorus and zinc contents of the palm fruits were 58.75±0.07 ppm, 94.20±0.14 ppm, 68.45±0.64 ppm, 5.21±0.00 ppm, 1.22±0.00 ppm, 1.60±0.00 ppm and 55.70±0.28 ppm respectively. These measured engineering properties of palm fruits help in determining the type of sorting and grading machines, their suitability, retail value and material selection in design and development of a palm fruit processing machine.
Keywords: Physical, coefficient of friction, angle of repose, mechanical, proximate, mineral.

VAN'DA (TÜRKIYE) BULUNAN İKİ *Urotricha* Claparede &Lachmann, 1857 TÜRÜ (EUKARYA, CILIOPHORA) ÜZERİNE MORFOLOJİK ARAŞTIRMALAR

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Özet
Bu çalışmada, Van Kalesi çevresindeki göletlerde gözlemlenen iki *Urotricha* popülasyonu *(Urotricha globosa* Schewiakoff, 1892 ve Urotricha *platystoma* Stokes, 1886) canlı ve gümüş boyama teknikleri kullanılarak morfolojik ve morfometrik olarak incelenmiştir.*U. globosa*, yaklaşık 25 × 22µm boyutlarında ve hemen hemen yuvarlak hatlıdır. Sitoplazma renksiz ve küçük granüllü, küresel veya hafif eliptik makronükleus, küresel mikronükleus, terminalde yer alan tek veziküler kontraktil vakuol, meridyonal olarak 18-24 kinet oluşturan 8 µm uzunluğunda somatik siller, sirkumoral kinetten başlayan kinetiler hücrenin 2/3'üne kadar uzanır, posterior 1/3 kaudal sil dışında sil içermez, yaklaşık 15 µm uzunluğunda tek kaudal sile sahiptir. Ağız açıklığı ön uçta, daireseldir. Çevresi 12-14 kinetozom çiftinden oluşan sirkumoral kineti ile çevrilidir, ventral yüzeyde vücut eksenine eğik olarak konumlanmış tek sıra kinetozomdan oluşan üç adoral organel bulunur. *U. platystoma*, yaklaşık 45 × 40 µm boyutlarında, küreselden hafif oval dış hatlara sahiptir. Hücrenin genel görünümü önceki türünkine benzer, ancak daha büyüktür. Çekirdek organizasyonu ve kontraktil vakuolün yapısı ve konumu önceki türlerle aynıdır. Vücut yüzeyinin arka 1/5'i hariç vücut yüzeyi somatik sillerle kaplıdır. Somatik siller meridyonal olarak dizilmiş 40 kadar kinetiden oluşur. Arka kutuptaki kaudal sil yaklaşık 15 µm uzunluğundadır. Bu çalışmada incelenen *Urotricha* türleri bazı küçük morfometrik farklılıklar gösterse de, bunlar genel olarak literatür verileriyle tutarlıdır. Ayrıca, bu çalışmada incelenen *Urotricha* türleri, Türkiye'nin az bilinen siliyat faunasının ikinci morfolojik kaydıdır.
Anahtar kelimeler: Urotricha globosa, Urotricha platystoma, morfoloji, morfometri, Türkiye

MORPHOLOGICAL INVESTIGATIONS ON TWO *Urotricha* Claparede & Lachmann, 1857 SPECIES (EUKARYA, CILIOPHORA) OBTAINED FROM PONDS IN VAN, TÜRKIYE

ABSTRACT
In this study, two *Urotricha* populations (*Urotricha globosa* Schewiakoff, 1892 and *Urotricha platystoma* Stokes, 1886) observed in the ponds around Van Castle were studied morphologically and morphometrically using live and silver impregnation techniques.*U. globosa*, about 25x22µm in size with almost rounded outline. Cytoplasm is colourless and tiny granulated, spherical micronuclei with spherical or slightly elliptical macronuclus, single vesicular contractile vacuole located terminally, 8 µm long somatic cilia forming 18-24 kineties meridionally, the kineties, arising from the circumoral kineties, extends up to 2/3 of the cell, the posterior 1/3 does not contain any cilia except the caudal cilium, single caudal cilium about 15 µm long. The oral apparatus is circular at the anterior end. It is surrounded by circumoral kinetosomes consisting of 12-14 kinetosome pairs, three adoral organelles on ventral surface consisting of a single row of kinetosomes positioned obliquely to the body axis.*U. platystoma*, obout 45 x 40 µm in size with globular to slightly oval outline. The general appearance of the cell is similar to that of the previous species, but larger. Nuclear organisation and the structure and position of the contractile vacuole are the same as in the previous species. Body surface covered with somatic cilia except posterior 1/5 of the body surface. The somatic cilia form up to 40 kineties arranged in meridionally. The caudal cilium at the posterior pole is about 15 µm long.Although the *Urotricha* species examined in this study showed some minor morphometric differences, they were generally consistent with the literature data. In addition, the *Urotricha* species studied in this study are the second morphological record of the little-known ciliate fauna of Türkiye.
Keywords: Urotricha globosa, Urotricha platystoma, morphology, morphometry, Türkiye

VAN'DAKİ (TÜRKIYE) GEÇİCİ SU BİRİKİNTİLERİNDEN İZOLE EDİLEN ÜÇ *Trithigmostoma jankowski*, 1967 TÜRÜNÜN (eukarya, ciliophora) MORFOLOJİK OLARAK YENİDEN TANIMLANMASI

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Özet
Bu çalışmada, Van'daki geçici göletlerden üç *Trithigmostoma* türü izole edilmiş ve morfolojik ve morfometrik olarak yeniden tanımlanmıştır. Sifonlama yöntemi ile alınan su örneklerindeki siliyatlar hem canlı olarak hem de çeşitli gümüş boyama teknikleri kullanılarak incelenmiştir.*T. cucullulus* 92 × 52 µm, elipsoid dış hatlı, dorso-ventral olarak yassılaşmış, dorsal yüzey konveks, ventral yüzey düzdür. Makronukleus oval ve mikronukleus küresel şekillidir. 18-21 sıra oluşturan somatik siller sadece ventral yüzeyde, dorsalde ise sadece dorsal fırçada bulunur. Somatik kinetiler arasındaki mesafe eşittir. Preoral sil sıralarının sayısı 6-7'dir. Dorsal fırça ana eksene eğik ve subapikal konumludur ve 30-35 kinetozomdan oluşur. Ağız açıklığı ön çeyrekte ventral yüzeydedir ve 12 kadar nematodesmal çubuk tarafından desteklenir.*T. srameki* 68 × 33 µm, uzun eliptik dış hatlıdır. Düzleşme, dorsal ve ventral yüzey özellikleri önceki türlere benzer, ancak 16-18 somatik ve 6-8 preoral kinetozom bulunur. Dorsal fırça ana eksene hafif eğiktir ve 14-17 kinetozomdan oluşur. Postoral kinetikler arasındaki mesafe lateraldekilerden daha fazladır.*T. steini* 195 × 105 µm boyutlarında ve eliptik dış hatlıdır. Genel morfolojik karakterler açısından önceki türlere benzer. Hücrenin çeşitli yerlerine dağılmış 15-30 kontraktil vakuol, 28 somatik kinet, 11-12 preoral kinet ve ana eksene eğik 50-55 kinetozomdan oluşan bir dorsal fırçaya sahip olmasıyla önceki türlerden ayrılır.Bazı küçük morfolojik ve morfometrik farklılıklar olsa da, bu çalışmadaki her üç tür de literatür verileriyle uyumlu bulunmuştur. Ayrıca bu çalışma, siliyatlar üzerine çok az çalışmanın yapıldığı Türkiye'de *Trithigmostoma* cinsi üzerine detaylı bir morfolojik çalışmanın ikinci kayıttır.
Anahtar kelimeler: Trithigmostoma, morfoloji, morfometrik, Türkiye

MORPHOLOGICAL REDESCRIPTIONS OF THREE Trithigmostoma Jankowski, 1967 SPECIES (eukarya, ciliophora) ISOLATED FROM TEMPORARY PUDDLES IN VAN, TÜRKİYE

ABSTRACT

In this study, three *Trithigmostoma* species were isolated from temporary ponds in Van and morphologically and morphometrically redescribed. The ciliates in the water samples taken by siphoning method were examined both live and by using various silver staining techniques.*T. cucullulus* 92 x 52 µm, with ellipsoid outline, dorso-ventrally flattened, dorsal surface convex, ventral surface flat. The macronucleus oval and the micronucleus spherical in shape. Somatic cilia forming 18-21 rows found only on ventral surface, dorsally only dorsal brush. The distance between the somatic kineties is equal. The number of preoral ciliary rows is 6-7. The dorsal brush is oblique to the main axis and subapically positioned and consists of 30-35 kinetosomes. The oral opening on ventral surface in the anterior quarter and supported by up to 12 nematodesmal rods. *T. srameki* 68 x 33 µm, with elongate elliptic outline. Flattening, dorsal and ventral surface features are similar to the previous species, but 16-18 somatic and 6-8 preoral kineties. The dorsal brush is slightly oblique to the main axis and consists of 14-17 kinetosomes. The distance between the postoral kinetics is greater than the lateral ones.*T. steini* 195 x 105 µm in size with elliptical outline. It is similar to the previous species in terms of general morphological characters. It differs from the previous species in having 15-30 contractile vacuoles distributed in various parts of the cell, 28 somatic kineties, 11-12 preoral kineties, and a dorsal brush consisting of 50-55 kinetosomes oblique to the main axis. Although there are some minor morphological and morphometric differences, all three species in this study were found to be compatible with the literature data. In addition, this is the second record of a detailed morphological study on the genus *Trithigmostoma* in Turkey, where very few studies on ciliates have been carried out.

Keywords: Trithigmostoma cucullulus, Trithigmostoma srameki, Trithigmostoma steini, morphology, Türkiye

PREPARATION AND CHARACTERIZATION OF BINARY LAYERED DOUBLE HYDROXIDE

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ABSTRACT
Layered Double Hydroxides (LDH) are anionic clay minerals with superior surface properties. These materials, which have H_2O molecules and charge-balancing anions in their interlayers, contain positively charged brushite-like metal hydroxide layers. These materials are considered a class of two-dimensional (2D) inorganic layered materials with versatile properties. Its general chemical formula is expressed as $[(M^{2+})_{1-x}\ (M^{3+})_x\ (OH)_2]^{x+} + (A^{n-})_{x/m}\ .nH_2O$. Here, M^{2+}, M^{3+}, and A^{n-} represent divalent cations, trivalent cations, and interlayer anions, respectively. Layered Double Hydroxides with water molecules in their inner layers show higher anion exchange capacity. Since they offer important features such as easy synthesis, low cost, non-toxicity, tunable band gap, and high specific surface area, these materials can be used in many application areas. In addition to these properties, since Layered Double Hydroxide materials show easy modification properties, their advantages can be improved by improving their physicochemical properties with various materials. These inorganic materials with outstanding properties have a wide range of applications such as biomedical, catalyst, filling material, corrosion resistance, carbon dioxide capture, adsorption, hybrid material, separation processes, and drug release systems. There are various methods in the literature to prepare Layered Double Hydroxides. Co-precipitation and hydrothermal method are the main synthesis methods.
In this study, a binary MgAl Layered Double Hydroxide was synthesized by the hydrothermal method. The obtained MgAl Layered Double Hydroxide structure was characterized by X-ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FT-IR) and Scanning Electron Microscope (SEM) analyses.
Keywords: Layered double hydroxide, anionic clay, binary, XRD, FT-IR.
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EVALUATION OF COMMERCIAL TABLETS OF *GANODERMA LUCIDUM* EFFECTS ON HEALTHY AND CANCER COLON CELLS

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ABSTRACT
Ganoderma lucidum (Curtis) P. Karst. (Lingzhi, Reishi) has a long history of use in Asian countries to support health and longevity, and is also widely used in Türkiye. *G. lucidum* is unique because it contains chemical components such as flavonoids, polyphenols, triterpenes, and ganoderic acid, which play an effective role against cancer. Colon cancer is quite common and the 2nd cause of cancer-related deaths. For this reason, there are many studies on colon cancer. However, there has been no previous study on colon cancer using the commercially available tablet form of the mushroom. This study aimed to investigate the ROS levels, and cytotoxic and apoptotic effects of two commercial tablets of *G. lucudium* (N1 and N2) on healthy intestinal/colon cells (FHC) and colon cancer cells (HT29). For this purpose, solutions prepared from tablets (N1 and N2) (500–32.5 µg/mL) were applied to the cells and incubated for 24 and 48 hours. At the end of each incubation, MTT for cytotoxicity, Annexin-V for apoptosis, and ROS levels for oxidative stress were measured. According to our results, while the solutions prepared from N1 and N2 tablets did not show a cytotoxic effect on healthy cells for 24 hours, on the contrary, proliferation was observed at high concentrations. According to the 48-hour results, cytotoxicity in cancer cells increased proportionally with the dose. In cancer cells, the N2 solution has a higher cytotoxic effect than the N1 solution. While N1 and N2 decreased ROS levels in healthy cells after 24 hours, they increased ROS levels in cancer cells. ROS levels are higher in both cell lines than in the control group after 48 hours. According to the results of apoptosis, we observed an increase in both cell lines compared to the control group at the end of 48 hours of incubation of N1 and N2 solutions, but the apoptosis in the cancer cell line to which N1 and N2 were applied at 24 hours was also lower than the control group. However, the apoptosis rate in cancer cells was found to be relatively higher than in healthy cells. In summary, it is concluded that commercial *G. lucidum* tablets inhibited the proliferation of HT29 cells by inducing apoptosis. Due to its adaptogenic effect, it can be said that it increases proliferation in healthy cells. As a result, GLE may be both a preventive and a potential, treatment for colorectal cancer, warranting additional research.
Keywords: Ganoderma lucidum, colorectal cancer, FHC, apoptosis, cytotoxicity, ROS

A REVIEW ON SYNTHESIS AND ANTI-ONCHOCERCAL ACTIVITY OF ACETAL

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ABSTRACT
Onchocerciasis, commonly known as river blindness, is a neglected tropical disease caused by the parasitic worm Onchocerca volvulus. The disease is transmitted through the bites of infected black flies and can lead to severe skin and eye complications, including blindness. Current treatment options for onchocerciasis are limited and often come with significant side effects. Therefore, there is a pressing need for the development of new and effective anti-Onchocercal agents. Acetals are a class of organic compounds that have shown promising anti-parasitic activity in previous studies. In this study, we aimed to synthesize novel acetals and evaluate their potential anti-Onchocercal activity. The synthesis of acetals was carried out using standard organic chemistry techniques, and the compounds were characterized using spectroscopic methods. The anti-Onchocercal activity of the synthesized acetals was evaluated using in vitro assays with Onchocerca volvulus larvae. Our results indicate that several of the synthesized acetals exhibit potent anti-parasitic activity, with IC50 values in the low micromolar range. Furthermore, the acetals showed minimal cytotoxicity towards mammalian cells, suggesting their potential as safe and effective anti-Onchocercal agents. Overall, our findings highlight the potential of acetals as a novel class of compounds for the treatment of onchocerciasis. Further studies are warranted to elucidate the mechanism of action of acetals against Onchocerca volvulus and to optimize their pharmacokinetic properties for clinical use.
Keywords: Onchocerciasis, river blindness, acetals, anti-parasitic activity, synthesis, drug development

TÜKETİM ALGISININ OLUŞUM VE DEĞİŞİM SÜRECİNDE ETKİLİ OLAN UNSURLAR

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ÖZET
Tüketim, uzun yıllardır bireylerin ihtiyaçları doğrultusunda gerçekleştirdiği bir eylem olarak karşımıza çıkmaktadır. Ancak toplumsal alandaki değişim ve dönüşümler sonucunda tüketim, yalnızca bireylerin ihtiyaçlarını karşılayan bir eylem olmaktan çıkmış, bireylerin sosyalleşebildikleri, eğlenebildikleri, hayallerini süsleyen imajlara sahip olabildikleri, tükettikçe kendi kimliklerini yaratabildikleri, güç, statü ve prestij kazanabildikleri bir eylem haline gelmiştir. Özellikle sosyoloji alanında tüketim, sembolik ve kültürel anlamlarıyla kullanılmış ve dolayısıyla tüketim algısı bu minvalde şekillenmiştir. Tüketim algısının şekillenmesinde etkili olan unsurlardan birisi tüketimin kültürü olarak ifade edilebilir. Tüketim toplumunun kültürüne gönderme yapan tüketim kültürü, toplumsal alanda yer edinen, günlük yaşam tarzları üzerine hâkimiyet kuran bir kültür olarak da görünürlük kazanmakta ve dolayısıyla tüketim algısını şekillendirmekte ve bu algıya yön vermektedir. Tüketim algısını şekillendiren ve toplumsal alandaki dönüşüme neden olan diğer unsurlar, bu çalışma içerisinde mekânsal unsurlar ve sanal unsurlar olmak üzere iki temel başlık altında incelenecek, mekânsal unsur olarak ise, hem sosyalleşme, hem tüketim, hem de kimlik kazanımı sürecinde önemli bir mekân olarak karşımıza çıkan, tüketim katedralleri olarak da bilinen alışveriş merkezleri ve eğlence/öğrence mekânları olarak görünürlük kazanan temalı parklar irdelenecektir . Tüketim algısını şekillendiren bir diğer unsur olarak ifade edilen sanal unsurlar ise, sosyal medya ve dijital alışveriş platformları olmak üzere iki alt başlık altında incelenecek ve tüketim algısını ne yönde şekillendirdiği açıklığa kavuşturulacaktır.
Anahtar Kelimeler: Tüketim, Tüketim Kültürü, Tüketim Algısı.

FACTORS AFFECTING THE FORMATION AND CHANGE PROCESS OF CONSUMPTION PERCEPTION

ABSTRACT
For many years , consumption has been an action that individuals perform in line with their needs. However, as a result of changes and transformations in the social sphere, consumption has ceased to be an action that only meets the needs of individuals, and has become an action where individuals can socialise, have fun, have images that adorn their dreams, create their own identities as they consume and gain power, status and prestige. Especially in the field of sociology, consumption has been used with its symbolic and cultural meanings and therefore the perception of consumption has been shaped in this respect . One of the factors that are effective in shaping the perception of consumption can be expressed as the culture of consumption. The culture of consumption, which refers to the culture of the consumption society, gains visibility as a culture that takes place in the social sphere and dominates daily lifestyles, and thus shapes and directs the perception of consumption. Other elements that shape the perception of consumption and cause the transformation in the social sphere will be examined under two main headings, namely spatial elements and virtual elements, and as a spatial element, shopping malls, also known as consumption cathedrals, and theme parks, which are important places in the process of socialisation, consumption and identity acquisition, and which gain visibility as entertainment/learning venues, will be examined. Virtual elements, which are expressed as another element shaping the perception of consumption, will be examined under two sub-headings: social media and digital shopping platforms, and it will be clarified how they shape the perception of consumption.
Keywords: Consumption, Consumption Culture, Consumption Perception.

AĞIRLIK AKTARIMI İLE QUADRICEPS AÇISININ DEĞERLENDİRİLMESİ

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ÖZET
Amaç: Çalışmaya katılan bireylerin quadriceps açılarının %0, %50 ve %100 ağırlık aktarımı ile değişiminin değerlendirilmesi ve spor yapan ve spor yapmayan gruplar arasında kıyaslanması amaçlanmıştır. Gereç ve Yöntemler: Çalışmamıza spor yapan 57 ve spor yapmayan 89 olmak üzere toplam 146 birey dahil edildi. Katılımcılar dik bir pozisyonda, ölçüm yapılan ekstremitelerine vücut ağırlıklarını %0, %50 ve %100 oranında aktarıyorken gonyometre ile quadriceps açıları ölçüldü. Bulgular: Sağ tarafa %0 ağırlık aktarıldığında sağ taraftaki quadriceps açısı $\bar{x}$= 5,35±0,84 (2,60-7,70), %50 ağırlık aktarıldığında sağ taraftaki quadriceps açısı $\bar{x}$= 6,56±0,9 (4,40-9,50), %100 aktarıldığında sağ taraftaki quadriceps açısı $\bar{x}$= 7,35±1,0 (4,20-11,80)'dir. Sol tarafa %0 ağırlık aktarıldığında sol taraftaki quadriceps açısı $\bar{x}$= 5,46±0,83 (3,30-7,70), %50 ağırlık aktarıldığında sol taraftaki quadriceps açısı $\bar{x}$= 6,58±0,86 (4,40-9,40), %100 ağırlık aktarıldığında sol taraftaki quadriceps açısı $\bar{x}$= 7,46±1,0 (5,10-10,6)'dir. Sağ ve sol tarafa %100 ağırlık aktarıldığında quadriceps açısı değerleri, % 0 ve %50 ağırlık aktarıldığında quadriceps açısı değerlerinden istatistiksel olarak anlamlı yüksek bulunmuştur. Sağ ve sol tarafa %100 ağırlık aktarıldığında spor yapan gruptaki değerler, yapmayan gruba göre istatistiksel olarak anlamlı yüksek bulunmuştur. Sonuçlar: Çalışmamız ağırlık aktarmanın quadriceps açısında artışa sebep olduğunu göstermektedir. Diz ekleminde gelişebilecek patolojilerin sinyali olarak görülen ve diz eklemi biyomekaniğinin anlaşılmasında önemli yere sahip olan quadriceps açısının arttığı vakalarda ağırlık aktarma egzersizlerinden kaçınılması gerektiğini düşünüp yapılacak daha ayrıntılı araştırmaların önemli klinik katkılar sağlayacağını düşünmekteyiz.
Anahtar Kelimeler: Diz, Quadriceps açısı, Ağırlık aktarma

EVALUATION OF QUADRICEPS ANGLE WITH WEIGHT TRANSFER

ABSTRACT
Purpose: It was aimed to evaluate thechange in the quadriceps angles of the individuals participating in the study with 0%, 50% and 100% weight transfer and to compare them between groups that do and do not do sports. MaterialandMethods: A total of 146 individuals, 57 who do sports and 89 who do not do sports, were included in our study. Quadriceps angles were measured with a goniometer while the participants were in an upright position, transferring their body weight to the measured extremities at 0%, 50% and 100%. Results: When 0% weight is transferred to the right side, the quadriceps angle on the right is $\bar{x}$= 5.35±0.84, with 50% transfer it is $\bar{x}$= 6.56±0.9, with 100% transmission, $\bar{x}$= 7.35±1.0. When 0% weight is transferred to the left side, the quadriceps angle on the left is $\bar{x}$= 5.46±0.83, with 50% transfer it is $\bar{x}$= 6.58±0.86, With 100% transmission, $\bar{x}$= 7.46±1.0. The quadriceps angle values when 100% weight was transferred to the right and left sides were found to be statistically significantly higher than the quadriceps angle values when 0% and 50% weight were transferred. When 100% weight was transferred to the right-left side, the values in the group that did sports were found to be statistically significantly higher than the group thatdid not do sports. Conclusions: Our study shows that weight bearing causes an increase in quadriceps angle. We believe that weight-bearing exercises should be avoided in cases where the quadriceps angle increases, which is seen as a signal of pathologies that may develop in the knee joint and has an important place in understanding the biomechanics of the knee joint, and that more detailed research will provide important clinical contributions.
Keywords: Knee, Quadriceps angle, Weight transfer

MICROBIOLOGICAL AND NUTRITIONAL QUALITY OF SOYBEAN CURD AND FRIED FISH FROM SELECTED MARKETS WITHIN ILORIN METROPOLIS, NIGERIA

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ABSTRACT
Soybean curd (Beske) and fried fish are major proteineous food consumed by many Nigerians of the lower class, which are mostly sold in open spaces such as market, road side and sometimes sold by hawkers. This study examined the microbiological and nutritional composition of fried fish and soybean curd purchased from selected markets in Ilorin (Kulende, Ipata and Oja Oba). The microorganisms were isolated using standard microbiological procedures. The bacterial isolates were identified using biochemical tests while fungal isolates were identified using colonial and microscopic characteristics. The proximate composition were obtained using standard analytical methods. Five bacteria and 3 fungi were isolated namely *Staphylococcus* sp., *Escherichia coli, Bacillus* sp., *Salmonella* sp., *Shigella* sp., *Saccharomyces cerevisiae, Aspergillus niger* and *Penicillium* sp. The total bacteriological count from all the samples ranged from 15.3±1.53 - 91.0±3.1 cfu/ml and the total fungal count ranged from 8.0±1.52 - 32.3±0.58 cfu/g. The proximate nutrition result revealed that the moisture, ash, protein, crude fiber, fat and carbohydrates content ranged from 9.10 – 25.5 %, 3.20 – 16.70 %, 0.2 - 5.2 %, 9.5 – 30.2 % and 7.4 – 34.4 % respectively. The fried fish and soybean curd from selected market in Ilorin, Kwara state contain unacceptable levels of microorganisms. The nutritional analysis from this work shows the fried fish and soybean contain high amount of protein and fat.
Keywords: fried fish, soybean curd, microbial analysis, nutritional analysis, markets

SERA KOŞULLARINDA MEDİKAL KENEVİR YETİŞTİRİCİLİĞİ

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ÖZET

Kenevir (*Cannabis sativa* L.) *Cannabinaceae* familyasına ait tek yıllık, otsu gelişen, endüstride çok yönlü kullanım alanlarına sahip bir bitkidir. Kenevirin serada kontrollü biçimde yetiştirilmesi tamamen farklı ve özel bir yaklaşım gerektirmektedir. Seralar kontrollü koşullarda, iklime ve diğer çevre koşullarına bağlı kalmadan veya kısmen bağlı kalarak ışık, sıcaklık, nem, karbondioksit, havalandırma gibi bitkiyi etkileyen faktörlerin kontrol altında tutulduğu alanlardır. Sera koşullarında kenevir yetiştiriciliğinde, vejetasyon dönemi süresince tam bir kontrol ile yıl boyunca üretim sağlanmakta, arzu edilen kannabinoid üretimi, kenevir biyokütle verimi ve kalitesi üzerine bazı avantajları yönleri bulunmaktadır. Tüm bu avantajlı yönleri göz önüne alındığında serada kenevir yetiştiriciliği konusunda bilgi birikimine sahip olmak gerekmektedir. Serada kenevir yetiştiriciliğinde kenevir bitkisinin etkili bir şekilde yetiştirilmesi, kullanılacak ışık miktarı ve yoğunluğu, kullanılacak fotoperiyod ve ışık kaynağı, sıcaklık, sulama ve bağıl nem, yetiştiricilik yapılan alandaki hava sirkülasyonu ve CO_2 miktarı yüksek verim ve kalite için önemli rol oynamaktadır. Serada kenevir yetiştiriciliğinde bir diğer önemli konu ise kenevirin çoğaltma yöntemleridir. Kenevirin çoğaltılması tohumla yapılabileceği gibi vejetatif olarak çelik ile veya doku kültürü teknikleri kullanılarak mikroçoğaltım da yapılabilmektedir. Hasat zamanının belirlenmesi önemli ve kritik bir aşamadır. Üretim amacına bağlı olarak bitkinin hasat zamanı takip edilmelidir. Hasat işleminden sonra kannabinoidlerin yapısı ve miktarında bozulma meydana gelmemesi açısından uygun sıcaklıklarda kurutma işlemlerinin yapılmasına dikkat edilmelidir. Bu çalışma serada medikal kenevir yetiştiriciliği konusunda yapılması gereken uygulamaları derlemek amacı ile yapılmıştır.

Anahtar Kelimeler: CBD, THC, Medikal Kenevir, Sera, Fotoperiyod, Kannabinoid

MEDICAL HEMP CULTIVATION IN GREENHOUSE CONDITIONS

ABSTRACT
Cannabis (*Cannabis sativa* L.) is an annual, herbaceous plant belonging to the *Cannabinaceae* family, which has versatile uses in industry. The controlled cultivation of cannabis in greenhouses requires a completely different and specialized approach. Greenhouses are areas where factors affecting the plant such as light, temperature, humidity, carbon dioxide, ventilation are kept under control in controlled conditions, without being dependent or partially dependent on climate and other environmental conditions. In cannabis cultivation in greenhouse conditions, year-round production is ensured with complete control during the vegetation period, and there are some advantages on the desired cannabinoid production, cannabis biomass yield and quality. Considering all these advantageous aspects, it is necessary to have knowledge about cannabis cultivation in the greenhouse. In greenhouse hemp cultivation, the amount and intensity of light to be used, the photoperiod and light source to be used, temperature, irrigation and relative humidity, air circulation and CO2 amount in the cultivation area play an important role for high yield and quality. Another important issue in greenhouse cannabis cultivation is the propagation methods of cannabis. Propagation of cannabis can be done by seed or vegetatively by cuttings or micropropagation using tissue culture techniques. Determining the harvest time is an important and critical stage. Depending on the production purpose, the harvest time of the plant should be followed. After harvesting, care should be taken to carry out drying processes at appropriate temperatures in order to prevent deterioration in the structure and amount of cannabinoids. This study was carried out to review the practices that should be done in the cultivation of medical cannabis in the greenhouse.
Keywords: CBD, THC, Medical Cannabis, Greenhouse, Photoperiod, Cannabinoid

ENDÜSTRİYEL KENEVİRİN EKOLOJİK İSTEKLERİ

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ÖZET
Kenevir *Cannabinaceae* familyasında bulunulan tek yıllık, çoğunlukla yabancı döllenen bir bitkidir. Kenevir erkek ve dişi çiçekleri farklı bitkilerde (dioik) ya da aynı bitki üzerinde farklı kısımlarda (monoik) bulunabilen formları mevcuttur. Çok eski zamanlardan beri kültürü yapılmaktadır. Geniş bir kullanım alanına sahip olan kenevir lif, gıda, kozmetik, inşaat, enerji ve ilaç alanları da dahil olmak üzere çok farklı alanlarda kullanılabilmektedir. Kenevir yetiştiriciliği dünya üzerinde bazı dönemlerde kısıtlamalara uğramış olsa da, son yıllarda ülkeler kısıtlamaları kaldırmış, yeniden gündeme gelmeye ve önemi artmaya başlamıştır. Günümüzde kenevirin çevre üzerine olumlu etkileri, yüksek verimi ve besin değeri, düşük üretim maliyeti gibi sebepler ile kenevir yetiştiriciliği yaygın hale gelmekte olup, daha çok lif, tohum ve ilaç kullanım amaçlı olarak yetiştiriciliği yapılmaktadır. Kenevir lifleri gövdenin dış kabuk kısmında bulunan floem lifi, sak lifi ve bast lifleri olarak adlandırılmaktadır. Bu lifler tekstil, sicim, halat, çuval gibi birçok farklı alanda değerlendirilmektedir. Tohumlar ise Anadolu'da çedene olarak bilinmekte ve gıda sektöründe kullanılmaktadır. Kenevir tohumu, kenevir unu ve kenevir yağının kullanıldığı pek çok alan oluşmuştur. Tohumları %85 oranında çoklu doymamış yağ asitleri içermekte ve bu yağ yemeklik kalitede bir yağdır. Kenevir bitkisi salgı tüylerinden birçok sekonder metabolit sentezlenmekte, kenevire özgü terpenofenolik bir bileşik olan kannabinoidler üretilmektedir. Bu kannabinoidler en fazla dişi çiçek kısmında bulunmaktadır. İçerdiği kannabinoid miktarına göre THC miktarı yüksek olan medikal (tıbbi) kenevir veya THC miktarı ülkelere göre (%0,2-0,3) değişik oranlarda olmak üzere, az olan çeşitlere de endüstriyel kenevir adı verilmektedir. Çok geniş adaptasyon kabiliyetine sahip olan kenevir ekvatorlardan kutup bölgesine kadar farklı alanda yetiştirilebilmekte olup, dünyanın birçok bölgesinde yetiştirebilmektedir. Bu kadar geniş bir alana yayılmış olan bitkinin ekolojik ve çevre isteklerinin belirlenmesi gereklidir. Bitki yetiştiriciliğinde ışık, sıcaklık, nem ve fotoperiyod gibi çevresel faktörler bitkinin hem fizyolojisi hem de morfolojisi üzerine önemli etkiye sahiptir. Bitkinin genetik yapısı ve ekolojik çevre koşulları bitkilerin nerede doğal olarak yetişebileceği ve nerelerde yetiştiricilik yapılabileceği hakkında bilgi verir. Kenevir yetiştiriciliğinde ekolojik koşulların uygun olması yüksek verim ve kalite için zorunludur. Bu çalışma ile çok yönlü kullanım alanına sahip endüstriyel kenevirin yetiştiricilik yapılacak uygun iklim, sıcaklık, su, ışık, toprak ve besin maddesi istekleri derlenecek ve bu konular üzerinde durulacaktır.
Anahtar Kelimeler: Endüstriyel Kenevir, İklim, Ekoloji, Kenevir Tarımı, Lif

ECOLOGICAL REQUIREMENTS FOR INDUSTRIAL HEMP

ABSTRACT
Hemp is an annual, mostly foreign-pollinated plant belonging to the Cannabinaceae family. Cannabis is available in male and female flower forms that can be found on different plants (dioecious) or in different parts of the same plant (monoecious). It has been cultured since ancient times. Hemp fiber, which has a wide usage area, can be used in many different areas, including food, cosmetics, construction, energy and pharmaceutical fields. Although hemp cultivation has been subject to restrictions in some periods around the world, in recent years countries have lifted the restrictions and it has started to come back to the agenda and its importance has increased. Nowadays, hemp cultivation is becoming widespread due to reasons such as its positive effects on the environment, high yield and nutritional value, and low production costs, and it is mostly grown for fiber, seed and medicine use. Hemp fibers are called phloem fibers, bast fibers and bast fibers located in the outer shell of the stem. These fibers are used in many different areas such as textiles, twine, rope and sacks. The seeds are known as çedene in Anatolia and are used in the food industry. There are many areas where hemp seeds, hemp flour and hemp oil are used. Its seeds contain 85% polyunsaturated fatty acids and this oil is of edible quality. Many secondary metabolites are synthesized from the secretory hairs of the cannabis plant, and cannabinoids, a terpenophenolic compound specific to cannabis, are produced. These cannabinoids are mostly found in the female flower part. Depending on the amount of cannabinoids it contains, medical hemp is called medical hemp, or varieties with a low amount of THC (0.2-0.3%) vary depending on the country, and are called industrial hemp. Hemp, which has a wide adaptability, can be grown in different areas from the equators to the polar region and can be grown in many regions of the world. It is necessary to determine the ecological and environmental requirements of the plant, which has spread over such a wide area. In plant cultivation, environmental factors such as light, temperature, humidity and photoperiod have significant effects on both the physiology and morphology of the plant. The genetic structure of the plant and ecological environmental conditions provide information about where plants can grow naturally and where they can be cultivated. Appropriate ecological conditions in hemp cultivation are essential for high yield and quality. In this study, the appropriate climate, temperature, water, light, soil and nutrient requirements for industrial hemp, which has a versatile use area, for cultivation will be compiled and these issues will be emphasized.
Keywords: Industrial Hemp, Climate, Ecology, Hemp Farming, Fiber

EXAMINATION OF THE CHEMICAL CALCULATION OF THE MOLECULE BY DFT METHOD OF ISOTHIOCYANIC ACID USING THE ELECTRON LOCALIZATION FUNCTION (elf)

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ABSTRACT
In this study, we employed Density Functional Theory (DFT) quantum chemical methods to investigate the molecular structure of Isothiocyanic acid. The optimization of the molecule was performed using the 6-31G basis set. Our DFT calculations yielded energy levels for the highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO) as -7.016 eV and -0.067 eV, respectively, with a calculated energy difference (ΔE) of 6.949 eV between them. Additionally, various electronic parameters including η, σ, χ, μ, ω, ε, ω+, and ω- were evaluated. The width of the HOMO-LUMO energy gap suggests effective charge transfer within the molecule. Furthermore, Molecular Electrostatic Potential (MEP) and Electron Localization Function (ELF) analyses provided detailed insights into the electronic structure of Isothiocyanic acid. Our findings contribute to a deeper understanding of the electronic properties and behavior of this important molecule.
Keywords: ELF, FT-IR, NMR, UV, MEP, DOS

NEMATICIDAL POTENTIAL OF CITRUS SPP. ESSENTIAL OILS ON SOIL NEMATODES UNDER IN-VITRO CONDITIONS

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ABSTRACT
Soils contain many species of nematodes with different feeding habits. Bacterivores, fungivores and omnivore nematodes are important organisms that contribute to soil fertility by acting as decomposers. In contrast, plant-parasitic nematodes can cause damage by feeding on the roots of crops. The nematicidal potential of lemon (*Citrus limon* L.), orange (*Citrus orientalis* L.) and grapefruit (*Citrus paradisi*) essential oils against adult and juvenile stages of bacterivore, fungivore, omnivore and herbivore nematodes in vineyards was investigated. Commercial essential oils were used in the trials. The nematicidal activity was assessed by application of essential oils for 12, 24 and 48 hours, and treatment efficacy was assessed by a count of nematode mortality 48 hours after application. Oils were applied at three doses: 5%, 10%, and 15% to 30 individuals from all species. All treatments affected nematode survival. The lowest level of nematode mortality was observed at the 5% dose of all the oils. Mortality was highest with lemon oil. *Xiphinema, Helicotylenchus*, *Pratylenchus* and *Paratylenchus* were herbivores with 100% mortality, whereas none of the omnivorous nematodes survived at 24 hours in the 15% lemon and grapefruit oil treatments. *Aphelenchus avenae and Aphelenchoides sacchari* were two fungivore nematodes in the experiments, and the survival rate was %64 after 24 hours at 15% doses. For the herbivore *Ditylenchus dipsaci*, the mortality rate at this dose was 57%. Virus vector *X. index* had a low mortality rate in 5% lemon oil (24% mortality) and oil (18% mortality) after 12 hours but reached 66% after 48 hours. Meanwhile, the least effective dose is orange 5% with up to 69% survival of all species at 24 hours.
Keywords: Non-chemical control, essential oils, nematode survival

ADSORPTION OF LEAD FROM WASTE WATER BY NANO COMPOSITE MATERIALS FOR ENVIRONMENT MANAGEMENT

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ABSTRACT
Many researchers have used nanomaterials, nanocomposites, rice husk ash, coal ash, polymeric materials of conducting polymer, and conducting polymer nanocomposites for water purifications. The adsorption techniques can be utilized for water purification to lead by conducting polymer nanocomposite materials. The parameters that affect the adsorption of lead by nanocomposite polymeric materials are contact time, pH, residence time, temperature, and pressure in the column. Here, we review the nanocomposite polymeric material for the adsorption of lead from wastewater. The objective was to find an effective polymeric nanocomposite for lead adsorption from an aqueous system.
Keywords: nanomaterials, nanocomposites, rice husk ash

İŞYERİNDE SAĞLIK VE GÜVENLİK EĞİTİMİNİN ÖNEMİ

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Özet
Herhangi bir işyerinde gerçekleştirilen işin yapılış çeşidine ve yapısına göre sağlık ve güvenlik açısından riskler meydana gelmektedir. Bu risklerin gerçekleştiği ortamların yalnızca %2-%3' ü önceden saptanmaz şekilde gerçekleşirken geriye kalan çok büyük bir kısmı saptanır ve önlene bilir şekilde meydana gelmektedir. Böyle bir yapının mevcut olduğu iş hayatında gereken önlemlerin alınması için yapılacak her türlü plan program ve eğitim çok büyük önem kazanmaktadır. İş sağlığı ve güvenliği alanında yapılan çalışmalar ve bu konuda işine hakim kişiler tarafından gerçekleştirilen eğitimler risklerin hemen hemen hepsini ortadan kaldırılması anlamına da gelmektedir. Bununla birlikte yalnızca risklerin bertaraf edilmesi değil aynı zamanda gerçekleşen iş kazalarında ilk yardımın doğru şekilde ve gereken zamanda yapılması da sağlanacaktır. İlk yardımın planlaması ve doğru şekilde uygulanması çalışanların sağlığı ve kaza sonrasında hayatlarını idame ettirmelerini de doğrudan doğruya etkileyecektir. Özünde sağlıklı ve güvenli bir şekilde çalışma ortamı oluşturmayı hedefleyen iş sağlığı ve güvenliği alanı günümüzde yalnızca denetim ve uygulamalarla değil gerekli eğitimin iş yerinde çalışan personellere de aktarılması, evrensel boyutta önemli bir noktaya gelmiştir. Son yıllarda ortaya çıkan tabloda İSG mevzuatı kadar İSG eğitimleri de işin bir parçası haline gelmektedir. Çünkü eğitim verilen çalışanın ulaştığı verileri uygulamaya ekleyerek davranışsal yapıda gelişim meydana getirmesi de iş sağlığı ve güvenliği ile örtüşen bir iş yapısını meydana getirmektedir. Minimum seviyede oluşan iş kazaları sonrasında doğru uygulamalar ise iş veren veya iş yeri amirleri içinde maddi ve manevi riskler açısından oldukça pozitif sonuçlar doğuracaktır. Bu meydana gelen iş ortamlarında yüksek verim ve düşük stres yapısının oluşacağı da öngörülebilmektedir. İşyerinde sağlık ve güvenlik eğitimlerinin düzenli disiplinli gerçekleştirilmesi sonucunda ortaya çıkacak tabloyu sizlere aktarmaya çalışacağız.
Anahtar Sözcükler: İş sağlığı, iş güvenliği, eğitim, riskler

THE IMPORTANCE OF HEALTH SAFETY TRAINING IN THE WORKPLACE

ABSRACT
Risks occur in terms of health and safety according to the type and structure of the work performed in any workplace. While only 2%-3% of the environments in which these risks occur are undetectable, a large part of the remaining risks occur in a way that can be detected and prevented. In business life where such a structure exists, all kinds of plans, programmes and training to take the necessary precautions gain great importance. The studies carried out in the field of occupational health and safety and the trainings carried out by people who have mastered their job in this regard also mean the elimination of almost all risks. However, it will not only eliminate the risks, but also ensure that first aid is provided in the correct way and at the required time in case of work accidents. The planning and correct implementation of first aid will directly affect the health of the employees and their survival after the accident. In essence, the field of occupational health and safety, which aims to create a healthy and safe working environment, has nowadays become a universally important point not only through inspections and practices, but also by transferring the necessary training to the personnel working in the workplace. In the picture that has emerged in recent years, OHS trainings are becoming as much a part of the work as OHS legislation. Because the development of the behavioural structure by adding the data reached by the trained employee to the application creates a business structure that coincides with occupational health and safety. Correct practices after work accidents occurring at minimum level will have very positive results in terms of material and moral risks for the employer or workplace supervisors. It can also be predicted that high efficiency and low stress structure will occur in these work environments. We will try to convey to you the picture that will emerge as a result of the regular disciplined realisation of health and safety trainings in the workplace.
Keywords: Occupational health, occupational safety, training, risks

BOMBA UZMANI ELBİSESİLERİNDE ÜZERİNDE KARIŞIM ORANLARI VE KATMAN SAYILARI DEĞİŞTİRİLEN KOMPOZİT MALZEMELERİN ÇEKME GERİLMELERİNE ETKİSİNİN TAGUCHİ L9 ORTHOGONAL ARRAY KULLANILARAK İSTATİSTİKSEL KARŞILAŞTIRILMASI

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ÖZET
Bomba uzmanı elbiseleri, bomba imha uzmanlarının hayatlarını kurtarabilecek hayati öneme sahip donanımlardır. Bu elbiseler, patlama anında oluşabilecek şarapnel, ısı ve basınç gibi etkilerden korunmayı amaçlar. Mevcut EOD 9 modelindeki ağırlık (~40 kg), uzmanların olay yerinde hızlı ve etkin bir şekilde hareket etmelerini zorlaştırabilir. Bu durum, acil durumlarda müdahale etkinliğini azaltabilir. Bu sebeple, elbisenin ağırlığının azaltılması ve esnekliğinin artırılması, operasyonel performansı doğrudan etkileyebilir. Ayrıca hayati öneme sahip olan darbe dayanımlarının ergonomik koşullar iyileştirilirken en üst seviyede tutulması gerekmektedir. Bu çalışmada mevcutta kullanılan aramid fiber malzemenin cam fiber ve karbon fiber takviye elemanlarıyla epoksi reçine matris içerisine vakum infüzyon yöntemi kullanılarak farklı karışım oranı ve katman kalınlıklarıyla üretilerek mekanik dayanımları karşılaştırılmıştır. Bu çalışmada cam fiber, karbon fiber ve aramid fiber malzemelerin epoksi matris malzeme ile %10-30 arasında değişen karışım oranının ve 2-6 arasında değişen katman sayısının çekme mukavemetine etkileri Taguchi L9 orthogonal array kullanılarak kıyaslanmıştır. Bulgular sonucunda katman sayısının artışı yüzey alanının artmasıyla birlikte çekme mukavemetini azalttığını bununla birlikte matris malzemenin oransal artışı da yine çekme mukavemetini azalttığı gözlemlenmiştir. Sonuç olarak bomba imha uzmanı elbise tasarımında minimum matris malzeme ile yine minimum katman sayısı kullanımı daha yüksek bir gerilme sağlayacaktır. Bu çalışmada karşılaştırılan cam fiber, karbon fiber ve aramid fiber gerilmelerinde en yüksek mukavemet oranı tüm parametreler için karbon fiber takviye elemanı kullanıldığında elde edilmiştir.
Anahtar Kelimeler: Kompozit Malzemeler, Çekme Dayanımı, Bomba Uzmanı Elbisesi, Karışım Oranı, Katman Sayısı

STATISTICAL COMPARISON OF THE EFFECT OF MODIFIED COMPOSITE MATERIALS WITH DIFFERENT MIXTURE RATIOS AND LAYER NUMBERS ON TENSILE STRESSES IN BOMB DISPOSAL SUITS USING TAGUCHI L9 ORTHOGONAL ARRAY

ABSTRACT
Bomb disposal suits are critical equipment that can save the lives of bomb disposal experts. These suits aim to protect against shrapnel, heat, and pressure that may occur during an explosion. The weight of the current EOD 9 model (~40 kg) can make it difficult for experts to move quickly and effectively on-site, potentially reducing intervention efficiency in emergencies. Therefore, reducing the weight and increasing the flexibility of the suit can directly affect operational performance. It is also essential to maintain the highest level of impact resistance while improving ergonomic conditions. In this study, the mechanical strengths of materials produced using different mixture ratios and layer thicknesses through the vacuum infusion method with epoxy resin matrix incorporating glass and carbon fiber reinforcements, in addition to the currently used aramid fiber material, are compared. The effects of varying mixture ratios (10-30%) of glass fiber, carbon fiber, and aramid fiber materials with epoxy matrix material and the number of layers (2-6) on tensile strength were compared using the Taguchi L9 orthogonal array. The findings indicate that an increase in the number of layers, along with an increase in surface area, reduces tensile strength, and likewise, an increase in the proportion of matrix material also reduces tensile strength. Consequently, in bomb disposal suit design, using the minimum amount of matrix material and the minimum number of layers will result in higher stress. Among the glass fiber, carbon fiber, and aramid fiber tensions compared in this study, the highest strength ratio was achieved using carbon fiber reinforcement for all parameters.
Keywords: Composite Materials, Tensile Strength, Bomb Disposal Suit, Mixture Ratio, Layer Count

TERMOPLASTİK KOMPOZİTLERDE MİKROKAPSÜL ESASLI KENDİ KENDİNE İYİLEŞME

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ÖZET
Kendi kendini iyileştiren polimerler, malzemelerin kullanım ömrünü artırmayı, çeşitli alanlarda kullanılarak malzeme güvenliğini geliştirmeyi, malzemenin bakım maliyetini düşürmeyi hedeflemektedir. Otomotiv, havacılık, uzay endüstrisi ve inşaat sektörü gibi çeşitli alanlarda potansiyel kullanım alanına sahip bu yöntem, basit üretimleri sayesinde endüstride tercih edilmektedir. Herhangi bir dış müdahale olmadan malzemedeki hasarı otonom olarak iyileştiren kapsülleme yöntemi, aktif bir iyileştirici ajan içeren bileşenler içerir. Mikrokapsül içerisine hapsedilen iyileştirici ajanlar, sadece hasar oluştuğunda serbest kalarak kontrollü bir iyileşme süreci sağlar. Bu proje kapsamında, matris içerisinde birden fazla kullanıma imkan sunan kapsülleme yöntemi ele alınmıştır. Kabuk malzemesinde, hızlı kürlenmeleri, yüksek reaktiviteleri, alev almamaları ve düşük maliyetleri nedeniyle üre-formaldehit reçine tercih edilmiştir. Kondenzasyon reaksiyonuyla elde edilen kabuk formunun içerisine iyileşme ajanı olarak oda sıcaklığında kürlenmeye uygun olan reaktif termoplastik Elium reçine emdirilmiştir. Termoplastik reaktif bir reçine olan, Elium reçine, geri dönüştürülebilirliği, mekanik performansı, kür kinetiğiyle son zamanlarda araştırma alanlarında yerini almıştır. Elium reçineden oluşturulan matris malzemede çekme yüklemesi, yorulma yüklemesi, darbe hasarı ve termal döngü mikro ve makro çatlakların oluşmasına neden olabilir. Kapsül içerisinde bulunan iyileştirici ajanlar, bu çatlaklara sızar. Çatlakları doldurarak kürlenen reçine, iyileşme vasfını yerine getirir. Kendiliğinden iyileşme etkinliğinin gösterilmesi için iyileşme öncesi ve sonrası tekrarlanan mekanik testler sonucunda toplam yutulan enerji belirlenebilir. Yüklemeye maruz kalan malzemede, enerji yeni yüzeylerin oluşmasıyla sönümlenir.

Anahtar Kelimeler: Kendi kendine iyileşme, Reaktif termoplastik reçine, Otonom iyileşme, Mikrokapsül, Elium reçine, Polimer, Kompozit.
Teşekkür: Bu çalışma Tübitak-Teydeb-1505 programı tarafından desteklenen 5220011 nolu proje kapsamında gerçekleşmiştir. Yazarlar, desteği için TÜBİTAK'a teşekkür ederler.

MICROCAPSULE-BASED SELF-HEALING OF THERMOPLASTIC COMPOSITES

ABSTRACT
Self-healing polymers aim to increase the service life of materials, improve material safety by using them in various fields, and reduce the maintenance cost of the material. This method, which has potential use in various fields such as automotive, aviation, space industry, and construction sector, is preferred in the industry thanks to its simple production. The encapsulation method, which autonomously heals the damage in the material without any external intervention, contains components containing an active healing agent. The healing agents trapped in the microcapsule are released only when damage occurs, providing a controlled healing process. Within the scope of this project, the encapsulation method, which allows multiple uses within the matrix, has been addressed. For the shell material, urea-formaldehyde resins were preferred due to their fast curing, high reactivity, non-flammability, and low cost. The shell form obtained by condensation reaction was impregnated with reactive thermoplastic Elium resin, which is suitable for curing at room temperature, as a curing agent. Elium resin has recently taken place in research areas due to its recyclability, mechanical performance, and curing kinetics. Tensile loading, fatigue loading, impact damage, and thermal cycling can cause micro and macro cracks in the matrix material formed from Elium resin, a thermoplastic reactive resin. The curing agents contained in the capsule seep into these cracks. The cured resin fills the cracks and fulfills its healing properties. In order to demonstrate the effectiveness of self-healing, the total absorbed energy can be determined as a result of repeated mechanical tests before and after healing. In the material subjected to loading, energy is absorbed by the formation of new surfaces.
Keywords: Self-healing, Reactive thermoplastic resin, Autonomous healing, Microcapsule, Elium resin, Polymer, Composite.
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İKİ YÖNLÜ ONDÜLASYONA SAHİP ALÜMİNYUM ÇEKİRDEK VE KOMPOZİT PLAKALARLA GELİŞTİRİLEN SANDVİÇ YAPILARIN EĞİLME VE PENETRASYON DAVRANIŞI

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Özet
Kompozit sandviç yapılar, havacılık, otomotiv, denizaltı, inşaat gibi çeşitli endüstrilerde geniş bir kullanım alanına sahiptir. Hafiflikleri ve yüksek mukavemet-kütle oranları ile enerji verimliliği sağlayan bu yapılar, modern mühendislik uygulamalarında önemli bir role sahiptir. Bu çalışmada 0.2 mm kalınlığa sahip alüminyum plakalardan çekirdek yapılar oluşturulmuştur. Çekirdek yapıların eğilme altında daha üstün performans göstermesi amacıyla kompozit plakalar ile sandviç hale getirilmiştir. 1 mm kalınlığa sahip plakalar cam, karbon ve Kevlar kumaşlara vakum infüzyon yöntemi ile epoksi reçine emdirilmesiyle üretilmiştir. Yüksek hızlı dinamik üç nokta eğilme testi ile yapıların eğilme altındaki davranışları incelenmiştir. Bu testler 298 s^{-1} şekil değiştirme hızında gerçekleştirilmiştir. Ayrıca sandviç plaka yüzeylerinde çarpma etkisi oluşturabilecek etkenler dinamik penetrasyon testleri ile karakterize edilmiştir. Testler esnasında alüminyum hücrelerde oluşan burkulmalar, kompozit plakalarda meydana gelen hasar mekanizmaları ve sandviç yapılarda meydana gelen deplasman yüksek hızlı kamera ile incelenmiştir. Deneylerden elde edilen kuvvet deplasman eğrileri ile sandviç yapıların eğilme rijitlikleri karşılaştırılmıştır. Ayrıca çekirdek malzemenin, çekirdek malzeme ile kompozit plakalar arasındaki yapıştırıcı malzemenin ve kompozit plakaların mekanik özellikleri çekme deneyi ile belirlenmiştir. Elde edilen sonuçlar ile sandviç yapıda kullanılan her bir malzemenin mukavemet modülleri ve malzeme özellikleri tespit edilmiştir. Sonuç olarak kompozit sandviç yapının kritik öneme sahip yapısal elemanlarda kullanılabilirliği mekanik testler ile tespit edilmiştir.

Anahtar Kelimeler: Sandviç malzeme, kompozit malzeme, penetrasyon, ani darbe, üç nokta eğilme testi.

Teşekkür: Bu çalışma Tübitak-Teydeb-1505 programı tarafından desteklenen 5220143 nolu proje kapsamında gerçekleşmiştir. Ayrıca ondülasyonlu sac ve Aluminyum malzemeler ERBAB Otomoat Yedek Parça San. Ltd. Şti. tarafından sağlanmıştır. Yazarlar, TÜBİTAK ve Erbab Ltd. Şti'ye teşekkürlerini sunar.

FLEXURAL AND PENETRATION BEHAVIOR OF SANDWICH STRUCTURES DEVELOPED WITH TWO DIMENSIONAL CORRUGATED ALUMINUM CORE AND COMPOSITE PLATES

ABSTRACT

Composite sandwich structures have a wide range of uses in various industries such as aerospace, automotive, submarine and construction. These structures, which provide energy efficiency with their light weight and high strength-to-mass ratio, have an important role in modern engineering applications. In this study, core structures were developed from aluminum plates with a thickness of 0.2 mm. The core structures are sandwiched with composite plates in order to provide superior performance under bending. 1 mm thick plates were produced by impregnating glass, carbon and Kevlar fabrics with epoxy resin by vacuum infusion method. The behavior of the structures under bending was examined with the high-speed dynamic three-point bending test. These tests were performed at a strain rate of 298 s^{-1}. In addition, the conditions that may cause impact effects on the sandwich plate surfaces were characterized by dynamic penetration tests. During the tests, buckling in aluminum cells, damage mechanisms in composite plates and displacement in sandwich structures were examined with a high-speed camera. The force-displacement curves obtained from the experiments were compared with the bending stiffness of the sandwich structures. In addition, the mechanical properties of the core material, the adhesive material between the core material and the composite plates, and the composite plates were determined by tensile testing. With the results obtained, the strength modules and material properties of each material used in the sandwich structure were determined. As a result, the usability of the composite sandwich structure in critical structural elements has been determined by mechanical tests.

Keywords: Sandwich material, composite material, penetration, impact, three point bending test.

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BEBEKLİK VE ÇOCUKLUK ÇAĞINDA OLUŞAN ALERJİLER HAKKINDA GÜNCEL ARAŞTIRMALAR

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ÖZET
Çağımızda bebek ve çocuklarda besin alerjisi gün geçtikçe artmaktadır. Besin alerjilerinin nedenleri arasında değişen çevre faktörleri, beslenme davranışı, ailede alerji öyküsünün varlığı ve mikrobiyota çeşitliliği bulunmaktadır. Besin alerjisi bağışıklık sisteminin vücuda alınan besini yabancı madde olarak tanımlayarak bağışıklık sistemini uyarmasıyla oluşmaktadır. Ek gıdaya yeni başlayan bebeklerde sıklıkla besin alerjisi görülmektedir. En alerjik besinler arasında inek sütü, yumurta, yer fıstığı, soya fasulyesi, balık, kabuklu deniz ürünleri, buğday ve histamini yüksek sebze-meyveler bulunmaktadır. Besin alerjileri sonucunda bebek ve çocuklarda kronik ishal, egzama, sedef, ciltte kuruluk, burun akıntısı gibi semptomlar oluşabilmektedir. Bu semptomları azaltmak ve oluşmasını engellemek amaçlı bir çok çalışma yapılmaktadır. Bebeklik ve çocukluk çağında önlem alınması çok önemlidir. Mikrobiyota sağlığı küçük yaşlarda ele alınmalıdır. Besin alerjilerinin artışı ayrıca doğum şekline, anne sütüne başlama zamanına, ek gıdaya başlama zamanına bağlıdır. Bundan dolayı besin alerjilerinin doğum öncesi, doğum süreci, doğum sonrası ve çocukluk döneminde önlenmesi için yapılan uygulamalar ve çalışmalar bulunmaktadır.Çalışmalarda eliminasyon diyeti yapılarak alerji meydana getiren besinin hastanın diyetinden çıkarılması ve 4-6 ay sonra yüklenmesiyle beslenmeme tedavisi uygulanmaktadır. Ayrıca tıbbi tedavi olarak immüniterapi, antihistaminik ilaç tedavisi, semptomları azaltmak için kremler kullanılabilmektedir. Bu bildiride ki amacımız besin alerjisi olan bebek ve çocuklar için nedenlerini ve önlenmesi için yapılması gerekenleri vurgulamak amaçlı güncel çalışmaları incelemektir.
Anahtar kelimeler: Alerji, besin alerjisi, bebek alerjisi

RESEARCH ON ALLERGIES DEVELOPING IN INFANCY AND CHILDHOOD

ABSTRACT
In our era, food allergies in infants and children are increasing day by day. The causes of food allergies include changing environmental factors, dietary behaviors, the presence of allergies in the family history, and microbiota diversity. Food allergy occurs when the immune system identifies the ingested food as a foreign substance and triggers an immune response. Food allergies are frequently observed in infants who are just starting solid foods. Among the most allergenic foods are cow's milk, eggs, peanuts, soybeans, fish, shellfish, wheat, and fruits/vegetables with high histamine levels. As a result of food allergies, infants and children may experience symptoms such as chronic diarrhea, eczema, psoriasis, dry skin, and runny nose. Numerous studies are being conducted to reduce and prevent these symptoms. It is crucial to take preventive measures during infancy and childhood. Microbiota health should be addressed from a young age. The increase in food allergies is also linked to the method of delivery at birth, the timing of starting breastfeeding, and the introduction of solid foods. Therefore, there are interventions and studies aimed at preventing food allergies during prenatal, perinatal, postnatal, and childhood periods. In studies, elimination diets are implemented, where the allergenic food is removed from the patient's diet and reintroduced after 4-6 months to treat food allergies. Additionally, medical treatments such as immunotherapy, antihistamine medication, and creams to alleviate symptoms can be used. The purpose of this report is to examine current studies highlighting the causes of food allergies in infants and children, as well as emphasizing the necessary measures for prevention.
Keywords: Allergy, food allergy, infant allergy.

KENEVİRİN KANSER TEDAVİSİ ÜZERİNDEKİ ETKİSİYLE İGİLİ GÜNCEL ÇALIŞMALAR

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ÖZET
Günümüzde sağlık alanında gelişmeler arttıkça en yüksek ölüm oranlarında bulaşıcı hastalıklarının yerini kronik hastalıklar almaya başladı. Epidemiyolojik araştırmalarda ölüm oranlarında en yüksek sıralamada bulunan kronik hastalıklardan birincisi kalp damar hastalıkları iken ikincisi kanser olduğu vurgulanmaktadır. Bunun nedeni de değişen yaşam tarzları, çevresel faktörler, genetik faktörler, kötü beslenme alışkanlıkları ve ağır metal birikimi gibi etmenlerin artmasıyla kanser hastalığının ortaya çıktığı sonucuna varılmaktadır. Kanserin oluşmasını engellemek ve erken teşhis koymak amacıyla ülkeler kampanyalar yapmaktadır. Böylece toplum bilinçlendirilmekte ve önlemler alınmaktadır. Bir yandan da tedavi süreci geliştirilmeye çalışılmaktadır. Günümüzde kanser tedavisinde fonksiyonel bitkilerden faydalanmak için birçok araştırma yapılmaktadır. Bu bitkilerden biri de 500'den fazla kimyasal ve biyolojik olarak aktif bileşen içeren otsu bir bitki olan kenevirdir. Kenevir bitkisi gıda ve yem, kozmetik, inşaat ve ilaç endüstrisine kadar birçok uygulama alanında kullanılmaktadır. Kenevir bileşiklerinin çeşitli kanser hücrelerinde in vivo ve in vitro çalışmalarla araştırılmaktadır. Birçok çalışmada farklı dokulardaki kanser hastalığının endokannabinoid sistemde rol alan üyelerinin ekspresyon düzeylerinde farklılık gerçekleştiği gözlenmiştir. Ve çalışmalar neticesinde kenevir bitkisinin bileşiklerinin kanser ve yaşamı tehdit eden hastalıkları tedavi etmek için anlamlı gelişmelere ışık tutacağı vurgulanmıştır. Son zamanlarda, kenevirin tıbbi amaçlarla tedavilerde kullanımı yasallaştırılması için artan bir ilgi gözlenmektedir. Eski yıllarda da tedavi amacıyla birçok hastalıkta kullanılan kenevir günümüzde tekrar hastalıklarda kullanımı araştırılıp geliştirilmektedir. Bu çalışmamızın amacı; ölüm oranı yüksek kronik hastalık olan kanserin tedavisindeki kenevirin rolünü güncel çalışmaları inceleyerek, toplu bir bilgi sunmak ve önemini vurgulamaktır.
Anahtar kelimeler: fonksiyonel bitki, kanser,kenevir

RECENT STUDIES ON THE EFFECT OF CANNABIS IN CANCER TREATMENT

ABSTRACT
Today, with the development in the field of health, chronic diseases have begun to replace infectious diseases in the highest mortality rates. In epidemiological studies, it is emphasized that while cardiovascular diseases are the first of the chronic diseases with the highest ranking in mortality rates, cancer is the second. The reason for this is that cancer has emerged with the increase in factors such as changing lifestyles, environmental factors, genetic factors, poor eating habits and accumulation of heavy metals. Countries are conducting campaigns to prevent cancer and diagnose it early. Public awareness is being raised and measures are being taken. On the other hand, efforts are being made to improve the treatment process. Today, many researches are being conducted to use functional plants in cancer treatment. One of these plants is hemp, a herbaceous plant that contains more than 500 chemically and biologically active compounds. The hemp plant is used in many applications ranging from food and feed, cosmetics, construction and pharmaceutical industries. Hemp compounds are studied in vivo and in vitro in various cancer cells. In many studies, differences in the expression levels of members involved in the endocannabinoid system have been observed in cancer diseases in various tissues. And as a result of these studies, it has been emphasized that compounds from the hemp plant will shed light on significant developments in treating cancer and life-threatening diseases. Recently, there has been a growing interest in legalizing the use of cannabis in medical treatments. Cannabis, which has been used therapeutically in the past for many diseases, is now being researched and developed again for use in diseases. The aim of this study is to provide collective information and highlight the importance of the role of cannabis in the treatment of cancer, a chronic disease with a high mortality rate, by reviewing current studies.
Keywords: cancer, functional plant, hemp

ANTERİOR RESTORASYONLARIN GÜLÜŞ VE ÖZGÜVEN ÜZERİNDEKİ ETKİLERİ: 2 YILLIK KONTROL

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ÖZET

AMAÇ: Gülme hattı, gülümseme sırasında maksiller kesici dişlerin insizal kenarlarının kurvatürü ile alt dudak kurvatürünün ilişkisini ifade eder. Üst ön dişlerin şekil, boyut ve konumlarındaki değişiklikler bu ilişkiyi etkileyen primer faktördür. Bu vaka sunumunun amacı rotasyona uğramış, kırılmış ve uyumu bozulmuş eski restorasyonlar nedeniyle tersine gülme hattına sahip bir hastamızın gülüş estetiğinin direkt kompozit lamina restorasyonlarla iyileştirilmesinin anlatılmasıdır. OLGU SUNUMU: 20 yaşında kadın hasta kliniğimize anterior bölgedeki uyumsuz, renklenmiş ve kırılmış restorasyonlarından kaynaklanan şikayeti üzerine başvurdu. Estetik açıdan değerlendirildiğinde anterior dişlerin yetersiz labial desteğe ve tersine gülme hattına sahip olduğu ve sağ üst lateral dişte çapraşıklık olduğu görüldü. Dişlerdeki renklenmelerin giderilmesi amacıyla 2 hafta süre ile ev tipi beyazlatma (Opalescence PF, Ultradent) uygulandı. Beyazlatma işleminden 2 hafta sonrasında restorasyonların yenilenmesi için randevu verildi. Dişlerdeki boyutsal estetik oranların elde edilmesi ve pozitif gülme hattını desteklemek için kompozit rezinle kron boylarının uzatılması ve çapraşıklıkların kompozit laminalarla düzeltilmesi planlandı. Rubberdam ile izolasyon sağlandı, dişlerdeki eski restorasyonlar kaldırıldı. Palatal duvarlar şeffaf bant kullanılarak mine kompoziti (Esteliate Sigma, Tokuyama) ile hazırlandı. Kaşık matriks ile aproksimal duvarlar hazırlandı ve tabakalama tekniği kullanılarak mine ve dentin kompozitleri ile restorasyonlar yapıldı. Restorasyonlar elmas frezler, polisaj diskleri ve polisaj pastaları ile bitirildi ve parlatıldı. BULGULAR: Tedavi öncesinde ve sonrasında alınan fotoğraflar incelendiğinde, hastanın pozitif gülme hattının ve yapılan restorasyonların hastaya özgüven kazandırdığı görüldü. Anterior dişlere labial ve insizal bölgelerde kompozit ilavesi ile dudağın da desteklendiği görüldü. İki yıllık takip kontrolünde, restorasyonlar iyi renk uyumu ve estetik görünüm sergiledi. SONUÇ: Direkt kompozit laminalarla hastaların gülme estetikleri üzerine kısa sürede olumlu katkılar sağlanabilir. Üst dişlerdeki pozitif gülme hattının hastanın daha doğal ve özgüvenli gülmesiyle sonuçlandığı bu vakada görülmektedir. İki yıl sonundaki kontrolde restorasyonlarda hafif renklenme ve yüzey pürüzlülüğünde artış gözlense de restorasyonların cilası ile sorunsuz şekilde devamlılık sağlanmıştır.

Anahtar Kelimeler: Özgüven, gülüş, anterior restorasyon

THE EFFECTS OF ANTERIOR RESTORATIONS ON SMILE AND SELF-CONFIDENCE: 2-YEAR CONTROL

ABSTRACT
Introduction: The smile line expresses the relationship between the curvature of the incisal edges of the maxillary incisors and the curvature of the lower lip during smiling. Changes in the shape, size and position of the upper anterior teeth are the primary factors affecting this relationship. The aim of this case report is to describe the improvement of the smile aesthetics of a patient with a reversed smile line due to rotated, fractured and incompatible old restorations with direct composite lamina restorations. Case Report: A 20-year-old female patient referred to our clinic with complaints about incompatible, discolored and fractured restorations in the anterior region. Aesthetic evaluation revealed that the anterior teeth had inadequate labial support, reversed smile line and crowding in the upper right lateral tooth. Home bleaching (Opalescence PF, Ultradent) was applied for 2 weeks and restorations were renewed 2 weeks after bleaching. Incisal lengthening and correction of crowding with composite laminates were planned to achieve dimensional aesthetic proportions and to support a positive smile line. Isolation was provided with rubber-dam and old restorations were removed. Palatal walls were prepared with enamel composite (Esteliate Sigma, Tokuyama) using mylar strip. Aproximal walls were prepared with spoon matrix and restorations were made with enamel and dentin composites using layering technique. Restorations were finished and polished with diamond burs, polishing disks and polishing pastes. Results: When the before and after the treatment photographs were analyzed, it was seen that the patient's positive smile line and restorations gave the patient self-confidence. The upper lip was also supported with the addition of composite in the labial and incisal areas of the anterior teeth. At the two-year follow-up visit, the restorations showed good color matching and aesthetic appearance. Conclusion: Direct composite laminates can contribute positively to the smile aesthetics of patients in a short time period. In this case, the positive smile line in the upper teeth resulted in a more natural and confident smile. Although slight discoloration and increased surface roughness were observed in the restorations at the two-year follow-up, the polish of the restorations was maintained without any problems.
Keywords: Self-confidence, smile, anterior restoration

KOKULU KESME ÇİÇEKLER

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ÖZET
Yüzyıllardır insanlar, doğal çevrelerinde bulunan bitkilerin estetik ve görsel etkilerinden faydalanmaktadırlar. Kokulu kesme çiçekler, doğanın bize sunduğu zarif ve hoş kokulu bitkilerdir ayrıca zarif görünümleri ve hoş kokuları sayesinde bulundukları ortamları güzelleştirmektedirler. Bahçelerimizi, evlerimizi ve özel etkinliklerimizi süsleyen bu çiçekler, genellikle kesilerek vazolarda veya aranjmanlarda kullanılmak üzere yetiştirilmenin yanı sıra parfüm ve kozmetik gibi birçok sektörün ürünlerinde çiçek kokuları ön plana çıkmaktadır. Kokulu kesme çiçekler, yaşamın her alanına estetik ve duygusal zenginlik katan doğal güzelliklerdendir. Koku, karakteristik ve genellikle hoş aromaya sahip organik bileşikler olarak tanımlanmaktadır. Süs bitkileri ve kesme çiçeklerde koku arzu edilen bir özelliktir. Çiçeklerde başta taç yaprak, çanak yaprak, erkek organ ve bunların yanı sıra özel organ ve dokular tarafından üretilen yüzlerce uçucu bileşikler ile karakteristik koku oluşumu sağlanmaktadır. Çiçek kokusu, düşük molekül ağırlıklı uçucu organik bileşiklerden oluşmakta ve terpenler, fenilpropanoidler ve yağ asidi türevleri olmak üzere üç farklı yol ile sentezlenmektedir. Güzel görünümleri ve etkileyici kokularıyla dikkat çeken gül, zambak, süsen, nergis, frezya ve daha birçok farklı kokulu kesme çiçek bulunmaktadır. Farklı kesme çiçek türlerinde; uçucu organik bileşiklerin bileşimi, miktarı ve emisyonundaki değişkenlere bağlı olarak farklı çiçek kokuları oluşmaktadır. Bu özellik sebebiyle her bir çiçek de kendine özel kokusuyla ve güzelliğiyle insanları etkilemektedir. Bu çalışmada, bazı kokulu kesme çiçeklere ait karakteristik koku bileşenleri ve biyosentezine yönelik bilgiler verilmektedir.
Anahtar kelimeler: Kesme çiçek, koku, uçucu bileşen

SCENTED CUT FLOWERS

ABSTRACT
For centuries, people have benefited from the aesthetic and visual effects of plants in their natural environment. Scented cut flowers are elegant and fragrant plants offered to us by nature, and they beautify the environments they are in thanks to their elegant appearance and pleasant scents. These flowers, which decorate our gardens, homes and special events, are usually cut and grown to be used in vases or arrangements, as well as floral scents come to the fore in the products of many sectors such as perfumes and cosmetics. Scented cut flowers are one of the natural beauties that add aesthetic and emotional richness to every aspect of life. Odour is defined as organic compounds with a characteristic and usually pleasant aroma. Odour is a desirable feature in ornamental plants and cut flowers. Hundreds of volatile compounds produced by the petals, sepals, stamens, male organs as well as special organs and tissues provide the characteristic odour in flowers. Floral odour consists of volatile organic compounds with low molecular weight and is synthesised by three different pathways: terpenes, phenylpropanoids and fatty acid derivatives. There are many different scented cut flowers such as roses, lilies, daffodils, freesia and many more, which attract attention with their beautiful appearance and impressive scents. Different types of cut flowers have different floral scents depending on the composition, amount and emission of volatile organic compounds. Due to this feature, each flower impresses people with its special scent and beauty. In this study, information on the characteristic scent components and biosynthesis of some fragrant cut flowers is given.
Keywords: Cut flowers, scent, volatile components

PREVALENCE OF QARD AND QARB RESISTANCE GENE EXPRESSION IN ESCHERICHIA COLI IN COMPARISON TO LACTOBACILLUS

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ABSTRACT
Antibiotics support current medicines as their usage has decreased the mortality rate and improved life standards. The amount of infections produced by multidrug-resistant (MDR) bacteria is growing worldwide and the spectrum of terminal infections is becoming certain. The shocking rise in antibiotic resistance of some pathogenic strains of Escherichia coli has developed tangible public health hazards. Some of the genes determine Antibiotic resistance amongst the bacteria. OnrA and OnrB are the moxifloxacin-resistant genes in Escherichia coli; it showed resistance towards fluoroquinolones via different mechanisms. Lactobacillus is

present in the normal microbiota of the human intestinal tract and plays a vital role as a probiotic. Lactobacillus acts as a pool of gene resistance. Lactobacillus transmits resistance genes to Escherichia coli via horizontal gene transfer method. Clinical samples were collected from human patients and cultured on Eosin methylene blue agar and a sensitivity assay was performed through disc method. Samples were subjected to isolation of gDNA and amplification of bacterial DNA through PCR. Gel electrophoresis was performed for the separation and analysis of nucleic acids and gene expression was analyzed through qRT-PCR. The data was subjected to statistical analysis using one-way ANOVA and DMR by using graph pad prism version 6.OnrA and QarB are resistant genes of Escherichia coli against fluoroquinolones and are highly expressed in this species (P=0.015) when compared to gene expression in Lactobacillus (P=0.2). It is concluded that moxifloxacin a broad spectrum-drug is highly resistant to Escherichia coli.
Keywords: Lactobacillus, Eosin methylene blue agar, moxifloxacin

İÇ MEKÂN SÜS BİTKİLERİ SEKTÖRÜNDEKİ ÜRETİCİ VE ARACILARIN COVİD-19 PANDEMİSİ VE SONRASI DURUM ANALİZİ: YALOVA ÖRNEĞİ

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ÖZET
İç mekan süs bitkileri kapalı mekanlara estetik, işlevsel ve ekolojik katkısının yanı sıra insan sağlığı üzerinde de olumlu katkılar sağlamaktadır. 2019 yılının Aralık ayında, Çin'in Wuhan kentinde ortaya çıkan ve tüm dünyayı etkisi altına alan yeni koronavirüs enfeksiyonuyla ortaya çıkan pandemi sürecinde uygulanan sosyal izolasyon, bireysel ve toplumsal yaşamda bazı değişikliklere yol açarak sağlığın beraberinde sosyal, psikolojik açılardan da etkilemiştir. Bu süreçte doğa ve bitkilerle uğraş içerisinde olmak izolasyonla yaşanan zorluklarla baş etme yollarından biri olarak da görülmüştür. Pandemi sürecinde iç mekân süs bitkileri üretimi ve tüketimiyle ile ilgili yapılan çalışmalar kısıtlıdır. Bu eksiklikten yola çıkılarak, Covid-19 pandemi sürecinde insanların evlerinde daha çok vakit geçirmelerinin iç mekân süs bitkileri üreticilerinin ve çiçekçi esnafının bu durumdan nasıl etkilendiğini belirlemek amacıyla gerçekleştirilen çalışma; süs bitkilerinde önemli bir yeri olan Yalova özelinde gerçekleştirilmiştir. Yalova ilindeki iç mekân bitkisi üreticileri ve bunların satışlarını yapan çiçekçilerle yüz yüze görüşme sağlanmıştır. Görüşmelerden elde edilen sonuçlara göre hem üretici hem de aracıların çoğunluğu pandemi sürecinde satışlarının azaldığını bu azalışın personel sayısındaki azalmayla bağlantılı olduğunu belirtmişlerdir.
Anahtar Kelimeler: İç mekân, süs bitkileri, pandemi

SITUATION ANALYSIS OF PRODUCERS AND MIDDLEMAN IN THE INDOOR ORNAMENTAL PLANTS SECTOR DURING AND AFTER THE COVID-19 PANDEMIC: YALOVA CASE

ABSTRACT
In addition to their aesthetic, functional and ecological contribution to indoor spaces, indoor ornamental plants also make positive contributions to human health. In December 2019, social isolation during the pandemic process that emerged with the novel coronavirus infection that emerged in Wuhan, China and affected the whole world, led to some changes in individual and social life and affected health in social and psychological aspects. In this process, engaging with nature and plants was also seen as one of the ways to cope with the difficulties experienced in isolation. Studies on the production and consumption of indoor ornamental plants during the pandemic are limited. Based on this deficiency, the study, which was carried out to determine how indoor ornamental plants producers and florist tradesmen were affected by people spending more time in their homes during the Covid-19 pandemic process, was carried out in Yalova, which has an important place in ornamental plants. Face-to-face interviews were conducted with indoor plant producers and florists selling indoor plants in Yalova province. According to the results obtained from the interviews, the majority of both producers and middleman stated that their sales decreased during the pandemic, and that this decrease was related to the decrease in the number of personnel.
Keywords: Indoor, ornamental plants, pandemic

DESCRIPTION OF AGRICULTURAL LAND MONITORING USING REMOTE SENSING TECHNOLOGIES

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ABSTRACT

This article aims to assess the capabilities and effectiveness of remote sensing technologies in agricultural land monitoring. Remote sensing allows you to obtain information about various parameters of agricultural land, such as vegetation types, soil conditions, moisture levels and others, without the need for direct contact with the land. Analysis of remote sensing data can identify changes in the agricultural landscape, evaluate the effectiveness of agricultural practices, predict crop yields, and optimize the use of land resources. The study will cover various remote sensing techniques such as multispectral and hyperspectral imaging, radiometry, and basic data analysis tools and algorithms. Assessing the condition of agricultural land: Remote sensing provides information about various characteristics of agricultural land, such as vegetation types, soil fertility, moisture levels, etc. This information allows you to assess the current condition of the land and identify potential problems or vulnerable areas. Assessing the condition of agricultural land using remote sensing uses data obtained from satellites. This data includes various spectral measurements such as visible light, infrared radiation and microwave radiation. Using spectral characteristics, researchers can determine types of vegetation, assess soil fertility, and also identify the level of moisture in land. For example, green areas in satellite imagery may indicate the presence of vegetation, while different shades of brown may indicate varying degrees of soil fertility. Change identification: By comparing data obtained from different satellite images, changes occurring in agricultural land over time can be identified. These may include changes in land use, expansion or contraction of areas under certain crops, and changes in vegetation cover due to natural or anthropogenic factors. Comparing data obtained from different time points makes it possible to identify changes occurring in agricultural land. For example, comparing satellite images over several years can show expansion or contraction of the area under certain crops, changes in land use, and increases or decreases in plant cover density. These changes can be caused by various factors, such as changes in agricultural practices, climatic conditions or human activities. Assessing the effectiveness of agricultural practices: Analysis of remote sensing data allows assessing the effectiveness of agricultural practices being used. For example, the impact of different tillage systems or irrigation methods on crop yields and soil health can be assessed. Remote sensing data can be used to evaluate the effectiveness of various agricultural practices. For example, time series analysis of satellite data can show which tillage or irrigation practices lead to increased yields or improved soil health. This allows agricultural enterprises and farmers to make informed decisions about choosing the best agricultural practices for their lands. Yield and Risk Forecasting: Based on remote sensing data, models can be developed to predict crop yields. This allows agricultural enterprises and government agencies to plan production, as well as assess risks associated with changes in climatic conditions and other factors. Resource Management: Remote sensing data helps inform decisions on land and water management. For example, you can optimize the distribution of irrigation water or identify areas with a high risk

of soil erosion and develop measures to prevent them. Remote sensing data helps manage agricultural land and water resources. For example, analyzing data on soil moisture and water consumption allows you to optimize the distribution of water for irrigation and prevent unnecessary water loss due to waterlogging or lack of irrigation. Also, data on soil condition can be used to develop programs to improve soil quality and fertility, as well as prevent soil erosion and degradation. Thus, monitoring of agricultural land using remote sensing plays an important role in effective management of agricultural resources, increasing productivity and sustainable agricultural development. List of specific applications of remote sensing and monitoring of agricultural lands: Assessing soil conditions: By analyzing spectral data from Landsat or Sentinel satellites, researchers can assess the composition of soil in agricultural lands. For example, the presence of organic matter, the content of nitrogen, phosphorus and other elements in the soil can be determined by its spectral characteristics. This allows you to assess soil fertility and optimize the use of fertilizers. Monitor soil moisture and determine irrigation needs: Using remote sensing data such as NDVI (Normalized Difference Vegetation Index) soil moisture indices, moisture levels in agricultural land can be assessed. Based on this information, farmers can determine the optimal time and amount of watering to ensure the required level of moisture for plants and increase yield. Land cover identification and monitoring: Using satellite data, vegetation cover can be monitored on agricultural land. For example, time series analysis of satellite imagery can track plant growth and development and identify areas with vegetation health problems such as drought, disease or pests. Crop yield forecasting: Based on historical data on soil conditions, weather conditions and crop yields, and using machine learning algorithms, models can be developed to predict crop yields. It helps farmers plan crops, determine production volumes and assess potential economic risks. Land use optimization: Satellite data analysis allows determining the optimal allocation of land resources for agricultural purposes. For example, abandoned land or areas with low productivity can be identified and measures for their restoration or reclamation can be proposed. These examples demonstrate the wide range of applications of remote sensing and farmland monitoring to improve agricultural efficiency, optimize land use and increase crop yields. Conclusion. Monitoring agricultural land through remote sensing is an effective approach to obtain information about vegetation types, soil conditions and moisture levels without direct contact with the land. Analyzing this data helps identify changes in the agricultural landscape, optimize agricultural practices and predict crop yields. Remote sensing techniques such as multispectral imaging and radiometry, coupled with geographic information systems, provide significant opportunities for data analysis and decision-making in agriculture. These detailed explanations for each section demonstrate how remote sensing allows for deeper and more extensive monitoring of farmland, which in turn contributes to effective agricultural management and land use.

Keywords: Remote sensing, Agriculture, Land monitoring, Satellite data, GIS (geographic information systems)

APPLICATION OF GIS IN ENGINEERING AND GEODETIC RESEARCH

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ABSTRACT

This research focuses on the application of geographic information systems (GIS) in geodetic engineering studies. GIS provide powerful tools for analyzing and visualizing spatial data, making them an integral tool in the planning and design of engineering systems and structures. They are also used to monitor changes in terrain and environmental parameters, optimize land use and develop infrastructure. Examples of the use of GIS in various engineering projects are given, which emphasizes their importance and promise for solving complex problems in the fields of engineering, surveying and environmental management. Geographic information systems (GIS) provide powerful tools for solving various problems in engineering surveying. The following are the main applications of GIS in this area: 1. Planning and design of engineering systems and structures: GIS is used to analyze the terrain and select the optimal location for the placement of engineering projects such as roads, bridges, tunnels, power plants, etc. With their help, engineers can assess the impact of a project on the environment and make informed decisions. Example: When designing a new road, engineers use GIS to analyze topographic data, predict traffic, and determine the optimal route. This reduces construction costs and minimizes environmental impact. Fact: According to a study by the National Environmental Institute (EPA), using GIS in planning infrastructure projects can reduce time and costs by 20-30%. 2. Monitoring changes in terrain and environmental parameters: GIS allows you to analyze changes in the natural environment, such as soil erosion, changes in topography or vegetation distribution. This is important for land use planning, environmental protection and forecasting of possible environmental threats. Example: Using GIS, data on the dynamics of changes in forest cover are analyzed. This makes it possible to identify zones of forest degradation, predict the spread of fires and develop strategies for their prevention. Fact: A study conducted by the World Bank found that the use of GIS in environmental monitoring helps reduce soil degradation and biodiversity loss. 3. Optimize land use: GIS helps optimize land use by analyzing and modeling spatial data about land use, farmland, forests and other natural resources. This allows you to effectively manage land resources and minimize negative impacts on the environment. Example: GIS is used to analyze land use data and determine the optimal placement of agricultural land. This allows you to increase productivity and efficiency of land use. Fact: According to a report by the United Nations Food and Agriculture Organization (FAO), the use of GIS in agriculture can increase crop yields by 10-20%. 4. Infrastructure Development and Urban Development Management: GIS plays an important role in urban development planning, infrastructure development and urban resource management. They help optimize transportation systems, distribution of residential and commercial development, and ensure efficient management of utilities. Example: GIS is used to analyze data on traffic flows, population distribution and infrastructure for urban development planning. This makes it possible to optimize transport systems and ensure sustainable urban development. Fact: According to a World Bank report, the use of GIS in urban planning can reduce traffic jams and improve the quality of life of citizens by 15-20%. Conclusion All of these applications

of GIS in engineering and surveying demonstrate the importance and promise of using this technology to solve complex problems in the fields of engineering, surveying and environmental management. These examples and facts highlight the importance of using GIS in geodetic research to solve complex problems in planning, monitoring and managing natural and technical systems.
Keywords: Geographic information systems (GIS), Engineering and geodetic research, Spatial data, Topographic data, big data, geodesy

ANALYSIS OF PEDAGOGICAL STANDARDS: THE ONGOING EVOLUTION OF TEACHER TRAINING

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Abstract
Due to the problem of high drop-out rates in secondary schools, many efforts have been made to improve the quality and effectiveness of teacher qualification courses through in-service training. Our main objective is to facilitate teacher participation in induction and qualification programs. To this end, we collected data using a comprehensive questionnaire covering both factors (induction and qualification). The questionnaire has high reliability (Cronbach's alpha = 0.777). Notre échantillon était composé de 105 enseignants (ratio équilibré entre les sexes) avec un âge moyen de 35,83 ± 1,08 ans. Les résultats ont montré que 78,1 % des enseignants ont confirmé qu'ils participaient activement à un programme d'introduction à la formation continue et 18,1 % des participants ont indiqué qu'ils participaient actuellement à un programme d'accréditation. Il existe une forte corrélation entre les deux programmes. Cependant, 72,4 % n'avaient jamais assisté à une conférence ou à un atelier. Cette situation exige que les personnes responsables concernées intensifient leurs efforts et en même temps fournissent des facilités de participation pour améliorer la qualité des formateurs et des stagiaires.
Keywords : Pedagogical Standards

FULL TEXT

XIX ƏSRDƏ QUZEY AZƏRBAYCANDA HƏYATA KEÇIRILMIŞ AQRAR QANUNLARIN TARIXINDƏN

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Xülasə
XIX-XX əsrin əvvəlləri Azərbaycan kəndi üçün son dərəcə əhəmiyyətli bir dönəmi təmsil edir. Məhz bu zaman kəsiyində ölkəmiz ağrılı-acılı, uzunsürən, eyni zamanda mahiyyət səciyyəsi kəsb edən aqrar dəyişikliklər dövrünə qədəm basmışdı. Bu, həm torpaq mülkiyyəti münasibətlərində, həm təsərrüfatçılıq forma və üsullarında, həm də zəif və qeyri-ardıcıl da olsa, təsərrüfat texnikasının yenilənməsində özünü büruzə verirdi. Ümumrusiya bazarına cəlb olunma, XIX əsrin son rübündən etibarən tədrici kapitalist transformasiyalarına məruz qalma Azərbaycan kəndinin sadəcə aqrar deyil, bütövlükdə sosial simasını dəyişdirən amillər idi.Məqalədə Azərbaycanın rus işğallarınadək daxil olduğu islam sivilizasiyasına xas aqrar münasibətlər sisteminin mövcudluğu göstərilmiş, bu sistemin İslam dininin torpaq və mülkiyyətlə bağlı müddəalarından irəli gələn spesifik cəhətlərinə aydınlıq gətirilmişdir. Bəlli olduğu kimi, ölkəmizdə Avropaya xas olan həm torpaq üzərində qeyd-şərtsiz feodal mülkiyyətçilik institutuna, həm də həmin institutdan irəli gələn iyerarxik sosial strukturun – vassalitetin təşəkkülünə rast gəlmirik. Xanlıqlar dönəmində, əvvəlki yüzillərdə olduğu kimi, istər xan və mülkədar mülklərində, istərsə də tiul torpaqlarında feodalın özünün təsərrüfatı demək olar ki, yox idi. Bu baxımdan rus istilaları sözügedən sahədə köklü dəyişikliklərə yol açmışdı.İnqilabdan əvvəlki və sovet dövrünün mövzumuza dair ədəbiyyatı ilə tanışlıq söyləməyə əsas verir ki, Azərbaycanda feodal-asılılıq münasibətləri də Avropadan və Rusiyadan fərqlənirdi. Burada biz kəndlinin torpağa bağlanılmasını – təhkim olunmasını görmürük, hərçənd bəzi sovet tarixçiləri bu tezisi coşqunluqla müdafiə edirdilər. Üstəlik, burada Avropa feodalizmi üçün səciyyəvi olan kəndli üzərində "əşya hüququ" əsla Azərbaycana xas deyildi.
Açar sözlər: Aqrar islahat, təhkimçilik, torpaq, kəndli islahatı, vergi.

FROM THE HISTORY OF AGRARIAN LAWS IMPLEMENTED IN NORTHERN AZERBAİJAN İN THE XIX CENTURY

Abstract
The beginning of the 19th-20th centuries represents an extremely important period for the Azerbaijani village. It was during this time period that our country entered the period of painful, long-lasting, and at the same time significant agrarian changes. This was manifested both in the relations of land ownership, in the forms and methods of farming, and in the renewal of farm equipment, albeit weak and inconsistent. Involvement in the All-Russian market, exposure to gradual capitalist transformations from the last quarter of the 19th century were the factors that changed not only the agrarian, but also the social image of the Azerbaijani village as a whole.The article shows the existence of a system of agrarian relations specific to the Islamic civilization, which Azerbaijan entered before the Russian invasions, and clarified the specific aspects of this system arising from the provisions of the Islamic religion regarding land and property. As it is known, in our country we do not find both the institution of unconditional feudal ownership of land, and the formation of a hierarchical social structure - vassality, which is typical of Europe. During the khanate period, as in previous centuries, the feudal lord's own farm was almost non-existent, either in the khan and mulkadar estates, or in the tiul lands. In this regard, the Russian invasions led to radical changes in the mentioned field.Acquaintance with the literature of the pre-revolutionary and Soviet period on our topic gives reason to say that feudal-dependency relations in Azerbaijan differed from Europe and Russia. Here we do not see the peasant being tied to the land, although some Soviet historians enthusiastically defended this thesis. Moreover, the "property right" over the peasant, which is typical for European feudalism, was not peculiar to Azerbaijan at all.
Keywords: Agrarian reform, serfdom, land, peasant reform, tax.

Yeni inzibati idarəçiliyin, mülki və məhkəmə sisteminin yerli xüsusiyyətləri rədd etməsi, sakinlərin çoxəsrlik mədəni-mental ənənələrini qulaqardına vurması, eləcə də bəylərin idarəetmə strukturlarından uzaqlaşdırılması, onların mülkiyyət hüquqlarının məhdudlaşdırılması geniş ictimai narazılıq dalğasına ali silkin nümayəndələrinin də qoşulmasına gətirib çıxarmışdı.[1]Artan narazılıqlar fonunda hökumət 1842-ci ilin əvvəllərində Cənubi Qafqaza hərbi nazir A.İ.Çernışev və stats-katib M.P.Pozen tərkibli xüsusi komissiya göndərir. Komissiyanın nəticələri təsəlliverici deyildi. Knyaz Çernışev Qafqazda olarkən kəndlərindən məhrum olan ağalar, habelə analoji halla üzləşəcəyi gözlənilən bəylər ona bu tədbirin həyata keçirilməməyi barədə müraciət ünvanlamışdılar. Knyaz Çernışev imperatora hesabatında bu xahişləri diqqətə layiq hesab etmişdi.[2] Çernışev və Pozenin təftişi nəticəsində bəylərin torpaqlarının müsadirəsi məsələsi aradan qalxdı. Hökumət üçün bəlli idi ki, bəylərin və ağaların bundan sonrakı durumu onların hüquqi və iqtisadi vəziyyəti mahiyyətcə dəyişdirilmədən mövcud ola bilməz. Həm də ağalar silkinin hüquqi haqlarının yol verilmiş yanlış yozumları da getdikcə aydınlaşırdı. Ağalar silki daxilində narazılıq və şikayətlərin və ümumən həyəcanların artması da məsələyə yenidən baxmağa sövq edirdi.[3] 1843-cü ildə Tiflisdə ali müsəlman silkinin hüquqlarının müəyyənləşdirilməsi məqsədilə komitə işinə başlamışdı. Onun hazırladığı layihə faktiki olaraq azərbaycanlı feodalların torpaq mülkiyyəti hüququnu danan Qan-Qolovin xəttini davam etdirirdi və A. Bakıxanovun da daxil olduğu 13 nəfərdən ibarət bəy nümayəndəsinin qəti etirazı ilə qarşılaşmışdı.[4] Canişinliyin təsisindən 1844-cü il və qraf M.S. Voronsovun canişin təyinindən sonra hökumət diyarın idarə olunmasının həddən ziyadə mərkəzləşməsindən yayınaraq, Qafqazın nisbi özünəməxsusluğunu bir növ tanımış olurdu. Bu, Voronsovun ali müsəlman silki ilə sıx ittifaq qurmaq cəhdlərində də özünü büruzə verirdi. Çar administrasiyası mülkədarlara geniş mülkiyyət imtiyazları verməklə, onu təhkimçiyə çevirməklə kəndlilər üzərində hakimi-mütləq səlahiyyətləri ilə təchiz etməklə, torpaq sahiblərindən dinməz-söyləməz loyallıq və etibarlılıq gözləyirdi. Bəylər və ağalar kənddə polis və məhkəmə funksiyaları həyata keçirməklə mükəlləf idilər. Üstəlik, yerli polisin vəzifələri sırasına kəndlilərə nəzarət etmək və sahibkarların tələblərinə yardım etmək

[1] Гасанов И.М. Частновладельческие крестьяне в Азербайджане в первой половине 19 века. Баку:Изд-во Академии Наук Азерб. ССР, 1957, с.44
[2] Николаи А.П. Воспоминания из моей жизни. Крестьянская реформа в Закавказском крае// Русский архив, 1892,№8, с.447
[3] Авалиани С.Л. Крестьянский вопрос в Закавказье, Т. III, с.8
[4] Гасанов И.М. Частновладельческие крестьяне в Азербайджане в первой половине 19 века. Баку:Изд-во Академии Наук Азерб. ССР, 1957, с.175

daxil edilmişdi. Yeni qanunla kənddə bəy ağalığı o dərəcəyə çatmışdı ki, bəzi ir bürokratiyası nümayəndələrinin belə narazılığını doğurmuşdu. Bununla yanaşı, belə bir məqam da vurğulanmalıdır ki, ali müsəlman silkinə mənsub şəxslərin hüquqları heç vaxt rus dvoryanlarının hüquqları ilə tam uyğun olmamışdı.[5]

Tədqiqatda XIX əsrin ilk yarısında çarizmin həm aqrar tədbirlərinin, həm də ali silkə münasibətdə zaman-zaman ziddiyyətli görünən siyasətinin məhz müstəmləkəçilik strategiyasının məcrasında taktiki fərqliliklər qazandığı müxtəlif faktlarla sübuta yetirilir. Artıq ilk rus komandanlarından etibarən çar hərbi-siyasi administrasiyası ali müsəlman silkinə münasibətdə ikili siyasət yürüdürdü. Bir tərəfdən çarizm öz sosial dayaqlarını yaratmaq ehtiyacı duyurdu, bu səbəbdən elə ilk vaxtlardan müsəlman feodalları ilə müəyyən dil tapmağa, onları loyallıq və sadəqətli xidmət qarşılığında torpaqla mükafatlandırmağa çalışırdı. Digər tərəfdən, çarizmin ümumən müsəlman xalqlarını etibarsız sayması, güvənməməsi, üstəlik də Azərbaycanda bəzi xanların və bəylərin rus işğallarına qarşı müqavimətə faktiki başçılıq etməsi hökumət çevrələrini mütəmadi olaraq repressiyalara əl atmasına, müsadirələr keçirməsinə rəvac verirdi. Ümumiyyətlə, 1846-1847-ci il qanunvericilik aktlarının dərcinədək çar hökumət dairələri müsəlman ali silkinin torpaq mülkiyyət hüququna dair birmənalı və sabit kurs yürütməmişdi. Biz bütün mərhələlərdə çarizmin müsəlman ali sillkinə münasibətdə "kökə və qamçı" siyasətinin şahidi oluruq.

[5] Полное Собрание Законов Российского империи. Собрание 2-е. Том XXXV, Отделение 1-ое. СПб.:Типография II Отделения Собственной е.И.В.Канцелярии, 1862, ст. №35903, с.753-755

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Məqalə ədəbiyyatın ayrılmaz qollarından olan uşaq ədəbiyyatı və mətbuatına həsr edilmişdir. XIX əsrin sonu, XX əsrin əvvəllərində söz sənətimizin müstəqil bir sahəsinə çevrilən Azərbaycan uşaq ədəbiyyatı, tarixin müxtəlif mərhələlərində inkişaf etmiş, müxtəlif zaman kəsiyində inkişafdan qalmış və yenidən çiçəklənmişdir. XX əsrin əvvəllərində Azərbaycandakı iqdisadi-siyasi vəziyyət Azərbaycan ədəbiyyatının, incəsənətinin, eləcə də uşaq ədəbiyyatı və mətbuatının inkişafı üçün yeni zəmin yaradırdı. Ədəbiyyatın bəhs edilən qolu bəşəriyyətin yaratmış olduğu bütün maddi və mənəvi sərvətləri yeni nəslə öyrətməli, onları bu sərvətin əsl varisi kimi tərbiyə etməlidir. Uşaq ədəbiyyatı üçün yazılan əsərlər, folklor nümunələri uşaqların yaş və anlaq səviyyəsinə uyğun olmalıdır. Uşaq ədəbiyyatından söz düşən kimi adətən ilk sual belə olur: uşaqlar üçün olan ədəbiyyat necə yazılmalıdır? və müxtəlif fikirlər meydana çıxır. Bu çox ciddi bir sualdır və yazıçılar, alimlər, bəstəkarlar, oxucular bu suala cavab verməli, ortaq nəticəyə gəlməlidirlər. Çünki hansı dil və üslubda, bədii formada yazılmağından aslı olmayaraq, həmin bədii ədəbiyyat və musiqi nümunələrini ilk növbədə uşaqlar seçməli, sevməli, oxumalı, bəyənməli və mənimsəməlidirlər. Müasir uşaq yazarları qarşısında məsul problemlər durur. Bu problemlər tək şeir yazmaq deyil, eyni zamanda uşaq psixologiyasını geniş bilməyə və valideynlərlə sıx təmasda olmağı təcrid etməlidirlər. Əgər belə olarsa, yazdıqları əsərlər uşaq zövqünə uyğun ola bilər. Elə əsərlər vardır ki, yazar öz içindən gələn kimi qələmə alır, uşağın zövqünə uyğun yazmır, Ona görə də nə əsər, nə də müəllif oxucularımızın yaddaşında qalmır. Uşaq ədəbiyyatı məqsəd və vəzifələrinə görə 17 yaşına kimi müxtəlif oxucu qruplarının təlim, təhsil və əxlaqi estetik tərbiyəsinə yönəldilən bədii əsərlərə deyilir. XX əsrin əvvəllərində ədəbiyyatımız həqiqətən böyük və şərəfli bir yol keçmişdir. Azərbaycan yazıçıları da uşaqlarımızın artan mənəvi tələbatlarını nəzərə alıb, onlar üçün xeyli gözəl bədii əsərlər yaratmışlar. Uşaqların oxuduqları sağlam, dolğun ideyalı, yüksək səviyyəli bədii əsərlər böyük əhəmiyyət kəsb edir. Uşaqlar üçün əsərlər yazan A. Səhhət, M.Ə.Sabir, A.Şaiq, S.S.Axundov Y.Əzimzadənin əsərləri uşaqların mütaliəsi üçün bir örnəkdir. Azərbaycan ədəbiyyatı tarixində özünəməxsus yer tutan, Azərbaycan mədəniyyəti və ictimaiyyətinin bədii və ictimai fikrin formalaşmasında müstəsna rolu olan böyük ədəbi simalardan biri də M.Ə.Sabirdir. Böyük Azərbaycan şairi M.Ə.Sabir nəinki dövrünün, hətta bu gün də sevilə-sevilə xatırlanan, oxunan, araşdırılmasına ehtiyac duyulan və haqqında gözəl fikirlər söylənilən dahi, ümumbəşəri satirik bir şairdir. Əsrin əvvəllərində həm kiçik yaşlı uşaqların, həm də gənclərin təlim-tərbiyə məsələləri ziyalılarımızı dərindən düşündürürdü. O, 1862-ci ildə may ayının 30 da Şamaxıda anadan olmuşdur. Sabirin uşaqlar üçün yazdığı şe'rlərin dili sadə və aydındır. Müəllif təzə-təzə dil açan uşağa onların başa düşəcəyi dillə təbiət, həyat hadisələri haqqında ilkin məlumat verirdi. Sabirin "Uşaq və buz" şe'rini əzbər bilməyən

Azərbaycan uşağı təsəvvür etmək mümkün deyildir. Əlində çantası məktəbə gedən, buz üstündə sürüşüb yerə yıxılan; ancaq yolundan dönməyən, buzla danışan uşağın bədii portreti son dərəcə cazibədardır. **[2; 51]**

Dərsə gedən bir uşaq,
Çıxdı buz üstə qoçaq;
Sürüşdü birdən-birə,
Düşdü üz üstə yerə.
Durdu uşaq neylədi?
Buza belə söylədi:
"Sən nə yamansan a buz?
Adam yıxansan, a buz !
Az qalıb ömrün sənin,
Yaz gələr, artar qəmin,
Əriyib suya dönərsən,
Axıb çaya gedərsən!". **[3; 10]**

Ədəbiyyata ömrünün həsr edən, uşaqlar üçün yazıb yaradan, uşaqların kamil vətəndaş, vətənpərvər yetişməsi üçün əlindən gələni əsirgəməyən şairlərimizdən biri Abdulla Şaiqdir. O XX əsr uşaq ədəbiyyatımızın yaranması və inkişaf etdirilməsində məqsədyönlü şəkildə işləmiş, öz fəaliyyəti ilə bu sahədə bir məktəb yaratmışdır. Ədib mütəmadi və ardıcıl şəkildə, hər zaman uşaq ədəbiyyatı ilə yaşamış, nəfəs almışdır. Azərbaycan uşaq şeri və nəsri, dramaturgiyası bütöv və müstəqil bir klassik səviyyəsində məhz onun yaradıcılığında kamala çatmışdır. Abdulla Şaiq Mustafa oğlu Talıbzadə 1881-ci il fevralın 24-də Tiflisdə ruhani ailəsində həyata göz açmışdı. Ömrünün 34 ilini Azərbaycan təhsilinin inkişafına həsr edən Abdulla Şaiq maarif və məktəb işləri ilə məşğul olmuş, qadınlar üçün jurnal çıxarmaq, uşaqlar üçün bağça açmaq, kitabxana yaratmaq, kasıb uşaqları pulsuz oxutmaq yollarını axtarıb tapmışdır. Eyni zamanda o, "Əlifba" kitabı tərtib etmiş, müxtəlif dərsliklər və dərs proqramları hazırlamışdır. "Laylay" adlı uşaq şeri ilə imzası mətbuat səhifələrində görünməyə başlayan Abdulla Şaiqin uşaqlar üçün yazdığı bir sıra şeirlər dövrünün tanınmış "Dəbistan" və "Məktəb" uşaq-gənclər toplularında işıq üzü görmüşdü. O həm də 1910-cu ildə yazdığı "Gözəl bahar" pyesi ilə milli uşaq teatrının əsasını qoymuşdu. Yazıçını dəyirmançıya bənzətmək olar. O, dəyirman daşı kimi zamanın irəliyə doğru inkişafında və xalqın mənəvi təkamülündə maraqlı olandır. Abdulla Şaiq də belə yazıçılardandır. Öz dövrünün fövqündə dayanan yazıçıdır. Yaratdığı əsərlər ruhun qidası olmaqla yanaşı, həm də gələcək nəslin tərbiyəsində əvəzsizdir. A.Şaiq uşaq psixologiyasına, onun maraq dairəsi

və anlama səviyyəsinə bələd olan, zərif duyğulu, incə zövqlü sənətkat idi. Şair Azərbaycan milli uşaq ədəbiyyatının incilərini yaratmışdır. O, 1906-cı ildən etibarən silsilə şeirləri, dünya ədəbiyyatından tərcümələri ilə milli uşaq ədəbiyyatının əsasını qoymuşdur. Abdulla Şaiqin uşaqlar üçün yazdığı "Xoruz", "Bənövşə", "Keçi", "Quzu", "Qızıl gül", "Qərənfil" və digər şeirləri, "Tülkü həccə gedir", "Tıq-tıq xanım" kimi pyesləri uşaqlar tərəfindən indi də maraqla qarşılanır. Onun uşaq şeirləri həm uşaqları müxtəlif canlılar, o cümlədən təbiət hadisələri, bitkilərlə yaxından tanış etmək, onların xüsusiyyətləri və ətraf mühitdəki yeri barədə anlayışı, məlumat və bilik vermək məqsədi daşıyır. Uşaqların nağıl və əfsanə qanadlı fantaziyası, gördükləri, müşahidələr qarşısında hiss etdiyi heyrət və təəccüb onun şeir və hekayələrində romantik bir vüsətlə əks etdirilmişdir. Uşağın ilkin olaraq ətraf aləmə, təbiətə, canlılara göstərdiyi maraq şairin "Keçi", " Xoruz", " Uşaq və dovşan, "Yetim cücə" və. s şeirlərində öz əsini həyatdan doğan romantik heyrətamiz poetik ifadəsi şəklində tapmışdır. Xoruzun hərəkət və əlamətlərindən heyrətlənib bütün bunların sirrini anlamağa çalışan uşaq ona deyir:

Ay pipiyi qan xoruz,
Gözləri mərcan xoruz!
Sən nə tezdən durursan,
Qışqırıb banlayırsan.
Qoymayırsan yatmağa
Ay canım, məstan xoruz! **[1. s.14]**

Hər birimizin uşaqlıqdan dillər əzbəri olan bu kiçik şeirdə əks olunan heyrət və saflıq dolu məna və məzmun dərinliyi, bütün bu cəhətlərin böyük sənətkarlıqla uşaq marağına uyğun ifadəsinin nəticəsidir ki, o, uşaq poeziyamızın klassik örnəkləri sırasına daxil olmuşdur. Yaxud "Keçi" şeirində keçinin hərəkətləri ilə bərabər, onu gözləyən təhlükədən narahat olan uşağın hiss və həyəcanlarını görürüksə, digər bir şeirdə "Uşaq və dovşan" ın dialoqu ilə canlılarla insanın ünsiyyət yaratmaq cəhdinin şahidi oluruq. Dovşanın ondan uzaqlaşmasını istəməyən uşaq, dovşanı özü ilə dostluğa səsləyir:

Dovşan, dovşan, a dovşan;
Qaçma, dayan, a dovşan!
Qaçma səni sevəndən,
Can kimi bəsləyəndən.
Dovşan isə uşaqdan qaçmasını səbəbini belə ifadə edir!
Dura bilmərəm dadaş

Yanında var Alabaş.

Xəbərdaram işindən,

Qurtarmaram dişindən. **[1. s.15]**

Bu ifadənin özündə insan qayğı və həssaslıqdan ibarət bir münasibət var.

Bəhs edilən dövrdə uşaq ədəbiyyatının inkişafında C.Məmmədquluzadənin sözlə ifadə olunmayacaq xidməti vardır. Görkəmli yazıçının "Usta Zeynal", " Saqqallı uşaq", " Buz", " Zırrama", "İki qardaş", "Oğru inək", "Dəllək", "Poçt qutusu" və.s hekayələri vardır. C.Məmmədquluzadə bu hekayələri yazarkən təlim və tərbiyənin, müxtəlif adət və ənənələrin bu və ya digət cəhətlərinə diqqəti cəlb edir. Bu hekayələrin bir çoxu məhz uşaqların təhsili, tərbiyəsi, düşdüyü ağır mühit, keçirdiyi iztirablarla bağlıdır. Ədibin tərbiyə haqqında fikirlərini iki hissəyə ayırmaq olar. Bunlardan biri oğruluq, yalançılıq, qorxaqlıq, riyakarlıq və.s kimi burjua-feodal əxlaqına xas olan çirkin sifətlərin ifşası; ikincisi isə tərbiyənin müsbət cəhətlərindən olan cəsarət, doğruluq, şüurlu intizam və humanizm ideyalarının təbliğ edilməsidir. C.Məmmədquluzadə dram əsərlərində də uşaqların taleyini unutmamış, avamlığın və nadanlığın qurbanı olan yeniyetmələrin halına acımış "Ölülər" komediyasında Cəlal və Nazlı kimi yadda qalan surətlər yaratmışdır. **[4; 120]** Zəngin şifahi xalq ədəbiyyatından, müdrik xalq məsələləri, əfsanə və rəvayətlərindən, klassik Şərq şeiri ənənələrindən bəhrələnən A.Səhhət hər zaman uşaqların təlim- tərbiyə məsələlərinə diqqət yetirmişdir. Onun "İki uşaq", " Ana və bala", " Tənbəl", " Məktəb şagirdi", "Ata və oğul" və.b şeirləri vardır, ədib bu kimi şeirlərində uşaqları məktəbə və maarifə çağırır, nicat yolunun ancaq elmdə olduğunu söyləyirdi. A.Səhhətin şeirlərində vətənə, xalqa məhəbbət böyük ilhamla tərənnüm olunmuşdur. O, "Vətən", "Əhnədin qeyrəti", "İstiqbal bizimdir" və.s əsərlərində gəncləri vətəni sevməyə, onun azadlığı naminə mübarizə aparmağa sövq edir.

Könlümün sevgili məhbubu mənim,

Vətənimdir, vətənimdir, vətənim

Deyən şair vətəni anaya bənzədir. Ana uşağı böyüdüb bəslədiyi kimi, vətəndə bizi sinəsində böyüdür. Bizim qanımız onun südüdür.

Vətən - əcdadımızın mədfənidir,

Vətən – övladımızın məskənidir.

Vətəni sevməyən insan olmaz.

Olsa, o şəxsdə vicdan olmaz. **[3; 145]**

Azərbaycan uşaq ədəbiyyatını öz əsərləri ilə daha da zənginləşdirən ədəbiyyatşunaslardan biri F.Köçərlidir. Firudin bəy vətənə, xalqa, onun çox qədim və zəngin söz sənətinə, uşaqların bədii zövq tərbiyəsinə dərin məhəbbətini əks etdirən "Balalara hədiyyə" ancaq yeniyetmələrin deyil, böyüklərin də, qəlbinə sığal vermək, onlarda xalqın ibrətamiz mədəniyyət tarixinə sevgi hissləri oyadıb yaşatmaq məramı izləyir. "Balalara hədiyyə" kitabına Firudin bəy Azərbaycan şifahi xalq ədəbiyyatı nümunələrindən uşaqlar üçün sadə və anlaşıqlı, eyni zamanda tərbiyəvi əhəmiyyətə malik olan parçalar salmışdır. Şairin "Balalara hədiyyə" kitabında daha çox hadisələr heyvanlar üzərində qurulur. Başqa sözlə desək, heyvanların xarakteri vasitəsi ilə uşaqlara nəyin yanlış, nəyin doğru olduğu açılıb göstərilir. Heyvanların daxili aləmi, onların xarakteri müəyyən mövzular üzərində köklənərək uşaqlara tərbiyə edici mahiyyət aşılayır. Bir növ insanların həyatda mənfi münasibət qazanmalarının səbəbləri və yaxud pis insanların etdiyi xoşagəlməz hərəkətləri heyvanlar vasitəsi ilə izah edir. F.Köçərli gənc yaşlarından insanların maarifləndirilməsi istiqamətində əsl fədakarlıqlar göstərmişdir. Xüsusilə də, milli və mənəvi dəyərlərin təbliğində, milli mətbuatın, milli ədəbiyyatın inkişafında parlaq qələmini bir an olsun belə yerə qoymamışdır. Firudin bəy Köçərli dövrünün mətbuatı ilə çox sıx şəkildə əlaqə yaradaraq bir çox problemləri işıqlandırmışdır. O, "Kaspi", "İrşad", "Tərəqqi", "İqbal" və s. qəzetlərlə əməkdaşlıq edərək dövrün problemlərini gündəliyə gətirmişdir. Həmçinin F.Köçərli mətbuat vasitəsi ilə topladığı xalq yaradıcılığı örnəklərini də çap etdirirdi. XX əsrin əvvəllərində Azərbaycanda ictimai-siyasi və mədəni həyat canlanırdı: maarif, məktəb, mətbuat insanların tələbatına çevrilmişdi. XX əsrin " Kəlniyyət", " Məzəli", "Zənbur", "Tuti", "Bəhlul", "Lək-lək" kimi satrik jurnalların meydana çıxması uşaq mətbuatının yaranmasına səbəb oldu. Əsrin əvvəllərində nəşrə başlayan "Dəbistan"(1906-1908), "Rəhbər"(1906-1907), "Məktəb"(1911-1920) məcmuələri uşaq mətbuatı kimi milli uşaq ədəbiyyatının inkişafına geniş yol açdı. Dövrün qabaqcıl ziyalıları-yazıçıları, müəllim və tərcüməçiləri bu jurnallarda yaxından çıxış etməyə başladılar. Maarifpərvər ziyalılardan Əliiskəndər Cəfərzadə və Məhəmmədhəsən Əfəndizadənin uzun müddət nəşrinə çalışdıqları "Dəbistan" jurnalının məramı yeniyetmələrin təlim və tərbiyəsinə, zehni inkişafına istiqamət vermək, onları vətənə və xalqa məhəbbət ruhunda tərbiyə etmək idi. "Məktəb" jurnalının səhifələrində çap edilən şeirlərdə jurnalın məramına- yeni məktəbin, elmin, təlim – tərbiyənin roluna, yeni nəslin böyük gələcəyinə inam hissi ifadə olunurdu. Bəhs olunan bu jurnal 1920 ci ilədək nəşrini davam etdirdi. Uşaq aləminin səlnaməsi olan jurnal on illik fəaliyyəti ərzində Azərbaycan uşaq ədəbiyyatının yaranmasına və təşəkkülü işinə böyük köməklik göstərmişdir. **[5; 114]**

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ANALYSIS AND EVALUATION OF THE IMPACT OF SUSTAINABLE DEVELOPMENT OF GREEN FINANCE APPLICATIONS IN THE REPUBLIC OF AZERBAIJAN

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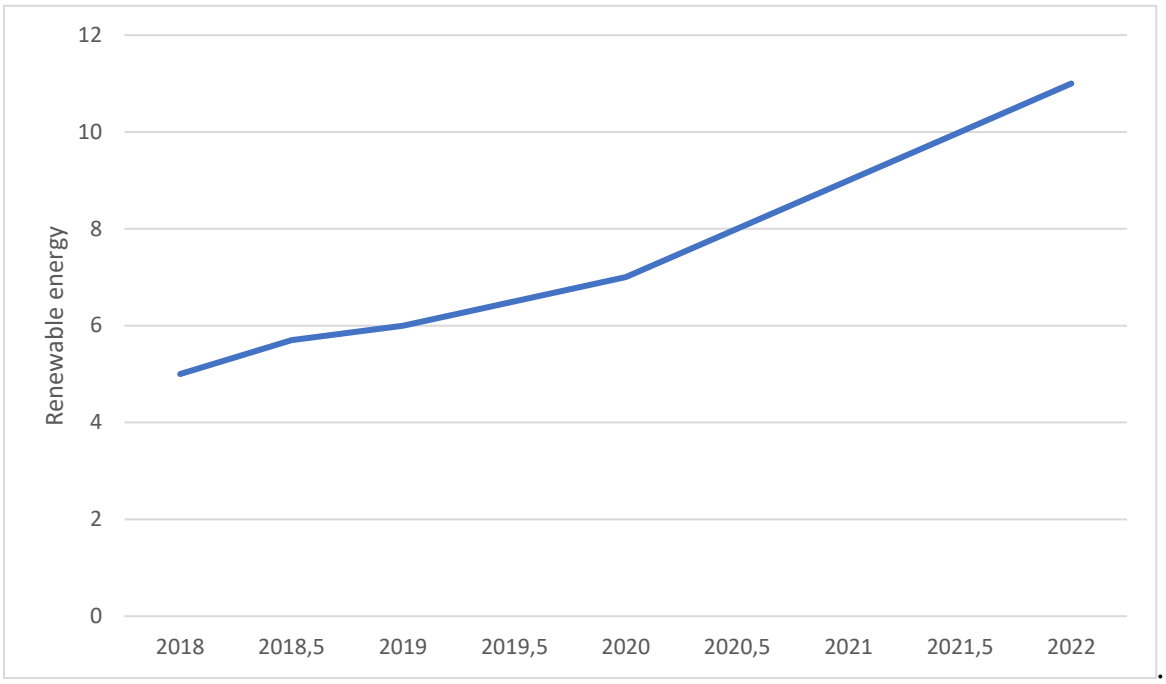
ABSTRACT
This thesis aims to investigate the effects of green finance on sustainable development in Azerbaijan. The motive behind adopting green finance is to provide financial support to projects that reflect the principles of environmental sustainability. This study will look at various indicators to assess the economic, environmental and social impacts of Azerbaijan's adoption of green financial practices.
Keywords: green finance, sustainable development, environmental policy, economic development.

Introduction

Green finance is a financial approach that aims to direct economic activities in accordance with the principle of environmental sustainability. In this context, it aims to invest in projects that reduce environmental impacts, protect natural resources and support sustainable development. Sustainable development refers to a development model that balances society, the environment and the economy while meeting the needs of the present while taking into account the needs of future generations. These concepts aim to create a balanced relationship between economic growth, conservation of natural resources and promotion of social welfare.The economic and financial structure of Azerbaijan is based on an economic model based on energy resources. Although oil and natural gas are among the country's main sources of income, revenues from the energy sector have a large economic impact. Azerbaijan continues its efforts to direct the revenues from energy exports to infrastructure projects and diversification of the economy, and in parallel, there are developments in other sectors as well[1].

Green finance refers to guiding financial decisions and investments in accordance with the principle of environmental sustainability. This financing approach supports environmentally friendly projects, encourages investments that combat climate change, improve energy efficiency, protect water resources and support natural ecosystems. Elements of green finance include green bonds, sustainable loans, financial products that incorporate environmental risk assessments and sustainability criteria. These elements aim to reduce environmental impact in the financial sector and contribute to sustainable development[2].In Azerbaijan, green finance is undergoing significant evolution in the process of the country's economic transformation and adaptation to sustainable development goals. Given its leading role in the energy sector, Azerbaijan has focused on environmental sustainability and has invested in green projects by adopting green finance practices. The importance of green finance in the country has been integrated into Azerbaijan's development strategies, supporting efforts to reduce the impact on the environment, protect natural resources, and strengthen the economy on a sustainable path. The evolution of green finance can be seen as part of efforts to diversify Azerbaijan's economic model and emphasize environmental sustainability.

GRAPH 1. Annual Development of Renewable Energy Production and Green Financing in Azerbaijan



Azerbaijan stands out as a country that has increased its obligations in accordance with sustainable development goals. Azerbaijan has adopted the Sustainable Development Goals of the United Nations and demonstrated its determination to achieve these goals. In particular, sustainable practices in the energy sector, efforts to diversify the economy and investments in environmental projects are important steps that reflect Azerbaijan's commitments in the field of sustainable development. Azerbaijan is strengthening its national strategies in the context of sustainable development and promoting sustainable practices in various sectors[3].Green financial applications in Azerbaijan are financial products based on the principle of ecological sustainability. These applications include green bonds, sustainable loans and other financial applications aimed at financing environmentally friendly projects. By adopting green finance applications, Azerbaijan reflects its commitment to support environmental projects and to focus its economic activities on reducing the impact on the environment. Green finance applications are increasingly important in the financial sector to support a country's efforts to achieve sustainable development goals.

Green bonds are financial instruments issued to finance environmentally friendly projects. These bonds offer investors the opportunity to support projects that meet environmental sustainability criteria.

Sustainable loans are loan products specifically allocated by financial institutions for environmentally friendly and socially responsible projects. These loans support the goals of projects to reduce their environmental impact or contribute to social development.Other green finance applications cover a variety of financial applications and generally aim to finance projects that comply with the principles of environmental and social sustainability. These applications include applications as diverse as green bonds, green funds, and environmental risk assessment applications[4]. Green finance applications are important applications that guide the financial sector to assess environmental and social impacts and support sustainability.

Azerbaijan has developed various policies and regulations to promote green finance and support investments in sustainable projects. Some of these policies and rules include:

1. **Green Bond Issuance:** Azerbaijan has taken various steps towards issuing green bonds and aims to finance environmental projects through these bonds. These bonds are used for private and public sector projects in accordance with environmental objectives.
2. **Green Finance Strategy:** Azerbaijan has created a strategy to support the development and adoption of green finance at the national level. This strategy aims to direct the financial sector to sustainable investments by adopting the principle of environmental sustainability.
3. **Sustainable Loan Programs:** Financial institutions in Azerbaijan support projects aimed at reducing environmental and social impacts by offering sustainable loan products. These loan programs aim to finance projects that meet sustainability criteria in various sectors.
4. **Promotion of Green Finance:** The government of Azerbaijan has developed policies that include tax benefits, incentives and other economic support mechanisms to promote green finance. These incentives aim to attract green investments and promote sustainable projects.
5. **Environmental Risk Assessment:** Azerbaijan's financial sector has adopted regulations aimed at minimizing environmental impacts and making investments more sustainable by carrying out environmental risk assessment.These policies and regulations reflect Azerbaijan's commitment to green finance and its contribution to sustainable development goals.The impact of green financial practices on the economy of Azerbaijan can be assessed as increasing investments and strengthening the financing of environmental projects based on the principle of sustainability. These practices can contribute to a balanced

combination of environmental sustainability and economic development by supporting economic growth, especially in areas such as clean energy projects and green infrastructure works in the energy sector. Green finance can accelerate the diversification of Azerbaijan's economy and increase employment by creating jobs in environmentally friendly sectors[5].Various indicators are used to monitor sustainable development. These indicators are intended to assess the progress of development in economic, environmental and social dimensions. Developed indicators include measurements in various areas such as poverty rates, education level, clean energy use, ecosystem protection, gender equality. These indicators provide information to policymakers and society by tracking progress towards the achievement of sustainable development goals, as well as helping to assess the impact of development efforts[6].Measuring the impact of green finance on sustainable development in Azerbaijan requires the use of various indicators and data collection methods. There are different steps to measure these effects:

1. **Monitoring of Green Finance Projects:** Implementation and monitoring of implementation of green finance projects helps in measuring environmental impacts. The progress of projects in areas such as energy efficiency and environmentally friendly infrastructure projects can be assessed.
2. **Financial Performance Indicators:** The impact of green financial practices on financial performance indicators can be analyzed.
3. **Environmental Indicators:** Various environmental indicators can be used to measure the impact of green finance on environmental sustainability. These indicators may include factors such as energy consumption, carbon footprint, water conservation and waste management.
4. **Monitoring social impacts:** Social indicators can be used to assess the social impacts of green finance projects. Indicators that incorporate social dimensions such as job creation and access to education and health care can help measure impacts on sustainable development.
5. **Participatory Evaluations:** Participatory evaluations that include community and stakeholder feedback can be conducted to measure impacts on sustainable development. This can help to more comprehensively assess the impact of projects on society Green financial practices in Azerbaijan make important contributions to sustainable development. Green finance projects aim to reduce environmental impacts by supporting projects in areas such as energy efficiency, clean energy and environmentally friendly infrastructure based on the

principle of environmental sustainability[7]. In addition, the adoption of green finance accelerates efforts to achieve the sustainable development goals while increasing the environmental and social responsibility of the financial sector. These practices contribute to long-term sustainable growth by supporting the diversification of Azerbaijan's economy.

Conclusion

Adopting green finance practices to support Azerbaijan's efforts to achieve sustainable development goals has had positive environmental, economic and social impacts. Environmental investments through green finance projects include steps towards energy efficiency, clean energy production and development of environmentally friendly infrastructure. From an economic perspective, the adoption of green finance has increased the environmental responsibility of the financial sector, while supporting the growth of green project financing. Socially, it aims to improve living standards. As a result of this, the adoption of green finance in Azerbaijan has strengthened environmental, economic and social sustainability and made it possible to take concrete steps in the field of sustainable development.

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THE IMPACT OF GUT-BRAIN AXIS ON COGNITIVE HEALTH: A REVIEW OF DIETARY SUPPLEMENTS AND FUNCTIONAL FOODS

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ABSTRACT
Exploration of the link between gut health and cognitive function suggests that the composition of gut microbiota can influence cognitive well-being. A balanced gut microbiota may help reduce inflammation, a contributing factor to neurodegenerative conditions. Prebiotics, probiotics, and synbiotics, available as dietary supplements and functional food ingredients, play pivotal roles in promoting gastrointestinal health. The bidirectional communication of the gut-brain axis is essential for maintaining physiological balance, and these supplements can impact cognitive functions such as attention, perception, and memory. Several studies indicate that incorporating these supplements into a well-rounded diet may improve cognitive performance and mood. Thus, preserving a healthy gut microbiota could optimize cognitive function, which is crucial for disease prevention in our rapidly evolving society. Our review aims to provide a comprehensive overview of the effects of these dietary interventions on cognitive function via the gut-brain axis, potentially reducing the risk of neurodegenerative diseases. Nonetheless, individual responses may vary, highlighting the importance of considering personal health status and requirements when incorporating these dietary supplements.

Keywords: gut-brain axis, cognitive health, gut microbiota, prebiotics, probiotics
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INTRODUCTION

Promoting healthy aging is a key priority as Europe's population - and beyond - is aging rapidly. Research areas focusing on the potential positive effects on cognitive functions and the favorable regulatory effects on the gut microbiota are of paramount importance, including investigations into the supplementation of vitamins and antioxidants (Fekete, Csípő, et al., 2023). Probiotics, prebiotics, and synbiotics support gastrointestinal health and have garnered increasing attention for their positive effects on cognitive function and dementia prevention. Research exploring the connection between the gut and the brain suggests that the state of the gut flora can influence cognitive health. Healthy gut flora can help reduce inflammation, which may be linked to neurodegenerative diseases. Prebiotics, probiotics, and synbiotics are functional food components associated with gastrointestinal health, while the gut-brain axis represents a bidirectional relationship essential for maintaining homeostasis. Numerous studies uniformly suggest that incorporating prebiotics, probiotics, and synbiotics as part of a healthy diet can promote cognitive function and improve mood (Ansari et al., 2023; Fekete, Lehoczki, et al., 2023; Freijy et al., 2023). Sustaining and supporting a healthy gut flora facilitates optimal cognitive function, which is essential for disease prevention in our fast-paced, "westernized" civilization. The aim of our review is to provide a literature overview of the effects of these dietary supplements.

RESEARCH AND FINDINGS

The impact of western lifestyle and diet on gut microbiota and cognitive health

The dietary patterns and lifestyle prevalent in Western societies significantly influence gut microbiota composition and, consequently, cognitive functions (Clemente-Suárez et al., 2023; Patangia et al., 2022; Tristan Asensi et al., 2023). Diets high in added sugars and refined carbohydrates, particularly low in fiber and probiotic intake, can detrimentally affect gut flora, potentially contributing to mental illnesses and cognitive impairments (Clemente-Suárez et al., 2023). The widespread consumption of artificial additives, prepackaged ultra-processed foods, and diets rich in saturated fats negatively affect gut flora and cognitive health, often associated with cardiovascular issues (Raposa et al., 2016; Tristan Asensi et al., 2023). Overuse of antibiotics and other medications can also disrupt beneficial gut bacteria, leading to long-term adverse effects on mental well-being (Patangia et al., 2022). Sedentary behavior, low physical activity levels, and chronic stress further exacerbate cognitive decline (Park et al., 2020; Yabluchanskiy et al., 2018). Therefore, preserving and promoting a healthy gut flora is crucial for optimizing cognitive functions and maintaining a balanced

gut-brain axis.*The role of probiotics in cognitive healthy aging* Growing evidence suggests that supporting gut flora with probiotics, thus bolstering the gut-brain axis, presents a promising avenue for addressing mental health issues such as depression, anxiety disorders, chronic fatigue syndrome, ADHD, and various mood disorders (Jach et al., 2023; Mörkl et al., 2020). Additionally, their positive impact on the central nervous system and psychological well-being extends to healthy individuals facing heightened stress, underscoring their safety and necessity in Western dietary and urban lifestyles (Madison & Kiecolt-Glaser, 2019; Wang et al., 2021). Probiotics, defined as live microorganisms that confer health benefits when consumed in adequate amounts, primarily belong to the Lactobacillus and Bifidobacterium genera (Abdolhosseinzadeh et al., 2018). Prebiotics, on the other hand, are indigestible compounds that reach the colon intact and are broken down by gut flora or concurrently consumed probiotics, contributing to therapeutic effects and bolstering colon microflora (Tabrizi et al., 2019). In the colon, prebiotics are broken down by the gut flora or concurrently consumed probiotic microorganisms, which not only have therapeutic and health-preserving effects but also strengthen and nourish the microflora found in the colon (Tabrizi et al., 2019). Key prebiotics include galacto-oligosaccharides, fructo-oligosaccharides, and xylo-oligosaccharides. Although official data on prebiotic consumption are lacking, researchers recommend a daily intake of 7-10 g (Tabrizi et al., 2019). The combined use of pro- and prebiotics, termed synbiotics, synergistically addresses various diseases, including mental disorders.*The role of gut microbiota in cognitive health and neuroprotection* Numerous studies have demonstrated that gut microbiota influences cognitive function and plays an important role in the prevention and treatment of Alzheimer's disease, depression, and various mental disorders (Fang et al., 2022; Varesi et al., 2022; Xiong et al., 2023). Despite these conditions being treated with medication, there is growing interest in the use of natural substances such as probiotics and prebiotics, which have no side effects and may have a beneficial role in prevention. Maintaining the optimal balance of gut flora with the presence of pro- and prebiotics alters and increases the levels of metabolites such as tryptophan and SCFAs (short-chain fatty acids), which directly influence the functioning of the central nervous system. This affects certain factors and hormones such as gamma-aminobutyric acid (GABA), serotonin (5-hydroxytryptamine), brain-derived neurotrophic factor (BDNF), and dopamine levels, ultimately influencing mental disorders. The feedback mechanism of the hypothalamic-pituitary-adrenal (HPA) axis, which regulates mood and emotional state, can be weakened by some probiotics, thereby reducing the level

of corticosteroids (Ansari et al., 2023; Ansari et al., 2020). The immune system enhances the production of anti-inflammatory cytokines in response to the effects of pro- and prebiotics, thereby reducing inflammation levels in the nervous system, influencing nerves and the hormonal system, and improving neurological function (Ansari et al., 2023; Ansari et al., 2020). *The role and promising effects of probiotics in Alzheimer's disease* Given the prolonged progression of Alzheimer's disease (AD), it is particularly important to research and develop intervention methods that can be effective in the early stages of the disease (Uleman et al., 2021). AD is a gradually progressive neurodegenerative disorder characterized by memory loss, as well as impairments in thinking, language, and problem-solving abilities (Kumar et al., 2023). In recent decades, numerous studies have been conducted testing dietary interventions for Alzheimer's disease in randomized groups (Dobreva et al., 2022; Moreira et al., 2020). It has been reported that probiotics and prebiotics slow the progression of Alzheimer's disease (Ngandu et al., 2015). Research indicates that the composition of gut flora changes in neurodegenerative diseases such as Alzheimer's disease (Chaudhari et al., 2023). According to various theories, changes in gut flora composition directly influence neurotransmission and inflammatory processes. As a result, the permeability of the barrier between the brain and blood increases, contributing to the growth of neuroinflammatory reactions. Additionally, the production and accumulation of amyloid protein increase in brain tissue, which is one of the pathological processes observed in Alzheimer's disease. Comparative studies, including research on live organisms and clinical trials, all indicate that the use of probiotics has no side effects in patients with Alzheimer's disease (Naomi et al., 2021) and restoring gut flora slows the progression of pathological changes in the brain, reducing amyloid accumulation and inflammation (Naomi et al., 2021).*The role of pre- and probiotics in anxiety, depression, and sleep improvement* Current research suggests that supplementation with pre- and probiotics may have a potential impact on improving symptoms of mental illnesses (Burokas et al., 2017; Davani-Davari et al., 2019; Noonan et al., 2020). Various lactic acid bacteria, such as Lactobacillus rhamnosus, Lactobacillus casei, Lactobacillus plantarum, as well as bifidobacteria, such as Bifidobacterium bifidum and Bifidobacterium lactis, and some yeasts, such as Saccharomyces cerevisiae, play a prominent role among probiotics. Clinical trials have shown that some psychobiotics containing these ingredients have good antidepressant and anxiolytic effects (Burokas et al., 2017; Davani-Davari et al., 2019; Noonan et al., 2020). Dysbiosis has negative effects on mental health, and mental disorders affect the gut

microbiota, with the process being bidirectional. Depressive symptoms are often associated with gastrointestinal problems, such as irritable bowel syndrome, and treating one condition positively influences the other. Recent research indicates that probiotics have a positive effect on patients with depressive symptoms (Umbrello & Esposito, 2016; Zagórska et al., 2020), with these effects being mediated through normalization of cortisol levels, reduction of inflammatory mediators, and regulation of synthesis of serotonin and other central nervous system neurotransmitters. Additionally, the use of probiotics can contribute to improving the quality of sleep by promoting the production of free tryptophan in the central nervous system and supporting the conversion of serotonin into melatonin. This can help regulate the circadian rhythm (Chen et al., 2021).*Key aspects in maintaining cognitive abilities* Numerous factors play a pivotal role in promoting cognitive health, preventing dementia, and sustaining cognitive abilities. Regular physical activity, adhering to a nutritious diet, and achieving an optimal body weight are essential components of promoting cognitive health and healthy aging. Furthermore, fostering social connections and engaging in social activities contribute to overall brain health and the preservation of cognitive faculties. Participating in cognitive challenges, such as acquiring new skills, solving puzzles, reading, engaging in creative pursuits, and seeking intellectual stimulation, can significantly bolster cognitive abilities. Adequate and restorative sleep quality also plays a critical role in facilitating brain regeneration and preserving cognitive functions. Effective stress management, emotional well-being, and maintaining cardiovascular health are additional crucial factors, as they support optimal blood circulation and oxygen delivery to the brain. Given the link between diabetes, elevated blood sugar levels, and dementia risk, it is imperative to monitor blood glucose levels and adhere to a balanced dietary regimen. These combined factors contribute synergistically to the maintenance of cognitive health and overall well-being in older adults. It is worth noting that individual differences and genetic predispositions may also influence long-term cognitive preservation and health outcomes. Nevertheless, adopting a lifestyle that prioritizes health and implementing preventive measures can yield manifold benefits.

CONCLUSION

This synthesis underscores the significance of probiotic interventions as a potential avenue for promoting cognitive vitality in aging individuals. Both pre- and probiotics demonstrate promising effects on cognitive function across diverse age groups, encompassing improvements in memory and attention, regardless of health status. Future investigations

should prioritize in-depth analyses and characterization of gut microbiota composition, with a particular focus on delineating the predominant strains associated with various mental health conditions, including anxiety, depression, autism spectrum disorders, and neurodegenerative diseases such as Alzheimer's disease.

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TECHNIQUE AND TECHNOLOGY - THE CHALLENGE OF THE NEW AGE: "*TECHNIQUE AS HUMAN DESTINY*" AND TECHNOLOGY ACHIEVEMENTS

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ABSTRACT
The central theme of this paper is shown in the importance to distinguish and define the terms techniques and technologies in order to achieve demarcation of their use. In returning to the meaning of the word *techne*, there is certainly no justification for the use of technology, which should be used as a name for a single science, in such a way that it replaces, obscures or throws out of use the word technique, which is originally related to knowledge, practical ability, marking the area of human action, production and not the use of something already finished, already produced. *Techne* means that the existent is introduced into the open from what is closed, that is, it shows and produces the existent and unconcealed. In this showing, it is the production that distinguishes *techne* from making, that distinguishes technique from technology, that shows that *techne* is the understanding in which it is produced and created, and in which then *truth happens*, so the way the Greeks used and understood the word t*echne*, which refers equally both on craft and art. *Techne* is a way of knowing and in this sense, it is closest to the Greek term *episteme*.
Keywords: philosophy of technique, production, *techne*, technique, technology

INTRODUCTION

All scientific fields face the challenge of a new age that technology transforms, which need metaphysical intervention (one can freely say help) on the question of technique and the question of the human position in these transformations, because the question of how to deal with and master technical and technological advances that influence the formation of our image of the world of reality through elucidating the meaning of the phenomenon of techniques. With the rapid progress and development of technique and technical achievements, man is in *danger*, therefore, we must approach the understanding of the world of technology and technological achievements responsibly and carefully, so take responsibility in such a way that we think about the phenomenon of technique from the perspective of metaphysics, philosophy, ethics, politics, etc. such an approach requires, in the first place, the interpretation of the opinion of the Greek philosophers who founded the meaning of the term techne, and then the opinion of Martin Heidegger, who in the interpretation of the meaning of the term techne returns to what the Greeks understood by that term. In the above, the importance of terminology is certainly revealed and shown, in the sense that the movement of a certain concept, its transformation and movement, taking on extended meanings is a process that undoubtedly represents opinion. In this sense, production, the *transition to presence from the non-present*, means the production of the existing.

Therefore, the fact is that considering the progress of technological achievements, then thinking about the positive and negative consequences of technological development, we are in the sphere of the problem that thematizes on the one hand the development of technique and technology, on the other hand, the same problem, the influence of technology on the formation of the image of reality as well as the positioning of technique as human destinies. (Makhamatov, T. M., Makhamatov, T. T., & Makhamatova, S. T. (2019, December). Philosophical Aspects of the Development of Technique and the Destiny of a Human. In *Institute of Scientific Communications Conference* (pp. 816-825). Cham: Springer International Publishing).In the first place of philosophers, and then of other critics of social reality, the question of technology, the modern world of technology, the development of technology, man's relationship with them, then the question of whether technology is in our hands or we are its object of manipulation, whether technology serves us or we to her, they are some of the questions that necessarily occupy more and more space in the thoughts of scientific and technical civilizations. Right here, it is shown how important it is, for the

understanding of both the phenomenon of technology and human reality in general, to understand the meaning of the Greek term techne and to make a distinction from today's term technique. For what techne meant to the Greeks (egg techne rhetoric, techne poetics), there was no word corresponding to what we mean by the term technique today. Techne is therefore a skill that refers to knowledge and production, which cannot be equated with the meaning of today's term technique. What is important here is that the distinction between the terms techne and technique, i.e., returning and referring to the meaning of the ancient Greek term techne, ensures the incorrect, or synonymous, use of the terms techne and technique. On the basis of the above, it is clear that it is wrong, but also impossible, to ignore the issue of technique and technology, because they are simply omnipresent in the world of reality, and that this question before us, or the problem before us, needs metaphysical, critical - philosophical help, for solving it. It should be kept in mind that we do not think in a direction that does not negate the development of technique and technology, nor do we work to emphasize their negative consequences, but to observe them as a segment that both advances and regresses human life, just as humans themselves do. This means that the problem of technique should not be forcibly pushed into the space of negation, on the contrary, it should be confronted with the existence of the problem by abolishing the possibility of denying technique and its achievements and subjecting it to the spirit principle. Only such an approach shows the essence of philosophy, it (philosophy) is essentially freedom, not rule (technique). Thus, the question of technique as what is man's destiny turns out to be a problem of the philosophy of technique.

TECHNE IS NOT SYNONYMOUS WITH TODAY'S TERM TECHNIQUE?

It is unjustified to narrow down or replace the term technique with the term technology, or to be more precise, to use these terms incorrectly and in an inappropriate manner and thereby lead to misunderstanding and ambiguity of the terms knowledge (techne), technique (machine) and equipment (technology). Today, the terms technique and technology are used more and more in such a way that the term technique is suppressed by the term technology, and the term technique seems to take the place of the term that gave it the meaning - of the Greek term techne. The essential and first question is: What is the justification for such use, if we know that technique arose from the movement and development of the Greek term techne, and that technology is the science of technical procedures for processing raw materials into a finished product? Defining and distinguishing the terms techne, technique and technology is important primarily for the purpose of delimiting their use. Production,

the transition to presence from the non-present, means the production of the existing. From this, techne means that the existing is brought into the open from what was closed, that is, it shows and produces the existing and unconcealed. In this showing, it is production that distinguishes techne from making, that distinguishes technique from technology, that shows that techne is the understanding in which it is produced and created, in which truth happens, that is, the way the Greeks used and understood the word techne, which refers equally to to craft and art. Techne is a way of knowing and in this sense it is closest to the Greek term *episteme.*Therefore, techne cannot and should not be understood as a synonym for modern technique, techne is not the same as the term technique, because technique refers to the technical mastery of nature, while techne refers to understanding and production. production is the basic determinant of human being and is determined by knowledge, skill, freedom, and by no means „non-thinking" and obeying rules. In the same way, technique cannot be understood as a synonym for technology. Technology is a term that owes its meaning to the term techne, it is also related to man, while technology is the name for, for example, the technology of the way of communication, new technologies in car equipment, computer equipment, etc., which is why the term technology has acquired several meanings that are essentially connected with the connection between technology and society. Techne is not just one Greek word whose meaning we need to approach, but returning to its meaning shows its essentiality both for understanding the philosophy of the sophists, Socrates, Plato, Aristotle and Heidegger, as well as construction and understanding, production and produced, building and built reality. "Techne is translated as either craft or art". (Kooy, B. K. (2015). Stanford Encyclopedia of Philosophy–http://plato.stanford.edu. *Reference Reviews*, *29*(8), 14-16.). The determinant of techne that points to the affirmative answer given in this part of the paper (isn't techne synonymous with today's term technique?) is that the meaning of techne is in what is a practical skill, so that techne is knowledge, but also the application of the principals involved in the production of objects and achieving goals, that is, techne is the application of principles in practical sciences and "a human skill that is based on principles and the ability to learn". (Audi, R., & Audi, P. (Eds.). (1999). *The Cambridge dictionary of philosophy* (Vol. 584). Cambridge: Cambridge university press.) Techne implies production skills, knowledge for making a certain item. Thus, the understanding of techne (a way to know, to know how) also requires a necessary understanding of the related terms *episteme* and *phronesis* (as a type of knowledge). In ancient times, techne was understood as the type of knowledge by which we know how to produce something and

according to certain rules of production. "Episteme refers to what the Greek philosophers considered truth and certain knowledge. For the Greeks to have episteme; what is believed to be the case is necessary for the case to be". (Eisner, E. W. (2002). From episteme to phronesis to artistry in the study and improvement of teaching. *Teaching and teacher education*, *18*(4), 375-385.)The definitions of the term techne are discussed by Gagarin M. in the book, he emphasizes the essentials of techne and its positioning, Athenian: oratory, law, and justice in the age of the Sophists, focusing on a new way of thinking and the position of Socrates and the sophists in Plato's dialogues. the middle of the fifth century was a period of intellectual innovation and excitement throughout the Greek world, but nowhere more pronounced than in Athens. Poets, philosophers and medical writers and practitioners, religious reformers, historians and others introduce new ways of thinking. They talked and debated ideas, verbally experimented with new methods of communication, often in public forms, and explored the possibilities offered by a relatively new medium of communication, writing." (Gagarin, M. (2002). *Antiphon the Athenian: oratory, law, and justice in the age of the Sophists*. University of Texas Press.) The possibility to learn tech can also be shown in the sense of an appeal to (especially young) people in charge of determining the means to use their free time, (especially today in the digital world, the world of modern technology when the focus is on the dangers of this world, cyber violence and protection options) but also in the sense of an appeal for a better understanding of those who possess skills. However, techne has one very, very important advantage, which is that it is based on what is episteme and what is true, rather than an opinion-based set of principles and mechanisms that will govern operations in the field in question. Techne has a demarcated field and the principles of techne cannot be expected to apply to other disciplines. These principles, within their limits, will produce a safe result, provided that they are correctly applied, in fact, these principles are therefore necessary, in order to obtain safe results. These principles could be taught, and the teacher should be able to think through the underlying principles and mechanisms, and to express their nature and inner connection in words. To man as the measure of all things; “If man is the measure of all things and if what seems to him is true for him, then what is good and morally beautiful is not fixed, but these concepts are understood in constant change as perceptions of the senses". (*Plato's Theaetetus*. Routledge. 157d). Another important segment in the research of the term techne, and thus its distinction from everything that we mean today by the name of technique, is the fact that it has a common property with virtue, which is reflected in the possibility that it can be learned;

virtue and techne can be learned. Taken together, these characteristics form a theory of science understood as techne, the goal of which is practical use rather than theoretical knowledge.Taken together, these characteristics form a theory of science understood as techne, the goal of which is practical use rather than theoretical knowledge. Taken together, these characteristics form a theory of science understood as techne, whose aim is practical use rather than theoretical knowledge. When working on researching the meaning of the term techne, what should always be kept in mind is that it is the term that gives meaning to today's term technique. It should also be emphasized that the first systematic consideration of the word techne occurs in Aristotle's *Nicomachean Ethics*. „Let there be five ways in which the soul achieves truth with the help of sayings or negatives, and these are: art, science, prudence, wisdom, intelligence". (*Aristotle* 1985. *Nicomachean ethics*.), while in *Metaphysics* (Aristotle, 1985. *Metaphysics.*) He has a determination that techne directs towards what is a theory directed to practice. Therefore, philosophy's interest in technique did not arise with the emergence of the word technique itself and all that is implied by that term today. Philosophical interest in technique has its origin in the term techne, which has significantly different, broader, more comprehensive definitions than the term technique, which primarily refers to abilities in creation - skill, which certainly refers to its first term - production according to rules. For Aristotle, art - the ability to create, to produce something with an accurate understanding, which implies that the scope of defining the art of production includes both knowledge and craft, knowledge that is not utility and is not the ability to do something because utility is not equated with knowledge but is equated with techne, with skill. Art is as Aristotle defined it in *Physics* where he talks about the purposefulness of things. In this determination of the purposefulness of everything, *art completes what nature failed to complete*. (Aristotle, 1987. *Physics*)

The horizon from which the only possible understanding of Heidegger's point of view on the meaning of techne and on technique is the research and understanding of the concept of techne among the Greeks. Heidegger's point of view is determined and directed towards what is the correct understanding of techne, which includes and implies a return to the source of the concept. Heidegger renews the question about the meaning of battle and saves thinking from the rule of technology. "Thus, the instruction to what the word techne means and how the Greeks defined it leads us to the same connection that was revealed to us when we asked the question: what is truly instrumental as such?" (Heidegger, 1972, "Question about technique", *Introduction to Heidegger*, Book 4, p. 99.) The certainty of Heidegger's position

by returning to the originality of the term techne ensures that the ancient term techne is not confused with the modern term technique. We consider the aforementioned determinants of Heidegger's position on technique to be "insurance" against a wrong understanding of technique, and the foundation for which is shown in Heidegger's return to the meaning of the term techne. In this, so to speak, the non-confusion of the current term technique with the meaning of the term techne is ensured, but also the possibility of researching the basic a feature of human reality. In Heidegger's understanding of technique, it is important, there is no place for the synonymous use of the terms techne and technique, because his understanding leads to the understanding, the opposite, that is, the definition of techne as knowledge and skill, as art and as truth, as skill and familiarity with production. Technique is not meant the way techne is meant. Originality is therefore necessary as a beginning that is in the one who thinks. Originality is thought of as a beginning, something from which something begins. Heidegger's understanding of techne refers to production, but production in which understanding does not refer to the use of something but ready-made, ready-made knowledge, or the use of ready-made means used for making. So, the essential techne is in the disclosure that is pro-execution. Heidegger first wants to separate the understanding and meaning of technique from the essence of technique, and secondly to show its meaning from the horizon of techne, which is then shown as a way of disclosure. "We ask about technology when we ask what it is. What technology is includes the production and use of tools, accessories and machines, only what is made and used, and the needs and purposes it serves. The totality of these devices is technology. It itself it is a device. Accordingly, the correct instrumental determination of the technique does not yet show us its essence. In order to get to it, or at least to approach it, we have to search for what is true". (Heidegger, 972, pp. 92-93).Techne as knowledge, production and disclosure in the sense of meaning, does not correspond to what is making, using and adopting, therefore what is technique. As such, the meaning of techne always refers to the original connection with knowledge, and with such knowledge that helps us find our way in concrete situations. The knowledge to which the technique is directed is the adoption of already produced knowledge. It is the knowledge of using resources out of necessity and for the achievement of a goal. If technology refers to the adoption of knowledge that has already been produced, ready-made knowledge, then it refers to knowledge that is produced from techne in which production takes place, which is always a way of producing knowledge that reveals something such that it can look like this

but also differently. At the same time, we should not forget that techne did not originate in the sphere of technology and cannot be understood that way.

Heidegger's question about technique, with which he asks about its essence, goes towards understanding and distinguishing what is action from what is *poiesis,* towards what is techne and *episteme*, and thus towards understanding what is the life and reality of a human being. The question that is revealed here as fundamental is: How does technique relate to what is its original meaning, to techne? In Heidegger's definition of technique, we find that technique can only be, so to speak, the memory of techne. In this determination, it is crucial to understand the ways of disclosure. Technique and techne do not have the same ways of disclosure. "The disclosure that rules in modern technology is a calling out (Herausforden) that imposes on nature the demand for the delivery of energy." (Heidegger, M. 1972.)

CONCLUSION

Based on the analysis carried out here, it is most significant to understand that the ancient understanding of techne is not only that techne is a skill or a practiced skill, but that it is a *skill that knows,* On the basis of the analysis carried out here, it is most important to understand that the ancient understanding of techne is not only that techne is a skill or a practiced skill, but that it is a skill that knows, and immediately that Heidegger's azuring does not mean challenging technique, as well as dealing with technical achievements in terms of their significance, but exclusively with the question of the essence of technique and techne that did not originate in the sphere of technique. Heidegger's original understanding technique and its distinction from techne is in the understanding of techne based on the Greek use of this term and the question of the essence of technique, which is a model for understanding the entire human reality that is possible based on following these determinants. In this model, but also following it, the preservation of the original meaning of techne is ensured, which at the same time is the interpretation of being and being, reality, and crucial for what is the determinant of the analysis in this paper, it prevents the identification of techne and technique.Man's original possibility lies in revealing, which is not in revealing and mastering. Thus, what is the way of technical disclosure and what is the essence of technique cannot determine man's essential possibility of production, that is, it cannot encompass the determination of his essence. In this way and in that technical world, i.e., what the technical method of disclosure strives for, man is in danger of losing the possibility of determining his essence, as well as of losing that essence as such, which is primarily given to man in the possibility of production as his essence. Mastering, using,

making, adopting, etc. are not ways of uncovering for production, nor are they ways of understanding man's fundamental characteristic, production, by which he understands the world, himself and reality.Heidegger's understanding of the point of view on technology is determined from the perspective of knowledge, craftsmanship, art and skill, that is, from the perspective of the Greek understanding of the word techne and what is the meaning of the totality of technical devices, that is, the meaning of modern technology. In this context, Heidegger understands technology and modern science as essential phenomena of the modern age. (Heidegger, M. (1977). *The age of the world picture*). Heidegger's search for the metaphysical foundation of modern science (and modern technology) takes place in order to understand the modern age as such. In this search, the essence of modern science and modern technology was discovered, then it was examined how the essence of the former is used by the essence of the latter. The essence of the modern age is the understanding of the attitude that reigns in technology, and it shows technology as something that hides the truth and production.Modern technique and science are methods of disclosure in the field of creation and use of already produced knowledge by techne. In this context, the question of technique and its essence was revealed. Heidegger did not find the essence of technique in something that is technical, but understood technique as technical. Therefore, his intention to separate the meaning of the technique from the essence of the technique is also clear. The meaning of the technique is in the totality of the use of the device where the technique itself is a device, while the essence of the technique is determined from the horizon of techne. In this way, Heidegger referred to the forgotten origin of the phenomenon of techniques, which is in Greek techne.

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TRANSLATION OF NEWSPAPER HEADLINES (BASED ON «THE TIMES»)

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Abstract
This study is an overview of the methodology and results of the translation of newspaper headlines based on the materials of the publication "The Times". The research analyzes the translation techniques and strategies used to transfer the content, style and emotional coloring of the original headlines into Russian. In addition, the problems faced by translators when working with headlines are discussed, and recommendations are offered to improve the quality of translation in order to preserve informativeness and effectively attract the attention of readers
Keywords: headlines , headline functions, stylistic techniques, translation

Introduction:

Newspaper headlines are short phrases or sentences used to draw readers' attention to articles or news in newspapers. They usually contain basic information about the event, and may also contain a brief summary or key points presented in the article. Newspaper headlines should be concise, informative and attractive. The headline helps the reader navigate through the variety of newspaper publications and is one of the fundamental motivators-There are many factors that arouse the reader's interest.Newspaper headlines perform a number of functions, including, first of all, the nominative one. The purpose of this function is to give a name to the text highlight it from among others. "The specific construction of English newspaper headlines serves various purposes, they should make the reader interested in the note and provide information compression. Therefore, The Times is known for its high-quality articles and news coverage, and is also one of the most reputable and influential newspapers in the UK.

The newspaper was the first in the world to publish photos on the front page, as well as the first to introduce the "headlines" column in its publication.

Literature Review

– "Headlines double the size of events."

John Galsworthy

The headline, as a rule, can be used and assimilated by the reader in one meaning, but, having appeared in the text, it acquires a radically different meaning, that is, the title can undergo various modifications, transform its original meaning.For example: in the headline to an article in The Times newspaper about discoveries in cosmology - "Beyond our le blue dot" (1). Here it is emphasized that in comparison with other cosmic objects, the planet Earth is just a "pale blue dot". "Clegg can now define himself against the cabinet's red meat,(2)" the headline of The Times article tells us about the political struggle. Tension between the two parties - Conservative and Liberal Democratic - is increasing every day in parliament.

Here, the phrase "red meat" refers to opponents in general, their opinions and judgments, which are very difficult to resist. The author informs us that the leader and The Liberal Democrats are ready to fight for their post.

The author specifically chose this expression to headline it in the newspaper for the general attention of the public.

In texts, headings are involved in various semantic processes that transform their meaning, which gives them a deeper meaning. A vivid linguistic image is created and a new contextual meaning is assigned to the title.

Methodology

The translation of newspaper headlines included various methods, depending on the context, cultural characteristics and the target audience. Some of the main methods include:

Transliteration: Headings can be transliterated, that is, translated using letters from the alphabet of the original language, in order to preserve the sound and original form of the word.*Meaning translation:* Headings can be translated in such a way as to convey the main meaning or idea expressed in the original, even if this requires changing the form or structure of the phrase.*Creative translation:* Have they been used to create attractive and memorable headlines that may differ from the literal translation, but convey the essence of the original title.*Localization:* This method involves adapting the title to the cultural characteristics and preferences of the target audience, including the use of local expressions, anecdotes or rhymes.*Using brevity:* Headings in translation can be shortened to reduce the length of the text, while retaining key elements of information.These are mainly the methods that were used while working with « The Times» newspaper. Metonymy, metaphor, antithesis, cliché, etc. are most often used.

Conclusion

In conclusion, I would like to say that the study of the lexical and stylistic aspects of a modern headline based on the material of The Times newspapers

allows us to conclude that the most productive means of increasing the expressiveness of modern newspaper headlines are metonymy, metaphor, antithesis. Euphemism, antonomasia, contamination of stable expressions and cliches are often found, which contribute to the fulfilment of the most important communicative function to attract the reader's attention and influence his choice.

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CONSUMPTION OF CARBONATED DRINKS IN OYO STATE

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ABSTRACT
The study assessed the consumption of carbonated drinks in Oyo state. Primary data was collected with the aid of a well-structured questionnaire. A simple random sampling technique was used to select 60 respondents in the study area. The data collected were analyzed using descriptive statistics and the almost ideal demand system (AIDS) model. The study showed that majority of the household heads are single (50%) most of them (27%) attained degree education. Also 8.5% of the household members preferred taking fruit juice in the afternoon, 11.3% of them preferred tea in the morning, 1.5% preferred malted drink in the evening while 2.0% and 8.7% preferred taking energy drink and milk in the night and morning respectively.
Keywords: Non-alcoholic beverages, Consumption, Almost Ideal Demand System (AIDS) model

INTRODUCTION

The term beverages to human could be the earlymorning tea, coffee and anything which we drink apart from water either to bring satisfaction to the body, aid digestion after meal or quenching of thirst Some beverages serve as substitute in filling human nutritional deficit because of the nutrients they contain while some are consumed as source of stimulant (Food and Beverages services, 2006). The discussion on beverages always revolves around two major areas which are Non-alcoholic beverages.Alcoholic beverages are beverages or drinks which are made up of alcohol by volume and are generally produced through the fermentation of sugar containing liquid or starch containing food (Food and Beverages service, 2009)Alcoholic beverages are traditionally grouped based on percentage level of alcohol they contained which are spirit, beer and wine are obtained through different fermentation processes. Their productionsand utilizations are often limited by religious and traditional taboos and norms.Non-alcoholic beverages are beverages with noalcohol in or at most 5.0% Alcohol (Food and Beverages service, 2006). They are classified into stimulating, refreshing and nourishing non- alcoholicBeverages (NAB) and their major constituent is water.Stimulant NAB such as coffee and tea are non- alcoholic beverages mostly consumed early in themorning, refreshing NAB such as Coca cola, Pepsi, Fanta and so on are mostly aerated water which is made up of water, gas, sugar and artificial essence while nourishing NAB including fruit juice, Milo, Ovaltine and so on are usually consumed because of their satisfactory nature, quenching of taste and their sugar content.

Non-alcoholic Beverages are mostly consumed because of their nutritional value and they have little or no religious or traditional taboos for consumptions and supplies.

Status of food consumption: Atobatele (1981) reported that the current food security problem in Nigeria arose as a result of the inability of the food production level to meet with the ever increasing population.The major aspects of food crisis are the inadequacyof food producers and suppliers in meeting the quantitative requirement of basic nutrient of the people in term of protein, vitamin and satisfaction. The rate of growth in food production is low and estimated to be between 2.0% and 2.5% while growth in demand for food is between 3.0% and 3.5% (Tolu *et al,* 1988). This implies that food demandgrowth rate was higher than that of aggregate local food production. As a result of this, food importation to equilibrate the demand and supply was embarked upon to curtail tendency for sudden jumping in food price An analysis of food consumption pattern in the urban centers indicate that 54%, 41% and 29% of total monthly income are spent on food by low, middle andhigh income earners respectively. Food takes the greatest proportion of the monthly expenditure

of the household and the expenses on the proteinous food items like milk and meat because of increases with income (Ojo, 1983).Dwivedi (1980) reported that when the real income of a society increases in the short run, its total consumption increases, but not by an equal amountof increase with the income. This Keynesian Hypothesis of income consumption relationship was later termed the "Absolute Income Hypothesis". The Keynesian consumption function stems from the fundament psychological law which states that "Propensity to consume decrease with the increase inreal income".

Dallenberger (1992) submitted that one of the major determinant of food consumption habits are tradition, religion, social status, season, superstition, education level, advertisement, availability and disposable income.Apart from social and cultural factors which influence choices, income is the major determinant of food consumption in that it determines the quality and quantity of food consumed, the composition of the diet, access to social service which have some link with the nutritional conditions of individual (FAO, 1975).Okiki (1987) reported that the amount spent on food and the quantity consumed of a particular set of food items were determined basically by some factors such as income, family size and the price of food itemwith income being the major determinant.Isamah (1992) confirmed thus when he investigated the effect of some socio economic variables on household food consumption expenditure pattern in Ibadan metropolis. In his findings, he concluded that household size and income are positively related and the percentage of expenditure on food items increases as income increases.French *et al* (2003) reported that comparing 1977 – 1978 with 1994 — 1998, children consumed an increasing share of their soft drink intake from restaurants, fast food, and vending machines. This shows that there has been an increased in the consumptions of food prepared away from home.Harnack *et al* (1999) reported that soft drinks have displaced the consumptions of milk and fruit juice in United State of America.Economic Research Service (ERS, 1999) reported that an average American consumes 50 gallons of carbonated soft drinks, 25 gallons of coffee, 23 gallons of milk, 32 gallons of bottled water and fruit juice, and 8 gallons of tea including from home and away from home per year. Also, it reported that fruit juices were consumed mostly from home while bottled water and carbonated soft drinks were consumed away from home.The variation in the consumption of different varieties of non-alcoholic beverages or the declined in the consumption of one variety in preferable to other occurs due to consumer health status and price of the beverages. Also, human choice and home majorly affect the variety on non-alcoholic beverages consumed.

Determinant of non-alcoholic beverages consumption: PRICE; Price is considered to a crucial agent through which the quantities of productssupplied and demanded are brought into a state of equilibrium in the market (Olayemi, 1976).Hexem (1971) described the process thus " Through the pricing system, consumer reflect their demandpreferences for consumer goods and producer reflect their demand for factors of production including intermediary goods", producers and resourse owners indicate the amount of goods and factors servicesrespectively which they will offer at various prices. Thus, prices allocate resources. However, price is efficient as long as pricing system machinery is efficient. Pricing efficiency is imperfect when prices fail to fully represent consumer preferences, direct resources from lower to higher valued use and coordinate the buying and selling activities of consumer and marketer respectively.Mehren (1970) reported that food prices could bebroadly divided into 2 categories i.e. the farm gate price and the retail price. The different between the two is the market margin.Olasegba (1973) reported that the final prices paid byconsumers were not only a function of the availability of the commodity but also of the margin set by the wholesalers and retailers. Also, the quantity demanded of a commodity is a function of the price ofthe commodity.

DISPOSABLE INCOME; Umoh (1994) reported that study on the household food consumption andincome distribution pattern in Uyo metropolis using variables like total household monthly disposable income, size of the household and years of formal education of the household head to determine the consumption pattern of food. It was found that income is the major determinant of household food expenditure with the household size and education level of household head being the secondary determinants.Lateef (1982) in his analysis of consumption expenditure pattern in two towns of Oyo state, estimate income elasticity for food, transport, accommodation, clothing, household goods and miscellaneous to be 0.43, 0.90, 0.36, 0.58, 2.13 and 0.90 respectively. He went further to conclude that the portion of income spent on other items and the average expenditure on food increased as incomeincreased research on income elasticity carried by Aboyade (1983), reported that expenditure elasticityis low for staple foods such as grain, cereals but high for protein foods like meat, egg, milk, and fish. This implies that substitution of more expensive for less expensive foodstuff by higher income groups.

Substituttion and complementality; Sexton (2008) and Schiller (2008) reported that substitution occurs ifa decrease (an increase) in the price of one good causes a decrease (increase) in the demand for another good and complementality occurs if a decrease (an increase) in the price of one good causes an increase (a decrease) in the demand for another

good. The carbonated soft drinks, fruit juice and coffee sometimes serve as substitute for milk. The most substitutes for powdered soft drinks arepowdered soft drinks is fruit juices and malted drinks. Milk, carbonated soft drinks and coffee aresubstitutes for isotonic. Bottled water is a complements to isotonic. Fruit juice and milk are the most notable substitutes for bottled water while milk, coffee, tea. Bottled water and carbonated soft drinks, fruit juices and malted drinks are the key substitutefor coffee. Finally, fruit juice and milk are the primary substitutes for tea. Consequently, substitutes for the respective non-alcoholic beverages are evident and many of those involved are milk, carbonated soft drinks and fruit juice. With all the competing products in this segment, substitution effects are dominant.Harnack *et al* (1999) reported that soft drinks had displaced milk and fruit juice. This knowledge did a great job in understanding trends and to monitor the changing environment of the non-alcoholic beveragesindustry.

TASTE OR PREFERENCES; Oxford advance learner dictionary defined preference as the choice ofor strong liking for one thing rather than another and taste is one of the five kinds of sensing which helps indifferentiating substances by means of the taste bud.Aykut (2003) reported that food preference or taste is influenced by culture, family, habit, traditions, religions believes, food availability and income.

Varian (1992) reported that in most empirical studies, the idea justifying the grouping of commodities is called weak separability. If weak separability holds, preferences over commodities grouped together will be independent of the quantities of goods in other groups. Suppose q_1 represents the vector of commodities in one group and all the remaining commodities are classified as q. Weak separability implies $[q_1, q] > [q, q_1] = [q_1, q] > [q_1, q]$This means if q_1 is preferred to q_1 for some choice of other goods, it will be preferred to the choice of all other goods (Varian, 1992). In this case, sub-utility functions for each group of commodities exist. If allthe commodities are partitioned into n groups and thecommodity groups are weakly separable in preferences, utility, u, can be represented as, $u= f [v_1 (q_1), v_2(q_2),\ldots, v_n(q_n)]$…where $v_i(q_i)$ is the sub-utility function for group i (q_i is the vector of commodities in group i) and f is an increasing function in the argument (see Deaton and Muelbauer, (1980). If q_1 represents the individual commodity j in group i and if d utility function can be written in the above form, i.e the commodities are weakly separable, then the subgroup demand for all j belonging to group I can bewritten as x_i is the total expenditure on commodities in group I and pi is a vector of the prices of commodities in the same group. This implies according to the author that the demand for a goods in a group is not affected by expenditures and prices of goods in other groups.

DEMOGRAPHY; The demographic of a household is characterized with the respect with income, household size, age, employment status and the education of household head, age and presence of children, race, region and ethnicity. Demography is the study of changes in the size and structure ofpopulation. Central interest of demography includes the study of population growth, fertility, marriage,

mortality and migration. Population phenomenal and demography effect cannot be view in isolation. In fact they are central to research question that socio- scientist are addressing today and will be discussed in the future. For example, the social implications of migratory flows on regional development, changes in population age structure and the relationship between growth and the sustainability of the world's natural resources are all important question in demography research. When population phenomenon and the processes that involved them are studied, questions like those presented above areoften formulated into research design. Furthermore, the behavior, choices and social activities of individual people more or less directly influence demographic phenomena. By analysis demographic phenomena, demography also attempts to providesocial interpretations of people's choices and actions.

HEALTH CONCERN; when asked about the reasonsfor choosing certain foods, health emerged as one of the factors considered. This may result from genuine health concern or from an awareness of health message disseminated in the population. The popularopinion about the relationship between the food consumed and health includes makes one grow strong and healthy, build bones, makes one feel goodand replace lost energy.

Problem statement: It is possible that most households in Egbeda local government area in Oyo state consumes some varieties of non-alcoholicBeverages (maybe) once in a while, every morning before going out (coffee or tea) or during festival periods only (Fanta, Coca-Cola, Pepsi and so on). This could be as a result of the prices of NAB, household income, taste or preference of the NAB

The Questions are

1. What are the socio-economic factors responsible for the consumption of NAB?
2. How does household size influence theconsumption of NAB?

There is limited empirical evident for these. This study seeks to investigate the consumption of non- alcoholic beverages among households in Egbedalocal government area of Oyo state.

Objectives of study

Broad objective: The broad objective is to study the consumption of non-alcoholic beverages among households in Egbeda local government area of Oyo state.

Specific objectives: The specific objectives of the study are

1. To determine the socio-economiccharacteristics of the respondents
2. To determine the factors affecting theconsumption of non-alcoholic beverages
3. To identify the preferred time ofconsumption of NAB
4. To identify the brand of NAB consumesin Egbeda L.G.A.

Justification: The need for conducting this research is to study the consumption of NAB in Egbeda L.G.A, the effect of the household size on the consumptionof NAB. We also need to know the response of consumers to price changes.

These findings will be useful to policy planners in understanding the present state of consumption ofcertain NAB by households for the purpose of policy making and other stakeholders such as producers.

RESEARCH METHODOLOGY

Description of study area: My study area is Egbedalocal government area of Oyo state. It was situated in the North-western part of Ibadan and carved out Defunct Ibadan municipal government in August 1991 The local government population is 281573 (2006population census). It is one of the largest local government areas in Oyo state. The indigenes of this area are predominantly Yoruba's which are highlycultured and enterprising. There are also minority tribes like Hausas, Igbos and Igbiras in the area. The major occupations of residents are trading andfarming. There is adequate interland road networkand the major languages for communications in the area are Yoruba and English.

Sampling technique and sample size: Simple random sampling technique was used to select six

(6) Villages from the study area and ten (10)households were randomly selected from each village. The total sample size is sixty (60) respondents.

Source of data: The source of data for this research is Primary data. This was collected personally from the respondents through the administration of a well- structured questionnaire. All the 60 copies of the Questionnaire retrieved were found useful for analysis.

Analytical framework: Data collected were analyzedusing description statistics and the Almost Ideal Demand System (AIDS) model

Descriptive statistic: Descriptive statistics wereemployed to address the first and other objectives of the study. The socio-economic characteristics of the respondents such as sex, age, marital status, education, family size and the type of non-alcoholic beverages consumed in the study area were successfully analyzed using mean, range and percentages.

Regression analysis: This was used to determine the relationship between the independent variables and the dependent variables and to determine the factors affecting the consumption of NAB in Egbeda local government area of Oyo state.

ECONOMETRIC MODEL

Almost ideal demand systems (aids) model: The AIDS model (Deaton and Muellbauer, 1980) is one of the most widely used models in applied demand analysis. The popularity of this model is related to non-linear in demand system parameters.

$W_i = \alpha_1 + \gamma_{1i} \ln P_1 + \gamma_{2i} \ln P_2 + \ldots\ldots\ldots\ldots + \gamma_{7i} \ln P_7 + \beta_i \ln(m/p)$

Where w_i =share budget of i^{th} itemsin NAB expenditure

I = milk, tea, carbonated drinks, malt,energy drink, fruit juice and wine.

α = constant

γ_{iJ} = coefficient price of NAB

β_i = coefficient for effective incomep_{ij}= price of other NAB

m/p= effective income

To estimate income elasticity

Problems encountered

1. Non-response due to absences; some copies of the questionnaire were not recovered because some of the respondents did not make themselves available
2. deliberate non-response; some respondents deliberately refused to give information on the amount of money they realized from their source of occupation and how much they spend on food and soon.

3 inaccuracy of monthly beverages information given; most of the respondents cannot give a price quantity of beverages consumed per month.

Solution to the problems

1. Follow-up of non-responding individuals was done several times.
2. Provision of extra copies of the questionnaire for those not filled appropriately
3. The total sum of NAB consumed weekly was summed up to determine their monthly consumptions.

RESULTS AND DISCUSSION

Socio-economic characteristics; Table 1, 2 and 3 shows some contrasting characteristics between the consumption pattern and brands of non-alcoholic beverages consumed among the respondents in the study area. Most of the respondents were within the age range of 21-30 corresponding to about 35% ofthe respondents. Also, the table shows that female occupied 52% of the total population of the respondents in the study area. Furthermore, the differences among the respondents were noticed in their educational status where majority of them are Degree/HND holders, the brand of non-alcoholic

$n_1=1 + (\beta_i / w_i)$beverages preferred and their consumption pattern.Consumers of non-alcoholic beverages were more

To estimate own price elasticity educated which may be as a result of the nutritive

$E_{ii}= -1+ (y_{ii} / w_i)$

To estimate cross price elasticity$E_{ii}= (y_{ii} / w_i) - \beta_i$

Where n_1 = income elasticity

E_{ii} = own price elasticity E_{ij} = cross price elasticity awareness of NAB consumption. Also, Table 1 showsthat the majority of NAB consumers are students (48%) while civil servant occupied 27% of the whole respondents which greatly has effect on the consumption pattern and brand of NAB preferred. Furthermore, Table 2 reviews the pattern of consumption of NAB which shows that the majority of the respondents preferred consuming carbonated soft drink and fruit juice anytime of the day due to their refreshing ability and quenching of thirst. In addition, Table 3, shows the brand of NAB preferred by the respondent is the study area which are Peak milk (30%) for brand of milk, Milo (28%) for brand of cocoa-based beverages and Lacasera (13%) for the brand of carbonated soft drinks.

Table 1; social-economic characteristics of therespondents

VARIABLES	FREQUENCY	PERCENTAG E (%)
GENDER		
MALE	99	48.5
FEMALE	105	51.5
TOTAL	204	100.0
EDUCATION STATUS		
NONE	8	4.4
KG/NURSERY	4	2.0
PRIMARY	25	12.3
JSCE	12	5.9
SSCE	50	24.5
ND/NCE	27	13.2
DEGREE/HND	54	26.5
POST GRADUATE	25	11.3
TOTAL	204	100.0
CLASS OF AGE		
<1O YEARS	24	11.86
11-20	38	18.60
21-30	70	34.30
31-40	24	11.80
41-50	28	13.70
51-60	14	6.90
61 & ABOVE	6	2.90
TOTAL	204	100.0
PRIMARY OCCUPATION		
NONE/FULL HOUEWIFE	8	3.9
STUDENT	92	45.1
ARTISAN	21	10.3
TRADING/BUSINESS	17	8.3
CIVIL SERVANT	56	27.5
RETIREE	5	2.5
MEDICAL/NURSE	2	1.0
CLERGY	1	0.5
APPRENTICE/HOUSE MAID	2	1.0
TOTAL	204	100.0

Table 2; Analysis of non-alcoholicbeverages concumption pattern

VARIABLES	FREQUENCY	PERCENTAGE (%)
CARBONATED PREFERRED MORNING	1	0.5
AFTERNOON	22	10.8
EVERNING	8	4.4
NIGHT	1	0.5
ANYTIME	171	83.5
TOTAL	204	100.0
JUICE PREFERRED		
MORNING	3	1.5
AFTERNOON	11	5.4
EVENING	8	3.9
NIGHT	2	1.0
ANYTIME	180	88.2
TOTAL	204	100.0
MILK PREFERRED		
MORNING	18	8.7
AFTERNOON	1	0.5
EVENING	6	2.9
NIGHT	6	2.9
ANYTIME	173	84.8
TOTAL	204	100.0

Table 3: Analysis of non-alcoholicbeverages brand consumed

FAYROUZ	3	5.0
LACASERA	8	13.3
MIRINDA	2	3.3
MOUNTAIN DEW	1	1.7
PEPSI	2	3.3
SCHWEPPE	1	1.7
NONE	34	56.7
TOTAL	60	100.0

VARIABLES	FREQUENCY	PERCENTAGE (%)
BRAND COAST	7	11.7
COWBELL	6	10.0
DANO	8	13.3
HOLLANDIA	1	1.7
JAGO	9	15.0
NUNU	5	8.3
PEAK	18	30.0
3 CROWN	1	1.7
NONE	5	8.3
TOTAL	60	100
BRAND		
BOURNVITA	15	25.0
MILO	17	28.3
OVALTINE	8	13.2
RICHOCO	3	5.0
NONE	17	28.3
TOTA	60	100.0
BRAND		
COCA COLA	4	6.7
FANTA	5	8.3

Regression results: Table 4 shows that the result ofthe Econometric modeling supports the traditional factor that affects consumption expenditure. Income and the price of the seven (7) NAB significantly explain their consumption. At 1% significant level, a unit change in price of tea, malt, energy drink and the effective income are significantly related to the consumption of fruit juice, wine, milk and tea respectively. Also, at 5%, change in price of tea and energy drink are positively and negatively significant to wine consumption respectively. This indicate that aunit change in the price of these NAB have a direct effect on wine consumption. Finally, at 10% significant level, change in price of carbonated drink, energy drink and the effective income are positive significantly related to wine and malt consumption in the study area. From the regression results, it can be seen that energy drink under milk is positively significant at 10% while change in effective income is negatively significant to milk consumption at 1% level. Change in price of milk is negatively significant to malt at 10% level while the change in price of tea is negatively significant to fruit juice at 10% significantlevel.

TABLE 4; PARAMETER ESTIMATES OF DEMEAND SYSTEM (AIDS) MODEL

	Milk	**Tea**	**Carbntd**	**Malt**	**Energy**	**Fruit juice**	**Wine**
Constant	-1.630 (-0.994)	1.496 (1.249)	2.417 (1.438)	-1.995* (-1.757)	0.581 (0.396)	-0.369 (-0.368)	0.501 (0.278)
LN milk price	0.167 (1.297)	0.134 (1.421)	-0.076 (-0.574)	0.084 (0.938)	-0.146 (-1.270)	-0.019 (0.244)	-0.144 (-1.013)
LN tea price	-0.032 (-0.101)	-0.022 (-0.036)	-0.067 (-0.772)	-0.006 (-0.108)	0.121 (1.603)	-0.203*** (-3.925)	0.209** (2.246)
LN carb price	-0.014 (-0.101)	-0.132 (-1.351)	-0.083 (-0.605)	0.097 (1.049)	-0.062 (-0.516)	-0.048 (3.225)	0.241* (1.642)
LN malt price	-0.111 (-0.995)	-0.066 (-0.812)	0.170 (1.478)	-0.009 (-0.114)	0.011 (0.106)	-0.116*** (-1.703)	0.123 (0.997)
LN ene rgyprice	0.477* (1.940)	-0.131 (-0.732)	-0.037 (-1.470)	0.065 (0.385)	0.115 (0.524)	0.483*** (3.225)	-0.639** (-2.366)
LN f juice	-0.073 (-1.111)	0.045 (0.952)	0.060 (0.898)	-0.008 (-0.171)	0.027 (0.466)	-0.031 (-0.779)	-0.021 (-0.298)
LN wine price	-0.115 (-0.662)	-0.040 (-0.0315)	0.034 (0.188)	0.093 (0.768)	-0.140 (-0.897)	-0.023 (-0.219)	0.192 (1.004)
LN m/p	-0.094*** (-5.320)	-0.054*** (-4.188)	0.014 (0.801)	0.021* (1.741)	-0.023 (-1.483)	0.033*** (3.055)	0.103*** (5.297)
R^2	0.399	0.403	0.147	0.144	0.125	0.407	0.488
F	4.241	4.301	1.101	1.077	0.921	4.369	6.067
Mean square	0.067	0.037	0.018	0.008	0.012	0.026	0.117

R^2= coefficient of multiple determinantF = overall significant of the model t_{ratio} values are in parentheses

(***), (**), (*) shows that the values are significant at 1%, 5% and 10% respectively

Table 5 reviews the relationship between own price elasticity, cross price and income price elasticity of the seven (7) NAB. As shown earlier, income significantly explained the consumption of NAB in the study area. The elasticity values in the table 5 shows that the income elasticity for milk, tea, carbonated drink, malt, energy, fruit juice and wine are 0.70, 0.76, 1.11, 1.31, 0.58, 1.37 and 1.81 respectively. As normal goods, it implies that an increase in income will increase but at a lower percent than the increaseb income. This result is related to the work done by Lateef(1982), on analysis of consumptionexpenditure pattern in two towns of Oyo state, estimated income elasticity for food, transport, accommodations, clothing, household goods and miscellaneous to be 0.43, 0.90, 0.36, 0.58, 2.13 and

0.90 respectively. He went further to conclude that the proportion of income spent on other items and theaverage expenditure on food increased as incomeincreased.

Table 5; Own price; cross price elasticity; income elasticity

Price change	**Milk**	**Tea**	**Carbntd**	**Malt**	**Energy**	**Fruitjuice**	**Wine**	**Income elasticity**
Milk	**-0.37391**	0.66444	-0.66058	1.14216	-2.54581	-0.33478	-1.38658	0.70050
Tea	-0.03300	**-1.04290**	-0.57651	-0.16509	2.316422	-2.38245	1.463749	0.76216
Carbntd	-0.00658	-0.55218	**-1.28485**	1.39793	-1.07631	-0.59204	1.80281	1.11491
Malt	-0.33452	-0.27623	1.38362	**-1.15417**	0.223077	-1.34296	0.91240	1.31073
Energy	1.53479	-0.56564	-3.04419	0.94682	**1.05477**	5.45769	-5.08028	0.57900
Fruitjuic	-0.20469	0.22092	0.48275	-0.14186	0.53510	**-1.38430**	-0.24010	1.37397
Wine	-0.32984	-0.14672	0.26019	1.33269	-2.50414	-0.31169	**0.41122**	1.81232

CONCLUSION AND POLICY RECOMMENDATION

Based on the findings of this study, it can be concluded that the brands of NAB consumed in the study area are limited which is a reflection of thelimited choice available to the consumer as a result oflow awareness.

Also, it can be concluded that the level of NAB production is low which makes the market to be monopoly instead of oligopoly. They were mostly consumed by civil servant and high income earnersas a result of high price of these beverages. Lastly, having established the various factors affecting NAB consumption in the study area, it can also be concluded based on my findings that milk, tea and energy drink are necessity goods.

RECOMMENDATIONS

Based on the findings of this study, the study recommends the following

An appropriate plans and strategies should beformulated by the government which will be in support of the private sector activities that will lead to efficient, low cost production and selling of NAB so that it will be affordable to low income earners Effort should be made by the government to produce a conducive environment for NAB merchants so that there will be increase in the supply of these commodities in the market.Government should reduce the tax imposed on both the consumers and the producers to ensure the affordability of these commodities.The producers should advertise the different brandsof NAB available to improve the consumers' awareness. Government should encourage small scale industry by providing funds to increase their level of production so that the market for NAB will be competitive.

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ÖĞRETMENİN, ÖĞRENCİ ÜZERİNDE ÇALIŞMA YÖNTEMLERİ

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GİRİŞ

21.yüzyılın öğretmeni, yeniliğe hevesli, öğrencilerin kalbine giden yolu bulabilen, öğrencilerin ruhunu ve öğrenme konusundaki zayıflıklarını anlayabilen bir öğretmen-psikolog olmalıdır. Yine de öğrencilerin öğrenmedeki zayıflıkları üzerinde çalışmak gerekir. Çünkü çocukların ülkemizin geleceği olduğunu düşünmeliyiz. Günümüz çocuklarının öğrenmeye olan ilgisini artıran oyunlar, ilgi çekici ve renkli görseller kullanırsanız dersin olumlu yönleri görünür. Oyun yani oyunu her dersin başında, ortasında, sonunda ya da sessizken kullanırsanız öğrencilerin konuya olan ilgisi artar, dersin olumlu ve ilgi çekici yönleri artar. Oyunları kullanarak başta çocuğun düşünme yeteneğini geliştiririz, konuşma, yazma yeteneklerini geliştiririz ve en önemlisi öğrencilerin konuya olan ilgisini arttırırız. İlginç oyunlar kullanırsak, öğrencilerin bir sonraki derste aynı oyunu tekrar oynamak isteyecekleri doğrudur, böylece öğrenciler oyun üzerinden çalıştıklarını ve yukarıdaki yetenekleri geliştirdiklerini bilmezler (Shagrir, 2015). Derslerde antrenman yöntemini kullanmak gerekiyor. Ancak tüm uygulamalı derslerde eğitim yöntemini kullanmalıyız. Uygulamalı derslerde alıştırmaların çok önemli olduğunu söylemek yanlış olmaz. Öğrenciler alıştırmalar yoluyla konuyu ve dersi tamamlar, kendi çalışmalarını (kelime bulmacası,sözlük, özet, cümle),yazıp oluşturarak bilgilerini genişletir ve sıkı çalışmaya alışırlar. Önemli olan öğretmenin anlatım yöntemini iyi kullanabilmesidir. Anlatılarak ders öğrenciler için uygun, anlaşılır, basit ve kolay hale gelir (Cakmak, 2008). Günümüzde tüm sınıflarda çeşitli görsel araçların kullanımı, teknik araçların kullanımı,elektronik ders kitaplarının kullanımı günün en acil sorunları ve öğretmenin görevidir. Çünkü farklı elektronik ders kitapları öğrencilere yeni ve ilgi çekici geliyor ve çocukların yeni şeylere düşkün olduğunu hepimiz biliyoruz. Geleceğe iyi bir uzman hazırlamak, iyi öğretmenlerin ve eğitim kurumunun organizatörlerinin görevidir. Bazı öğretmenler çalışmayan çocuklara sert davranılması gerektiğine inanıyor. Ben de bu tür görüşlere katılmıyorum çünkü öğrenciye sert davranmak yerine övgüyü, ilgiyi, oyunla öğretme yöntemlerini, işbirliği teknolojilerini kullanmanın daha iyi olduğunu düşünüyorum. Bu teknolojinin talep teknolojisinden iletişim teknolojisine geçtiği anlamına geliyor. Yani çocuğa erdem,öğretmek demektir (Maaranen et al., 2008). Bu nedenle çalışmada, her öğretmenin orta ve yüksek düzeyde pedagojik eğitim almakla yetinmemesi, sürekli olarak etkili eğitim ve öğretim yollarını araması ve bunları çalışmalarında kullanmasına önerilerde bulunmuştur.

Anahtar kelimeler: Eğitim, öğretim, öğrenci.

TEACHER'S METHODS OF WORKING ON STUDENTS

ABSTRACT

The teacher of the 21st century must be a teacher-psychologist who is eager for innovation, can find the way to the hearts of students, and can understand the students' soul and their weaknesses in learning. However, it is necessary to work on students' learning weaknesses. Because we must think that children are the future of our country. If you use games and interesting and colorful visuals that increase today's children's interest in learning, the positive aspects of the lesson will be visible. If you use games at the beginning, middle, end or during silence of each lesson, students' interest in the subject increases and the positive and interesting aspects of the lesson increase. By using games, we first develop the child's thinking ability, improve their speaking and writing skills, and most importantly, increase students' interest in the subject. It is true that if we use interesting games, students will want to play the same game again in the next lesson, so that students do not know that they are working through the game and developing the above skills (Shagrir, 2015). It is necessary to use the training method in lessons. However, we must use the training method in all practical lessons. It would not be wrong to say that exercises are very important in applied courses. Students complete the topic and lesson through exercises, expand their knowledge by writing and creating their own works (word puzzles, dictionary, summary, sentences) and get used to working hard. The important thing is that the teacher can use the narrative method well. By explaining, the course becomes suitable, understandable, simple and easy for students (Cakmak, 2008). Nowadays, the use of various visual tools, the use of technical tools, and the use of electronic textbooks in all classes are the most urgent problems of the day and the duty of the teacher. Because different electronic textbooks seem new and interesting to students and we all know that children are fond of new things. It is the duty of good teachers and organizers of the educational institution to prepare a good specialist for the future. Some teachers believe that children who do not study should be treated harshly. I also disagree with such views because I think it is better to use praise, attention, game teaching methods, and collaboration technologies instead of being harsh on the student. This means that technology is moving from demand technology to communication technology. In other words, it means teaching virtue to the child (Maaranen et al., 2008). For this reason, in the study, suggestions were made that every teacher should not be satisfied with receiving secondary and high level pedagogical education, but should constantly search for effective education and training methods and use them in their work.

Keywords: Education, training, student.

ÖĞRETMEN EĞİTİM ÇALIŞMA YÖMTEMLERİ

Günümüzün 21. yüzyıl öğretmeni yaratıcı, eğitimli, yetenekli, kültürlü, vatansever, erdemli,adil, inançlı, girişimci, çalışkan, sabırlı, iyi eğitimli, nazik ve en önemlisi öğrencilerin önünde adil olmaya çalışmaktır.

20. yüzyıldaki öğretmen modeline bir öğrenci gözüyle bakarsak, 21. yüzyılın rekabetine uygun,çok yönlü yetenekler yetiştirebilmek için bir öğretmenin öncelikle akıllı ve akılcı olması gerekir. Yükseköğretim kurumlarının tüm faaliyeti 'nitelikli insan yetiştirme' temel görevine dayanmalı ve bu temel görevi yerine getirebilmek için öğretmenin yüksek düzeyde zekaya sahip olması gerekir (Shagrir, 2015).

İ.Smanova,A.Ongarbaylar, 'Pedagoji' eğitim aracındaki 'Geleceğin pelajiklerine bir söz' başlıklı makalesinde öğretmenlere güzel düşünceler verdi.

Öğretmenlik mesleğinde yaşam ruhun sürekli emeğidir. Ustalık işi, heyecanlar ve kaygılar, aldanmalar ve pişmanlıklar, arayışlar ve sürekli çalışma,bilgeliğin sabrın, mesleki beceriye giden yolda sürekli deneyimimizin farklılaşmasının çalışarak, öğrenerek,ileri deneyim biriktirerek hedefe ulaşmanın sınavlarıdır.

Öğretmenlik mesleğinde yaşamın ilk etapta zor olduğunu ama aynı zamanda oldukça ilgi çekici bir meslek olduğunu da söylemek isterim.

İlginç olan bilim adamı,akademisyen ve yılın en iyileri ödüllerini alan yaşlı ve genç nesil öğretmenlerimizin başarıları,sözleri, hayatları bize güç, cesaret veriyor ve bize bir sebep veriyor. Pedagoji mesleğinde hayatımıza devam ediyoruz (Palak et al., 2009).

İyi bir uzmanın bu ihtiyaçtan doğması gerektiğini düşünüyorum. İyi bir uzman, iyi bir öğretmen her zaman yanında tutulmalı, öğrencilerine kaliteli eğitim ve bilinçli eğitim vermeyi unutmamalıdır. Bazen yerine getirilmediğinde bu durumları görüyoruz.

S.A. Amonaşıvılı: 'Öğretmen iyimser olmalı', 'Ben bir şey yapamam','Yapılacak bir şey yok' bazı öğretmenlerde ama eğitim ve yetişmede karamsarlık mezara gömmek gibidir. Çocuğun parlak geleceği canlı. Sadece bizim iyimserliğimiz çocuğu cesaretlendirir, çocuktaki enerciyi ve ilgiyi uyandırır ve geliştirir. Eski pedagoglar daha sonraki pedagoglardan sürekli yaratıcılık ve yorulmak bilmez araştırma talep ettiler.

Günümüzde ögretmenin davranış imajından bahsederken görünüşüne özel önem verilmektedir. Öne çıkan öğretmenler, öğretmenin yüz ifadesine, ses tonuna, davranışlarına ve giyimine dikkat etti. Öğretmenin dış ve iç yönleri, içeriği,öğretmenin dünya görüşünü, hakikat dünyasına ilişkin görüş sistemini,kendisine ve başkalarına karşı tutumunu, temel yaşam konumunu, inançlarını ve bilişsel ilke ve eylemlerini, yönlendirilmiş değerlerini ve

onun bu varlıktaki yeri. Öğretmenin dünya görüşünde ahlaki nitelikler: pedagojik tutum yardımseverlik , açıklık ve diğerleri 'pedagojik etik', kavramına aittir.

Öğretmenin dünya görüşü doğrudan davranışla ilgilidir. Bir sanatçı, kötü bir karakterli de iyi resim yapabilir, bir besteci, bir sanatçıyla aynıdır ve bir öğretmen, kötü bir karakterle çalışamaz, bunun tek nedeni onun ahlak öğretmeni olmasıdır. Bu kadar kötü davranışıyla tüm meslektaşlarının yüz karası olur ve kendi hayatını mahveder (Smith, 2000).

Sonuç olarak öğretmenin temel işlevleri şunlardır.

1)Bilgi üretimi, bilimsel araştırma yapmak, deneysel tasarımlar oluşturmak ve uygulamak, uzmanlık yapmak,uygulamaya koymaktır.

2)Uzmanların niteliklerinin geliştirilmesi ve kurum içi danışmanlık sağlanması da dahil olmak üzere her düzeyde eğitim veya öğretim sağlamak.

3)Eğitimsel ve metodolojik materyallerin,bilimsel ve psikolojik, pedagojik makalelerin, monografilerin hazırlanmasını içerir.

4)Öğrencilerin eğitimi ve yeteneklerinin geliştirilmesi. Uzmanların ve öğrencilerin genel değerlendirmesine göre öğretmenin şu niteliklere sahip olması gerekmektedir.

-ortalamanın üzerinde zeka,

-psikolojik istikrar,

-öğrencilerin hedef bilişsel aktiviteye tamamlama yeteneği,

-aktivite seviyesini arttır,

-öğrenciler ve meslektaşlar arasında iyi ilişkileri teşvik etme ve sürdürme sanatı,

-risk almak,

-pedagojik vizyon.

Bir lise öğretmeninin yerine getirdiği temel işlevler her zaman aşağıdaki gibi olmalıdır:

✓ Öğretme ve eğitimin işlevi, öğrencilere bilgi sağlamak, bilişsel aktivite için beceri ve yetenekler oluşturmaktır.

✓ Eğitimsel işlev, sınıftaki öğrencilerin kişiliğini oluşturmaktır.

✓ Organizasyon- öğrencilerin sınıf içindeki ve sınıf dışındaki çalışmalarını organize etmek, faaliyetlerini oluşturmak.

✓ Bilimsel çalışma alanında öğrencilere nasıl araştırma yapacaklarını,bilimsel ve teknik açıdan nasıl yaratıcı çalışacaklarını öğretmektir.

Bir lise öğretmeninin kaliteli mesleki faaliyetini belirleyen ana unsurlar şunlardır:

➢ Görünüm kültürü.

➢ Siyasi okuryazarlık.

- Ses tonu.
- İletişim kültürü.
- Pedagojik teknik.
- Öğretim becerileri.
- Mim,pantomim.

N.B.Kudasova'nın 'Yabancı Dil Öğretiminde Karşılaşılan Eksiklikleri Giderme Yöntemleri ve Öğretmenin Metodik Çalışmaları' adlı eserinde 35 çeşit öğretmen eksikliği ve bunların üstesinden gelme yolları çok güzel anlatılmıştır.Bütün bu eksiklikleri ortadan kaldıracak yöntemlere başvurursak derslerin kalitesi de üst seviyeye çıkar (Кудасова, 2017).

Tüm öğrencilerin eşit şekilde hakım olması gereken devlet standardı:

Amacı:

-öğrencileri yabancı dilde iletişim kurma konusunda eğitmek,

-eğitim-öğretim sürecinde öğrencileri eğitmek, yetiştirmek,onları çok yönlü bireyler olarak yetiştirmek,

-eğitimin içeriği,öğrencilere bilgi ve becerilerin kazandırılması, bunların analiz edilmesi, mantıksal düşünme yeteneklerinin oluşturulması,

-çeşitli türlerdeki metinleri okuma ve anlama yeteneğinin oluşumu,

-yeni bilgi için bağımsız bir arayış duygusunu uyandırmak, yeteneğe giden yolu açmak,

-ilerici öğretim yöntemleriyle formları ve teknolojiyi kullanarak eğitim sürecinin kalitesini artırmak.

Görev: konuşma, okuma, yazma, dinlediğini anlama alanlarında iş becerilerinin geliştirilmesi.

Eğitimsel amaç: Yabancı dil öğretiminde iki farklı amaç gerçekleştirilmektedir. Bunlardan biri öğrencilerin filoloji bilgilerini artırmak, diğeri ise genel dünya bilgilerini ve düşünce alanlarını genişletmektir.

A. İyileştirme hedefi: öğrenciler yabancı dil öğrenimi sırasında kapsamlı bir şekilde gelişirler. Dil materyalini bilmek ve kelime dağarcığına hakim olmak, öğrencilerin çok yönlü gelişimi ve birey olarak oluşumu için çok önemlidir.

B. Pratik hedefler: öğrencileri bir bilgi beceri ve yetenek sistemiyle donatmak.

Gelişimsel: yabancı dil öğretmenin pratik amacının uygulanmasının bir ön koşulu, eğitim sürecinde iletişimsel yönelimdir, öğrencilerin mezun olduktan sonra yabancı bir dili konuşma,okuma ve anlama becerilerinin oluşumu okul duvarları içinde vurgulanmalıdır. Bu

nedenle öğrencilere yabancı dilde konuşmayı ve kitaplar aracılığıyla çalışmayı öğretmek gerekir (Кудасова, 2017).

Eğitim amacı: öğrenciler, yabancı halkların yaşamı, tarihi ve kültürüyle tanışarak, halkların dostluğuna saygı duyma ve bunu derinden hissetme ruhuyla yetiştirilirler.

Öğrencilerin çok yönlü gelişimi, bilimsel dünya görüşünün oluşması, kişinin yüzyıllar boyunca biriktirdiği değerli deneyim ve öğretilerin aşılanması için,ahlak ilkeleri, konuya karşı tutum ve bilgi arzusu (Борытко, 2001; Гейхман et al., 2013).

Büyük öğretmen Ebu Nasır el-Farabi şöyle demiştir: 'Öncelikle insana eğretim değil eğitim verilmelidir. O olmadan eğitim insanlığın en büyük düşmanıdır.'

Uygulamada öğrencinin düzen ve davranışlarında sapmalarla karşılaşılmaktadır. Bu nedenle eğitim-öğretim çalışmalarında yeniden eğitim geniş yer tutar ve öğrenciyi sapmaların önlenmesi ve üstesinden gelmeye yönlendirir. Yeniden eğitim, kişilik yapısının yeniden inşası, kişinin tüm psikolojik niteliklerinin yeniden inşasıdır (Авдеенко, 2021).

ÖĞRENCİ GELECEĞİ VE EĞİTİM BEKLENTİLERİ

Pek çok öğrenci, bir sertifika, ön lisans veya lisans derecesini tamamlamak amacıyla topluluk kolejine gelir. Ancak niyetleri çok somut olmayabilir. Bazı öğrenciler kolejleri "örnekliyor" olabilir çünkü devlet kolejleri genellikle evlerine daha yakındır ve dört yıllık kurumlardan daha az maliyetlidir. Diğer öğrencilerin çok özel hedefleri vardır ancak az sayıda ders alarak bu hedeflere ulaşılabilir. Kamu kolejlerine devam eden öğrencilerin hedeflerinin doğası, bu kurumların çoğunda bulunan düşük mezuniyet oranlarıyla ilgilidir. Aslında Ulusal Eğitim İstatistikleri Merkezi tarafından yayınlanan bir araştırma, öğrencilerin hedefleri dikkate alındığında devlet üniversitesi sonuçlarının göründüğünden daha iyi olduğunu öne sürüyor. Araştırmacılar, örneklemdeki öğrencilerin yalnızca yüzde 49'unun, bir derece kazanmaya "daha kararlı" olan öğrenciler için kriterleri karşıladığını buldu: öğrenim gördükleri yılın en az yarısında üniversiteye gitmek ve bir devlet üniversitesi diploması veya sertifikası kazanmak ya da dört yıllık bir üniversiteye geçiş yapmak kurum kayıt için bir nedendi. Araştırmanın yazarlarına göre, "sonuçlar, eğer devlet üniversitesi mezuniyet oranları, öğrencilerin sadece resmi bir lisans programına kaydolmak yerine, net bir transfer veya derece tamamlama niyetini ifade etmelerine dayansaydı, bu oranların oldukça yüksek olacağını gösteriyordu" (İnce et al., 2006).

Birincisi, toplum üniversitesi öğrencilerinin karşı karşıya kaldığı ve onların okulda kalmalarını ve mezun olmalarını engelleyen ekonomik, sosyal ve akademik sorunların çoğu, kolejlerin kontrolü dışındadır. İkincisi, tüm kolejlerin Eğitim Bakanlığı'na bildirmesi gereken Öğrenci Bilme Hakkı (SRK) kurumsal mezuniyet oranının, üniversite

performansına ilişkin taraflı bir tablo sunduğu söyleniyor. Üçüncüsü, kısa vadeli mesleki sertifikaların ve bakalorya transferlerinin devlet üniversitesini bitirmenin önemli bileşenleri olduğu gerçeği, devlet üniversitesi "mezuniyet" oranlarını ölçme çabalarını karmaşık hale getiriyor. Dördüncüsü, pek çok devlet üniversitesi öğrencisi derece dışındaki hedeflerin peşinde koşuyor (Korkmaz, 1995).

Düşük gelirli ailelerden gelen devlet üniversitesi öğrencilerinin çoğunun iddialı eğitim hedefleri vardır, ancak yalnızca küçük bir kısmı bu hedeflere ulaşmaktadır. Onlarca yıldır, sosyologlar bu sorunu öncelikle üniversite uygulayıcılarının, en az gelecek vaat eden öğrencileri derece hedeflerini düşürmeye teşvik eden akademik yeniden yönlendirme süreçlerini kullanarak öğrencilerin eğitimsel hırslarını azalttığı bir soğuma sürecine bağladılar. Soğutma açıklaması, öğrenci kararlarını etkileyen diğer faktörlerden ziyade, yalnızca kurumsal topluluk koleji aktörlerinin eylemlerine odaklanmakta ve bu nedenle, topluluk kolejlerini eşitsizliğin motoru olarak kötülemek için kullanılmıştır (Murtonen et al., 2008).

Community kolejleri genellikle yüksek öğrenimde demokratikleştirici bir güç olarak görülür; özellikle sınırlı akademik hazırlığı veya mali kaynakları olan öğrenciler için eşitleyici bir fırsat ve yukarıya doğru hareketlilik için bir yol sağlar. Bu inançlar, gençler arasında hırs ve fütüristik yönelim duygusunu geliştiren Amerika'nın yarışma hareketlilik sistemindeki meritokratik ideallerle derinden iç içe geçmiş durumda. Günümüzde aile geçmişi ile üniversite bitirme arasındaki ilişki her zamankinden daha güçlü. Yüksek gelirli ailelerden gelen öğrencilerin lisans diploması alma olasılığı artık düşük gelirli ailelerden gelen öğrencilere göre 6 kat daha fazla. Düşük üniversite bitirme oranları ve artan öğrenci borç yükü, bazı akademisyenlerin devlet üniversitelerinin sosyal eşitsizliği yeniden ürettiğini veya şiddetlendirdiğini iddia etmesine yol açtı. Özellikle soğuma teorisi, devlet üniversitesi aktörlerinin eşitsizliğe aktif katkıda bulunanlar olduğu anlayışına katkıda bulundu ve bu da bu kurumun karalanmasını destekledi (Kung, 2017). Üniversiteden ayrılma olgusu üzerine eğitim sosyologlarının yaptığı geniş ve giderek büyüyen bir çalışma var, ancak konu devlet üniversitesi öğrencilerinin eğitim hedeflerini düşürüp o sektörü neden terk ettiklerine ilişkin açıklamalara gelince, bir açıklama son derece popüler. Araştırmacılar ve uygulayıcılar, en azından kısmen, Burton Clark'ın (1960) soğuma teorisine atfediyorlar; bu teori, devlet üniversitesi aktörlerinin sistematik olarak akademik olarak en az ümit vaat eden öğrencileri, kendi devlet kolejlerinde verilen eğitimin ötesinde eğitim almaktan caydırmak için çalıştığını ve bunun sonucunda da olduğunu öne sürüyor (Abdumutalibovich, 2020).

Öğrenciler eğitim hedeflerini azaltırlar. Clark, sakinleşme terimini Goffman'ın (1952) bir dolandırıcının hedefini veya dolandırıcılığının amaçlanan hedefini soğutmasına ilişkin açıklamasından ödünç alır. Marka yatırımını kaybettiğinden ve aldatıldığını hissedebileceğinden veya dolandırıcılığı durdurmak isteyebileceğinden, sömürü duygularını hafifletmek için bir soğuma süreci gereklidir. Clark'ın (1960) yeniden anlayışına göre, işaret, başarı şansı çok az olan bir devlet üniversitesi öğrencisidir ve üniversite, orta öğretim sonrası eğitime yönelik motivasyonu ve ilgiyi sürdürürken "sonuç olarak ortaya çıkan stresi hafifletmek" ve "reddedilenleri yumuşatmak" için sistematik bir yanıt kullanır. genel olarak. Daha spesifik olarak Clark, kültürel olarak teşvik edilen istekler ile sınırlı kurumsal fırsatların gerçekliği arasındaki tutarsızlığın, akademik açıdan en az umut vaat eden öğrencilerin başarısız olmasına yol açtığını savunuyor (Kapsargina et al., 2020). Tek bir kurumun vaka çalışması metodolojisini kullanarak, "sakinleşme" adını verdiği ayrıntılı bir "yumuşak inkar" sürecini belgeliyor. Akademik yeniden yönlendirme süreçlerinin öğrencileri çeşitli meritokratik yollara (örneğin, son ortak veya 4 yıllık üniversite transferi) ayırdığını ve bu süreçlerin, üniversiteye erişimi teşvik eden toplumsal normlar göz önüne alındığında kabul edilemez olan, daha az umut vaat eden öğrencilerin alenen veya daha iddialı bir şekilde başarısız olmasını önlemek için gerçekleştiğini iddia ediyor. Clark'a göre, yerleştirme testi, telafi edici kurslar, danışmanlık oturumları ve oryantasyon sınıflarını içeren kurumsal süreçler, öğrencilerin ilgi alanları ve yetenekleri üzerinde düşünmelerine ve daha az akademik potansiyeli olanlardan uzak durmalarına yardımcı olmak için açıkça tasarlanmıştır. Amaç, bu öğrencilerin kendi başlarına üniversite malzemesi olmadıklarını fark etmeleri ve böylece eğitimden beklentilerini ön lisans derecesine düşürmeleridir (Slavin, 1983).

SONUÇ

Sonuç olarak, 21yüzyılın öğretmeninin yukarıda sayılan hedeflere ulaşması gerekmektedir, bu hedefler yerine getirildiği takdirde eğitimin kalitesi üst seviyelere çıkacaktır. Diğer mesleklerle karşılaştırıldığında öğretmenlik işi çok benzersizdir ve yaratıcılığı sever. Çünkü,gençleri hayata çalışmaya ve sosyal faaliyetlere hazırlamak,öğretmenleri çok araştıran , düşündüren en önemli iş türüdür. Bu nedenle her öğretmenin orta ve yüksek düzeyde pedagojik eğitim almakla yetinmemesi , sürekli olarak etkili eğitim ve öğretim yollarını araması ve bunları çalışmalarında kullanması gerekir. Ancak o zaman bir yenilikçi, eğitim ve öğretim teorisi ve pratiğinin geliştirilmesinde itici güç ve büyük bir usta olabilir. Kısacası,öğretim işinin herhangi bir organizasyon biçimini kullanmayalım, dersler sisteminde amaç ve hedefleri birbiriyle bağlantılıdır ve birbirini tamamlar. Gençlerin çağın

gereklerine uygun olarak gelişen teknolojileri kullanma eğiliminde oldukları hepimiz için aşikardır. Bu nedenle dersin etkililiğini artırmak ve genel olarak geleceğe yönelik farklı yöntemlerin kullanılması daha doğru olacaktır.'Talebe göre teklif yapılmalı' dedikleri gibi, zamanın talebine göre öğretmenlerin de talebe göre çalışması gerekiyor.

Her ne kadar mantığa aykırı olsa da, bu bulgu, yardımın karmaşık bir şekilde ulaştırılmasının, üniversitenin gerçek maliyetleri konusunda kafa karışıklığı ve belirsizlik yarattığı fikriyle tutarlıdır. Bu azaltılmış derece hedefleri zaman içinde devam etse de, derece kazanım oranlarını etkilemedi; bu da öğrencilerin beklentilerinin önceki araştırmaların önerdiğinden daha şekillendirilebilir ve daha az sonuç verici olabileceğini düşündürüyor. Bu makale, gözlemlenen soğuma olgusunun mutlaka meritokratik bir sınıflandırma sisteminin sonucu olmadığını ve daha önce sosyolojik teori tarafından ihmal edilen süreçleri içerdiğini göstermektedir.

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PACIOLI: A FRANCISCAN FRIAR AT THE BEGINNING OF GLOBAL ACCOUNTING

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ABSTRACT
Luca Pacioli, an Italian Franciscan friar, maestro of the abacus (commercial mathematics), professor at several Italian universities, was the first author of a printed text on accounting. He has contributed to society in various fields such as art, architecture, mathematics, statistics, calligraphy and business, being considered an authentic Renaissance Man. His trajectory of life was marked by the notoriety of his book published in Venice in 1494, Summa de Arithmetica, Geometría, Proportioni et Proportionalita (Encyclopedia of Arithmetic, Geometry, Proportion and Proportionality),which in its content contains a small treatise, Particularis de Computis et Scripturis (About Accounts and Bookkeeping) which contributed to the dissemination of accounting. With the elaboration of this article, we intend to clarify and demonstrate the importance of Luca Pacioli for the accounting profession.
Keywords: Accounting. Accounting History. Accounting Books. Pacioli. Italy.

Introduction

This article, of an eminently informative nature, aims to present the most important aspects related to the life and work of the founder of modern accounting: Luca Pacioli (1446–7/1517). In parallel, the exhibition also aims to highlight the importance, for an accounting professional, of knowing the anchor ideas about Pacioli, namely that of being in the presence of the author who for the first time published an accounting manual in print, *De Computis et Scripturis* (*On Accounts and Bookkeeping*), a 27-page section (a treatise) included in a comprehensive mathematical work, the *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (*Collection of Arithmetic, Geometry, Proportions and Proportionality*) , a 616-page book printed in Venice in 1494.That said, the *paper* is structured into six brief sections. After this introduction, the second section lists the main characteristics of the accounting recording method that Pacioli made known in 1494: double entry bookkeeping. This section is constructed from a contemporary perspective, although it concerns topics first systematized by Pacioli in 1494 (although using different terminology). Then, the third section addresses Pacioli's most relevant bio-bibliographical features. The fourth section highlights the *Summa* and *De Computis et Scripturis*. The fifth section highlights the symbolic importance of Pacioli's figure for accounting activity as the first promoter of double entry bookkeeping. Finally, the conclusion of the study is presented.

Double entry bookkeeping: main characteristics

The first use of the expression double entry bookkeeping (in a printed manual or in a legislative text), however paradoxical it may seem, is not due to Luca Pacioli's treatise, the *Summa* (1494), but rather to a work by Pierre Savonne (father) (1540–1592), a French author of Italian descent, who, in 1567, published in Antwerp an account book entitled *Instruction et Manière de Tenir Livres de Raison ou de Comptes par Parties Doubles* (*Instruction and Manner of Keeping Books of Ledger or Double-Entry Accounts*) (González Ferrando, 2014). Luca Pacioli only mentions in *De Computis et Scripturis* that he will make readers aware of the Venice method (“ *il moda di Vinegia* ”, in his exact terms); the author does not spell or convey the expression double entry bookkeeping in his 1494 incunabula. That said, Table 1 condenses the six main axioms of double entry bookkeeping from a contemporary perspective.

Table 1: The six axioms of double entry bookkeeping.

#	**Explanation of the axiom**
1	A division in any account: the account is divided into debit and credit.
2	A separation of accounts: accounts of people (or organizations), impersonal accounts (of values, or things), capital accounts, results accounts (expense accounts and income accounts); five types of accounts, therefore. This is a complete set of accounts. The asset, liability and equity accounts (net equity) are called equity accounts and the management accounts reflect the performance (increases or decreases in equity) of the entity in a given period, increments or decreases that arise as a result of the activity and of the management exercise of that entity in pursuit of its corporate name. Basically, there is an opposition between the balance sheet accounts and the income statement accounts by nature.
3	A double recording of the same event: a recording in the debit of one account and a recording in the credit of another account (simple entry). These are antithetical records. Once the methodology of a simple entry is understood, compound entries (entry that result in the movement of two or more debit accounts or two or more credit accounts) are easily assimilated by everyone. The term *double entry bookkeeping* comes from this axiom no. 3; the system owes its name to the circumstance that each article/entry in the journal causes two records/notes to be recorded in the ledger, one as a debit to one account and the other as a credit to another account. Full and rigorous observation of the duality of records is a *sine qua non* (Roover, 1937, p. 270) of this accounting method.
4	A double record of the same event in two separate places (two different media): in the diary and in the ledger.
5	Equality between the total amount transferred by debit and the total amount transferred by credit.
6	All value amounts must be represented under the same monetary unit.

Source: Gonçalves (2019).

3. Luca Pacioli: biography and bibliography

Literature and iconography usually attribute to Jacopo de' Barbari (*ca.* 1440 – 1516) , a Venetian painter, the authorship of a painting representing the figure of Pacioli. Although this authorship has recently been called into question (Gonçalves, 2019), it seems unquestionable that Pacioli appears at the center of Jacopo de' Barbari's painting, as can be seen in Figure 1.

Figure 1: The Franciscan friar Luca Pacioli, in the center (1495).



Source: *Google* images.

It is estimated that the painting (cf. Figure 1) was painted around 1495 (Hernández Esteve, 1994, p. 46). In its lower part, on the right, rests beneath a wooden dodecahedron, the book that allowed Pacioli to achieve universal fame as a mathematician: the *Summa*. This painting is currently located in the city of Naples at the Capodimonte National Gallery and Museum. It is an oil painting on panel**.**

3.1 Pacioli's main biographical traits

Luca Bartolomeu Pacioli was born in Borgo de Sansepolcro, in the Tuscany region, in Italy, in 1446 or 1447 (the year of his birth is unclear) . In the same city he learned to read and write, and possibly had Franciscan friars as teachers (Carqueja, 2011). He lived with Piero della Francesca (1415–1492), around 30 years older and his fellow countryman, who taught him the first elements of mathematics (Gonçalves and Lira, 2009). Between 1464 and 1470 he was in Venice, where he studied mathematics and worked for the merchant António Rompiasi (Gonçalves, 2019). He was also a tutor for his three children, to whom he taught arithmetic (Gonçalves and Lira, 2009). After Rompiasi's death, in 1470 Pacioli traveled to Rome, where he stayed in the house of Leon Battista Alberti (1404–1472) , architect and cleric, and with his support he studied Plato and Aristotle (Carqueja, 2011). With the death of Alberti in 1472, Pacioli entered the Order of Franciscans and between 1472 and 1475 he completed his novitiate, studying in his theology course the *trivium* (Grammar, Rhetoric and Dialectic) and the *quadrivium* (Arithmetic, Geometry, Astronomy and Music) (Carqueja, 2011). He was then professor of abacus (commercial mathematics) and university professor of mathematics at seven of the 12 Italian universities at the time: Rome, Naples, Padua,

Pavia, Pisa, Bologna and Venice (Sangster, 2018a). Between 1496 and 1499, Pacioli lived in the Duchy of Milan in close friendship with Leonardo da Vinci (1452–1519) (Gleeson–White, 2012, p. 7, p. 82; Gonçalves, 2019), as he is well known.

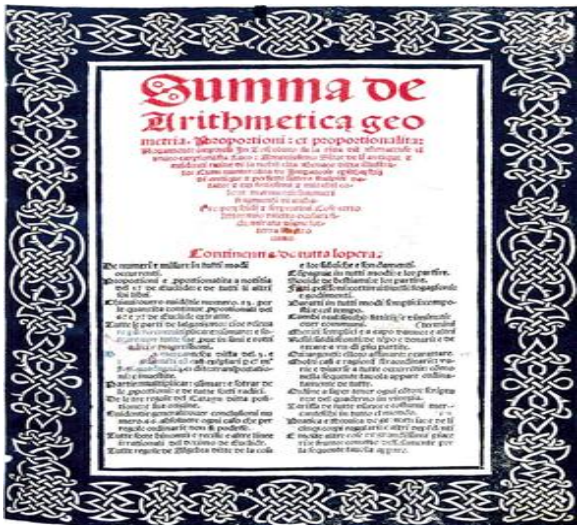
As mentioned, Luca Pacioli's year of birth is not documented (Carqueja, 2011; Gonçalves, 2019), although it is known that he was born between October 23, 1446 and June 19, 1447 (Sangster, 2018a, p. 4, 2018b, p. 309). As for his death, it is known that in 1978 (by Japanese professor Akira Nakanishi, 1905–2005) a record was discovered in the Convent of Santa Cruz in Florence indicating that Pacioli died on June 19, 1517 at the age of 70. years (see Nakanishi, 1979, p. 74). It is not known exactly where Pacioli died, but the literature points to three locations: Borgo de San Sepolcro, Florence or Rome (Gonçalves, 2019). In fact, it would be interesting to know, actually, where Pacioli is buried; however, the documents that could support this information were destroyed during the Napoleonic invasions of Italy at the end of the 18th century (Nakanishi, 1979). *3.2 Brief bibliographical aspects of Pacioli*

Pacioli was the author of several manuscripts, some of which have not survived to date. As for printed works, the most relevant were undoubtedly the *Summa* , from 1494, and the *Divina Proportioni* (*Divine Proportion*), a mathematical work about the golden ratio (golden number) printed in 1509 in Venice (Hernández Esteve, 1994, p 38). Divina *Proportioni* had the particularity of including 60 geometric figures drawn by Leonardo da Vinci (the manuscript had been completed in Milan in 1498).

4. Pacioli's magnum opus – the *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* – and his treatise (one section), *De Computis et Scripturis*

The *Summa* was printed in Venice in 1494, and shortly after Pacioli's death a second edition was printed in Toscolano (a city in northern Italy), which documents the success of the *editio princeps* (Sangster, 2007). In Portugal there are three copies of the 1494 edition in public libraries: one in the Ajuda Library, in Lisbon; another at the National Library, also in Lisbon; and another at the Porto Public Municipal Library (Gonçalves, 2019). In Spain, according to Hernández Esteve (1994, p. 239), there are six copies of the first edition of *Summa* in public libraries.Regarding the original edition (1494), it should be noted that it did not have any page containing the title of the work; the same did not happen in the 1523 edition, as shown in Figure 2.

Figure 2 : Home page of the second edition of the *Summa* (1523).



Source : *Google* images.

In a panoramic view, Pacioli's *Summa* concerns a comprehensive mathematical work, as is well known. In it, the treatise *De Computis et Scripturis* has received special attention from the community of accounting historians, as it has been translated from Italian into 14 other languages. In Portugal, the reference translation of *De Computis et Sripturis* is very recent (cf. Carqueja, 2014) and unique, it should be noted. There are translations by Brazilian authors that are very difficult to access in Portugal, so this study calls for the translation made by professor Hernâni Carqueja (see Carqueja, 2014) to be the subject of greater dissemination in (and by) academia.The 27-page treatise *De Computis et Scripturis* is the only part of the *Summa text* that specifically refers to accounting, in this specific case double entry bookkeeping. Pacioli thus became the first promoter of double entry bookkeeping on a global scale. It consists of 36 chapters, in which Pacioli enunciated the rules, procedures, means and ways of recording merchants' accounts and bookkeeping in the Venetian way (Carqueja, 2014).In the first chapter, Pacioli begins by mentioning that anyone wishing to dedicate themselves to commerce must meet three requirements (Pacioli, 1494, *apud* Carqueja, 2014). Therefore, they must have, above all, cash or another asset that can be easily transformed into currency; they should also know how to do math quickly; and, finally, they had to register and write down all transactions in an orderly manner (Pacioli, 1494, *apud* Carqueja, 2014). Pacioli wrote that, at the initial moment of establishing the business, the merchant should make an inventory and, subsequently, open three essential books for the organization of commercial activity: the memorial, the diary and the ledger; he also clarified that for traders with a reduced turnover, the use of the diary and ledger

would be sufficient, with the memorial being, therefore, dispensable (Pacioli, 1494, *apud* Carqueja, 2014). The memorial was book where the merchant recorded all his transactions, meticulously noting all his purchases and sales, as well as all other operations (Pacioli, 1494, *apud* Carqueja, 2014). In the diary, items should be written in the most schematic way possible – without superfluous indications – and when drafting them, the terms "By" should be used, preceding the debited account, and "A", preceding the credited account. [6]Pacioli only resorted to explaining simple launches (Gonçalves, 2019). In Pacioli's ledger, accounts are formatted with debits on the left and credits on the right, with separation of debits and credits on different sides of each page (Carqueja, 2011, pp. 34-35; Gonçalves, 2019), that is, *alla veneziana* . The title of the ledger accounts was indicated in a book called *the ledger alphabet* , so that they could be found more easily and quickly by the bookkeeper (Gonçalves, 2019). The treatise contains 25 examples of daybook entries (Sangster, Stoner, McCarthy, 2011) and 19 examples of ledger entries (Sangster, 2018b).

5. The symbolic importance of Luca Pacioli for an accounting professional

It is important for anyone to know their origins; Therefore, it seems relevant for a student to know the origin and founding father of their area of knowledge. This way, you will understand better and acquire a greater taste and motivation to study and dedicate yourself to the subject. With Pacioli, so-called modern accounting was founded and the truth is that even today, more than 500 years after the publication of *De Computis et Scripturis* , the accounting system described and disseminated by him is still the accounting recording method for economic entities with organized accounting. According to Pacioli, "the accounts are, in reality, nothing more than an *ad hoc arrangement* made by the trader so that their regular use provides him with constant information on all his business, so that it is easy for him to understand whether the things go well or badly" (Pacioli, 1494, *apud* Hérnandez Esteve, 1994 p. 45); Now, an accounting professional, by internalizing this old *Paciolian principle* , can, in a simple and effective way, convince third parties that accounting can and should be understood as an information system to support management.

On the other hand, Pacioli, in 1494, made known to the world for the first time the characteristics of double entry bookkeeping, which seems remarkable, because the mastery

[6] Vlaemminck (1956, p. 133) states that it was the Italian Simón Grisogono who, in a 1609 work published in Venice , adopted the technical characteristic currently used in his diary, dropping the term "By", imposed by Pacioli.

of these characteristics began to constitute the basis of the accountant's professional qualifications since the end of the 15th century to the present day.

6. Conclusion

The *paper* intended to clarify Luca Pacioli's important contribution to the advancement of accounting. The literature review undertaken made it possible to document the importance that Luca Pacioli had and which is still reflected today. The idea often transmitted by academics that this character was, strictly speaking, the founding father of modern accounting, became more noticeable.

the context of disseminating accounting through printed books (*e.g* . :, the Italian Domenico Manzoni, in 1534, or the Flemish *Jan Ympyn Christoffels , in 1543. Bear in mind that* it is public knowledge that this last treatise writer traveled through Portugal and Spain before writing his book).

This article thus launches the challenge for more studies to be produced in this unexplored field in Portugal on the contribution made to the development of accounting by the authors who pioneered the dissemination of double entry bookkeeping.

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PORTUGAL, 1759: A PEDAGOGICAL NOTE ABOUT THE FIRST ACCOUNTING SCHOOL IN EUROPE

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ABSTRACT
The public and official teaching of Accounting was born in Portugal, in 1759. With the creation of the School of Commerce, in Lisbon, by the Marquis of Pombal, in the reign of D. José I, the country was the first to make the teaching of accounting official and since then we have never stopped teaching and learning the discipline. This study aims to publicize this notable educational institution of proven importance for the history of the accounting profession. Addressing aspects of a normative nature, that is, giving emphasis to the question of what the School of Commerce was as an entity executing its statutes, constitutes the fundamental concern of this article. Therefore, the article does not make references to positive issues regarding the real and effective consequences of the exercise and performance of the school. Therefore, a general overview of the 19 paragraphs of the statutes of the Lisbon School of Commerce is proposed.
KEYWORDS: Accounting; Accounting Education; Accounting History; Portugal; 18th century.

Introduction

The Lisbon School of Commerce is a mandatory subject in the history of Portuguese Accounting from the 18th century. In fact, it was this Accounting school, founded in Lisbon in 1759, that helped train the first Portuguese accountants, in a three-year course that qualified them to carry out, among others, administrative and office management functions. one of the largest companies of the time, the monopoly trading companies founded by the main minister of D. José I (1714-1777), the Marquis of Pombal (1699-1782).The objective of this article is, therefore, to explore the founding document of this school instruction establishment – the Statutes of the School of Commerce, published in 1759. To this end, the article is structured into four sections. After the introduction, the second section addresses the origin of the first Portuguese school establishment, the Board of Trade. Then, the third section presents the main features of the 19 paragraphs of the School of Commerce Statutes. The fourth and final section, relating to the conclusion of the text, concludes this article. One last note to mention that some passages in the *paper* respect the spelling and syntax of the time, the Portuguese 18th century.

Origin of the first Portuguese Accounting School

It was in the statutes of the Board of Commerce that the germ of the Lisbon School of Commerce resided. The Statutes of the Board of Commerce, dated December 12, 1756, were approved by confirmation charter dated December 16, 1756. The Board of Commerce had been founded by Pombal, on September 30, 1755, but, at the time, the Government only created it, that is, it did not give it statutes. The Board of Commerce represented an arm of the Portuguese Government for the general coordination of the kingdom's commercial and industrial activities. Its responsibilities were very broad (registration of traders, administration of bankruptcy, administration of lighthouses, admission of clerks, creation and administration of wool factories in Covilhã, Fundão and Portalegre, among other responsibilities).The Statutes of the Board of Commerce, a document from December 1756, as mentioned, included 20 chapters: one of these chapters was dedicated to the professional training of those who intended to pursue the profession of bookkeeper (chapter 16). Chapter 16 of the 1756 Statutes of the Board of Commerce was entitled as follows: “Of the masters of the Class of Commerce and their exercises”. It was, therefore, here that the creation of an accounting school in Portugal was envisaged for the first time. With the flavor of the time, it will be convenient, we think, to transcribe it *from verb ad verbum* the following passage, instead of clarifying it *motu proprio* , as the studies by Perdigão (1949), Gonçalves (1960), Portela (1968), Silva (1970) and Carvalho (1978) did in the specialized literature.) :*Because*

the lack of collection of books, reduction of money, measurements and weights, intelligence of exchanges, and the other parts, which constitute a perfect Negotiante, has caused great harm to the commerce of Reynos, faith must be established by efta Junta, a ***CLASS*** [our emphasis] , *in which, due to the income from the fobreditas contributions* [a tax of over 4% on customs duties on imported goods, created as a consequence of the Lisbon Earthquake of November 1, 1755] *fe makes one prefer, or two Meftres , of the most experts, who know it, determining competent salaries and the obligations that come with such an important job.*

§ In order to make it easier for people who are deprived of means for subsistence to take advantage of the wonderful lesson, they will accept twenty Affistentes, children of Business Men, and there will be them, to whom they will contribute the emolument, which they judge to be worth it. to encourage those who have means, and encourage those who lack them to live their lives; and for the good administration of the aforementioned Class, private Statutes were formed, which were made public (Statutes of the Board of Commerce, 1756 – Chapter XVI).

Statutes of the Lisbon School of Commerce

However, after it was planned (December 1756), the School of Commerce was not immediately founded, as there were difficulties in finding a teacher suitably qualified to teach commercial, accounting and similar subjects. It should also not be forgotten that Lisbon had been the target of an episode that left the city devastated, the earthquake of November 1, 1755. This circumstance meant that the Government's priorities at the time were more pressing and urgent.Be that as it may, in 1759, the statutes of the School of Commerce saw the light of day; the Commerce Class Statutes, dated April 19, 1759, were approved by confirmation charter dated May 19, 1756 (Gonçalves, 2017, 2019). The school was opened on September 1, 1759 and its first teacher was the Portuguese João Henrique de Sousa (1720-1788) (Gonçalves, Lira and Marques, 2013, 2017), born in the city of Setúbal.The information contained in the proem of the Commerce Class Statutes is clearly enlightening. Like this:*The Board of Commerce of these Kingdoms and Dominions, having confided that the lack of formality in the distribution and order of the books of the same Commerce, is one of the first causes, and the most evident principle of decadence, and ruin of many Traders; as well as, that the ignorance of the reduction of money, of weights, of measures, and of the intelligence of exchange rates and other mercantile matters, cannot fail to cause great harm and impediment to any and all Business with foreign Nations; and seeking, as required by the obligation of his Institute, to amend this well-known deformity,*

he proposed to His Majesty in the tenth Chapter of the Statutes of the same Board, that fe should establish a Class, in which one or two Meftres preside, and fe admittiff twenty Affistants of the number, and other fupernumeraries, so that nefta publica is very important Efcola fe enfinaffem the principles necessary for any perfect businessman and by the communication of the ***Italian method*** [that is, double-entry accounting; our emphasis] *accepted throughout Europe, no one fails to keep the books of the feu Commercio with due formality* (Statutes of the Commerce Class, 1759, proem).

Paragraphs 2 and 3 refer to the number of teachers to teach the *Class* − one or two (determination left to the consideration of the Board) and the appointment process for three years of teaching staff. The *numerus clausus* is set at 20 cash assistants in paragraph 4 of Statutes of the Commerce Class, allowing, however, an exceptional regime, or In other words, it was possible to admit supernumeraries, as long as they did not exceed 30, "*because the care of a fó Meftre, or Lente, could not involve more than five difficulties"* (Statutes of the Class of Commerce, § 4.º).

It is established by paragraph 5 that no candidate may attend school without be previously examined by the *class teacher*, with the aim of determining whether the proposer is possessing the essential skills for this purpose: ability to read, write and count (in the four basic arithmetic operations, at least). In the articles relating to paragraphs 6 and 7, it is stated that the applicants children or grandchildren of businessmen, with equal education and procedures, should be preferred for those taking the class. However, it was reserved for the Board to faculty, at the end of the first academic year of the three for each course, to take exams to renew or dismiss those who are incapable or negligent.According to the provisions of the 8th paragraph, the appointment of a practitioner could not be granted except to the applicant who was 14 years of age. They did not stipulate *maximum* age statutes; however, in cases with many suitors, under equal circumstances, the youngest should be admitted, " *because it demonstrates the experience, which they do more able for teaching, and faith must provide more definitions for the office, and Eftudos* " (Statutes of the Class of Commerce, § 8.º). The Commerce Class course lasted three years, "*which is the necessary time to complete dictate, know, and practice the main objects of the Eftudos defta mefma Efcola"* (Statutes of the Commerce Class, § 9.º). In the Commerce Class, lectures should begin, in winter, at eight in the morning and end at noon and, in summer, they should begin at seven and conclude at 11, in accordance with paragraph 10. Monthly control of the attendance of class members would be the responsibility of clerks or accounting practitioners at the Board of Commerce,

who would thus act as [7]study watchdogs.Paragraphs 11, 12, 13, 14 and 15, most relevant to the case we are dealing with here, concern the school's curriculum program or the scheme of studies to be taught in the *Class*. The Accounting program, according to Amorim (1936), proved to be quite advanced at the time. In this way, it was established that Arithmetic, as the foundation and principle of any trade, should constitute the first part of the *Class lessons*, with perfect knowledge of the four operations, as well as fractions, the rule of three and other subjects considered indispensable. [8]to a complete merchant or bookkeeper. As the Statutes state, in paragraph 11:*Arithmetic, as the foundation and principle of any and all commerce, must form the first part of the lesson of the Class, limiting itself to the faithful Practitioners, regarding the common and ordinary method of the four main species, the many, and diverse modes , how much easier and faster today do they find the forms, do the reductions and multiplications, do the abbreviations of the division, and take away the proofs; once perfection has been achieved in this part, faith must finally complete the broken count, rule of three, and all the others, which are indispensable to a Merchant, or complete bookkeeper* (Statutes of the Class of Commerce, § 11.º).

After these lessons, the weights and measures of the main commercial areas followed, particularly those with which Portugal conducted transactions. The study of weights and measures was very complicated, not only from country to country, but within the national territory itself, in which, with no standardization standards, even in the Portuguese provinces, different models were applied. As Cunha (1899) states, it was only at the end of the 18th century that French scholars, in this case a commission appointed by the French Academy of Sciences, made all measurements (length, surface, volume, capacity and weight) depend on a single unit, fixed, invariable and deduced from the magnitude of planet Earth − the meter [9].In continuation, this Lisbon commercial academy would teach and learn

[7] Former secretarial employees who, at the University and other educational establishments, pointed out the absences of students and teachers.

[8] For example, arithmetic and geometric progressions, interest rule (simple and compound) and discounting operations (Rodrigues, Gomes and Craig, 2003).

[9] The metric system was legally established in Portugal in 1852. The meter, according to the Academy's calculations, should be one ten millionth of a quarter of the earth's meridian" (Crato, 2008: p. 127). In this exact sense,

> *The French Government, recognizing the great* ***embarrassments that the diversity of measures that existed in the different provinces of France, as was also the case among us, brought to commerce*** [our emphasis] *and to administration, deemed it necessary to carry out a complete reform of the system of weights and measures. To this end, extensive geodesic work was carried out, from which it was concluded that the length of the fourth part of the terrestrial meridian that passes through Paris is 5,130,740 toezas (French measurement). The ten millionth part of this length was called meter, and the metric system was adopted*

the notions of exchange rates, insurance, the practice of commissions and obligations that result from them, and the formalities of charters[10], as knowledge of arithmetic without mastery of exchange rates and insurance, it would not be enough to acquire certainty about the cost of the farms (this is to consciously evaluate the sales price).According to Rodrigues *et al*. (2003: p. 50), "it would also be important to know solids, so that, through their dimensions, we could know the volume necessary to regulate the freight that is transported to Brazil".Finally, commercial bookkeeping was taught using double entry (paragraph 15), distinguishing, for this purpose, wholesale trade from retail sales.[11] In the Commerce Class, attention was devoted to the books *Borrador*, *Diário*, *Razão*, *Auxiliares*, *Balance Sheets* and the exemplification of how to work in double entry (Rodrigues *et al*., 2003).Once the Commerce Class course has been completed, once the certificate of completion has been issued, practitioners will benefit from privileges in all appointment procedures by the Junta da Fábrica das Sedas and in all other inspections by the Board of Trade.Sales clerks who had been working for more than five years and who had successfully attended the *Class* were given the opportunity to open stores on their own.The statutes ended with a paternal-style recommendation that schoolchildren should be used in lessons, for their own benefit and for the business houses that took advantage of their commercial conduct.

Conclusion

This work presents a theoretical/practical implication for society: it aims to provide a valid study tool to increase the initial motivation of Accounting students upon entry (and attendance) at higher Accounting and Management schools. It is believed that knowledge of the accounting past, in addition to contributing to intellectual enrichment, helps to prepare and better sustain the future. It is clear that the issues relating to the teaching of Accounting and the first Portuguese school to teach it in public terms represent themes that capture the attention of Accounting students, and it could even be said that the first literature in the scope of the history of Accounting that As a rule, they dedicate consideration to the school portrayed here.

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as the fundamental unit. All other measurements and weights are derived from the meter. The meter is, therefore, the ten millionth part of the Paris meridian (Cunha, 1899: p. 224).

[10] Based on Borges (1839: p. 217), charter is the "*ship's rental contract; It is done in writing, and this writing is called a charter or charter - and at its price, Freight*".

[11] "*Lately, they will be working on refining the method of writing books with commercial distinction in groffo, and retail sales, or by the small, all in double entry, even if with differences in the two aforementioned trades"* (Statutes of the Commerce Class, § 15.º).

These are the foundations on which this article launches a challenge to Accounting teachers for greater dissemination and more research into the oldest Portuguese public Accounting school. Studying the history of Accounting can be very valuable and very beneficial for Accounting students, because it helps them to develop and deepen their professional identity.Having systematized the main guidelines of the founding document of the Lisbon Commerce Class, we acquired the conviction that it was a serious thought that was the basis for the conception of the first public school of Accounting and Commerce in Portugal. However, in line with Azevedo (1961: p. 12), "more important than knowing the regulatory norms of an institution is knowing the way in which it achieves the purposes for which it was created". The implications that this last warning suggests to us remain a recommendation for future research work in the area of the history of Portuguese Accounting.

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A HOLISTIC APPROACH TO MENTAL HEALTH SUPPORT IN AMERICAN EDUCATIONAL INSTITUTIONS

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ABSTRACT
Purpose: This paper provides guidance on building an integrated approach to delivering mental health support in educational institutions in different countries that have faced challenges, using the U.S. experience as an example.A definition of mental health within the context of educational environments was presented.An inquiry into mental health indicators among students was conducted in territories that have encountered significant challenges in recent years, such as Ukraine, Gaza, Sri Lanka, etc.A comparative analysis of mental health indicators between educational environments in the United States and other countries was performed.A comprehensive framework, termed the "Smart Pyramid for Mental Health in Educational Environments," was developed to facilitate a systematic and integrated approach to supporting mental health within school institutions.Furthermore, the study involved the synthesis and organization of American practices in maintaining mental health within educational institutions. Specific instances of mental health support for students, educators, and staff in U.S. colleges and universities are highlighted. These examples serve as a reference point for the potential implementation of American approaches within international educational institutions grappling with mental health concerns.
Keywords: mental health, trauma, resilience, educational environment, college, school, students

INTRODUCTION

In recent years, there has been a significant increase in global awareness and research on mental health issues, particularly focusing on individuals who are at risk or have experienced trauma or mental disorders. Factors such as armed conflicts, the COVID-19 pandemic, and natural disasters have heightened the prevalence of mental health disorders, especially among youth and children. In times of rapid global changes and landmarking collisions, students all around the world struggle with mental health issues. In 2018, the American Psychiatric Association, in collaboration with the World Health Organization (WMH-ICS), surveyed almost 14,000 first-year college students from eight countries and found that they struggled with a mental illness, particularly depression or anxiety: 35.3% during their lifetime, 31.4% during last year (American Psychiatric Association, 2018).

RESEARCH AND FINDINGS

Effective mental health maintenance requires tailored approaches that take into account age, life circumstances, and environments.

Therefore, defining mental health within the context of educational institutions may involve the following.

Mental Health in Educational Environments is a holistic framework encompassing ongoing efforts to promote and sustain the psychological well-being of all individuals involved in the educational process, including students, their parents, teachers, faculty, and other staff.

An inquiry into mental health indicators among students was conducted in territories that have encountered significant challenges in recent years (Ukraine, Gaza, and Sri Lanka).

Ukraine issue. The full-scale invasion of *Ukraine* by Russia in 2022 had severe consequences for the educational system in Ukraine. The war negatively affected the mental and emotional state not only of adults but also of children and youth. According to the survey among Ukrainian young people (14-35 years old), about 82% of them reported experiencing losses due to the war. Furthermore, 50% in 2022 vs. 35% in 2021 of youth expressed concerns about their own or their loved one's health, and 22% in 2022 vs. 11% in 2021 expressed worry about their mental health (Petsyk, 2023).

Gaza issue. Since the escalating conflict in Gaza in October 2023, an increase in violence has worsened a mental health emergency among its 2.1 million inhabitants, with 67% being refugees and 65% under the age of 25 (UNRWA, 2023). The ongoing attacks and forced relocation, as well as the loss of loved ones, are putting many children at risk of developing anxiety, depression, PTSD, and other mental health issues. Prior to this conflict, a study from 2020 revealed that 53.5% of children in Gaza already had PTSD (Abudaya, 2023).

Sri – Lanka issue. Sri Lanka faces unique challenges related to mental health among its younger population, exacerbated by historical events, the Easter Sunday terrorist attacks on Catholic Churches and high-rate hotels in 2019, the COVID-19 pandemic, and economic crises. As a result, Sri Lanka has one of the highest suicide rates among youth globally, ranging from 30–100 per 100,000 population in males and 20–70 per 100,000 population in females**.** About 14% of adolescents have mental health problems (mainly depression, anxiety, and behavioral disorders), and these contribute to a substantial proportion of the global burden of mental disorders (Rajapakshe, Mohan, and Singh, 2023, p. 41-43). 38.6% of school children aged 13–17 had experienced bullying within the preceding month. Nearly 9.5% had seriously considered attempting suicide (Senanayake, Gunawardena, Wickramasnghe, Gunawardena, Lokubalasooriya, Peiris, 201 9)

American students have mental issues as well. In 2022, about 70% of public schools stated that there had been a rise in the number of students seeking mental health support at school since the start of the COVID-19 pandemic (U.S. National Center for Education Statistics, 2022).). Xiao et al. (2017) defined the state of college student mental health as a "crisis," and the severity of symptomatology has appeared to increase in recent decades. Mental health issues among children, youth, and teachers negatively affect the outcomes of the educational process (Eisenberg, Lipson, Ceglarek, Kern, and Phillips, 2019).

Although American society, federal and local governments try to decrease this negative trend. Systematic approaches to maintaining mental health in educational institutions can be divided into two sections:

A) mental health support in the American school system (K-12);

B) mental health support in the American college system.

Ultimately, there are three levels (tiers) of mental support in American educational environments but they are not limited to:

1) Universal mental health prevention activities for all students: universal Guidance; universal screeners; anonymous surveys for students, teachers, and parents about the climate at school; risk assessments; staff mental health counseling; "School-wide wellness": mental health campaigns; group counseling; staff professional development; etc.

2) Targeted services for students and teachers: crisis response: planning and interventions; community-based referrals; community collaboration; progress monitoring; referral process; etc.

3) Individualized services: 504 plan for schools; Individualized Education Program; etc.

Based on these three levels, a comprehensive framework, the Smart Pyramid for Mental Health in Educational Environments, was developed to facilitate a systematic and integrated approach to supporting mental health within school institutions (Fig 1).

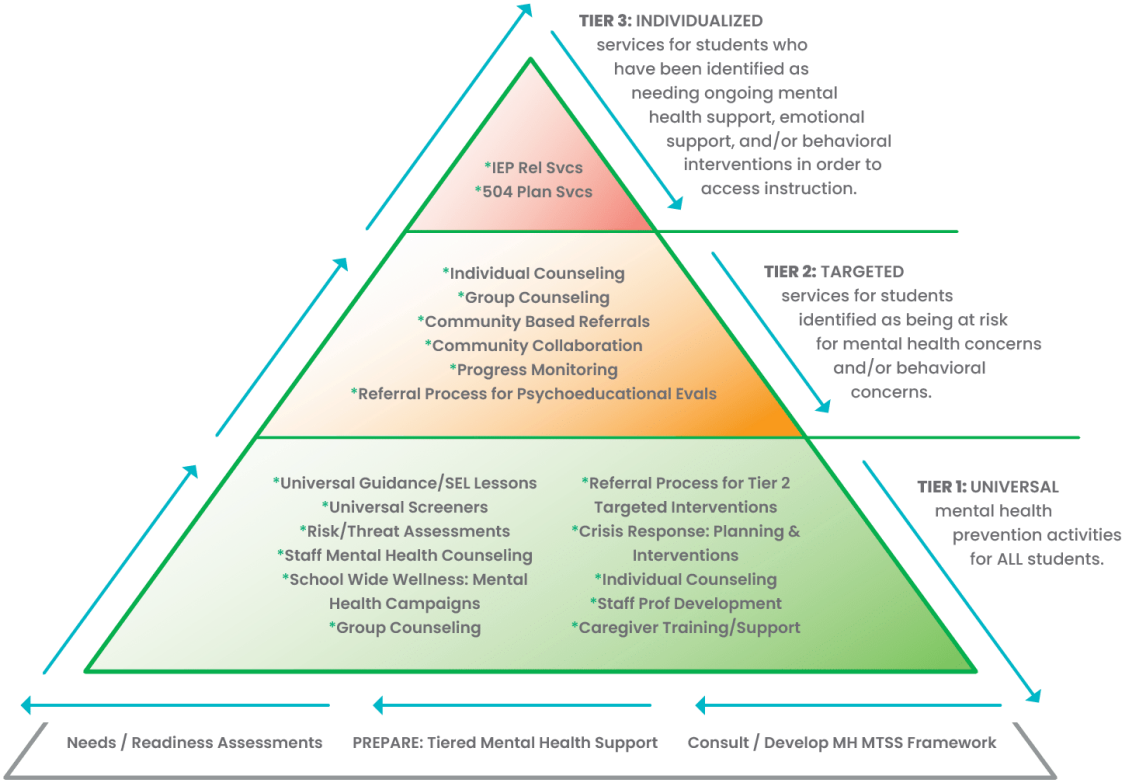


Fig.1. Smart Pyramid of Mental Health Support in American Schools

Support of mental health at American schools

School districts implement school-based mental health services in various ways. They may hire school-based therapists or social workers. Most American schools provide access to prevention programming, early identification of mental health challenges, and treatment options.

All American schools accept special education programs. There are different kinds of plans, such as The 504 Plan or the Individualized Education Program (IEP). Section 504 of the Rehabilitation Act of 1973: This is a federal civil rights law, which aims to stop discrimination against people with disabilities (Section 504, Rehabilitation Act, 1973). A 504 plan is intended for disabled children who do not need or qualify for special education but could benefit from accommodations and/or specialized help in school. IEP is a written plan that provides free special education services, related services, and support to

meet a child's unique needs. It also includes specialized instruction for gifted students (Price-Ellingstad, Reynolds, Ringer, Ryder, and Sheridan, 2020).

School districts have different approaches to implementing mental health services within schools, which can include but not limited to:

- hiring therapists or social workers;
- offering prevention programs;
- early detection of mental health issues;
- providing various treatment options.

Support of mental health at American colleges (universities)

The fact that mental disorders are common among college students from different countries. In line with the precision medicine initiative approach (Insel, 2014), American colleges try to implement the constructing personalized approaches that both identify each student's risk profile and then provide access to intervention resources designed to ameliorate the negative effects of mental disorders on this important segment of the population.

A comprehensive approach to maintaining mental health at American colleges/universities includes the following activities:

- *Increasing awareness.*

Different methods are used, such as traditional presentations, panel discussions, role plays, short videos, storytelling, and student testimonials, followed by small group conversations. During these sessions, students are educated on how to identify symptoms of mental illness, where to access resources and support, and how to communicate with friends who may be facing challenges.

- *Providing mental health screenings for free.*

Most U.S. colleges and universities regularly conduct online surveys to measure anxiety, depression, and other mental health issues among students, staff, and faculty. Sometimes, they collaborate with NGOs that support mental health to provide professional screenings and analyze findings. For example, NGO UCLA created the Depression Grand Challenge to cut the global burden of depression on human health and well-being in half by 2050. To achieve this ambitious goal, they are conducting massive online screenings with 100,000 participants in the educational environment (UCLA, 2020).

In 2015, the Drexel University Recreation Center became the first American university to establish a kiosk that screens for mental illness and looks like a sleek version of an ATM. While screenings similar to the one in the kiosk are available online at universities across the USA, the physical presence of a kiosk is unique to Drexel's campus (Rolen, 2015).

– Launching campus-wide courses, programs, and initiatives.

In 2018, Florida State University (FSU) launched The FSU Student Resilience Project, an online trauma resilience training tool developed through the Institute of Family Violence Studies and their College of Social Work.

The FSU Student Resilience Project incorporates captivating animation, videos, and TED-talk-style audio sessions led by faculty and mental health professionals to enhance student engagement. Through this training, students are empowered to leverage their current strengths and acquire fresh techniques that support well-being, while also acquiring essential resilience and coping skills (Oehme, Perko, Clark, Ray, Arpan, and Bradley, 2018).

Regardless of whether a student has encountered trauma in the past, the project equips them with the tools to navigate potential future stressors and develop the ability to recover from adverse experiences linked to challenges such as change, grief, loss, frustration, and stress.

The toolkit, which is offered in terms of the Project, consists of the approach to empower students' mental state in the following areas: a) reducing anxiety; b) improving resiliency; c) managing stress; d) increasing mindfulness; e) skill-building activities; f) nutrition and sleep; g) breathing for relaxation; h) well-being practices as a part of coursework.

In addition to endorsing peer-led endeavors and other campus initiatives, college instructors and professors promote student well-being by actively demonstrating preventive strategies and coping skills in the classroom setting.

For instance, every Friday during lunchtime, students and faculty staff of Florida State University can join group yoga practices such as "Friday Lunchtime Yoga" over Zoom.

- *Professional Courses and Certifications for Professionals.*

The FSU Trauma and Resilience Collaborative is a comprehensive program that integrates Florida State University's multifaceted initiatives addressing trauma and resilience across various life stages and within the community. This program encompasses a curriculum series created by the Clearinghouse on Trauma and Resilience housed within the university's Institute for Family Violence Studies, in collaboration with the FSU Center for Academic and Professional Development. Through this curriculum series, professionals are equipped with the necessary knowledge and skills to comprehend the effects of trauma on adults and children, as well as the essential components of resilience.

- *Implementing virtual simulation programs.*

About 400 colleges currently use an online simulation program known as Kognito. This program teaches faculty staff how to communicate with students, as well as teaches students how to communicate with friends who may be experiencing emotional difficulties and

guides them toward the right resources. In the virtual environment of Kognito's campus, all participants of the educational process interact with virtual ones to better understand mental health. The company claims significant outcomes from using this resource. Fairfax County Public Schools trained 20,000 educators and increased student referrals to mental health services by over 30% (Kognito, 2022).

CONCLUSION

The study showed that mental health issues exist among students in all countries - both in those that have faced challenges and in relatively prosperous regions. At the same time, there is an increase in mental health disorders in educational institutions.

The holistic and inclusive approach taken by the United States to promote mental health within educational environments has the potential to serve as a valuable blueprint for the Global educational landscape. Implementation of proactive support systems for individuals facing interpersonal challenges at educational institutions can significantly enhance the mental well-being, academic achievements, and overall job satisfaction of a large number of stakeholders, including students, teachers, faculty members, and staff.

Utilizing the *Smart Pyramid of Mental Health Support* method across every stage of the educational process offers a comprehensive strategy for maintaining mental well-being in educational environments.

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AN INDEPTH ANALYSIS OF ATTRACTIVE FACTORS FOR TOURISTS TO HON SON ISLAND, KIEN HAI DISTRICT, KIEN GIANG PROVINCE

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Abstract
This study, utilizing document research, field surveys, and questionnaires, aims to analyze the factors that attract tourists to Hon Son island in Kien Giang province, Vietnam. The research findings indicate that the attractiveness of Hon Son island influenced by six key factors including: Tourism resources, infrastructure and technical facilities, tourism services quality, human resources, security and safety, and tourism services prices. Additionally, this paper proposes suggestions to improve the quality of tourism and attract a growing number of tourists to Hon Son island. The findings of this study will provide valuable insights for local authorities, management teams, tourist agencies, ecotourism business owners, and the local community, supported by real data analysis.
Keywords: Attractive factors, Hon Son island, Kien Giang

Introduction

Kien Giang, situated in the southwestern part of the country, is a province blessed with abundant natural resources, making it well-suited for various forms of tourism development, such as resort tourism, eco-tourism, discovery tourism, and marine tourism. The province boasts approximately 105 large and small islands, with island tourism being a prominent focus. Aside from the renowned Phu Quoc Island, the island tourism in Kien Hai district has recently witnessed significant growth and attracted numerous tourists. In 2006, Kien Hai district was recognized by UNESCO as a world biosphere reserve, adding to its appeal as a tourist destination.Kien Hai district comprises four communes: An Son, Hon Tre, Lai Son, and Nam Du. The Nam Du archipelago and Hon Son island are particularly popular among tourists seeking island experiences. In recent years, Hon Son island has gained recognition among both domestic and international tourists for its captivating landscapes and beautiful beaches. This has not only contributed to the local economy but also improved the livelihoods of the residents. However, a comprehensive exploration of the specific factors that make Hon Son island attractive to tourists has been lacking, hindering authorities from identifying key areas for investment and appropriate development. Therefore, it is essential to conduct research to uncover the factors that draw tourists, particularly domestic tourists (who form the main tourist group visiting the archipelago), to Hon Son Island, Kien Hai district, Kien Giang province. Based on the findings, appropriate suggestions can be proposed to enhance and sustainably increase the island's allure, fostering stronger tourism growth.

2. Research methods

***2.1.* Secondary data collecting and processing**

Methods of analyzing secondary data from many different sources such as: internet, books, newspapers, scientific journals, documents, resolutions, statistics, reports related to the research problem. This source of data is processed by comparison, evaluation and synthesis methods to ensure the validity and relevance of tranferred data.

2.2. Primary data collection and processing

2.2.1. Field survey method

Field surveys were conducted at Hon Son island to observe, interview, photograph and collect actual data.

2.2.2. Interview method via questionnaire

Sample size: There are many ways to determine the sample depending on the different research model. According to Hair and collaborators (2006) (cited by Nguyen Dinh Tho,

2011), in order to use the exploratory factor analysis, the minimum sample size should be 50, sample size (n) = 100 is better. According to the experience, Sirakaya et al. (2017) suggest that the sample size for a study should be at least from 100 to 200. Thus, the sample size is 120 units which satisfied the condition. The sample was conducted through the non-probability sampling method by random sampling technique. The advantage of this method is that it is easy to approach the research object, save costs, time and direct interview form.

A five-point Likert scale was used in the questionnaire which the author adopted and complied from previous studies of the literature (Strongly disagree = 1; Disagree = 2; Not sure = 3; Agree = 4; Strongly agree = 5).

Data analysis method: After collecting all 120 questionnaires surveyed from tourists, the author filtered and entered data on SPSS (Statistical Package for the Social Sciences) version 20.0. The research used SPSS version 20 to analyse the data collected with Frequency, Percentage, Mean, Standard Deviation, Scale Reliability Analysis and Exploratory Factor Analysis.

Through literature reviews, the proposed research model of this research is as follows:

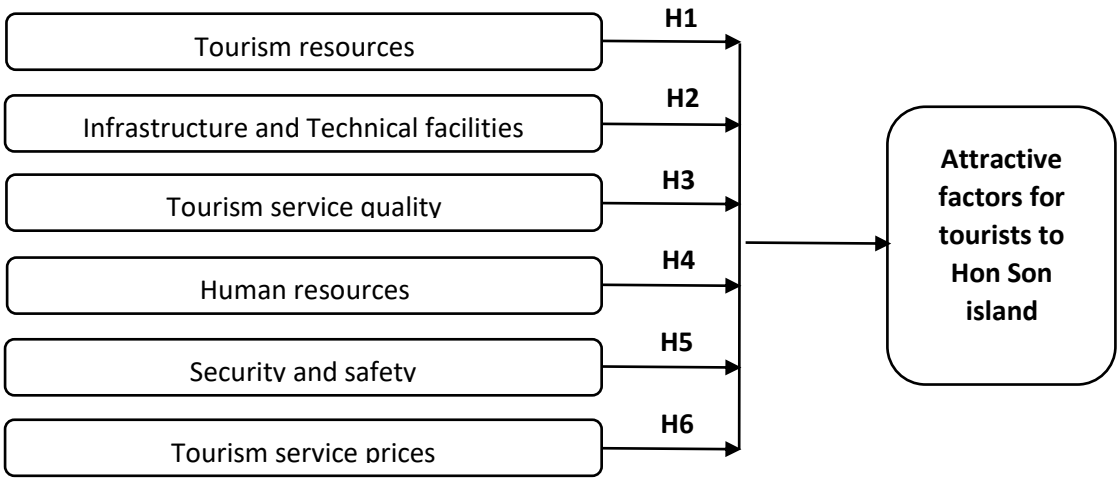


Figure 1: Proposed research model

(Source: Authors' proposal, 2023)

Hypothesis 1 (H1): There exists a positive relationship between H1 and attractive factors for ecotourism development at Hon Son island.

Hypothesis 2 (H2): There exists a positive relationship between H2 and attractive factors for ecotourism development at Hon Son island.

Hypothesis 3 (H3): There exists a positive relationship between H3 and attractive factors for ecotourism development at Hon Son island.

Hypothesis 4 (H4): There exists a positive relationship between H4 and attractive factors for ecotourism development at Hon Son island.

Hypothesis 5 (H5): There exists a positive relationship between H5 and attractive factors for ecotourism development at Hon Son island.

Hypothesis 6 (H6): There exists a positive relationship between H6 and attractive factors for ecotourism development at Hon Son island.

To assess the criteria in the research model, this study uses a Five - level Likert scale: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly agree, for observed variables. The author uses 8 criteria and 43 measurement variables to evaluate attractive factors for ecotourism development at Hon Son island.

3. Research findings

3.1. Analyzing research samples

Interview via questionnaire was conducted through 120 units who are tourists involved in tourism and currently directly visiting at the research site.

3.1.1. Summary the demographics of respondents

Tourists' gender: There is no ordinate amount of gender disparity, with 55 males (45,8%) and 65 females (54,2%).

Tourists' age: Within the tourist group, there are 87 individuals ranging in age from 18 to 30 years old, making up 72.5% of the total. Additionally, there are 27 tourists aged between 31 and 45, comprising 22.5% of the group. Lastly, there are 6 tourists aged 45 years and above, representing 5.0% of the total.

Tourists' educational levels: The research sample comprises three individuals with an educational level below high school (constituting 2.5% of the total), 22 individuals with a high school education (making up 18.3% of the sample), six individuals with vocational school education (representing 5.0%), 78 individuals with a college/university education (accounting for 65.0% of the sample), and 11 individuals with education beyond the university level (comprising 9.2% of the total).

Tourists' occupation: The data analysis reveals a diverse range of occupations within the research sample, which can be classified into six categories. Specifically, the sample consists of 66 students (constituting 55.0% of the total), 9 farmers/workers (making up 7.5%), 22 business owners/traders (representing 18.3%), 8 officials/civil servants (accounting for 6.7%), 10 retirees (comprising 8.3%), and 5 individuals engaged in other professions

(amounting to 4.2% of the sample). The "other" category encompasses occupations such as office staff and freelancers.

3.1.2. Summary the tourism activities of respondents

Tourists know about Hon Son island: Based on the research findings, it is evident that tourists gather information about Hon Son island, a renowned tourist destination, from diverse sources. Notably, the internet emerges as the primary channel, with 85.0% of respondents relying on it for information. Equally significant is the influence of word-of-mouth, as 80.0% of tourists acquire knowledge about the island through recommendations from relatives and friends. Television serves as another prominent source, contributing to 40.8% of the information acquisition process. Additionally, travel companies (38.3%) and print media such as newspapers and magazines (35.0%) play notable roles in disseminating information about Hon Son island.

Tourists come to Hon Son island with 4 main forms: The majority of tourists, accounting for 91.5% of the sample, prefer to travel with their family and friends. The next significant category consists of tourists who travel in groups or as part of organized tours, making up 34.0% of the total. Additionally, 21.3% of tourists opt for company-organized tours through travel agencies. A small percentage, 1.1% of tourists, choose to travel alone.

The attraction of Hon Son island for tourists: Based on a survey conducted on a sample of 120 domestic tourists visiting Hon Son island in Kien Hai district, Kien Giang province, several key factors were identified as the main attractions for tourists. The primary factor that garnered the highest interest, accounting for 85.0% of respondents, was the presence of numerous beautiful, breezy, and clean beaches such as Gieng beach, Bang beach, Bac beach, and Da Chai beach. Following closely behind, with a significant percentage of 78.3%, was the appeal of the island's breath taking natural landscapes, featuring many picturesque spots for photography, including Ma Thien Lanh Mountain, Ong Rong Mountain, the cross-island road, and the local wharf. Additionally, activities such as diving to explore coral reefs, fishing along the beaches, and indulging in fresh seafood were appreciated by 68.3% of tourists. The friendly, enthusiastic, and dedicated attitudes of the management staff and local residents were also regarded as a notable factor by 50.8% of respondents. Finally, the availability of suitable locations for picnic activities was identified as a factor of interest by 23.0% of tourists.

Popular activities chosen by tourists when coming to Hon Son island: The most popular activities enjoyed by visitors to the island include watching sunsets and capturing memorable photographs, accounting for 86.7% of respondents. Another highly favored activity is

swimming in the pristine and refreshing waters, making up 85.0% of participants. Engaging in underwater activities such as snorkeling and coral viewing, as well as fishing at the beaches, also holds substantial appeal, accounting for 75.8% of respondents. Furthermore, exploring historical sites and landmarks is a significant activity for 47.5% of visitors, while taking a leisurely stroll around the island, hiking mountains, and trekking through forests is enjoyed by 40.0% of tourists.

3.2. Assessing factors that attract domestic tourists to Hon Son island

To evaluate the factors that attract domestic tourists to Hon Son island, this paper has analyzed exploratory factors including 6 criteria with 25 observed variables, specifically as follows:

(1) Tourism resources (4 observed variables)

(2) Infrastructure and technical facilities (3 observed variables)

(3) Tourism service quality (5 observed variables)

(4) Human resources (4 observed variables)

(5) Security and safety (4 observed variables)

(6) Tourism service prices (5 observed variables)

To ensure the reliability of the scale and observed variables, the author uses the method of evaluating the scale's reliability. The reliability of the scales is assessed through Cronbach's Alpha coefficient. Cronbach's Alpha coefficient is used to eliminate "junk" variables. Variables with a total correlation coefficient less than 0.3 will be excluded (Nunnally, 1978; Peterson, 1994; Slater, 1995). The scale will achieve reliability when Cronbach's Alpha coefficient is greater than or equal to 0.6. The scale will reach reliability when Cronbach's Alpha coefficient is greater than 0.6. The analysis results show that non observed variables are excluded from the model because the correlation coefficient of variables is greater than 0.3.

(1) "Tourism resources" has Cronbach's Alpha coefficient of 0.885 and there are 4 variables with variable correlation coefficients ranging from 0.677 to 0.818 meeting the requirements. Hence, non observed variables are excluded from the research model.

(2) "Infrastructure and technical facilities" has Cronbach's Alpha coefficient of 0.894 and has 5 variables with variable correlation coefficients ranging from 0.719 to 0.767 meeting the requirements. Hence, non observed variables are excluded from the research model.

(3) "Tourism service quality": The Cronbach's Alpha coefficient for the scale is calculated at 0.894, indicating high internal consistency among the observed variables. Additionally,

the variable-total correlation coefficients for the five observed variables fall within the range of 0.719 to 0.767. Hence, non observed variables are excluded from the research model.

(4) "Human resources" has Cronbach's Alpha coefficient of 0.842 and there are 4 variables with variable correlation coefficients ranging from 0.642 to 0.707 meeting the requirements. Hence, non observed variables are excluded from the research model.

(5) "Security and safety" with Cronbach's Alpha coefficient of 0.878 and 4 variables with variable correlation coefficients ranging from 0.688 to 0.760 meeting the requirements. Hence, non observed variables are excluded from the research model.

(6) "Tourism service prices" has Cronbach's Alpha coefficient of 0.880 and there are 5 variables with variable correlation coefficients ranging from 0.666 to 0.765 meeting the requirements. Hence, non observed variables are excluded from the research model.

After the author evaluates the reliability of the scale, there are 6 scales of independent factors with 25 observed variables eligible to conduct exploratory factor analysis. Before conducting exploratory factor analysis, the study used the KMO test (Kaiser-Meyer-Olkin Measure of sampling adequacy) and Bartlett's Test of Sphericity to check the relevance of the research data. The results from the data test show that the KMO = 0.908, Sig = 0.000 (below 0.005 is statistically significant), the total explanatory variance is 68.067% (greater than 50%) satisfying the conditions for exploratory factor analysis.

Table 1. *KMO and Bartlett's Test*

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.908
Bartlett's Test of Sphericity	Approx. Chi-Square	2183.889	
	Df	300	
	Sig.	0.000	

Source: Results of data analysis based on direct interviews with tourists on Hon Son island in 2023, n = 120

In exploratory factor analysis, the author used the Principal Components Analysis with Varimax rotation. In order to ensure the practical significance of the exploratory factor analysis, it is necessary to remove the measurement variables with unsatisfactory factor loading coefficients for each factor. According to Hair and collaborators (1998), factor loading is an indicator to ensure the practical significance of exploratory factor analysis. Factor loading above 0.3 is considered to reach the minimum level for sample size 350, if the sample size is about 100, it is recommended to choose a factor loading above 0.55 and sample size is about 50, the factor loading must be above 0.75. In the study, the author

interviewed 120 respondents, so as the factor loading coefficient is above 0.55, the measurement variable is kept.

Table 2. *Rotated component matrix*

Observed variable	**Factor**			
	1	**1**	**1**	**1**
TN4	0.850			
TN2	0.756			
TN1	0.731			
AT2	0.708			
AT3	0.706			
TN3	0.693			
AT1	0.621			
GC3	0.573			
GC2	0.562			
HT2		0.764		
HT3		0.722		
HT1		0.678		
GC1		0.650		
GC5		0.645		
GC4		0.625		
AT4		0.592		
DV4			0.811	
DV3			0.763	
DV1			0.730	
DV5			0.712	
DV2			0.684	
NL3				0.833
NL1				0.825
NL4				0.814
NL2				0.810

Source: Results of data analysis based on direct interviews with tourists on Hon Son island in 2023, n = 120

Based on "Rotated component matrix" (Table 2), there are 4 factors attracting domestic tourists to Hon Son island, of which 25 variables all closely meet the requirements (due to factor loading coefficient > 0.55).

In order to calculate the factor score for each observed varible, we have a factor equation (according to Hoang Trong and Chu Nguyen Mong Ngoc, 2008) as follows:

$$\mathbf{Fi = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + W_{i4}X_4 + \ldots + W_{ik}X_k}$$

In which: Fi: the estimated value of factor I; Wi: factor weight; k: number of variables

Table 3. *Rotated component matrix*

Observed variable	**Factor**			
	1	**2**	**3**	**4**
TN4	0.289			
TN2	0.223			
TN1	0.229			
AT2	0.188			
AT3	0.194			
TN3	0.175			
AT1	0.112			
GC3	0.082			
GC2	0.084			
HT2		0.297		
HT3		0.256		
HT1		0.255		
GC1		0.224		
GC5		0.232		
GC4		0.178		
AT4		0.164		
DV4			0.325	
DV3			0.283	
DV1			0.256	
DV5			0.228	
DV2			0.230	
NL3				0.300
NL1				0.289
NL4				0.299
NL2				0.291

Source: Results of data analysis based on direct interviews with tourists on Hon Son island in 2023, n = 120

Based on "Factor score matrix" (Table 3), we have the following equation:

F_1 = 0,289TN4 + 0,223TN2 + 0,229TN1 + 0,188AT2 + 0,194AT3 + 0,175TN3 + 0,112AT1 + 0,082GC3 + 0,084GC2

Factor 1 is influenced by 9 observed variables: There are many attractive attractions (TN4); Indigenous culture is diverse and unique (TN2); Beautiful and attractive natural landscape (TN1); There is no price challenge (AT2); There is no theft (AT3); Characteristic and

attractive local cuisine (TN3); There is no begging or solicitation (AT1); The reasonableness of food service prices (GC3); The reasonableness of accommodation service prices (GC2). This factor can be named *"Tourism resources, security and safety"*. The observed variables all have a positive impact on factor 1, in which the observed variables TN4, TN2, TN1 have the strongest impact due to having the highest scores. This shows that the observed variables TN4, TN2, TN1 have a stronger impact on attracting domestic tourists to Hon Son island than other variables in the factor.

F2 = 0.297HT2 + 0.256HT3 + 0.255HT1 + 0.224GC1 + 0.232GC5 + 0.178GC4 + 0.164AT4

Factor 2 is influenced by 7 observed variables, specifically: Public services are fully provided (toilets, parking lots) (HT2); Assured communication system (HT3); Roads are convenient for traveling to attractions (HT1); The reasonableness of transportation service prices (GC1); The reasonableness of shopping service prices (GC5); The reasonableness of prices for sightseeing, entertainment - entertainment services (GC4); Food hygiene and safety management is well ensured (AT4). This factor can be named *"Infrastructure, technical facilities and tourism service prices"*. The observed variables all have a positive impact on factor 2, in which the observed variables HT2, HT3, HT1 have the strongest impact due to having the highest scores. This shows that the observed variables HT2, HT3, HT1 have a stronger impact on attracting domestic tourists to Hon Son island than other variables in the factor.

F3 = 0.325DV4 + 0.283DV3 + 0.256DV1 + 0.228DV5 + 0.230DV2

Factor 3 is influenced by 5 observed variables, specifically: Diverse, attractive and unique sightseeing, entertainment - entertainment services (DV4); Food service locations provide delicious, clean and hygienic food (DV3); Modern and safe means of transportation (DV1); Easy shopping service, diverse items and souvenirs (DV5); The accommodation facility is clean, airy and fully equipped (DV2). This factor can be named *"Tourism service quality"*. The observed variables all have a positive impact on factor 3, in which variables DV4 and DV3 have the strongest impact due to having the highest scores. This shows that the observed variables DV4 and DV3 have a stronger impact on attracting domestic tourists to Hon Son island other variables in the factor.

F4 = 0.300NL3 + 0.289NL1 + 0.299NL4 + 0.291NL2

Factor 4 is influenced by 4 observed variables, specifically: Tour guides have high professional qualifications and good skills (NL3); Local people are friendly, polite and hospitable (NL1); Service staff have professional qualifications, good professional skills and are ready to meet the reasonable needs of tourists (NL4); Friendly, polite and professional

tour guide (NL2). This factor can be named *"Human resources"*. The observed variables all have a positive impact on factor 4, in which variables NL3 and NL4 have the strongest impact due to having the highest scores. This shows that the observed variables NL3 and NL4 have a stronger impact on attracting domestic tourists to Hon Son island than other variables in the factor.Upon assessing the scale's reliability and conducting exploratory factor analysis, the authors identified four distinct factors that capture the appeal of Hon Son island for domestic tourists, such as "*Tourism resources, security and safety"; "Infrastructure, technical facilities and tourism service prices"; "Tourism service quality"; and* "*Human resources".*

3.3. Evaluating the attractiveness level of factors for domestic tourists

To accurately evaluate the factors that attract domestic tourists to Hon Son, the authors conducted descriptive statistical analysis for observed variables of 4 factors through evaluation of 120 domestic tourists. Observed variables are measured on a 5-level Likert scale: ① Completely disagree, ② Disagree, ③ Neutral, ④ Agree, ⑤ Completely agree.

To facilitate the evaluation, the author makes the following convention:

1.0 ≤ Mean ≤ 1.8 : "Low" level

1.81 ≤ Mean ≤ 2.6 : "Average" level

2.61 ≤ Mean ≤ 3.4 : "Good" level

3.41 ≤ Mean ≤ 4.2 : "Good" level

4.21 ≤ Mean ≤ 5.0 : "Very good" level

The attractiveness level of the factor *"Tourism resources, security and safety"* is rated by tourists as "Good" with an average value of 4.09. That shows that tourism resources, security and safety on Hon Son island have a good influence on tourist attraction. According to assessment results, tourists are attracted by all attributes related to tourism resources, security and safety on Hon Son island, especially the beautiful natural landscape. and attractive (Mean = 4.17) and diverse and unique indigenous culture (Mean = 4.18).

The attractiveness level of the factor "*Infrastructure, technical facilities and tourism service prices"*" is rated by tourists as "Good" with an average value of 4.11. This shows that the infrastructure, physical and technical facilities and prices of tourism services on Hon Son island have a positive impact on tourists. According to the assessment results, domestic tourists are attracted by attributes related to infrastructure, physical and technical facilities and prices of tourism services on Hon Son island, especially the reasonableness of prices for sightseeing, entertainment - entertainment services and the reasonableness of prices for shopping services (Mean = 4.20 and Mean = 4.16, respectively) and the reasonableness of

transportation service prices (Mean = 4.15).The level of attractiveness of the *"Tourism service quality"* factor was evaluated by tourists as "Good" with an average value of 3.96. This indicates that the quality of tourist services on Hon Son island, has a positive impact on attracting tourists. The evaluation results reveal that the attributes related to tourist service quality that are deemed attractive to tourists during their trip to Hon Son island, are primarily convenient and diverse shopping services, as well as souvenir options (Mean = 3.99).The overall attractiveness level of the factor *"Human resources"* is rated by tourists as "Good" with an average value of 3.89. That shows that the quality of human resources on Hon Son island, has a good influence on tourist attraction. According to the assessment results, tourists are attracted by all attributes related to the quality of human resources on the island, especially tour guides with high professional qualifications and good skills (Mean = 3.94).According to the research findings, the evaluation of tourist satisfaction with the destination of Hon Son island was conducted among 120 tourists, resulting in the following distribution: The highest proportion, accounting for 45%, consisted of 54 satisfied tourists. Following closely behind, 43.3% of tourists (52 individuals) expressed a high level of satisfaction with the destination. Additionally, 9.2% of tourists (11 individuals) rated the island as an average tourist destination. On the other hand, a small percentage of tourists, 2.5% (3 individuals), expressed a significantly low level of satisfaction with the destination. Moreover, over 80% of domestic tourists have expressed their intentions to return to Hon Son island in the future.

4. Conclusion

Hon Son island is an undiscovered gem that holds great potential for tourism development. This destination possesses the characteristics of marine tourism, which is a focal point for investment, exploitation, and development not only in Hon Son island, Kien Hai district, but also in Kien Giang province. The island's pristine natural landscapes provide a favorable foundation for tourism growth.Through comprehensive data collection, analysis, and evaluation methods, this research has established a theoretical framework on tourism and the allure of tourist destinations. It has examined identified the factors that attract domestic tourists, and proposed directions for future tourism development on the island. Additionally, solutions to enhance the island's appeal to domestic tourists have been offered. The study has identified 4 key factors that attract domestic tourists to Hon Son Island: (1) Tourism resources, security and safety; (2) Infrastructure, technical facilities and tourism service prices; (3) Tourism service quality; and (4) Human resources. These research outcomes not only provide a comprehensive understanding of tourism aspects on Hon Son Island but also

serve as a crucial practical foundation for local authorities to implement effective plans for tourism development. This will enhance the island's competitiveness among other destinations within the region and nationwide.

5. Suggestions

5.1. For local authorities

Developing a plan to implement the Kien Hai district tourism development project until 2025, with a vision to 2030 in each specific period; planning the development of tourist destinations in accordance with the overall planning of the island district, promoting the implementation of investment projects and construction of planned tourist destinations; Planning for development of infrastructure and physical - technical facilities to serve tourism, promoting the implementation of investment projects, building infrastructure and physical - technical facilities to serve tourism have been planned such as: traffic system, communication system, public transport system, standard hotel to serve tourists, standard restaurant to serve tourists,... and other items. other; Develop preferential mechanisms and policies to attract domestic and foreign individuals and organizations to invest in island tourism development projects.Strengthening the implementation of training and fostering existing tourism human resources in many forms, such as: organizing sharing sessions, organizing study groups, organizing training classes,...; Strengthen the implementation of inspection and supervision of tourism service establishments on compliance with regulations on tourism service business to serve tourists; Strengthen the implementation of linkage and coordination with travel service businesses to build tourism programs connecting tourist destinations on the island and connecting the island with neighboring localities; Strengthen the implementation of research and building a separate tourism brand for Hon Son island; Strengthen the implementation of advertising and promotion of marine tourism on the island in many forms, such as: posting articles, images, videos, linking with stations such as reports, television memoirs, and productions. publish tourism publications,... on electronic portals or mass media such as newspapers, radio, social networks,...; organize forums, conferences, seminars, fairs, exhibitions, etc. domestically and internationally; Strengthen the implementation of propaganda and education to raise awareness about tourism for those involved in tourism activities, specifically individuals, organizations participating in tourism business activities, and local communities. local residents and tourists.

5.2. For local community

Having a polite, warm and friendly attitude towards tourists; Be responsible and conscious in preserving tourism resources and protecting the landscape environment around tourist

destinations and throughout the island; Actively participate in local tourism activities and contribute ideas to local tourism development.

Having correct perceptions about tourism and tourism business, avoid profiteering that causes loss of the destination's image in the hearts of tourists; Invest in expanding and regularly upgrading facilities (accommodation, souvenir shops, restaurants, eateries, etc.) while researching the market and tourists' needs to promptly innovate and respond.*5.3. For individuals and organizations participating in tourism activities*Improving and enhance professional knowledge and professional skills to serve tourists; Investing and upgrading physical and technical facilities to ensure service standards and the increasing needs of tourists.Travel agencies need to pay more attention to offering tourist programs on the island that are reasonable, impressive and bring the most interesting experiences to tourists; offering tour programs linked to tourist destinations in the province and more broadly in the Mekong Delta; Need to emphasize the issue of promoting and offering tours to your potential customers. Helping tourists know about Hon Son island for its wild but extremely impressive beauty, thereby stimulating curiosity from tourists, deepening the psychology of gradually increasing numbers of tourists visiting the island.

5.4. For tourists

Do not commit acts that harm the natural landscape on the island, such as: stealing or breaking coral; Take rocks from beach areas as souvenirs; breaking and cutting down forest trees when climbing mountains, etc.; Be conscious of environmental protection when going on a trip to the island, do not throw trash or personal items into the sea and sightseeing areas; In addition, it is necessary to encourage tourists to fish or release marine animals into the natural environment in order to protect the diversity in quantity and species towards sustainable tourism development.

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VERB DERIVATION WITH THE PREFIX VER- IN GERMAN AND THE POSSIBILITIES OF THEIR TEXTUAL REALISATION IN ALBANIAN AND ENGLISH LANGUAGE

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Abstract
The word formation of the verb in German is very productive compared to the other world languages. This linguistic phenomenon can be very misleading, especially when learning German. So, the main purpose of this article is to recognize how the word formation process in German is manifold and how to deal with the German verbs, especially with the verbs with prefix ver- and their concrete textual realization in Albanian and English.This work does not serve as an instruction on how to form new German verbs can be formed, but primarily discusses the process of semantics from which can be used as a basis for derivations, and which could help foreign language learners to expand their vocabulary for foreign language learners. Understanding the systematics of the German verb prefix ver- can help non-speakers to find their way around the extensive lexicon of German verbs more easily.
Keywords: German language, Albanian language, Englisch language, verb derivation, prefix verbs, prefix ver-

Aim, methodology and the structure of this paperwork

On the one hand, this work is a contrastive study of three genetically related languages - German, Albanian and English (the three Indo-European languages) - in the field of verb word formation; on the other hand, it is of didactic and methodological interest: Mastering grammatical knowledge during the course of study is subject to a dull abstraction if it is not of use to prospective teachers in being able to teach the foreign language pragmatically. The word formation of the verb in German, in contrast to Albanian and English, is very productive and this linguistic phenomenon can be very misleading, especially in the acquisition of German by Albanian and English learners. From our personal experience as teachers of German, we have noticed that learners have difficulties in understanding the meaning of prefix verbs and their appropriate use in the text. *schließen* and *verschließen, ziehen* and *einziehen, denken and gedenken*, etc. have the same meaning for the Learners. Therefore, we decided to study German verbs with the prefix ver- and to contribute to this field in many ways: lexically, semantically, and pragmatically.In terms of methodology, we approach the problem in a practical way, analysing the realization of German verbs with the prefix ver- through concrete conversational examples and situations in Albanian and English.This paperwork is divided in two parts: the theoretical part, where the notion of word formation of verbs in German, Albanian and English is clarified, with special emphasis on German verbs with the prefix ver- compared to Albanian and English (section 2 and 3) and the empirical part, in which, through concrete examples, a list of the most useful verbs in the DaF lessons is given and the possibilities of their concrete realization in Albanian and German (section 4).

2 Word formation of verbs in German and the ways of its textual realization in Albanian and Englisch language

No other language in the world has such a productive verb formation system as German. Several lexemes, i.e. words, can be formed from a basic lexeme. For example: ziehen – einziehen, anziehen, ausziehen, umziehen, beziehen, usw. Each prefix leads to a new meaning, which in Albanian, English, and other languages can be represented by completely different lexemes or words. Thus ‘anziehen’ in Albanian is ‘vishem’, Englisch ‘to dress’, umziehen – ‘shpërngulem’, ‘I move’, beziehen – ‘I referohem dikujt a diçkaje’, ‘I refer to’, etc.In German, there are two ways of word formation of the verbs: Composition and Derivation.The fusion of at least two words in grammatical theories is called composition (Duden 4, 2006:1178).In German, there are different ways of composing verbs (Elsen 2011:207):

- **Verb + Verb** compounds: liegen lassen, sitzen bleiben, kennen lernen (*after the 2005 language reform, they are no longer written together*). In Albanian and English, this type of verb + verb compound are also possible: rri shtrirë (Engl. 'to lie down'), rri ulur ('to sit down'), only 'kennen lernen' is rendered by a single lexeme in Albanian: 'njoh' and in Englisch is realized with the verb 'get': to get know sb'.
- **Noun + verb** compounds: radfahren, leidtun, standhalten, teilnehmen, handhaben, haushalten, maßregeln, etc.

According to Gramatika e Akademisë 1 (2002:354), it is possible to combine the noun with a verb. Examples: buzëqesh (buzë + qesh, N+V) – In German and Englisch realized only through one lexeme: lächeln, to smile, duartrokas (duar + trokas, N+V) – In German and Englisch: klatschen, to clap, udhëheq (udhë + heq, N+V) – In German and Englisch, führen, to lead, etc. But in Albanian, such German composites cannot be realized 1:1 (as the examples above show). The composition 'radfahren' is written separately in Albanian and is not to be seen as a composition, since the verb 'vozis' (drive, fahren) can also be combined with other nouns: vozis biçikletë, autobus, veturë, etc.. The other compositions are not the same in Albanian either: leidtun (më vjen keq), teilnehmen (marr pjesë), etc.

- **Adjective + verb** compounds: blankputzen, freihalten, krankschreiben, richtigstellen, heimlichtun, schwerfallen, festbinden, aufrechterhalten, geheimhalten, tiefkühlen, kurzarbeiten, frühstücken, etc.

In Albanian this group is compounded adverb + verb (for more on this, see Gramatika e Akademisë 1, ibid.).

The English refers to some German compositions and to some not: blankputzen – to polish, freihalten – to keep free, heimlichtun – to do it correctly, festbinden – tie up, and always in Englisch the equivalent forms are written separately.

- **Adverb + verb - compounds:** herbeikommen, herumlaufen, dahersagen, zurückblicken, etc.

Such compounds are also possible in Albanian and Englisch: herumlaufen - vij vërdallë (to walk around), zurückblicken- shikoj pas (to look back), but they are always written separately in Albanian and Englisch.

The **derivation** of the verb is a special feature of the German language, but at the same time this phenomenon causes many difficulties for learners of German, as each prefix brings with it a new meaning and so the derivation of the verb can lead to misdirection in the reception and production of texts.

There are numerous verb prefixes in German. They are divided into 'trennbare' und 'untrennbare' prefixes, (separable and inseparable). The separable prefixes are always stressed, and the following prefixes are used:

ab- (abreisen, abfallen, abfahren, abwerten, abwischen)

an- (ankommen, anblicken, anspannen, ankreuzen)

auf- (aufblühen, aufmachen, aufprallen, aufheben)

aus- (auswandern, ausheilen, aussterben, auslachen, ausruhen)

bei- (beifügen, beistehen, beisetzen)

dar- (darstellen, darbieten, darlegen)

ein- (einschlafen, einsteigen, eingehen, einstellen)

mit- (mitfahren, mitkommen, mitmachen, mitteilen)

nach- (nachkommen, nachgehen, nachahmen, nachweisen)

vor- (vorkommen, vorsorgen, vorbereiten, vorsingen, vorlesen)

zu- (zukommen, zuzahlen, zudrehen, zurufen)

The inseparable prefixes are always unstressed, and it is about the following prefixes:

be- (besohlen, bedachen, beglückwünschen, bemuttern, befreien, beengen, bepflanzen, befragen, befürchten, bejahen).

ent- (entthronen, entkleiden, entziffern, entmutigen, entfernen, enttäuschen).

er- (erwürgen, erheben, erklären, erfrischen, erkälten, ertragen)

miss- (misslingen, missglücken, missdeuten, missverstehen)

ver- (verglasen, verstehen, verfilmen, verblühen, vermeiden)

zer- (zerfleischen, zerreissen, zerstücken, zerschneiden)

However, there are also prefixes that are separable and inseparable, and they are stressed or unstressed depending on whether they are separable or inseparable (for more on this, see Duden 4, 2006:1178):

durch- (durchgehen, durchlesen, durchfallen, durchbraten)

über- (übernachten, überlisten, übersetzen, überlegen, übergeben)

um- (umarmen, umbinden, umfahren, umgeben)

unter- (untergehen, unterliegen, unterschreiben, unterschätzen)

voll- (vollenden, vollziehen, vollbringen, vollfressen)

wieder- (wiederbringen, wiederholen, wiedersehen)

Example: Ich **habe** ein neues Buch **übersetzt** – I've translated a new book.

Der Fährmann ***hat*** den Passagier ***übergesetzt*** (über den Fluss gesetzt).

The ferryman ferried the passenger across the river.

Due to the frequency of use, we have focused on the prefix ver- and the ways of its textual realization in Albanian and English.

3 The prefix ver- in German language

In the Digital Dictionary of the German Language (https://www.dwds.de/wb/ver-) are listed the semantic implications of ver-. Thus, the prefix ver-

1. expresses in formations with nouns or adjectives and an ending that a person or thing changes (in the course of time) into sth. (which is named in the noun or adjective)
2. in formations with nouns or adjectives and an ending, expresses that a person or thing is made into sth., put into a certain state, transformed into sth.
3. in formations with nouns and an ending, expresses that a person or thing is provided with sth.
4. in formations with verbs, expresses that a thing is removed, used up, no longer exists through sth. (an action)
5. expresses in formations with verbs that a person spends their time with sth.
6. expresses in formations with verbs that a person does sth. wrongly, incorrectly
7. expresses in formations with verbs that a thing is affected by sth.
8. has the same meaning as this in formations with verbs

The prefix ver- can be divided into two categories. In other words, the prefix ver- combines with bound roots when forming nouns and is considered a root prefix.

Example: ver + Noun: Ver + gnügen, Ver + ständnis (root level)
ver + Verb: ver + trag(en) (stem level)

In verbal prefixes, the prefix ver- is considered a root prefix.

Examples: ver + acht(en), ver + alt(en), ver + ehre(n),... ver + bau(en), ver + berg(en), ver + besser(n), ver + beug(en), ver + biet(en) ver + jubel(n), ver + jüng(en), etc.

Apart from the addition of the prefix ver- in native stems, it can also be added to foreign stems ending in the suffix -ier.

Examples:

ver + non-native root + non-native root suffix

ver + absolut + ier(en), ver + auktion + ier(en), ver + barrikad + ier(en),
ver + bürokrat + isier(en), ver + gallop + ier(en), ver + kalkul + ier(en),
ver + klausul + ier(en), ver + kompliz + ier(en), ver + konsum + ier(en),
ver + proletar + isier(en), ver + proviant + ier(en), ver + telefon + ier(en)

The prefix ver- is added to stems that are derived from other native prefixes. The stem absolutive shows a bound stem after the non-native suffixation. This means that the non-native suffix -ier is a non-native root suffix. The non-native suffixation takes place before the native prefixation. The following examples consist of native roots and the non-native root suffix -ier.

Examples:

ver + native root + non-native root suffix

ver + dünn + isier(en), ver + hof + ier(en), ver + schimpf + ier(en)

The prefigured verb ver-lier(en) is considered a marked case, as the prefix ver- is added to the bound base. This example cannot be explained by subcategorization. With multiple prefigurations it becomes clear that the stems are used recursively. The prefigured words Ur-sache, Ur-teil, Un-fall, Un-glück and Un-kraut are used as lexical entries in further ver-prefiguring.

Examples:

ver + native prefixes + native stems

a. ver + be + amt(en), *be + ver + amt(en), ver + un + fall(en), ver + ur + sach(en),
ver + ur + teil(en), ver + un + kraut(en), *un + glück(en), *un + fall(en)

b. ver + ge + walt + ig(en)

The native prefixes be- and ge- are closer to the root than the native prefix ver-. The derived stems be-amt and ge-walt are lexical entries that are entered in the lexicon as fixed words. The prefix ver- is only added afterwards. The native prefixes un- and ur- are closer to the root than the prefix ver-. The prefix ver- is affixed after the native prefix un- has been added to the bases.

Examples: ver + ab + red(s), ver + änder(n), ver + be + amt(en), ver + ge + waltig(en)

4 Verbs with the prefix ver- and the possibilities of their textual realization in Albanian and English Language

According to DWDS (see online at https://www.dwds.de/wb/ver-), the prefixations of the verb with ver- are often used in German in text constitution. There are a total of 323 verbs that are in use.

Albanian language has the equivalent prefix për-, which can only take up a few German verbs in the same form.

Examples: verarbeiten – përpunoj, verschreiben – përshkruaj, verwenden – përdor, verachten – përbuz, verbluten – përgjak, verkippen – përmbys,

verkleben – përngjit, përqesh – verspotten bzw. verlachen,

përthan – vertrocknen, u.a.

In Englisch language there is the equivalent prefix pre-, but only the verb ‘verschreiben’ can be realized through the prefix pre-: ‘prescribe’, the other ones through new lexemes: verarbeiten – process, verwenden – use, verachten – despise, verbluten – bleed to death, verkippen – tilt, verkleben – glue, verspotten – mock, vertrocknen – dry up, etc.

However, the prefixations with për- in Albanian can also be achieved by other lexemes in German.

Examples: përjashtoj – ausschliessen, exclude bzw. entfernen, remove, përgatit – vorbereiten, përpare, përllogarit – zusammenzählen bzw. auszählen, ad up, përlyen – beflecken, stain, përmallon – ergreifen, miss sb., përmban – enthalten, contain, përmbaroj – vollenden, complete, përmbledh – aufsammeln, collect, përmbush – erfüllen, fulfill, përmbyt – überschwemmen bzw. überflüten, flood, përmend – erwähnen bzw. zitieren, mention, citate, përmirësoj – korrigieren, correct, përparon – vorangehen, progres, përpilon – zusammenstellen, compile, përpin – verschlingen, devour,

përpiqet – sich bemühen, try, përplas – zusammenstossen, collide, përputh – einpassen, fit, përqafon – sich umarmen, embrace, hug, përqas – vergleichen, compare, përqendroj – konzentrieren, concentrate, përsërit – wiederholen, repeat, përsiat – überdenken, think, përsos – vollenden, complete, pështjell – umhüllen, envelope, përtërij – erneuern, renew, përthith – einsaugen, suck in, përul – demütigen, humble, përvetësoj – aneignen, acquire, përvijoj – skizzieren, scetch, etc.

The same thing happens with the prefix pre – in the English language. There is no match with the German ver-: preadapt – voradaptieren, para-përshtat, prefer – bevorzugen, parapëlqej, pretend – vorgeben, synoj, etc.

Some verb prefixes with ver- in German can also function by prefiguring with zh- in Albanian.

Examples: versetzen – zhvendos, put, be transferred, verstimmt sein – zhangllon, be out of tune, verbrennen – zhaparit, burn, veräußern – shet, zhbën, sell, verschwinden – zhduk, disapper, etc.

However, most verb prefixes with ver- are resumed in Albanian and English by completely independent lexemes (without prefixes).

Examples: verstehen – kuptoj, understand, vertauschen – ndërroj, këmbej, change, verhängen – var, hang, verabschieden – ndahem, say goodbye, verdecken - mbuloj, cover,

verbinden – lidh, connect, tie up, verbleiben – rri, remain, verbrauchen - harxhoj, consume, verdeutlichen - sqaroj, clarify, etc.

Conclusion

The aim of this article is to contribute to contrastive German-Albanian-English linguistics in the field of verb formation. Verb formation in German is very productive, which is not the case in Albanian and English. Prefixation is a unique feature of the German language and cannot function 1:1 in Albanian and English.

As already outlined, it is hardly possible to transfer verbs with the German prefix ver- more consistently in Albanian and English; this happens through completely new lexemes in the text constitution.

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EVALUATING THE PERFORMANCE OF VARIOUS SHADING DEVICES ON DAYLIGHTING AND VISUAL COMFORT IN THE TEMPERATE DRY CLIMATE OF NIGERIA

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Abstract
Architects and researchers have chosen various shading devices to reduce glare and overheating in indoor buildings. For example, many have recommended vertical shading devices for the Eastern and Western facades and horizontal shading devices for the northern and southern facades. Others have recommended overhang projection factors while more on egg-crate shading devices. This research is aimed at evaluating the influence of various shading devices on daylighting for indoor visual comfort in the temperate dry climate of Nigeria. It was achieved by evaluating the range of values for horizontal overhang, horizontal fin, horizontal angle fin, horizontal louvers, Egg-crate, and vertical fin shadings with their corresponding average mean values of Daylight Autonomy (DA) and their percentage DA reduction. Data was collected from the simulation of the prototype single-bank building using Google Sketch-Up 2022 and Open-Studio simulation tool which was done on the hypothetical sites devoid of surrounding buildings and trees, in Zaria Nigeria. It was then analyzed using MANOVA, bar charts, column charts, graphs, and tables with a significance threshold of 0.05. The research assumed that, for a room to be visually comfortable, the Shading device must admit a minimum recommended DA value of 60% and DA percentage reduction of less than 40%. The findings revealed that each of the shading devices has a different performance for daylighting and visual comfort and it is statistically significant: DA *($F(5, 18) = 217.64$; $p < .000$; partial $\eta 2 = .984$),* and rDA *($F(5, 18) = 241.65$; $p < .0000$; partial $\eta 2 = .85$).*
Keywords: Daylight autonomy, DA percentage reduction, Shading device, Single-banked building.

Introduction

There are broadly two types of solar shading devices which are: the external; and the internal solar shading devices. The external solar shades have proved to be more effective in reducing heat gains, glare, and eventually energy demands for a variety of climates (Dakheel & Aoul, 2017). Fixed shading devices can be horizontal, vertical, or a combination of both, commonly called an "egg crate." Fixed shading has several advantages over movable shading, so its potential for application in building energy efficiency should be considered. First, fixed shading is relatively inexpensive and easy to install and maintain. Secondly, fixed shading has a longer lifespan and can maintain its shading effect over a long period (Lechner, 2014). As a result, most buildings still use fixed shading designs.Different performances have been recorded from various shading devices by many researchers and architects to reduce glare and overheating in indoor buildings. For example, Syma, (2015) noted a 5% to 15% reduction in indoor energy depending on the type of shading device. Lee, Han, and Lee, (2017) noted that, as a rule of thumb, horizontal louvers are very effective shading devices for the northern and southern facades, while vertical louvers for eastern and western facades. Others have recommended overhang projection factors while more on egg-crate shading devices. This research is aimed at evaluating the influence of various shading devices on daylighting for indoor visual comfort in the temperate dry climate of Nigeria. It was achieved by evaluating the range of values for horizontal overhang, horizontal fin, horizontal angle fin, horizontal louvers, Egg-crate, and vertical fin shadings with their corresponding average mean values of Daylight Autonomy (DA) and their percentage DA reduction. These brought about the following hypothesis: the null hypothesis (H_O) stated that the mean performance of all shading devices in a building is significantly the same for all building elevations in the temperate dry climate of Nigeria; The alternative hypothesis (H_I) stated that the mean performance of all shading devices in a building is significantly different for at least one of the building façades in the temperate dry climate of Nigeria.

2.0 Concept of Comfort

Comfort is very complex and has diverse connotations depending on the context to which one is referring. Chappells and Shovel, (2004) identified six (6) different contexts of comfort, which include: comfort, in the context of technology and society; comfort and the indoor environment; comfort and the outdoor climate; comfort, in health and wellbeing; comfort, in culture and social convention and comfort and climate change. Kolcaba, (2010) described comfort as existing in three (3) forms: relief, ease, and transcendence. She described four (4) contexts in which one's comfort can occur: physical, psycho-spiritual,

environmental, and sociocultural. Holistic comfort is defined by Kolcaba, (2010) as the immediate experience of being strengthened through having the needs for relief, ease, and transcendence met in four contexts of experience. Many studies have shown that people prefer to live within a wider temperature range than contrary (ASHRAE standard 55, 2015) and this is possible within a natural environmental setting. Therefore, human beings prefer natural indoor environmental comfort to artificial, such as temperature, relative humidity, and daylighting. A literature review has shown that thermal comfort, and daylighting, are the main parameters in determining passive indoor environmental comfort in tropical climates (Sakellaris, *et a*l, 2016). Daylight is the total direct and indirect light originating from the sun during daytime that affects the visual and non-visual comfort of the building occupants. Daylighting is a term used to mean the controlled use of natural light in and around buildings (Reinhart, 2014). The effects of daylight on building users can be categorized into two: visual effect, (which enables people to see the world to interact with it, enhances human performance, health, well-being, and productivity (Edwards & Torcellini, 2002); and Non-visual effect, (which has vast impacts on human behaviours such as alleviating seasonal depression (Rosen et al, 1990), reduction of anxiety and depression (Öztürk, Moreno & Lowden, 2017), reducing risk in Cardiovascular disease (Yamada., Hara, Shojima, Yamauchi & Kadowaki, 2015), to mention a few). However, daylight can cause distracting glare and bring in heat that can cause temperature imbalances in the room if not properly controlled. Many researchers have used different methods of controlling daylight in tropical buildings like Nigeria such as reducing the aperture for solar penetration, glazing as well as shading as illustrated in Figure 1.

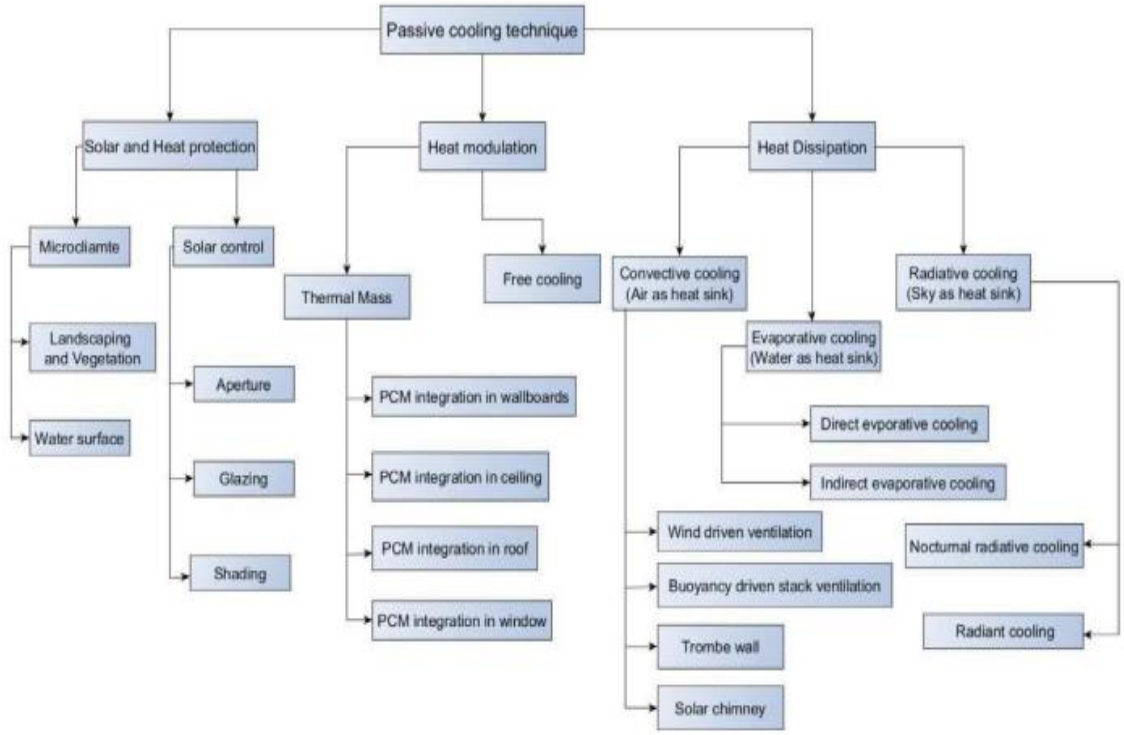


Figure 1. Classifications of Passive Cooling Techniques

Source; Bhamare, Rathod, & Banerjee, (2019).

Climate classifications can be grouped into three essential types, which are: empiric; genetic; and applied climate classifications (Guglielmetti, Macumber, & Long, 2011). This depends on type of the data used for classification. Köppen's and Miller's climate classifications were based on vegetation while Thornthwaites' was based on agriculture, and Atkinson's was based on thermal comfort. Koenigsberger, Ingersoll, Mayhew, and Szokolay, (2013) have observed that most climate categorizations that are based on human comfort have their origin in Atkinson's (1953) classification, such as Koenigsberger's, Komolafe, and Agwal's classifications, Olufowobi's, Szokolay's, Ogunsote and Prucnal-Ogunsote's climate classifications and Mobolade and Pourvahidi (2020) classification. The research has adopted the Mobolade and Pourvahidi (2020) climate classification as it is the only one that factored temperature, relative humidity, mean radiant temperature, and wind velocity as its determinants. Therefore, its classification is based on the Comfort and Bioclimatic Approach, as shown in Figure 2.

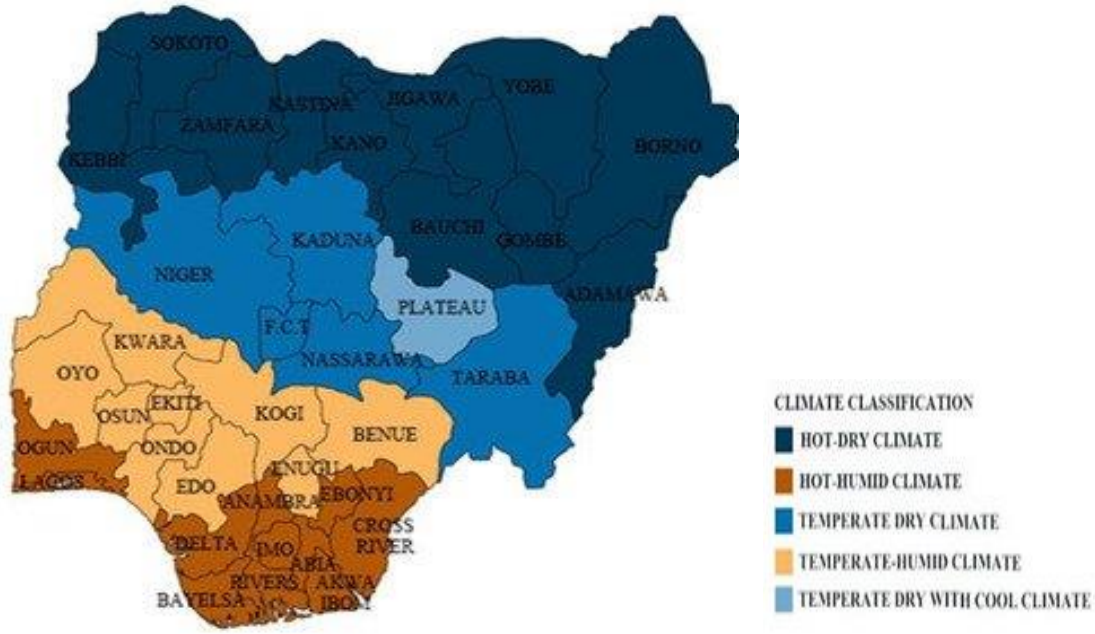


Fig. 2.. Classification of the Nigerian climate Mobolade and Pourvahidi (2020).

3.0 Methodology

To evaluate the Performance of six different types of shading devices on daylighting for visual comfort, as the most commonly used shading device in the temperate dry climate of Nigeria. These are; horizontal overhang, horizontal fin, horizontal angle fin, horizontal louvers, Egg-crate shading, and vertical fin shading devices. A quantitative research design and an explorative design approach were employed using an experimental research strategy through the simulation method was used in the research. Data was collected from the simulation of the prototype single-bank building using Google Sketch-Up 2022 and Open-Studio simulation tool which was done on the hypothetical sites devoid of surrounding buildings and trees, in Zaria Nigeria. It was then analyzed using MANOVA, bar charts, column charts, graphs, and tables with a significance threshold of 0.05. The research assumed that, for a room to be visually comfortable, the Shading device must admit a minimum recommended DA value of 60% and a DA percentage reduction of less than 40%. Consequently, the performance of shading devices was categorized as "***low"*** with DA percentage reduction of 0% to 09% and DA ≥ 60%; "***medium"*** with DA percentage reduction of 10 % to 19 % and DA ≥ 60%; "***Adequate"*** with DA percentage reduction of 20 % to 29% and DA ≥ 60%; "***Satisfactory***" with DA percentage reduction of 30% to 39% and DA ≥ 60%; and "***Over***" with DA percentage reduction of 40% to 100% and DA ≥ 60%.

4.0 Findings and Discussion

The data collected is tabulated and summarized in Table 1 below:

Table 1. Performance of various shading devices for visual comfort in the temperate dry climate of Nigeria.

S/No	Shading devices	North		South		East		West	
		DA	$_r$DA	DA	$_r$DA	DA	$_r$DA	DA	$_r$DA
		%	%	%	%	%	%	%	%
1	Horizontal Overhang	96.6	2.1	98.9	0.6	97.3	2.2	98.2	1.4
2	Horizontal Fin Shading	68.4	30	82.3	17	78	21.6	77.6	22
3	Horizontal Angle Fin Shading	3.5	96	11.3	88.6	13	86.9	11	88.1
4	Horizontal Louvers	94.8	3.9	98.3	1.2	96.8	2.7	97.3	2.3
5	Egg-Crate Shading	21.3	78	34.3	65.6	40.2	59.6	37.2	62.5
6	Vertical Fin Shading	77.3	21.6	88.5	11	84.1	15.4	84.1	15.5

The results indicate that the best shading device for all four elevations (northern, southern, eastern, and western facades) is the *Horizontal Fin*, followed by the *Vertical Fin Shading* device though in different levels of performance. For example, the performance of Horizontal Fin is found to be "*Satisfactory"* in the northern façade with DA percentage reduction of 20 % to 29% and DA ≥ 60%; "*medium*" in the southern facade with DA percentage reduction of 17% and DA of 82.3%; and "*adequate"* in the eastern and western façades with DA percentage reduction within the range of 20 % to 29% and DA ≥ 60% as indicated in Figure 3.

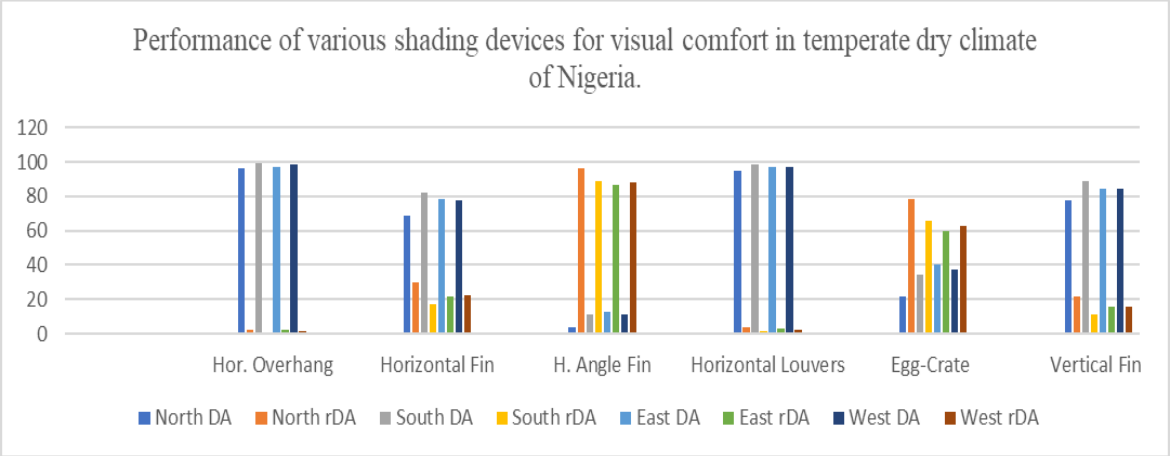


Figure 3. Performance of various shading devices for visual comfort in the temperate dry climate of Nigeria.

Performance of Overhang shading is very "low" in all elevations with a DA percentage reduction of less than 2.5% and DA ≥ 96.6%. However, *Horizontal Ange Fin* and *Egg-Crate Shading devices* have "Over" performed, with a DA percentage reduction of above 59% and DA less than 45% in all facades as shown in Figure 2. The performance of the Horizontal louvers shading device is "low" in all elevations with a DA percentage reduction of less than 4% and DA ≥ 96.8%;

3.1 Hypothesis Testing

H_{01}: The null hypothesis states that the mean performance of all shading devices in a building is significantly the same for all building elevations in the temperate dry climate of Nigeria; The alternative hypothesis (H_I) states that the mean performance of all shading devices in a building is significantly different for at least one of the building façades in temperate dry climate of Nigeria.The data were examined for skewness and kurtosis to test the hypothesis, and it was discovered that they fell within George and Mallery's (2010) acceptable range of values. One-way MANOVA was used to analyze the performance of various shading devices that differs from one elevation to another significantly in one or more of the visual comfort indicators**.** The homogeneity of variance-covariance matrices was tested using Box's Test of Equality of Covariance Matrices and the Box's M value obtained was 26.840 with a p-value of .212, which was interpreted as non-significant based on Huberty and Petosky's (2000) guidelines. Therefore, the covariance matrices of the dependent variables were equal across groups for MANOVA. It was tested and a statistically significant difference was obtained, $F(10, 34) = 31.71$, $p < .000$; Wilk's $\Lambda = .009$, partial $\eta 2 = .903$. Hence since there were more than two (2) levels of the independent variable, there was a need to determine where the differences truly came from, which brought about the need for posthoc test. A

homogeneity for variance assumptions was tested for all the variables before conducting a series of tests between the subject effects. Based on a series of Levene's F test, it was considered satisfactory. A series of one-way ANOVAs on each of the Visual comfort indicators was conducted as a follow-up test to the MANOVA. The results turned out to be statistically significant in all the two visual comfort indicators: DA *(F (5, 18) = 217.64; p < .000; partial η2 = .984),* and rDA *(F (5, 18) = 241.65; p < .0000; partial η2 = .85).*

5.0 Conclusion

The research has concluded that Shading devices for daylighting and visual comfort have different performances in different facades and there is a need to know their performances in each elevation before they are used.

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JUDICIAL PROCEDURE FOR THE PROTECTION OF ENVIRONMENTAL LAW AND ORDER IN THE REPUBLIC OF KAZAKHSTAN: PROBLEMS OF THEORY AND PRACTICE

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Annotation
The most important guarantee of the realization of the right to protection is the accessibility of justice. The article examines the problems of ensuring the right to access to justice, which enshrines the obligation of the state to legally and actually ensure the possibility of using this right to judicial protection in a real process. Human rights and their protection are one of the most important problems of the legal, political and cultural side of society and the State.
Keywords: Protection of rights, access to justice, environmental rights, the right to a favorable environment.

INTRODUCTION.

The nature of the mechanisms for the realization and protection of human rights is the result of the activities of thinkers of various scientific fields for more than a century. The concepts of human rights, equality among people, protection of violated rights, etc. are a vivid expression of ideas about the protection of the socio-legal status of a person in modern society [1]. The global problem of environmental protection from pollution and degradation, the problem of human survival, cannot be successfully solved through the activities of State institutions alone. Private initiative in protecting the right to a favorable environment is considered one of the central principles of global sustainable development.An important guarantee of the realization of citizens' environmental rights is access to justice for citizens in matters of protecting citizens' environmental rights. Ensuring the right of citizens to judicial protection is an essential feature of the rule of law. Ensuring access to justice for the protection of environmental rights of citizens is a task that is related not only to the activities of national judicial systems, but also depends on the effectiveness of international human rights protection mechanisms. Respect for the universally recognized principles and norms of international law is a prerequisite for integration and membership in the international community. In accordance with this, knowledge of the principles and norms of international law on the protection of environmental rights of citizens and bringing into line with them national legislation on the protection of environmental rights of citizens, including the creation of a new system of procedural guarantees of human and civil rights in the field of legal proceedings on environmental issues is an important step towards building a democratic rule of law State.

RESEARCH. The right to a fair trial is a fundamental human right. This is one of the universally applied principles, which is the cornerstone of the international human rights system. Ensuring access to justice has always been the focus of attention of States and international organizations. The right to a fair trial has been recognized and specifically stipulated in numerous other international and regional treaties and non-contractual norms adopted by the United Nations and regional intergovernmental bodies. These human rights standards have been developed in relation to all legal systems of the world, taking into account a wide variety of legal procedures – they set out the minimum guarantees that should be provided by all systems.At the same time, in the documents of international influential forums, in particular, the UN International Conference on Environment and Sustainable Development (Rio de Janeiro, 1992) [2], in the Stockholm Declaration adopted at the UN Conference in 1972, the human right to a healthy and favorable life in the natural

environment is proclaimed among the most important humanitarian human rights[3].In modern international law, there is a steady tendency not only to recognize and consolidate the right of citizens to a favorable environment as the most important natural human right, but also to strive to develop effective legal mechanisms for the protection of this right.A vivid confirmation of this is the Convention "On Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters", signed on June 25, 1998 by the ministers of the 36 member countries of the United Nations Economic Commission for Europe in the Danish city of Aarhus (hereinafter – the Aarhus Convention) [4].

*The Aarhus Convention was ratified by the Law of the Republic of Kazakhstan dated October 23, 2000. Kazakhstan became a Party to the Convention on January 11, 2001, after the Convention was ratified by 16 States, it entered into force. Paragraph 3 of article 4 of the Constitution of the Republic of Kazakhstan stipulates that international treaties ratified by the Republic have priority over its laws and are applied directly, except in cases where it follows from an international treaty that the publication of a law is required for its application. After ratification, the Aarhus Convention, being an international agreement, takes precedence over the laws of the Republic of Kazakhstan and its provisions and norms are applied directly. The Republic of Kazakhstan, having become a Party to the Aarhus Convention, has undertaken obligations to implement its three main components, including ensuring access to justice in environmental matters. Everyone's right to free access to justice is enshrined in article 8 of the Universal Declaration of Human Rights, in article 6 of the European Convention for the Protection of Human Rights and Fundamental Freedoms, in article 14 of the International Covenant on Civil and Political Rights and other international legal instruments.*In the Republic of Kazakhstan, everyone's right to protection of rights and freedoms, including judicial protection, is enshrined in paragraph 2 of Article 13. of the Constitution of the Republic of Kazakhstan[5] the right to judicial protection of their rights and freedoms is enshrined. No one has the right to assume judicial functions. Lynching, the creation of extraordinary, Sharia and other courts are unacceptable. Judicial protection of human rights is a set of material and procedural rights of every individual (regardless of any other circumstances), ensuring the restoration of violated rights or preventing the illegal application of legal norms by applying to court. The Court provides everyone with the right to judicial protection, regardless of which side they represent in this conflict. The execution of the guaranteed legal protection is a court decision. A court decision or sentence has the force of law, so its execution is mandatory. The foundations of a democratic society and internationally recognized human rights standards

certainly imply the possibility of judicial protection of violated rights.According to the Constitution of the Republic of Kazakhstan, justice is carried out only by the court. Judicial power is exercised on behalf of the Republic of Kazakhstan and has as its purpose the protection of the rights, freedoms and legitimate interests of citizens and organizations, ensuring the implementation of the Constitution, laws, other normative legal acts, international treaties of the Republic. Everyone is guaranteed judicial protection against any unlawful decisions and actions of State bodies, organizations, officials and other persons that infringe or restrict the rights, freedoms and legitimate interests provided for by the Constitution and laws of the Republic. No one may be deprived of the right to have his case examined by a competent, independent and impartial court in compliance with all requirements of law and justice. Judicial power is exercised through civil, criminal and other forms of legal proceedings established by law[6].The judicial system consists of the Supreme Court and local (regional, district) courts. The judicial system occupies a central place in the State human rights mechanism, being the main State institution for the restoration and protection of violated human rights, independent of the legislative and executive branches of Government. The judicial system of the Republic of Kazakhstan consists of the Supreme Court of the Republic of Kazakhstan, local and other courts established in accordance with the Constitution of the Republic of Kazakhstan and the Constitutional Law.The main task of the judiciary is to resolve conflicts and disputes arising in public and public life, restore violated rights, and bring to justice for violating the requirements of laws.In the field of environmental protection, the Aarhus Convention is of particular importance in the context of access to justice. In accordance with article 9, citizens and public associations have the right to go to court to challenge the actions or omissions of private individuals or public authorities that violate the provisions of national legislation related to the environment. The Aarhus Convention imposes on the country the obligation to cancel or reduce the financial costs associated with the exercise of the right to appeal to the court. The content of the adopted judicial acts should be accessible to all who wish to familiarize themselves with them.Access to justice for the protection of environmental rights of citizens is inextricably linked to the category of their protection. Everyone's right to access to justice is the most important guarantee of the realization of the right in society. The effectiveness of the exercise of the right to access to justice in matters of protecting the environmental rights of citizens in Kazakhstan depends, in our opinion, not only on the activity of citizens themselves and public associations, but also largely on the system of guarantees provided for in the Constitution of our state, in sectoral legislation.The presence of different views on the content determines the versatility and complexity of the concept of

access to justice. As part of the justification, we will consider the concepts of "access to justice". D. Kozak defined accessibility of justice as "the availability of institutional and procedural guarantees that ensure the rights of potential participants in the process to receive fair justice." Thus, the general category for the above positions is the guarantee, i.e. It is important to have effective legal means to ensure the realization of citizens' rights to access to justice, including on the protection of environmental rights of citizens [7].It is indicated that "the accessibility of justice is an opportunity guaranteed by law for interested persons to initiate a judicial process at any stage and receive judicial protection through the issuance of a lawful and reasonable judicial act"[8].At the same time, we understand access to justice not only as an opportunity to go to court for protection of a violated right, but also successful implementation this right. According to D. Kozak, the answer to the question of the accessibility of the court is the answer to the question "is there a court" [9].The realization of access to justice for the protection of environmental rights of citizens is possible in the presence of an effective legal mechanism, the elements of which are compensation for damage caused as a result of an environmental offense, recognition of decisions, actions (or omissions) of public authorities, local governments and their officials as invalid, securing a claim, etc.[7, p.4]. In the legal scientific literature, the right to a favorable environment is considered as a personal non-property right, and a favorable environment is considered as an intangible benefit [10].This understanding of the essence of the right to a favorable environment was greatly facilitated by the corresponding trends in the development of legislation.

The subjective right to a favorable environment is expressed in the ability of an individual to exist in a favorable environment, to exercise the right to a favorable environment by his own actions, to require obligated persons to comply with the norms of law ensuring the maintenance of the environment in a favorable state for the authorized person, to apply to the relevant state bodies for protection of the right in case of its violation or threat violations.It is generally recognized in the literature that, recognizing the subjective right of a citizen, legislation provides an authorized person with the right to protection, including in court. A subjective right that is not protected from violation by the necessary means of protection is only a "declarative right". In this case, although it is proclaimed in the law, but, not being secured by state law enforcement measures, it can only be calculated on voluntary respect for it by unauthorized members of society and therefore acquires only the character of a morally secured right based only on the consciousness of members of society and the authority of state power[10].It is obvious that the possibility of using judicial protection of

the right to a favorable environment depends on the establishment of clear criteria in objective law that allow an authorized person to assess the environment as favorable and require other persons to fulfill their obligations to maintain the environment in a favorable state through compliance with legislation. In turn, it is possible to identify criteria for assessing the environment as favorable only on the basis of the provisions of environmental protection legislation.The literature emphasizes that a favorable environment is primarily safe for health in terms of its regulatory characteristics and standards [12]. Along with this, there is a set of legal criteria for determining the state of the environment as favorable for humans: first, the criterion of non-pollution of the environment is compliance of the state of the environment with the requirements, regulations, and environmental quality standards established in the legislation on environmental protection; Secondly, the criterion of environmental sustainability is the compliance of the state of the environment with the standards of resource intensity established in the legislation on environmental protection; thirdly, the criterion of satisfying human aesthetic needs and preserving species diversity [13].On this basis, M.M. Brinchuk makes a fair conclusion that "the environment is favorable if its condition meets the criteria, standards, and standards established in legislation regarding its purity (uncontamination), resource intensity (inexhaustibility), environmental sustainability, species diversity and aesthetic richness."These criteria, standards, and regulations are enshrined in environmental protection legislation, therefore, violation of mandatory requirements of environmental protection legislation is the basis for judicial protection of the right to a favorable environment.It seems that this doctrinal approach should be used in judicial practice when considering claims and complaints in defense of the right to a favorable environment[14].

FINDINGS.

The essence of the provisions of article 9 of the Aarhus Convention is that national legislation provides the public with the opportunity to exercise their right to go to court to challenge the actions or omissions of individuals and public authorities that violate the provisions of national legislation in the field of the environment, as well as the right to a fair resolution of the application in court. Kazakhstan has consistently taken measures to develop the judicial system, increase the efficiency and objectivity of judicial proceedings, maximize the openness and transparency of judicial procedures and implement tasks to protect the rights, freedoms and legitimate interests of citizens.

CONCLUSION.

Thus, we can state that the legislation of the Republic of Kazakhstan provides ample opportunities for a citizen in the field of judicial protection of the right to a favorable environment by consolidating an impressive list of forms and methods of protection. However, as practice shows, in some cases it seems problematic to exercise one's right to a favorable environment through judicial protection of the violated right.

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FOSTERING WOMEN EMPOWERMENT THROUGH WOMEN ENTREPRENEURSHIP IN THE 21ST CENTURY INCLUSIVE SOCIETY

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Abstract
The current study fosters women's empowerment through women's entrepreneurship in a 21st-century inclusive society. People in the community think of women as the majority in society. In the past, four walls surrounded Indian clubs. They leave the four walls to engage in modern activities, like launching their own business. Promoting Women's entrepreneurship has become essential in our development programs in India. This study aims to ascertain the challenges contemporary women entrepreneurs encounter while managing their businesses and explore the role these women have played in the country's economic development. Based on current studies, this venture may suit female entrepreneurs who struggle to work outside the home because of cultural norms or family responsibilities. The roles that women play in society and the role that women's entrepreneurship plays within it are the domains of women's entrepreneurship. Women must overcome particular obstacles, such as family obligations, to ensure equal access to opportunities as men. Women's empowerment includes the capacity to make informed decisions for themselves, Information access, Resource management, and Economic support for their nation. The study aims to determine how entrepreneurship helps promote women's empowerment. In certain countries, women may face obstacles in reaching agreements and acquiring property. When women are to improve their status in society and among self-employed women, then more of them must be working. The overall development of any nation depends on entrepreneurship, which has grown in popularity in recent years as more women engage in it. The women of today exhibit greater progressiveness and make substantial contributions towards attaining financial stability and social status. The main factors driving today's female entrepreneurs are shifts taking place in the social, psychological, cultural, and economic spheres. Developed and developing countries' economic participation has improved due to these changes. Since women have so many opportunities in this progressive era, their role in entrepreneurship is growing quickly. Women's employment contributes positively to the economy. This study aims to develop an entrepreneurial model for women's empowerment in the twenty-first century inclusive society.

Keywords: Fostering, Women, Empowerment, Entrepreneurship, 21st Century, and Inclusive Society

Introduction

When you think like an entrepreneur, you are convinced that anything is possible: new manufacturing breakthroughs, sectors, technology, and, most significantly, job opportunities. Starting and expanding one's own business provides an unparalleled sense of fulfilment. Entrepreneurs passionate about making a difference will always be an asset to society, whether they innovate within established industries or start completely new ones. A person's remarkable ability, commendable personality, and bravery should inspire them to want to venture out on their own. There are easier ways to start and run a commercial. Since it is their unique role as primary caregivers, women sometimes find themselves putting in too many hours at home. A good work-life balance is essential, no matter the challenges they face. From formal associations to grassroots groups, women entrepreneurs can draw on a wealth of tools. To encourage more women to be company owners, the government has implemented numerous policies and programs that are favourable to women. A better future is taking root thanks to the deeds of hopeful Indian women. They can put their knowledge to good use and reach their full potential when encouraged and given chances to demonstrate their creative ability. Confidence in one's abilities allows one to cultivate and envision one's dreams. Achieving financial independence requires an entrepreneurial mindset. You may unwind now. A woman's commercial endeavours have the potential to significantly alter her perception of her agency, worth, and power dynamics. As an outcome, female entrepreneurs are given more freedom and opportunities to progress in their careers in the twenty-first century inclusive society.When asked about their desire to be their boss, fewer women than men bring it up. When questioned about their motivations for starting entrepreneurship, women are more inclined than men to desire greater autonomy over their own time. As an outcome of juggling paid work with unpaid caregiving, women are more likely to run smaller, more focused entrepreneurs. There needs to be more gender diversity in the financial sector if women-owned entrepreneurs can compete with male-owned entrepreneurs who lack the resources to attract and retain talented workers. There are some reasons why female company owners can earn 30–40% less than males. The economy and family budgets both benefit when women are the ones to manage the show. There are around 450 million females in the world. They have grown into rock-solid citizens. As a whole, society, the economy, and the nation gain when women achieve their goals. Traditional Indian society held that women should stay home and care for the house. Previously reserved, they are now actively participating in contemporary society. Their contributions to the growth of the economy have now become substantial. There is a crest on the horizon for female entrepreneurs. Powerful

women in business continue to rise to the top, which has caused a remarkable shift in a historically male-dominated profession (Vinesh, 2014). According to the OECD (2013c), when women do this, they take stock of their lives, plot out their futures, and study the leadership of a powerful female entrepreneurship model for women's empowerment in the twenty-first century inclusive society.

The Notion of Entrepreneur

The French term entreprendre, meaning to launch a new business, originates from the English word entrepreneur. Taking the plunge to launch a business is what an entrepreneur is all about. Entrepreneurial people take the initiative and think outside the box to find a need in the market. Then, they either start a new business or improve an existing one to meet that need. An entrepreneur willing to invest time and effort can transform a decent idea into a prosperous business. Entrepreneurs start enterprises, develop unique ideas, find clients, and run day-to-day operations. No one in business today can emphasize the importance of going it alone. Some think the Fourth Industrial Revolution has already begun. The ever-increasing improvement of information and communication technologies characterizes the modern era. Therefore, the paper's writers define entrepreneurship and information and communication technologies before explaining the ideas and their key connections. The risk of starting a company of one's own is something that everyone can do. A hallmark of an entrepreneur is the process of building a firm from the ground up. An entrepreneur is willing to take calculated risks in pursuit of unproven ideas to make a profit. A person's capacity for creative problem-solving, goal-setting, and leadership in pursuing financial gain through calculated risk-taking makes a person an entrepreneur. Production consists of four main elements: land, labour, materials, and capital. Managing a current business, creating and releasing a new product or service, and investigating potential new investment and manufacturing prospects are all part of it (Arora, V. K., 2012). Entrepreneurs quickly seize opportunities and thoroughly consider the what, where, when, and how much of a product or service. Taking a gamble, whether it's a financial, emotional, or time-based one, is what drives many entrepreneurs. Entrepreneurs who aren't afraid to move quickly or take chances could calm a nervous market. Entrepreneurs must be willing to take risks to accomplish remarkable personal growth, revolutionary discoveries, or massive financial success. Entrepreneurs have an even more crucial role when conditions are tough. Creative entrepreneurial methods have the potential to reverse a period of high unemployment and sluggish or flat economic growth. There may be fewer individuals out of work and more people looking for work if new businesses boost demand with innovative products or fiercer competition. These

entrepreneurs have the know-how in their industries and the drive and passion to build a firm from the bottom up. Finding a need in the market and filling it is how the most creative entrepreneurs start their businesses. Launching a business may need him to get funding, stock up on supplies, recruit key personnel, and get things moving. Someone of this type as an entrepreneur piqued his interest. Many motivational business leaders use this strategy when they are stuck for ideas. Their work is essential for a prosperous economy. In many developing nations, entrepreneurial efforts lead to new product and service innovations. This style of conduct is commonly displayed by the most ambitious executives in industrialized countries. The modern capitalist system can be traced to courageous, innovative, optimistic, and goal-oriented entrepreneurs in the twenty-first century inclusive society.

Women Entrepreneurs in Modern Era

Women entrepreneurs have a greater impact on enterprise, commerce, and industry. Their entry into business is quite recent. Women have contributed majorly to various professions, including politics, administration, medicine, engineering, technology, social work, and education. In recent years, wealthy countries have expanded into different enterprises. A woman entrepreneur is self-assured, creative, and imaginative, striving for financial independence while creating employment opportunities. Women entrepreneurs work in other sectors, including manufacturing, assembly, and employment; the administration handles female entrepreneurs uniquely based on their equity stake and employment situation. Women entrepreneurs have taken the lead in promoting and running enterprises, with many holding majority stakes. Entrepreneurs play a vital role in the 21st century inclusive society. These individuals have the necessary skills and motivation to bring innovative ideas to market, provide services, and make educated judgments that assure profitability. Cultural and societal conventions favouring men make it harder for educated Indian women to achieve equal rights and positions. Despite social hurdles, women have achieved tremendous success in various fields in the twenty-first century inclusive society.

Women entrepreneurs are persons or teams that start and run their businesses. A woman entrepreneur has various responsibilities. Entrepreneurs should seek new opportunities, take risks, develop, organize, manage, and lead successfully in all aspects of enterprise. Female entrepreneurs are becoming more common in various economies around the world. As society becomes more aware of women's roles and economic status, their latent commercial potential increases. Women are encouraged to create enterprises because of their knowledge, skills, and compliance. Several reasons inspire female entrepreneurs, giving them the confidence to pursue independence and success. The concept of independent decision-

making in life and profession implies that a women entrepreneur must travel a difficult path to accomplish personal goals and financial independence. Entrepreneurial women are driven to impact their families and society positively. The media has helped women better grasp their skills, rights, and working situations (Saraswat & Lathabahvan, 2020). When more women become entrepreneurs, we can use these resources more. When crafting legislation to help female entrepreneurs, the needs of start-ups and small businesses must be recognized. Politicians should not assume that women can run larger firms because they own a few. According to Gatewood et al. (2009), many female entrepreneurs want to grow their enterprises. Women-owned businesses should receive greater funding. One example of a business owner-focused program is Ireland's Going for Growth Initiative, a six-month small-group program. There should be more women in high-level roles. In almost every country, women-owned enterprises contribute to economic growth. Women's entrepreneurial possibilities have increased as women become more mindful of their financial situation. Women entrepreneurs are mostly driven by their skills, competence, and adaptability to economic changes. Women are increasingly starting enterprises that are small or medium-sized. They are inspired by female role models and their entrepreneurial endeavors. Women's education and ambitions have grown in modern society, influencing their way of life. She was successful in competing against guys in various fields, including business. These female leaders are powerful, persuasive, and willing to take chances. Their hard work, determination, and tenacity have enabled them to survive and thrive in a competitive industry. Its goal is to increase awareness and understanding of the importance of women's entrepreneurship in economic and other global development. Finally, the study discusses the problems that Indian women entrepreneurs encounter, success stories, factors that influence entrepreneurship, and societal opinions about entrepreneurship for women's empowerment in the twenty-first century inclusive society.

Role of Women Entrepreneurship in Economic Development

In the past, women's enterprises were not given the same consideration. However, as women's knowledge and awareness have increased, this perspective has evolved, and they are now acknowledged as the most exceptional and motivating businesswomen of our day. A family can be considered a wheeled chariot pulled by both male and female members. A family with only one chariot wheel to grow, prosper, and remain modern. Similarly, women's entrepreneurship plays an important role in the economy's performance and considerably encourages it. The nation will only advance quickly if women's entrepreneurship is handled and integrated into the primary economic activity (Chavan et al.; P. A., 2016). Going to

activities put on by the government is mandatory for a sizable chunk of the population. The foundation of every economy is its resources, which include money, raw materials, and human capital. The economy might grow more quickly if there were more production components or when technology was superior. Human resource optimization usually. The Industrial Revolution can hasten the social and economic development of any nation. An economy can only expand thanks to the bravery and initiative of its citizens. Individuals endowed with an entrepreneurial spirit face several challenges. The vibrant entrepreneurial environment is a sign of the country's expanding economy. A business-friendly atmosphere is essential for encouraging the next generation to take the reins of their enterprises for women's empowerment in the twenty-first century inclusive society.Women must have access to educational possibilities immediately (Goyal & Prakash, 2011). Increasing women's entrepreneurship is essential to achieving growth with equity and other, more general goals for development. A poll indicates that female entrepreneurs have more challenging work than male co-workers. Unfavourable business environments, expensive manufacturing costs, inadequate infrastructure, and unstable political environments frequently impact female entrepreneurs. Strict social and legal frameworks and limited access to essential resources like loans and land are examples of severe impediments. The path is challenging for female entrepreneurs. Offering women support, tools, and an ongoing flow of information about different business prospects is crucial (Kumbar, 2013). The advent of new technology, shifting trade routes, and the inexperience of many multinational firms have all contributed to the growing need for skill development during globalization. A close relationship exists between the ideas of female empowerment and female entrepreneurs. Leaving the safety of their homes and settling into community life has been promoted by various government programs for women. The government established multiple initiatives to empower women during the five-year plan. Women's entrepreneurial energy is essential for any nation's economic success. Successful women entrepreneurs open doors for other women and enable women to connect socially and professionally. However, a modern, inclusive society will need more than encouraging women to start their enterprises (Devi et al., L). Initially, things are the same for female entrepreneurs in India as in the West. There are many reasons why Indian women entrepreneurs go it alone, even though they may not have any conflicts between their professional and familial lives (Das, 2012). Many factors, good and bad, push women to start their enterprises, but the primary one is the need for autonomy in their personal and professional lives. To be inspired is to feel compelled to follow one's unique career and life trajectory. To help make finances meet, many women

who own their businesses are willing to undertake filthy work for free. To better themselves, their loved ones, and the world at large is the shared objective of entrepreneurial women. Striking out independently is a daring move for many women in a modern, inclusive society and highly technological environment. However, many women start their enterprises after facing hardship, such as a long-term financial crisis, a sudden drop in family income, the death of a breadwinner, or a divorce. Rural women can find the information and tools they need to launch their enterprises in easily accessible programs that focus on technology (Ashok & Abhishek, 2018). As an outcome of bias and self-doubt, many women do not believe they can be successful entrepreneurs, managers, technicians, or professionals (Kumar, 2015). The government must intervene immediately and resolve this matter for our benefit. Many find fascinating the idea that women entrepreneurs in undeveloped nations may be able to boost their economies. Due to their official and informal economic significance, women are frequently the target of development initiatives. Despite the best efforts of many organizations, gender inequality in developing-world business ownership, leadership, and profitability remains. Many women have significantly contributed to women's empowerment in the twenty-first century inclusive society.

Economic Empowerment of Women

Empowering women is a sure-fire way to boost a country's income. Nationwide morale is lifted when a growing number of women achieve financial autonomy. Modern society includes a sizable female population. Regarding the remaining responsibilities, like keeping the electricity on and filling out the register, even with their fortunes, most may benefit from increased influence within the banking industry. The capacity of married women to support their families is often lauded. Women in the middle class will be able to afford to start families more easily when their incomes increase. Many people all across the globe need help with their financial management, which is a huge problem. The fundamental goal of the empowerment social movement is to give people greater agency in their own lives. Women can achieve economic independence when they learn to maximize their resources. It is equally important to give women the tools they need to control their financial destinies. It is widely acknowledged that achieving development goals, including women's rights, health, education, prosperity, and welfare, may be achieved by economically empowering women. In the past five years, it has been quite apparent that some groups are committed to assisting women in becoming financially independent. All of them would profit from women's economic empowerment. Family poverty rates fall, economic development and production rise, and processes become more effective when women are encouraged to stand up for their

beliefs and strive to improve their circumstances. Economic empowerment is bestowed upon women when they can decide how much they spend and save. Reducing poverty, ensuring food supplies, promoting equitable and sustainable economic development, and economically empowering women can only be achieved by removing existing barriers. We can help women become financially independent by reforming institutions so that they are more progressive and empower women. Enhancing women's access to productive resources is of utmost importance. Lastly, women must be able to participate in economic policymaking; thus, we must remove obstacles to their education. Practicing more self-assurance is an excellent way to boost your confidence and competence. When women's disposable income rises, they can better participate in politics. Growth alone won't bring about gender equality, but it can help narrow the gaps when some exist. Feminist empowerment is the one ardour solution. Without women stepping up to the plate, we won't see any advancements in gender equality, personal autonomy, or social involvement. It is imperative that women spearhead efforts to build an inclusive society.When efforts to empower women find economic traction in the aftermath of a war, it may be a chance to challenge established gender norms. Through achieving financial independence, women can also profit from the wartime budget cuts, which will aid in their development objectives and provide them with new chances. To achieve true gender equality, women must first gain economic independence. Because they are the most economically disadvantaged, women must be our primary target for assistance. Social conventions and power dynamics that favor men over women make it hard for anyone to reach their maximum potential. When economies expand, the poverty rate goes down. Families are more resilient in natural disasters, and governments can shield their most vulnerable citizens from disease and starvation. The security of women can be improved through economic development, which puts their well-being first, even if low-income households aren't the main initiative. According to Tornqvist and Schmitz (2009), women gain more authority over their own finances and societal policy when they are financially empowered. Embracing gender equality in the workplace and ensuring that paid and unpaid care tasks are fairly distributed are essential steps for women's economic independence in the 21st century inclusive society.Encouraging economic development and empowering women go hand in hand. Gender inequality can be mitigated by development programs that place a premium on women's empowerment. The role of women must be acknowledged in strategies and initiatives aimed at boosting the economy. Last but not least, women often have men take for granted, which makes decision-making for them a distinct problem. Women's

dependence on unpaid domestic labour is a significant barrier to their economic emancipation (Thanikaivel, Priya, Elayamplayam, and Nadu, 2018). Economic empowerment creates a more equitable and mutually beneficial society by ensuring that men and women have equal opportunities to flourish economically. Greater access to market data, employment prospects, banks, and property is necessary for individuals to attain financial independence. We need financially secure and politically active women when we want them to do the right thing, live independently, and make a difference. More equal communities are our ultimate goal. Opinions vary with regard to the economic empowerment of women. Since every project and community is different, there is no universally applicable measure of success for creating an entrepreneurial model to empower women in a diverse and inclusive 21st century society.

Women Empowerment Through Women Entrepreneurship

Economic development, the introduction of new employment opportunities, and the freedom that accompanies being one's boss are just a few of the many ways in which entrepreneurial endeavours profit those living in rural areas. A growing number of low-income women in both urban and rural regions are considering starting their businesses. According to Faleye (1999), women's development programs should seek to empower women rather than focus on reducing poverty through enhanced productivity. The economic status of women can be defined by women's entrepreneurship, which is achieved through women's empowerment. The Industrial Revolution, improved educational possibilities, and globalization have all contributed to a historic shift in power away from men and toward women in areas where opinions have been formed in the last several decades. There are more women than men in the world. Culture, society, and the economy are all crucial factors to think about while attempting to empower women. Women aspire to achieve financial independence and leave their imprint in every industry, just like the successful female entrepreneurs in industrialized nations such as the UK, Canada, and Germany. There have been efforts to increase the number of women employed by large corporations, and there are also many female entrepreneurs so that things may be looking up. The rise of women has presented a fresh threat to the dominance of men. You can launch this venture with a modest sum of money and request further funding as you go along. There may be more room for women to thrive outside of the fast-paced corporate world in the traditionally male-dominated fields of politics and big business. Male employees are frequently sought after by female businesses. The fact that more and more women are getting to the top of their industries is also encouraging, even though gender bias is still very much present. When women in a country's

business community achieve great success, it positively impacts the economy, and an entrepreneurial model that empowers women is vital to an inclusive society in the twenty-first century.

When women are given opportunities to lead at the local and national levels when they are treated properly in terms of resources, and when they can make a big effect at work, only then will they feel empowered. Women can advance in the realms of riches and power. According to M.A. Awwal Sarker (2006), this method of education and empowerment will allow more individuals to engage in decision-making. The empowerment of women is a central tenet of the policies of the majority of modern international organizations. It is common knowledge that women gain a lot when they are given opportunities to participate in decision-making and other empowering pursuits. It is essential to assist women in their pursuit of self-employment in addition to reducing obstacles to employment. Some interesting suggestions have been put forward to boost women's family incomes. Despite the lack of female representation in senior executive positions, women are continuing to make breakthroughs in tech. Everyone agrees that women should have the same opportunities as men in the workplace, including equal pay and benefits, and that they should be able to make a financial contribution. Getting to gender parity will require a change in mindset, some new resources, and a revaluation of our present strategy. The word empower is to give someone greater influence or power. Women must have access to markets and capital for them to achieve agency through entrepreneurship. Being able to direct one's fate and the consequences that ensue is another crucial aspect. Once kids get this down pat, they'll be far more equipped to deal with the problems they're encountering right now. One possible solution to the current labour shortage could be to provide women with the resources they need to start their businesses. A bachelor's degree is not required of female entrepreneurs. Modern society places a premium on working mothers who can provide adequately for their families. Her boundless potential will be realized if she keeps on the correct path. These days, people often mention how important it is for women to have the ability to support themselves. More and more, individuals are speaking out in support of gender equality and the right of women to vote. Women will prioritize themselves and the environment when given a voice in policymaking. As far as this culture is concerned, women represent the archetypal leadership. At one point in history, the majority of societies were little and isolated. A rising number of women are taking the entrepreneurial plunge and engaging in different forms of economic activity in the 21st-century inclusive society.

Conclusion

Empowering women entrepreneurs is currently happening, and this is a once-in-a-generation opportunity to shift women's economic and social trajectory in India. In this space, we honour women who shine in every arena, from the home to the workplace. A convergence of factors, including shifting power dynamics, altered economic conditions, and the widespread dissemination of modern information and ideas, has liberated Indian women from centuries of societal reliance and oppression. Another positive development for the nation is the number of unafraid female entrepreneurs who take risks. A growing number of famous women are venturing into business ownership. It is our utmost priority to restore an entrepreneurial mindset. A combination of an entrepreneurial mindset and practical business understanding is necessary for the global success of women-owned businesses and the advancement of women in the 21st-century inclusive society.Given that women constitute the backbone of India's economy, it is imperative to allocate resources towards empowering them. Society benefits both now and in the long run from investments in women's empowerment. As an outcome of their incredible success, more and more women are entering male-dominated industries. Entrepreneurial pursuits yield innovation, capital, and a host of issues. Study on female entrepreneurs suggests this pattern will probably persist. The number of self-employed women has changed dramatically over the last several years. More and more of the country's wealth is due to the entrepreneurial spirit of women. Government programs supporting female entrepreneurs have facilitated the growth of women's economic power. It would never have happened if the government hadn't provided funding and encouraged female entrepreneurs. The number of women holding C-suite corporate positions has changed dramatically in recent years. Companies have profited from government programs encouraging women to start businesses to achieve gender equality in a 21st-century inclusive society.

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GLOBAL PERSPECTIVES ON SUSTAINABLE DEVELOPMENT GOALS: STATISTICAL ANALYSIS AND CORRELATIONS

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ABSTRACT
In the global context, sustainable development goals constitute a priority, the outcomes of which depend significantly on the efforts and achievements of all countries worldwide. As countries vary greatly in terms of socio-economic development levels, the initial situation regarding the achievement of sustainable development goals has placed countries in a certain rating that evolves over time.The main purpose of this article is to analyse statistical data and reports regarding the progress of various countries in relation to sustainable development goals, thus deducing correlations between different sustainable development objectives. In order to obtain a comprehensive and detailed picture of progress and relationships between different sustainable development objectives in various countries, highlighting European countries, using in this research he following methods: statistical research methods (such as dynamic analysis, regression analysis, cluster analysis, correlation tests), qualitative analysis, and cost-benefit analysis. Qualitative analysis allowed for the appreciation of perspectives and a deep understanding of the factors influencing progress in achieving SDGs in different contexts and to identify best practices or specific challenges. In turn, cost-benefit analysis allowed for the evaluation of the efficiency of different programs in achieving sustainable development goals, providing the opportunity for strategic prioritization and resource allocation. The research results have demonstrated that there are quite close connections on many dimensions between the outcomes of achieving sustainable development goals. At the same time, there are also some commonalities that can characterize countries through the common prism of poorly developed, developing, and highly developed countries that record very different results and progress. One thing is certain, that excessive effort by only some countries will not ensure the achievement of results at the global level, thus only through mutual agreement can valuable results be achieved that will ensure sustainable global development.
Keywords: SDG progress, international cooperation, progress' factors, resources, efficacy, effectiveness.
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INTRODUCTION

The pursuit of sustainable development stands as one of the quintessential challenges of the 21st century, a multi-faceted quest encapsulated within the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015. These goals serve not only as beacons for guiding global development policies but also as a mirror reflecting the varied tapestry of progress among nations. Recognizing the diverse starting points and trajectories of countries with regard to the SDGs is pivotal in both assessing global trends and tailoring interventions. This article delves into the statistical exploration of the progress made by countries, particularly those in the European context, in advancing the agenda of sustainable development.Amidst the complex interplay of socio-economic factors, this paper endeavours to dissect the intricate relationship between national development levels and the advancement toward achieving SDGs. Utilizing a robust methodological framework that encompasses dynamic analysis, regression analysis, cluster analysis, and correlation tests, the study presents a granular analysis of the progress dynamics. Through qualitative research, the study garners nuanced insights into the factors propelling or hindering the attainment of SDGs, subsequently framing the narrative of progress within the broader socio-economic discourse. Cost-benefit analysis further enriches this narrative by quantifying the efficacy of various initiatives, thus laying the groundwork for strategic planning and resource optimization.

With an empirical approach, this research threads together various dimensions of SDG outcomes, surfacing patterns of commonality and divergence among countries classified by development status.

RESEARCH AND FINDINGS

At the global level today, strategies and policies are very clearly oriented towards achieving the Sustainable Development Goals, although efforts and outcomes vary significantly from country to country, being influenced by multiple factors. In 2015, the United Nations General Assembly ratified the 2030 Agenda for Sustainable Development, a framework predicated upon seventeen Sustainable Development Goals (SDGs) that are further delineated by 169 subsidiary targets, monitored through 232 distinct indicators. The Agenda's objective is to realize an equitable triad of sustainable development dimensions-social, economic, and environmental-across the global landscape by the year 2030 (*Sustainable Development Goals - European Commission*, n.d.).

The Millennium Development Goals, followed by a set of seventeen Sustainable Development Goals (SDGs), have emerged as the future prototype for global development and serve as the blueprint for the world's future development agenda (Zeb-Obipi et al., 2023). To understand how the SDG Index Score at worldwide level is evolving, it is proposed to analyse the evolution of the SDG Index Score at worldwide level between 2000 and 2022 (figure 1).

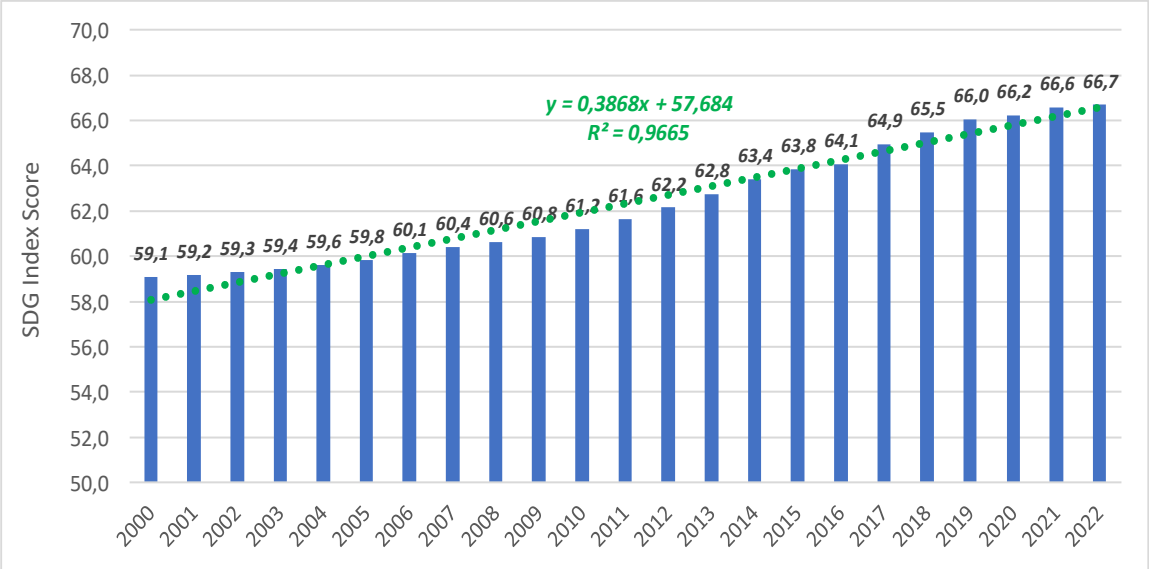


Figure 1. Evolution of the SDG Index Score at worldwide level between 2000 and 2022

Source: Elaborated by the authors on the basis of data available in the Report (Sachs et al., 2023)

The data suggests a positive trajectory in the SDG Index Score over the 22-year period, beginning at a baseline of approximately 59.1 in 2000 and culminating at 66.7 in 2022. This incremental ascent implies an improving alignment with SDG objectives globally. Such an increase is indicative of collective efforts toward sustainability and human development.The SDG Index serves as a barometer for gauging the global progress toward achieving 17 interlinked goals. An ascending score can motivate nations to continue or intensify their efforts. The interconnected nature of the SDGs means advancements in one area can lead to improvements in others, amplifying the impact of incremental gains. In recent years, the emergence and development of artificial intelligence has generated growing concern about its influence on the achievement of the Sustainable Development Goals (SDGs) (Jungwirth & Haluza, 2023).

Barriers to improving the achievement of the SDGs globally include:

- Economic challenges, including disparities between nations, can impede uniform progress towards the SDGs.

- Lack of commitment or political instability within countries can slow implementation of sustainable policies.
- Emerging global threats such as climate change, pandemics and conflict can disrupt or reverse progress, requiring adaptation strategies and resilient systems.

The elevation in the global SDG Index Score signifies a favorable evolution in sustainable practices and policy implementations across various countries. This progression is fundamental due to the holistic nature of the SDGs, which encompass environmental sustainability, social inclusion, and economic development.The trend line represents a linear regression analysis of the SDG Index Score over time, depicting a consistent upward trajectory from 2000 to 2022. The slope of the trend line (0.3868) indicates the average annual increase in the SDG Index Score. The high R^2 value (close to 1) signifies that the linear model provides a robust fit to the data, with approximately 96.65% of the variance in the SDG Index Scores being explained by the passage of time.Based on the regression line, one can conclude that there has been significant progress in the global attainment of Sustainable Development Goals over the examined period. The SDG Index Score has increased consistently, indicating a broad-based improvement in sustainable practices and outcomes. In summary, the analysis of the trend line suggests that while substantial progress has been made, vigilance and continued effort are necessary to address underlying challenges and ensure that the positive trend in achieving Sustainable Development Goals is sustained and inclusive.The overall trend indicates a positive alignment with sustainable development; however, the pace of improvement and the uniformity of progress across different regions and goals remain areas requiring dedicated attention to ensure the achievement of all 17 SDGs by the target year of 2030.In order to display multivariate data in the form of a two-dimensional chart, it is advisable to use the radar chart based on the overall SDG Index Score by objective type (Figure 2). The chart illustrates variegation in the attainment levels across different SDGs. The disparate radii for each goal represent the differential achievements or focus areas. The length of a “spoke” is proportional to the magnitude of the score for a specific goal, providing a visual representation of relative performance across the SDG spectrum.Goals 1 (No Poverty), 4 (Quality Education), 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities) and 12 (Responsible Consumption and Production) show higher scores, nearing or exceeding the 70-point mark. These areas may reflect targeted investments, policy prioritization, or more readily achievable targets under current global economic systems. Conversely, Goals 14 (Life Below Water), and 15 (Life on Land), 16 (Peace, Justice and Strong Institutions) and 17 (Partnership for the Goals)

register lower scores, signifying that these areas face more significant challenges and may be lagging in global prioritization or encountering inherent difficulties in measuring progress. The most critical situation relates to the achievement of Goal 10 (reducing inequalities).

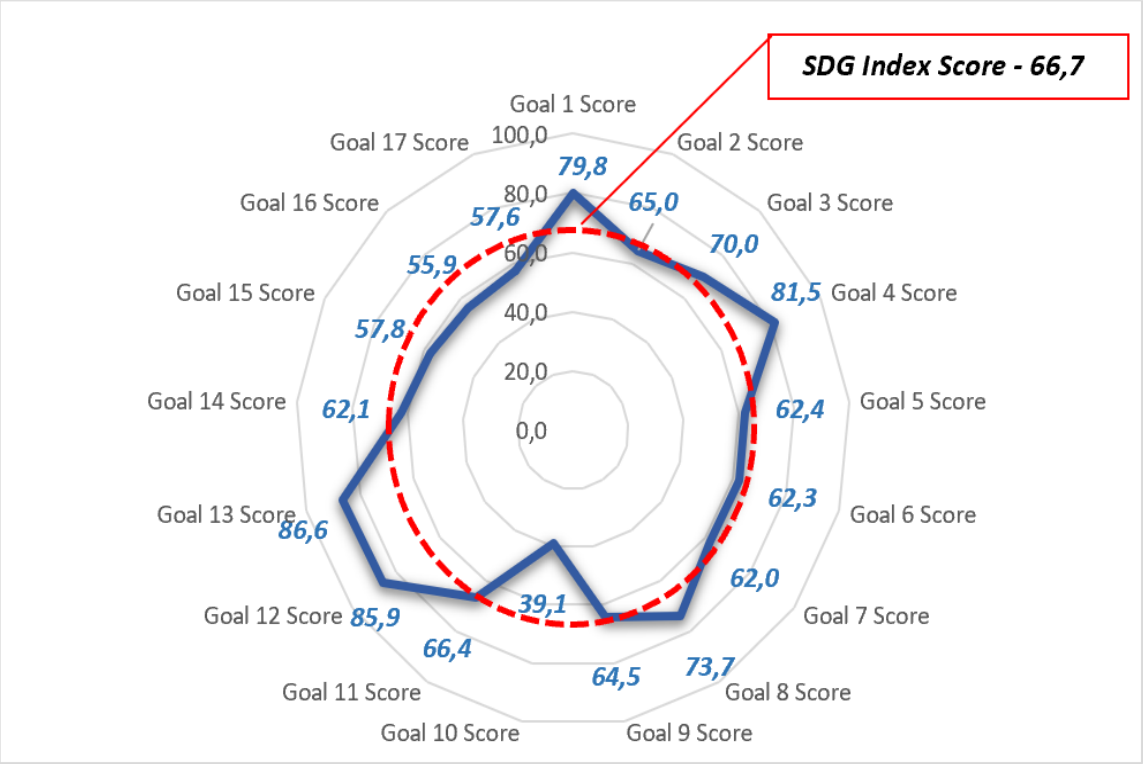


Figure 2. Distribution of SDG Index Score globally by goal type in 2022

Source: Elaborated by the authors on the basis of data available in the Report (Sachs et al., 2023)

The non-uniform distribution of the SDG Index Scores across the various goals indicates differentiated progress. This disparity underscores the complexity of achieving sustainable development, as it necessitates a multifaceted approach addressing economic, social, and environmental challenges simultaneously.

Reasons for Different Levels of the SDG Index Score include:

- Discrepancies in scores may reflect where governments, organizations, and donors have allocated their resources, with some areas receiving more attention and funding than others.
- Some goals have more reliable and comprehensive data collection mechanisms in place, leading to more accurate and higher scores.
- Certain goals, especially environmental ones, may represent more complex challenges that are difficult to address within existing economic and political frameworks.

- Some initiatives may have long-term impacts that are not yet visible, while others might demonstrate more immediate results, leading to variations in scores.

It may be highlighted the heterogeneity in global progress toward achieving the SDGs. Recognizing these variances is critical in strategizing and implementing targeted interventions to address gaps and bolster progress toward a more sustainable and equitable future.

Particular emphasis is placed on Sustainable Development Goals that pertain to environmental sustainability. Specifically, the research focuses on SDG 6, which aims to guarantee universal access to water and sanitation, SDG 7, which aspires to ensure access to affordable, reliable, sustainable, and modern energy for all, and SDG 11, which strives to foster cities that are inclusive, safe, resilient, and sustainable. In the context of SDG 6, the target is to ensure that all individuals have access to fundamental services, including the provision of clean water to facilitate core hygienic practices effectively (Del-Aguila-Arcentales et al., 2022).

Of particular interest is the dependence of the SDG index score by country group on their level of development (figure 3).

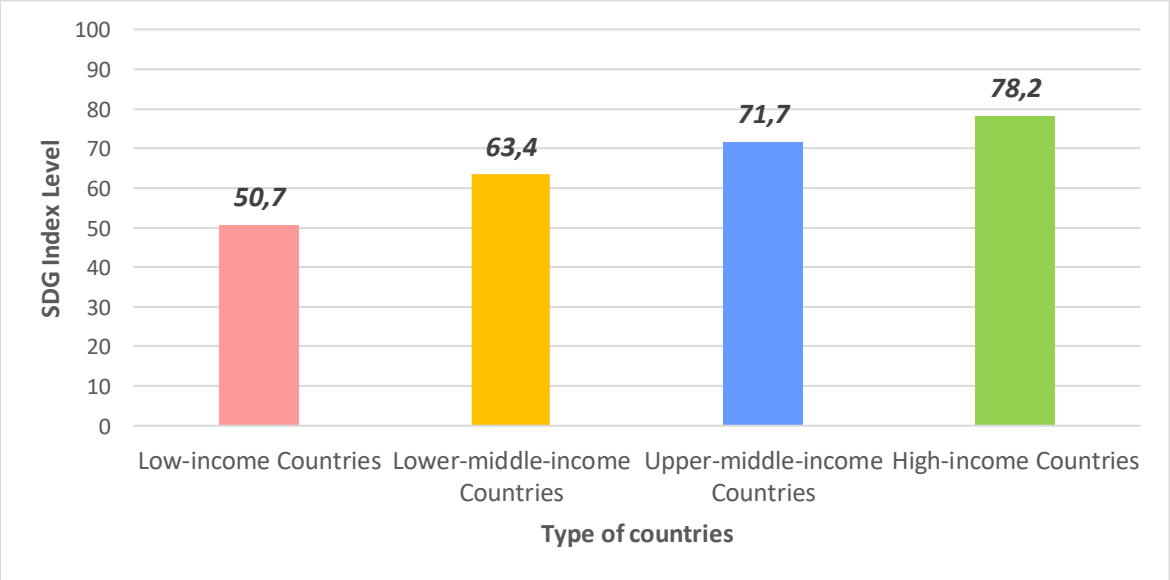


Figure 3. SDG Index Score per groups of countries in 2022

Source: Elaborated by the authors on the basis of data available in the Report (Sachs et al., 2023)

The ascending order of SDG Index Scores with increasing income levels reveals a positive correlation between a country's economic standing and its performance on SDG metrics. Specifically, low-income countries exhibit an average SDG Index Score of 50.7, which

gradually rises to 63.4 for lower-middle-income countries, 71.7 for upper-middle-income countries, and reaches its zenith at 78.2 for high-income countries. The data indicates a significant variance in SDG Index Scores corresponding to the developmental level of countries. The trend suggests that higher income levels facilitate better outcomes across the spectrum of sustainable development goals. This phenomenon can be attributed to a multitude of factors that intertwine economic resources with sustainable development capabilities. Studies in the field have identified a number of priority factors that contribute to achieving the SDGs in the context of sustainable development such as: food independence, infrastructure development, energy sustainability, strengthening economic integration, focus on hard innovation and digitalisation (Iroshkina, 2024). Research findings in this area have shown that the achievement of sustainable development goals is also strongly influenced by the level of cultural development, so that higher levels of culture can help to organise decent work and ensure economic growth (Titko et al., 2023). Effective management of environmental resources is a critical issue for achieving sustainable development in developing nations (Hunjra et al., 2021).

The main reasons for the significant variation in SDG index scores depending on the level of development of countries are the following:

- High-income countries have more financial resources to invest in sustainable infrastructure, healthcare, education, and environmental protection, contributing to higher SDG attainment.
- Wealthier nations often have access to advanced technology and better-developed infrastructure, aiding in the efficient implementation of SDG-related projects.
- Economic prosperity generally correlates with stronger institutional frameworks, which are crucial for the planning, regulation, and monitoring necessary for achieving SDGs.
- Higher-income countries typically invest more in education and research, leading to innovation and improved practices that support SDG goals.
- Wealthier countries have greater leverage in international relations and may receive more favorable terms in trade, aid, and environmental agreements, supporting their SDG progress.

The correlation between the SDG Index Score and the level of development suggests that economic growth and sustainable development are interconnected, with financial prosperity providing a platform for advancing overall sustainability goals. However, this also highlights the challenge faced by lower-income countries, which may lack the resources to invest

similarly in sustainable development. Addressing this discrepancy is vital for global efforts to achieve the SDGs uniformly.

Another direction of analysis that will confirm the variation in the level of the SDG Index Score is the dependence of GDP per capita. The graphical data provided includes a scatter plot (Figure 4) and a table of correlation coefficients (Figure 5), both illustrating the relationship between GDP per capita (expressed in current US dollars) and the SDG Index Score across 154 countries in the year 2022.

The scatter plot displays individual country data points, representing their respective GDP per capita on the x-axis and SDG Index Score on the y-axis. Two distinct trend lines are fitted to the data: a linear ($y = 54.536 \cdot x - 5825.6 \cdot x + 155891$) and a polynomial ($y = 1353 \cdot x^2 - 74476$). Both trend lines suggest a positive correlation; however, the polynomial model, with an R^2 value of 0.3837, provides a better fit than the linear model, with an R^2 value of 0.3212. This indicates that as GDP per capita increases, there is a general trend towards higher SDG Index Scores, with a non-linear relationship that suggests diminishing returns at higher income levels.

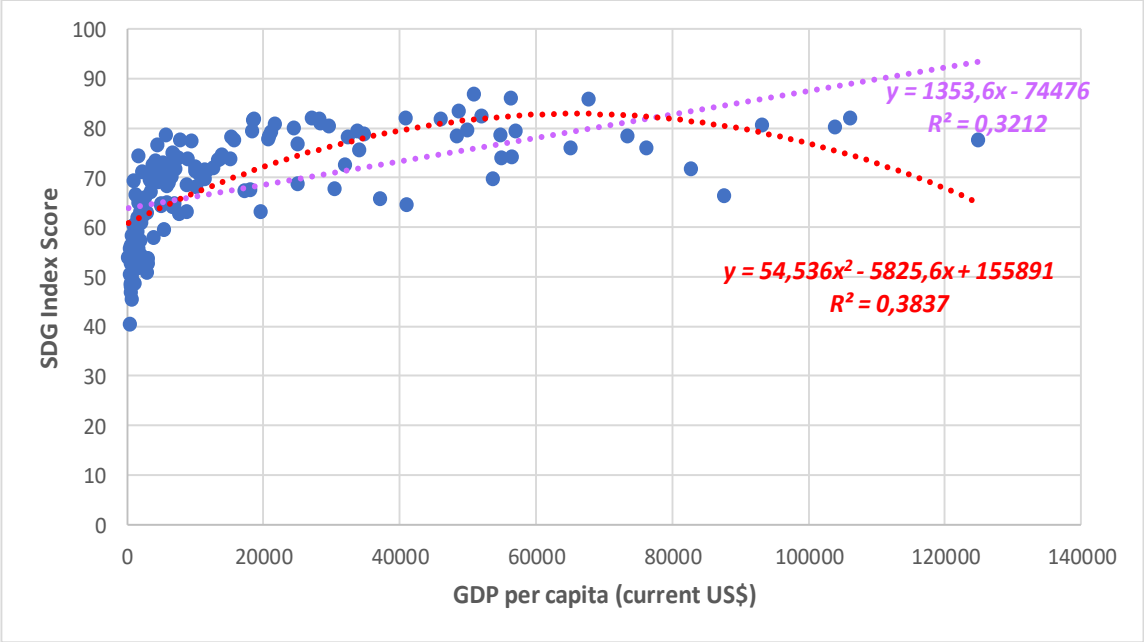


Figure 4. Correlation between GDP per capita and SDG Index Score of 154 countries in 2022

Source: Elaborated by the authors on the basis of data available in the Report (Sachs et al., 2023) and (World Development Indicators | DataBank, n.d.)The majority of nations worldwide are diligently engaging in the advancement of both the theoretical and practical

facets of sustainable development. Establishing propitious circumstances to foster sustainable development constitutes the principal priority of these countries (Dashutina, 2024). The advancement of sustainable economic development is demonstrably influenced by several key factors including financial development, abundance of natural resources, international tourism, trade openness, and foreign direct investment. Moreover, financial development assumes a positive moderating function in conjunction with natural resource abundance (Hunjra et al., 2022).It becomes manifest that, considering the heterogeneity of the Sustainable Development Goals (SDGs) and their concomitant Targets, the corresponding Indicators exhibit considerable diversity. It is incumbent upon every nation globally to amass data pertinent to the assessment of progress towards the multifaceted array of SDG Targets. Consequently, it is apparent that the constitution of the Indicators is contingent upon extant methodologies for measurement and the accessibility of data (Chowdhury & Chowdhury, 2024).

Correlations

		GDP_per_capita_USD	SDG_Index_Score
GDP_per_capita_USD	Pearson Correlation	1	.567**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	9.084E+10	21554869.31
	Covariance	593749448.3	140881.499
	N	154	154
SDG_Index_Score	Pearson Correlation	.567**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	21554869.31	15924.419
	Covariance	140881.499	104.081
	N	154	154

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 5. Correlation indicators between GDP per capita and SDG Index Score of 154 countries in 2022

Source: Elaborated by the authors using IBM SPSS Statistics on the basis of data available in the Report (Sachs et al., 2023) and (World Development Indicators | DataBank, n.d.)

The Pearson Correlation coefficient (r) between GDP per capita and SDG Index Score is 0.567**, with the notation ** indicating that the correlation is significant at the 0.01 level (2-tailed). This demonstrates a moderate positive correlation between the two variables. The significance level (Sig. (2-tailed)) of 0.000 suggests that the probability of observing this correlation by chance is extremely low, hence affirming the strength of the association between GDP per capita and the SDG Index Score.

There is a statistically significant moderate positive correlation between GDP per capita and SDG Index Score among the 154 countries assessed in 2022. The non-linear nature of the relationship suggests that increases in GDP per capita are generally associated with higher SDG Index Scores, yet the rate of increase in SDG achievement relative to GDP growth is not constant across all income levels.

The explanation of the correlation between GDP per capita and SDG Index Score can be argued by the following aspects:

- Higher GDP per capita indicates greater economic capacity for investments in health, education, infrastructure, and other areas critical to achieving SDGs.
- Wealthier nations often have better technological and institutional infrastructures, facilitating efficient implementation and tracking of SDG-related initiatives.
- The polynomial trend suggests diminishing returns, where the initial gains in SDG Scores associated with increases in GDP per capita are more substantial at lower income levels than at higher income levels.
- The moderate correlation coefficient indicates that while GDP per capita is an important factor, there are other determinants of SDG performance that are not captured by economic output alone, such as political stability, social policies, and cultural factors.

The findings underscore the importance of economic development as a facilitator of sustainable development goals, but they also highlight the necessity to address non-economic barriers and to implement targeted strategies in countries at different stages of development to optimize SDG outcomes.

CONCLUSIONS

The synthesis of data and analysis presented in this article offers a cogent appraisal of the interconnections and diverse landscape of Sustainable Development Goals (SDGs) attainment across the globe. Statistical exploration confirms the multifarious nature of progress, influenced by a confluence of socio-economic dynamics.It is unequivocally manifest that a positive trajectory in the worldwide SDG Index Score from 2000 to 2022 indicates an augmentation in sustainable practices and concerted efforts toward human

development. The linear regression's pronounced slope corroborates a consistent amelioration over time, while the substantial R^2 value intimates that temporal progression is a salient determinant of SDG performance. Despite this upward trend, the heterogeneity in scores among the 17 SDGs underscores the complexities inherent in achieving these multifaceted objectives, revealing a landscape where economic, social, and environmental challenges demand a nuanced, multifarious approach.The gradational increase in the SDG Index Score across income categories elucidates the substantive influence of economic resources on sustainable development outcomes. High-income countries, with their extensive fiscal capabilities, advanced technological infrastructure, and robust institutional frameworks, demonstrate superior SDG performance. In contrast, low-income countries encounter significant impediments due to resource constraints, elucidating the pronounced discrepancy in SDG achievements that align with economic stratification. This disparity accentuates the imperative for international cooperation and support mechanisms to foster equitable progress.Correlative analysis between GDP per capita and the SDG Index Score substantiates a moderate positive relationship, suggesting that economic growth, while not the sole influence, is a crucial catalyst for advancing SDGs. The diminishing marginal returns observed at higher levels of GDP indicate that beyond a certain economic threshold, additional gains in SDG performance may require alternative strategies beyond financial investment.In conclusion, this article contributes to the empirical body of knowledge on sustainable development, offering insights into the varying degrees of SDG fulfilment across nations and economic brackets. The findings reinforce the axiom that economic growth serves as a platform for sustainable development, but also underscore the indispensability of strategic interventions, policy coherence, and international solidarity. As the world strides towards the target year of 2030, the clarion call for collective action resounds, with a view to fostering a sustainable future that is not only envisioned but actualized. The article’s exposition makes it patently clear: the global attainment of SDGs is not merely an aspirational goal but an attainable reality, contingent upon the harmonization of efforts and the equitable distribution of resources and opportunities.

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SYNTHESIS AND PROPERTIES OF SILVER NANOPARTICLES STABILIZED BY EXTRACTS OF MEDICINAL PLANTS

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Abstract
To combat strains of bacteria with multiple drug resistance and prevent their spread, extensive scientific research is dedicated to discovering and developing new inorganic and organic agents with high biological activity, potentially equivalent to antibiotics in their antibacterial properties[1-2]. The advantages of antibacterial agents based on silver nanoparticles(AgNPs) are pronounced antimicrobial, antiviral and fungicidal activity for a wide range of stains without issue with development of the resistance. AgNPs has relatively low toxicity to multicellular organisms[3-4]. AgNPs can be synthesized by various physical and chemical methods that can be potentially hazardous to the environment [5]. Therefore, methods of AgNPs stabilization by plant extract is of increasing interest. It has advantages as simplicity of implementation, short synthesis time, long term storage, economic availability and green approach. The reduction of silver ions to nanoparticles occurs by means of functional groups of plant extracts. The main factors influencing the synthesis are temperature, pH and reaction time [3-4]. The aim of the work the selection of appropriate plant extracts for green synthesis of AgNPs possessing antimicrobial activity.
Keywords: plant extract, AgNPs, green synthesis, antimicrobial activity

Materials and methods.

Method 1. The synthesis of AgNPs involves mixing 160 mL of silver nitrate solution (1mM) with 4 mL of each alkaline peptide hydrolysate. This mixture was then left in a dark environment at room temperature for 30 minutes to create a silver-protein complex. The synthesis process was monitored using a UV–Vis spectrophotometer, observing color changes and absorbance spectra within the range of 420 nm to 460 nm[3].Subsequently, the pH of the reaction mixture was adjusted to alkaline (pH 9.0-9.5), neutral (pH 7.0-7.5), and acidic (pH 4.0-4.5) conditions using ammonia solution or acetic acid. The formation of AgNPs was induced using various methods: 1) heating to 90°C with stirring; 2) exposure to UV irradiation (UV lamp 254 nm) with stirring; 3) microwave (Mw) irradiation with stirring. Optical density (OD) measurements were taken every 10 minutes to determine the optimal stabilization time for nanoparticles. The resulting AgNPs suspensions were stored at 4°C for future use[3].Method 2. A 70% ethanolic extract commercially available of *Calendula officinalis* flowers was diluted with purified water at a ratio of 1:50. This diluted plant extract was then combined with 1 mM silver nitrate at a 1:1 ratio. The plant extract functioned as both a stabilizer and a reducing agent. The final concentrations of the starting materials in the reaction mixture were 1% ethanol tincture of Calendula officinalis and 0.47 mM silver nitrate. To evaluate the synthesis of AgNPs using the plant extract at different pH levels, the resulting solution was divided into three parts and titrated with a 0.01 M ammonium solution to achieve acidic (pH 5), neutral (pH 7), and alkaline (pH 9) conditions. A similar set of solutions was prepared using NaOH as the pH adjuster instead of ammonium. The reaction mixtures at different pH levels were then subjected to heat in a water bath at 80°C for 60 minutes, with measurements of OD460 taken six times, each for 10 minutes, in between heat treatments. After each heat treatment, the samples reached a temperature of 80°C. The AgNPs suspensions were stored at +4°C in a location shielded from sunlight throughout the entire research process [4].Method 3. AgNPs stabilized using an extract from Artemisia terrae-albae were synthesized as follows: Initially, 6.6 grams of ethanolic extract of A. terrae-albae, diluted in water at a ratio of 1 to 40, was combined with 13.2 ml of a 1.5mM AgNO3 aqueous solution. The pH of the resulting mixture was 4.6, which was then adjusted to 9.8 by adding a small amount of 10% ammonia solution. Immediately after this pH adjustment, the solution darkened, and the surface plasmon resonance (SPR) peak was observed at 445nm. In a separate procedure, 0.061 grams of ethyl acetate extract of A. terrae-albae was mixed with 2.75 mL of an 8% ethyl acetate solution in water. This solution, diluted 45 times, was then mixed with 5.5 mL of a 1.5mM silver nitrate aqueous solution, and the pH was

adjusted to 9.4 using 10% ammonia solution. Some separation of the organic phase was observed, and the color changed to dark grey, resulting in AgNPs@EtAc Artemisia x45 [6].

Results and discussion.

This study focuses on an environmentally friendly synthesis method for AgNPs with antibacterial properties with intended application for external use. The shift towards the larger wavelength of the surface plasmon resonance (SPR) spectrum observed in AgNPs obtained at pH 5 is attributed to the formation of hydrogen bonds between particles, resulting in some degree of aggregation. The colour of the particle suspension obtained at pH 5, 7, and 9[3].We propose to explain the AgNPs mechanism formation using Medusa software modelling(figure 1). For example, at pH 9, it included silver complexes such as [Ag(Gly)2] along with various amino acids and diverse organic compounds, each with differing stability and E0 potential (Figure 1). Proposing multiple mechanisms for the reduction process of silver complexes will be the focus of subsequent research. Upon exposure of the reaction mixtures to external physical factors such as UV radiation, MW radiation, and thermal exposure, systematic color changes were observed. These changes ranged from pale yellow to intense shades of bright purple, pink, and brown, contingent upon the concentration of AgNPs in the reaction mixtures. The alterations in color in the samples suggest the binding of the *Calendula officinalis* extract and silver ions, respectively. This indicates the formation of AgNPs stabilized by the extractives and their associated surface plasmon resonance (SPR)[4]. The primary driving force behind the formation of AgNPs is the significant disparity in redox potential. Specifically, the standard redox potential (E0) of Ag0/Ag+ is +0.8 V, whereas the redox potentials of amino groups and acetate/ethanol are -0.27 V and -0.39 V, respectively (as reported in [4]). It is essential to consider that at different pH levels, ions exist as different species, leading to variations in their standard redox potentials. For instance, glucose functions as a reducing agent with an E0 of -0.05V, and the complex Ag+/[Ag(NH3)2] has an E0 of -0.337 V.It was discovered that the combination of AgNPs-peptide and light irradiation at wavelengths 445 nm and 630 nm effectively suppressed the growth of bacterial strains. The inhibitory concentration was found to be 7.6 μM for AgNPs against E. coli and 110 μM against S. aureus. The effectiveness of light exposure was compared with AgNPs-peptide that were not irradiated. Surprisingly, there wasn't a significant difference in the antimicrobial activity between the irradiated and non-irradiated AgNPs-peptide, which could be attributed to the short duration of illumination or low light intensity. Alternatively, it is possible that the active radicals generated were neutralized by the functional groups of the proteins. The antimicrobial effectiveness of the Calendula

officinalis extract contrasts with previously reported data on its antimicrobial activity against various pathogenic bacteria. This disparity could be attributed to differences in the dilution factor or significant variations in the chemical composition of the extract due to variations in the extraction method. However, AgNPs stabilized with Calendula officinalis exhibited significantly superior antimicrobial activity compared to citrate-stabilized AgNPs[4]. Dissolving the poorly soluble ethanolic and ethyl acetate (EtAc) extracts of Artemisia terrae-albae in water using a method of serial dilutions (e.g., x40, etc.) did not demonstrate activity against E. coli and *S. aureus*. But, it proved challenging and impractical to prepare solutions at higher concentrations. EtAc extracts at dilutions of x15 and x8 exhibited comparable moderate levels of activity against Escherichia coli . AgNPs stabilized with EtAc extract at a dilution of x60 displayed activity against all the strains studied, with the highest sensitivity observed against E. coli and C. albicans[6].

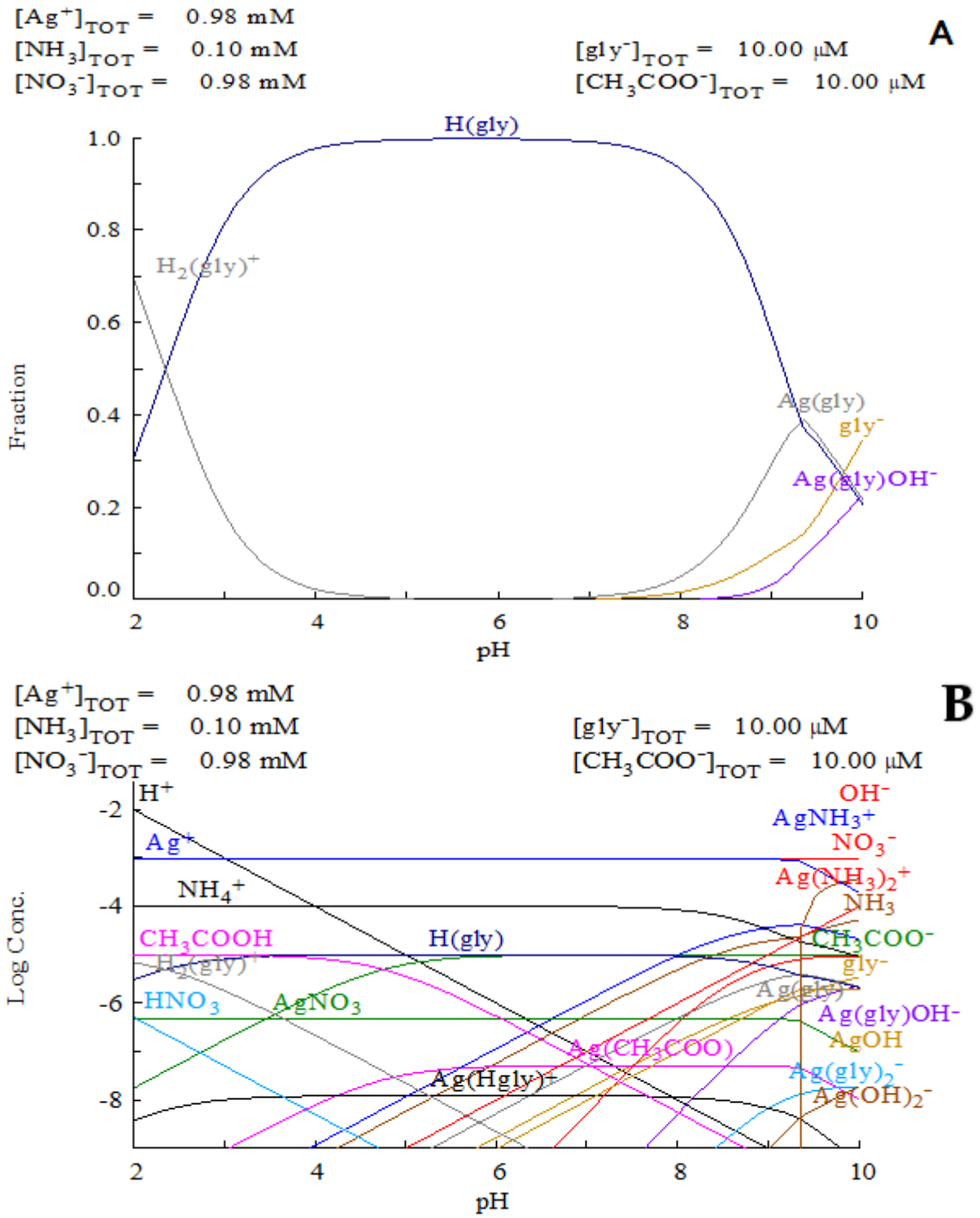


Figure 1 Speciation of silver ions in solution: A) 0.97 mM Ag ions in presence of 1mM glycine; B) 0.98 mM Ag ions in presence of 10 µM glycine and 10 µM acetate (Diagram created by Medusa software).

Obtained data in agreement with recent data where Rhazya stricta extract was utilized for the synthesis of aqueous (Aq) and alkaline (Alk) AgNPs, which exhibited average diameters ranging from 21 to 90 nm and 7.25 to 25.32 nm, respectively. Both types of AgNPs@Rhazya

stricta absorbed UV light at average wavelengths of 405 nm and 415 nm, respectively. In terms of fungicidal activity, the highest doses of the aqueous extract and aqueous AgNPs inhibited the mycelial growth of F. incarnatum (19.8%, 87.5%), F. solani (28.1%, 72.3%), F. proliferatum (37.5%, 75%), and F. verticillioides (27.1%, 62.5%), respectively. Interestingly, the alkaline fraction exhibited stronger inhibition compared to the biosynthesized AgNPs, leading to complete inhibition at doses of 10% and 20%[7].The influence of ultrasonic exposure time (ranging from 0 to 30 minutes) on AgNPs nanoparticle formation were investigated. AgNPs SPR peaks at 408 nm were observed. During a three-week storage period, slight aggregation of NPs was noticed at room temperature. Contrary a storage of NPs at 4°C lead to less aggregation of AgNPs. In both storage conditions, the optical density of the AgNPs increased, but no further increase of absorption was observed within 3 weeks. Minimal inhibitory activity(MIC) against gram-positive *S. aureus* was observed at a dilution of 1:4 for AgNPs. MIC for gram-negative *E. coli* was detected at a dilution of 1:5 for AgNPs. A control experiment with a diluted extract of herbs, roots, and rhizomes of *Paeonia anomala* and *Calendula officinalis* confirmed the absence of antimicrobial activity. Microbiological studies confirmed the good antibacterial activity of AgNPs@*Calendula* in concentrations of 1.4 × E9 particles/ml against gram-positive S. aureus and 0.74 × E^9 particles/ml against gram-negative *E. coli* regardless of additional blue (445 nm) and red (630 nm) spectra of light irradiation[4].

Conclusion.

We demonstrated that nanoparticles can be stabilized by plant extracts as well as peptides obtaibed via hydrolysis of proteins. The mechanism of AgNPs formation discussed. Exposed peony extract with silver nitrate to ultrasonic radiation exhibited promising antimicrobial capabilities against the test cultures. AgNPs@*Calendula;* AgNPs@peony extract AgNPs@Artemisia and AgNPs@peptide antimicrovial activity were tested. Additionally, AgNPs@ *Calendula* demonstrated significantly better antimicrobial activity compared to AgNPs stabilized with citrate. Antimicrobial activity was evaluated against photogenic S. aureus *E. coli* and semiphatogenic strains *Pseudomonas mendocina, Rhodococcus koreensis and Athrobacter Chlorophenolicus and Acinetobacter radioresistens* most probably due to low concentration. Overall, the research data supports the potential of using silver nanoparticles in the development of new antiseptic agents with the advantage of minimal adverse side effects.

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FİREBASE MESSAGING İLE KİŞİSELLEŞTİRİLMİŞ BİLDİRİMLER

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Özet
Mobil uygulama geliştiricileri için, kullanıcı etkileşimini artırmak ve uygulama içi iletişimi optimize etmek, başarılı bir uygulamanın temel taşlarından biridir. Bu bağlamda, Firebase Messaging servisinin sunduğu topic özelliği, kullanıcıların ilgi alanlarına göre segmentasyon yaparak ve onlara özelleştirilmiş içerik paketleri sunarak, bu ihtiyaca yönelik gelişmiş ve kolay bir çözüm sunmaktadır. Araştırmamızda, Flutter ile geliştirdiğimiz uygulamamızda kullanıcıların girdikleri e-posta adreslerine göre örevlendirme ve bildirim özelliğini, topic özelliği ile aktifleştirdik. Bu sayede, kullanıcılara uygulamayı kullanırken kişisel olarak gidecek bildirimleri kontrol edebildik. Ayrıca göncerilecek bildirimin saatini ve tasarımını da kolay bir şekilde yapabilmemizi de sağlayan Firebase Messaging ile hem vaktimizi hem de yazacağımız kodu daha anlaşılır hale getirdik. Kullanıcıların ilgi alanlarına göre özelleştirilmiş içerik sunumu, etkinlik duyuruları ve görevler gibi özel senaryolarda bildirimlerin etkin bir şekilde çeşitlilik göstermesi, uygulama deneyiminin daha tatmin edici hale gelmesini sağlamaktadır. Bu yaklaşım, kullanıcıların uygulama içi etkileşimini önemli ölçüde arttırırken, aynı zamanda geliştiricilere de kullanıcı çalışmaları üzerinde daha fazla kontrol ve esneklik sağlamaktadır. Firebase Messaging ve topic özelliği, mobil uygulama geliştiricilerine, kullanıcıların ilgisini çekme ve onları daha fazla dahil etme konusunda güçlü bir araç sunmaktadır. Bu özellik, kullanıcıların uygulama içi deneyimlerini zenginleştirirken geliştiricilere de kod yazarken daha fazla kolaylık sağlamaktadır. Bu özellik sayesinde geliştiricilerin kullanıcıyı uygulamadan daha fazla haberdar edebilme imkanını sağladık ve kullanıcıların uygulama üzerinde daha fazla zaman harcamalarına olanak tanıdık. Bu çalışmada, Flutter ile geliştirdiğimiz mobil uygulama ile Firebase Messaging'in topic özelliğini kullanarak kişiye özel ya da toplu olarak nasıl bildirim gönderebileceğimiz üzerinde çalıştık ve topic özelliğinin detaylandırılmasını inceleyerek, geliştiricilerin bu aracı nasıl etkin bir şekilde kullanabileceklerini ve kullanıcı deneyimini nasıl daha iyi hale getirebileceğini açıkladık.
Anahtar Kelimeler: Flutter, Firebase Messaging, Bildirim, Mobil Uygulama

Giriş:

Mobil uygulama geliştirme sürecinde, kullanıcıların etkileşimini artırmak ve önemli bilgileri iletmek için bildirimler kritik bir rol oynar. İşte bu noktada Firebase Cloud Messaging[5] (FCM) devreye girer. FCM, Google tarafından sunulan bir hizmettir ve uygulamaların anlık bildirimler göndermesini ve almasını sağlar. Bu, kullanıcıların uygulamayla etkileşimini artırırken, geliştiricilere de kullanıcıları bilgilendirmek ve yönlendirmek için güçlü bir araç sunar.FCM, uygulama içi bildirimler, haberler, güncellemeler ve özel teklifler gibi çeşitli mesaj türlerini destekler. Geliştiriciler, Firebase konsolu üzerinden basit bir şekilde bildirimleri özelleştirebilir, hedef kitleleri belirleyebilir ve zamanlamaları ayarlayabilir. Bu sayede kullanıcılar, uygulamalarını daha etkin ve kişiselleştirilmiş bir şekilde kullanabilirler.

1.1 Flutter:

Flutter, Google tarafından açık olarak sunulan bir yazılım geliştirme yazılımıdır ve modern mobil cihazın hızlı ve etkileyici bir şekilde çalıştırılmasını sağlamaktadır. Dart programlama dilini kullanarak geliştiricilere dinamik ve kullanıcı dostu dağıtımlar oluşturma imkanı sunmakla beraber bir araya getirilen bağlı widget'lar, animasyonlar, dokunmatik tepkiler ve daha birçok özellik kolayca entegre edilebilmektedir. Flutter'ın en dikkat çeken özelliklerinden biri, cross-platform olma yeteneğidir. Bu özellik, geliştiricilere iOS ve Android gibi farklı platformlarda çalışabilen uygulamalar geliştirmek için tek bir kod tabanını kullanma imkanı sunar. Yani, geliştiriciler aynı Dart kodunu kullanarak iOS, Android, web ve desktop için uygulamalar geliştirebilirler[1]. Bu, geliştirme sürecini hızlandırır ve kaynakların verimli kullanılmasını sağlar. Ayrıca, Flutter'ın cross-platform olma özelliği [2], uygulamaların farklı platformlarda tutarlı bir şekilde çalışmasını sağlar, böylece kullanıcılar herhangi bir platformda benzer bir deneyim yaşarlar. Bu da uygulamanın kullanıcı tabanını genişletirken, geliştirme maliyetlerini düşürür. Dart dilini[3] kullanan Flutter, yüksek performanslı uygulamalar oluşturmak için optimize edilmiştir, Flutter, geniş bir topluluk desteğine sahiptir ve güncel yapısıyla dikkat çekmektedir. Gerek tasarım yaparken hızlı bir şekilde arayüzün ayarlanması gerek ise tek kod ile farklı platformlarda çalışabilmesi açısından geliştiricilerin tercihleri arasında birinci sıraya yükselmektedir.

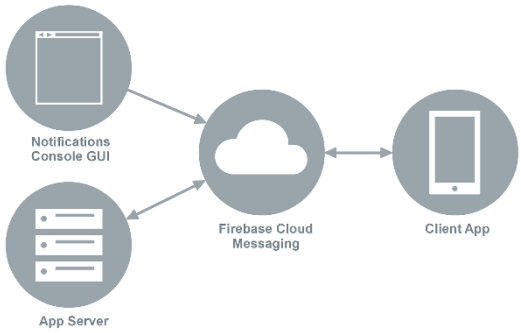
1.2 Firebase:

Firebase[3], Google tarafından sunulan, uygulama geliştiricilerine yönelik bir Backend-as-a-Service (BaaS) platformudur. BaaS, yazılım geliştiricilerin uygulamalarını hızlı bir şekilde geliştirmelerine ve dağıtmalarına yardımcı olmak için bulut tabanlı hizmetler sağlayan bir modeldir. Bu platform, sunucu tarafı kod yazma ihtiyacını ortadan kaldırarak, geliştiricilere

kullanıcı hesap yönetimi, veritabanı yönetimi, depolama, analitik ve mesajlaşma gibi çeşitli araçlar sunar. Firebase, özellikle mobil uygulama geliştirme işlemlerinde popülerdir ve geliştiricilere uygulama işlevselliğini hızlı bir şekilde uygulamaya koyma ve zorlu backend işlemleri için yüksek ölçeklenebilirlik sunma imkanı verir. Google Cloud Platform (GCP) üzerinde çalışan Firebase, GCP'nin altyapısını kullanarak geliştiricilerin uygulama geliştirme süreçlerini kolaylaştırır. Firebase'in sunduğu özellikler arasında Firebase Auth, Firebase Realtime Database[8], Firebase Storage[7], Firebase Cloud Messaging[5] ve Firebase Hosting[6] bulunur. Firebase Auth[9], kullanıcı hesap yönetimini kolaylaştıran bir kimlik doğrulama hizmeti sağlarken, Firebase Realtime Database gerçek zamanlı veritabanı yönetimi için kullanılır. Firebase Storage, kullanıcılara uygulama verilerini depolamak için güvenli ve ölçeklenebilir bir depolama hizmeti sunar. Firebase Cloud Messaging, mobil ve web uygulamaları[4] aracılığıyla bildirimler göndermek için kullanılır ve Firebase Hosting, uygulamaları hızlı ve güvenli bir şekilde dağıtmak ve barındırmak için kullanılır. Firebase, geliştiricilere zaman kazandıran ve uygulama geliştirme sürecini kolaylaştıran bir hizmettir ve mobil uygulama geliştirme işlemleri için ideal bir seçenektir.

1.2.1 Firebase Messaging:

Firebase Messaging, çapraz platform mesajlaşma çözümüdür ve yeni e-posta veya diğer verilerin geldiğini güvenilir bir şekilde bildirmenizi sağlar. Firebase Messaging, uygulama geliştiricilerine, belirli bir konuya katılan birden fazla cihaza mesaj gönderme imkanı sunar. Bu konsept, yayın/abone modeline dayanır ve mesajı doğru cihazlara yönlendirme ve güvenilir bir şekilde iletimini sağlar. Firebase Messaging'in "topic" özelliği, geliştiricilere belirli bir konu ya da kategori ile ilişkilendirilmiş kullanıcı gruplarına kolayca bildirim gönderme imkanı sağlar. Bir kullanıcı belirli bir konuya abone olduğunda, o konu ile ilgili bildirimleri alır. Bu, uygulamaların kullanıcılarına içerikleriyle ilgili önemli güncellemeleri ya da bilgileri hızlı bir şekilde iletebilmesini sağlar. Firebase Messaging'in bu özelliği, kullanıcıların ilgi alanlarına göre özelleştirilmiş bildirimler almasını sağlayarak kullanıcı deneyimini artırır ve geliştiricilere etkili bir bildirim stratejisi oluşturma imkanı sunar. Figür 1'de FCM örneği çalışma yapısı gösterilmiştir.



Figür 1. Firebase Cloud Messaging

Gelişme:

Flutter ile geliştirdiğimiz uygulamamız kullanıcılar ve adminin bulunduğu bir sistem etrafında oluşmaktadır. Kullanıcılara atanan görevler admin tarafından kontrol edilmektedir. Her gün admin görevleri kullanıcılara atayıp kullanıcıların görevlerini yerine getirmesi beklenmektedir. Her kullanıcı kendi ile alakalı görevi görebilmekte ve görevi gördükten sonra 'Görevi Aldım' butonuna basmalıdır. Görevi tamamladıktan sonra da 'Görevi Bitirdim' butonuna basarak arada geçen zaman görevi yapma süresi olarak kayıtlara geçmektedir. Bu sayede her kullanıcıların bir döngü içinde aynı görevi yaptıkları süre karşılaştırılarak ne kadar iyi performans ile verilen görevi yaptıkları sayısal sonuçlar ile karşılaştırılma imkanı sunulmuştur.Uygulamamızda Firebase Messaging (FCM) özelliği, admine özel bildirimler göndermek için kullanılmaktadır. Admine ait bir token ile giriş yapan kullanıcının bilgileri, uygulamaya her giriş yaptıklarında kendilerine özel bildirimler alabilmeleri için saklanmaktadır. Bu bildirimler, admine gerekli hatırlatmaları ve haberleri iletmek için kullanılmaktadır. FCM'nin sağladığı esneklik sayesinde, mesaj başlığı, içeriği, hedef kitle ve zamanlama gibi özellikler kolayca özelleştirdik.

Uygulamamız, FCM'nin zamanlama özelliğini kullanarak, düzenlenen bildirimler her gün belirli bir zamanda göndermek üzere ayarlandı. Bu, adminin günlük iş akışını düzenlemesine ve kullanıcılara yönelik görev atamalarını etkin bir şekilde yönetmesine olanak tanımaktadır. Ayrıca, bu özellik, adminin ve kullanıcıların uygulamayla etkileşimini artırarak, görevlerin zamanında ve verimli bir şekilde tamamlanmasını sağlamaktadır.

Sonuç:

Sonuç olarak, Firebase Cloud Messaging (FCM) kullanarak geliştirdiğimiz uygulamamız, kişiye özel bildirimler göndermek için güçlü bir araç sağlamaktadır. Bu özellik, kişilerin anlık olarak bilgilendirilmesini sağlayarak hızlı karar almasına olanak tanır ve uygulamanın

yönetimini daha etkin hale getirmektedir. Ayrıca, Firebase panelinden yapılan ayarlarla mesaj başlığı, içeriği, hedef kitle ve zamanlama gibi çeşitli parametrelerin kolayca yönetilmesi, iletişimi daha esnek hale getirir ve uygulamanın gereksinimlerine uygun olarak özelleştirilebilirliği artırmıştır. Sonuç olarak, Firebase Cloud Messaging, uygulamamızın kullanıcı deneyimini artırırken aynı zamanda yönetim süreçlerini daha verimli hale getirmiştir.

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MEASURING THE IMPACT OF LAND USE ON THE QUALITY OF NATURAL HABITATS IN MAZANDARAN PROVINCE, NORTHERN IRAN

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Abstract
Habitat quality is a crucial ecosystem service that reflects the ability of ecosystems to support and safeguard animal and plant populations and species. The Mazandaran province, located in the north of Iran, is an ecologically significant region due to its Hyrcanian forests and proximity to the Caspian Sea. However, in recent decades, the development and conversion of land uses have had a negative impact on the region. This study aims to evaluate the impact of land use on habitat quality in Mazandaran province. The land use map was created using Sentinel 1 and 2 land cover data in Google Earth Engine. Habitat quality was modeled using the InVEST model and analyzed using hot spot analysis in ArcGIS 10.7. The study revealed that habitats located in the central parts of the province were the most favorable, while the northern parts, including the plains and coastal areas, were the least favorable. Forests were found to be the most desirable habitats, while build-up areas were the least desirable. The hotspot analysis indicated that hot and cold habitat spots accounted for 10.5% and 13.8% of the region, respectively, at a 99% confidence level. The study results can aid in identifying habitat quality and prioritizing conservation efforts for the study area's managers and planners.
Keywords: Habitat quality, Land use, Hotspot analysis, InVEST

Introduction

Habitat quality is an important ecosystem service, indicating the capability and viability potential of ecosystems for the distribution and protection of animal and plant populations and species (Sharp et al., 2015). It can indicate the ability of an ecosystem to provide the resources and conditions necessary for the life of living organisms, and it changes under the influence of ecological factors and land characteristics (Han et al., 2019). Habitat loss and degradation represent the most significant threats to wildlife and biodiversity worldwide (Nematollahi et al., 2020). The study of habitat quality plays a pivotal role in elucidating the spatial dynamics of fragmented landscapes and evaluating the efficacy of biodiversity protection measures (Han et al., 2019). A multitude of factors influence the alteration of natural habitats in varying degrees. Among the most significant of these are land use change, climate change, urban development, and road networks (Demetriou et al., 2013). The quality of habitats is largely contingent upon their proximity to threat sources, such as industrial and agricultural areas, and their inherent sensitivity (Mirghaed and Souri, 2021). Human activities represent a significant contributing factor to habitat fragmentation and the disruption of ecological relationships, ultimately leading to a decline in biodiversity and habitat quality (Borges et al., 2017). The intensity of human activities is a key determinant of habitat vulnerability, resulting in a reduction in habitat quality and biodiversity. Conversely, the lower the level of human intervention in a region, the higher the quality of the habitat and the greater the biodiversity (Zhang et al., 2021).A variety of models have been developed to evaluate habitat quality. InVEST is one of the most widely used habitat quality assessment models that has been developed in the last decade and has been used to study habitat quality at different scales and locations. The InVEST model provides a simple method for assessing habitat quality at sites with limited and unsampled data (Wei et al., 2022). This model employs habitat threats and land use to estimate habitat quality, which is more efficient and accurate and has numerous advantages in calculating habitat quality over long periods of time (Gong et al., 2019). Pu et al. (2024) assessed the habitat quality of the Lake Taihu basin in China using the InVEST model. It was acknowledged that the quality of habitats in the study area had decreased as a result of changes in land use between 2000 and 2020. Mirghaed and Souri (2022) evaluated the habitats of the Taluk River watershed in Khuzestan province, southwestern Iran, using the InVEST habitat quality model. The study revealed that the quality of habitats located in the northern and eastern regions of the study area is significantly higher than that of other areas. Furthermore, forest habitats exhibited a higher quality than other habitats in the basin. Aneseyee et al. (2020) employed the InVEST

habitat quality model to analyze the spatial-temporal change in habitat quality across different land use types in the Wink basin in Ethiopia.The Mazandaran province in northern Iran is situated in close proximity to the Caspian Sea and the plains in the north, as well as the mountainous and high areas in the south. This diverse topography gives rise to a variety of climatic conditions and habitats, which in turn support a rich biodiversity of plants and animals. The province is home to numerous species of plants and animals, including unique, vulnerable, and endangered species. Due to its Hyrcanian forests and its proximity to the Caspian Sea, this province is considered to be an important ecological and habitat area. However, the development and conversion of land uses in the last decade have affected the region's ecological integrity. The development of land uses in this region has changed habitat conditions, especially in protected areas. Therefore, it is important to identify the threats and their effects on the quality of habitats in the province. The objective of this study was to evaluate the impact of land use on the quality of habitats in Mazandaran province, located in northern Iran. The study was conducted in accordance with the following objectives:

(i) Assessment of habitat quality in the study area based on land use pattern and the InVEST model.

(ii) Spatial analysis of habitat quality based on cold and hot spots in the study area.

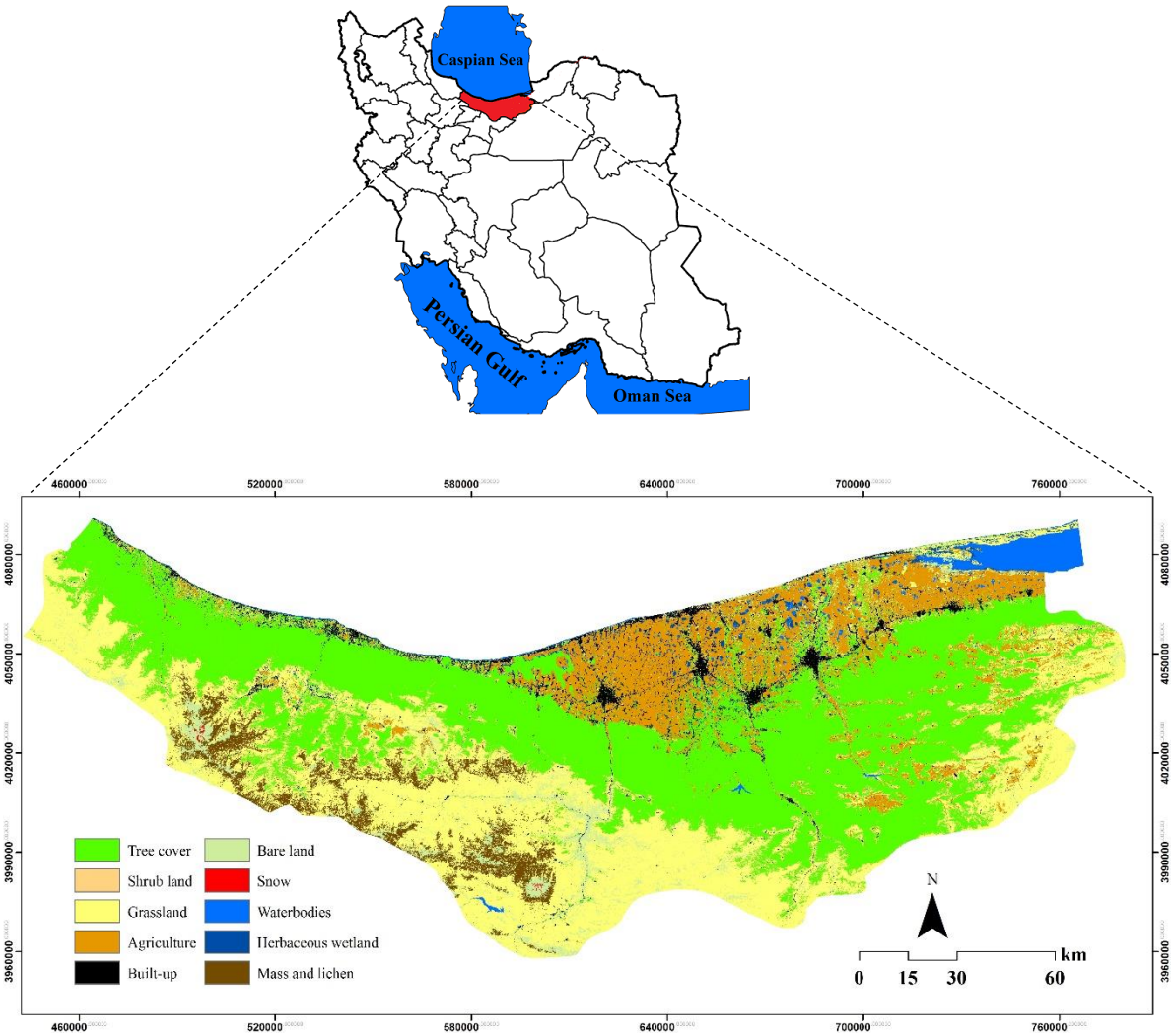


Fig. 1. Location of the study area

Materials and methods

Study area

The Mazandaran province, with an area of 23,756 square kilometers, is situated in the northern region of Iran (Fig. 1). It is bordered by the Caspian Sea to the north, Golestan province to the east, Tehran, Semnan, and Qazvin provinces to the south, and Gilan province to the west. The province represents approximately 1.46% of the total surface area of Iran, with an estimated population of 2602008, according to the most recent census results from 2015. The province's average annual rainfall and temperature are 631 mm and 17 degrees Celsius, respectively. The province's climate is classified as moderate and humid, cold semi-humid, and cold semi-arid. It has a variety of ecosystems, including riverine, wetland, forest, and pasture. The southern parts of the province are covered by Hyrcanian forests and pastures, while the northern plains are primarily agricultural and developed. The province's

diverse ecosystems have contributed to its rich biodiversity, supporting many important mammals and rare birds.

Habitat quality modeling

The InVEST model evaluates habitat quality based on a land use map, habitats, and threat factors, as outlined in equation 1. The following factors are considered in the modeling process:

(a) The impact distance of the threat source on a specific habitat considered in kilometers.

(b) Variability of threat effect in space defined as exponential or linear.

(c) Habitat importance defined on a scale of 0 to 1, with 0 representing the least important and 1 representing the most important. This value is determined by considering the ecological conditions and the habitat's role in maintaining biodiversity.

(d) The sensitivity of habitats to threat sources and the importance of threat sources are also considered. These values are assigned a score between 0 and 1, with 0 representing the least sensitive and 1 representing the most sensitive. This score is determined by considering the conditions of the region and the opinions of experts and scientific sources.

(e) The level of conservation measures is quantified on a scale of 0 to 1, with 0 representing the lowest level of conservation and 1 representing the highest level of conservation. This value is introduced to the model as a vector layer (Sharp et al., 2015; Mirghaed and Souri, 2021).

$$Q_{xj} = H_j\left(1 - \left(D_{xj}^z / D_{xj}^z + k^z\right)\right) \quad (1)$$

Q_{xj} = habitat quality in cell x with land use j

H_j = habitat suitability value of land use j

D_{xj} = overall degradation level in cell x with land use j

k = half saturation constant determined by the user.

z = constant equal to 2.5

In this study, habitat values, sensitivity of habitats and their distance from threat sources were determined according to Tables 1 and 2. The land use map was produced based on the Sentinel 1 and 2 land cover data in the Google Earth Engine system.

Statistical analysis

Hotspot analysis in ArcGIS 10.7 was used for spatial analysis of habitat quality at the level of zones in the region. The zoning of the region was created using the tessellation module in ArcGIS 10.7 software.

Table 1 Habitat importance and habitat sensitivity to each threats sources

Land use	Habitat importance	Threats	
		Agriculture	Built-up
Tree cover	0.9	0.9	0.9
Shrub land	0.7	0.7	0.6
Grassland	0.7	0.7	0.6
Agriculture	0.4	0	0.2
Built-up	0.1	0	0
Bare land	0.5	0.2	0.3
Snow	0.6	0.5	0.5
Waterbodies	0.8	0.9	0.9
Herbaceous wetland	0.9	0.9	0.9
Mass and lichen	0.6	0.4	0.5

Table 2 Maximum distance, weight and decay of each threat sources

Threat	Maximum distance (km)	Weight	Decay
Agriculture	3	0.7	linear
Built-up	3	0.9	exponential

Results

The habitat quality map of the region resulting from the InVEST model is shown in Figure 2. Figure 3 also shows the habitat quality classification map. The area allocated to each habitat quality class is also shown in Table 3 and Figure 4. It was found that the habitats located in the middle parts of the province had the highest quality, while the habitats located in the northern areas, especially the plains and the coastal strip of the region, had the lowest quality. The area assigned to the very low, low, medium, high, and very high quality classes was 13%, 24%, 25%, 30%, and 7%, respectively. The results of the hotspot analysis are shown in Figures 5 and 6. It is evident that at the 99% confidence level, some of the habitat patches situated in the central regions constitute the hotspot of habitat quality, while the coldspots of the habitat quality of the province are located in the northern regions. The results also demonstrated that forests and built areas exhibited the highest and lowest quality, respectively (Figure 7).

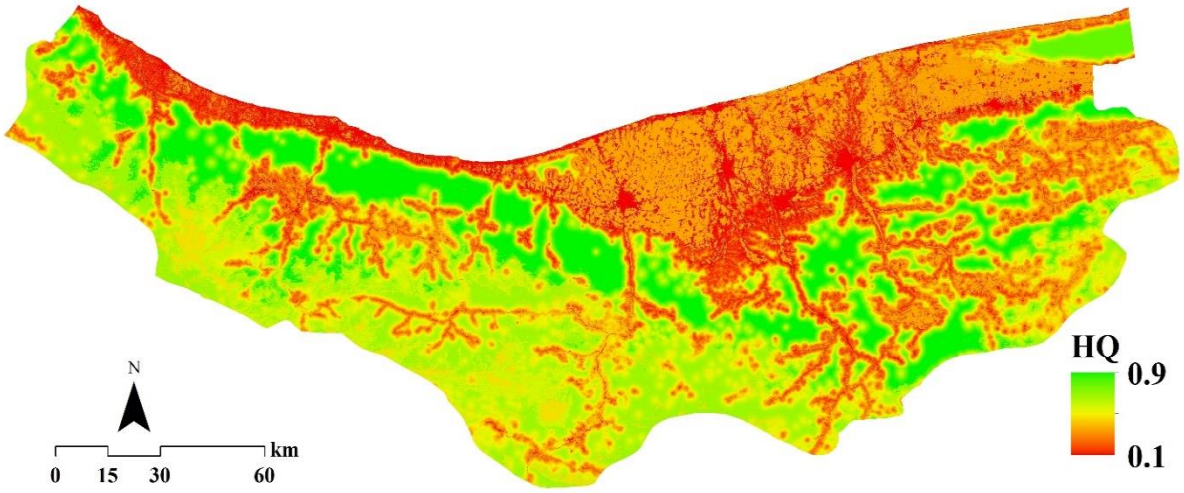


Fig. 2. Habitat quality map of the study area

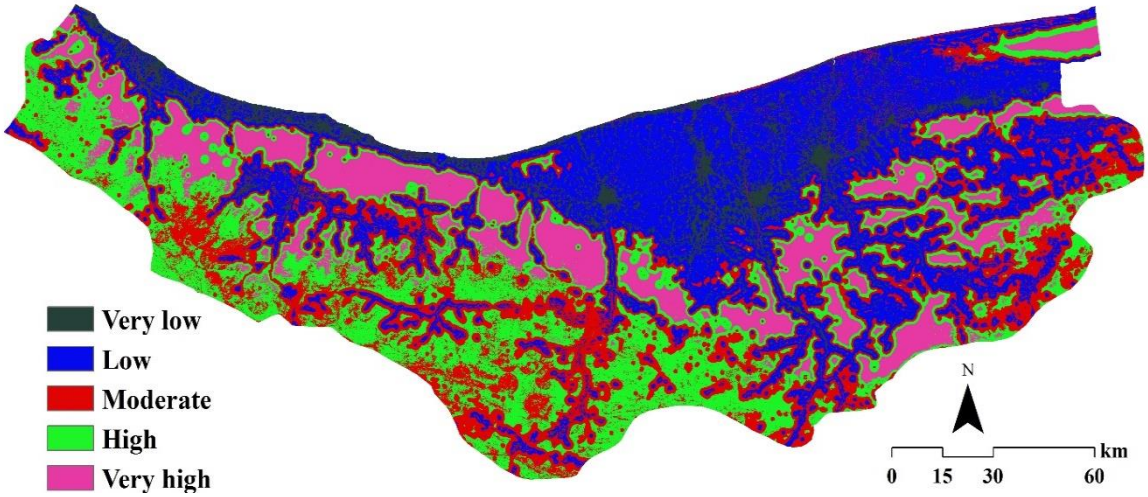


Fig. 3. Classified map of habitat quality of the study area

Table 3 Area allocated to each habitat quality class

Class	Very low	Low	Moderate	High	Very high
Area (ha)	167984	734045	612189	590686	313708

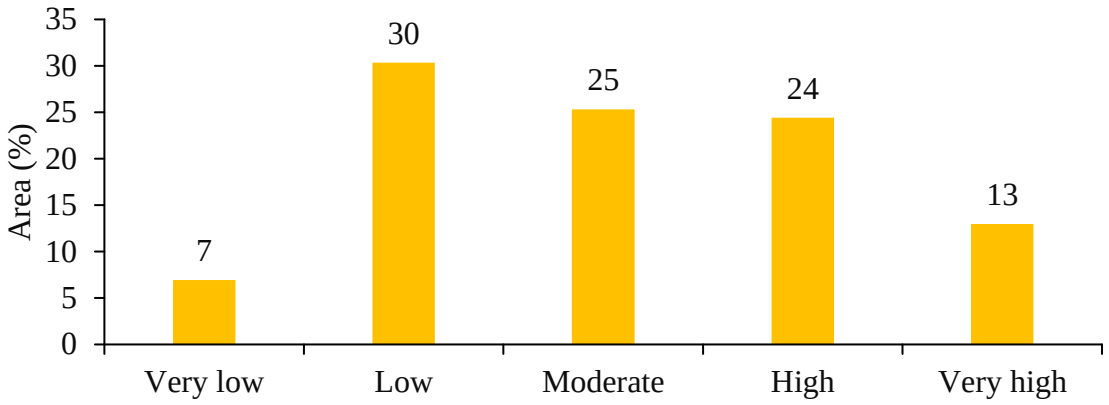


Fig. 4. Changes in the area allocated to each habitat quality class

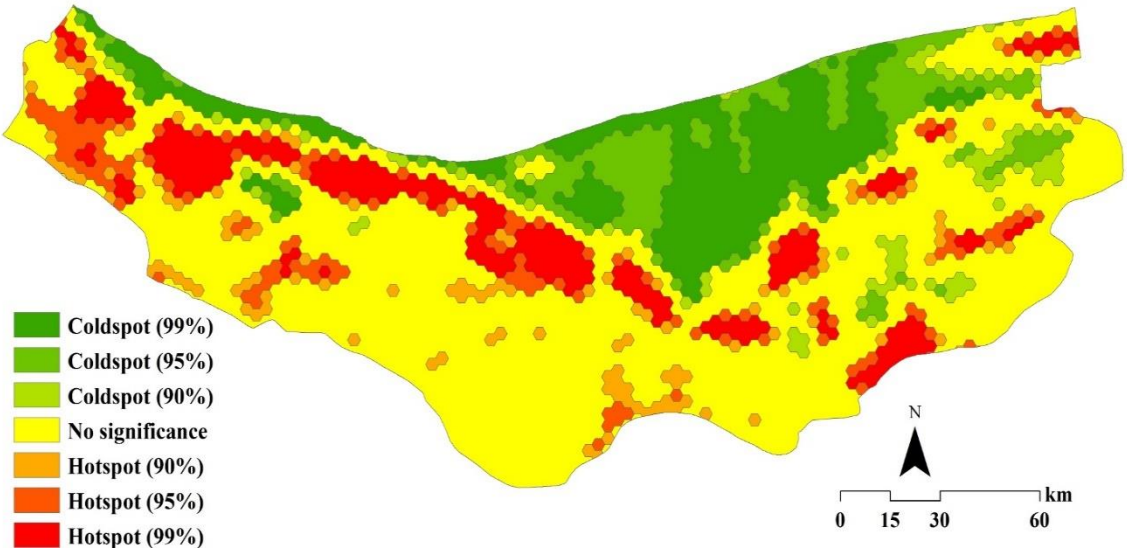


Fig. 5. Results of hotspot analysis

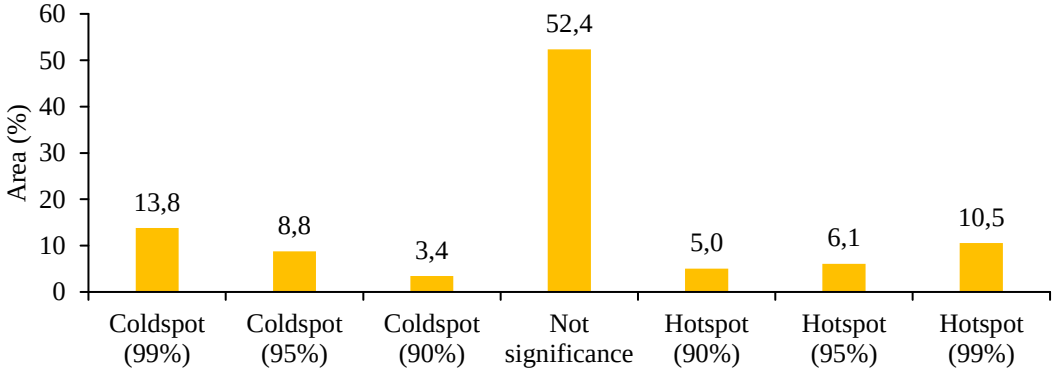


Fig. 6. Area allocated to hot and cold spots of habitat quality at 99%, 95% and 90% confidence levels

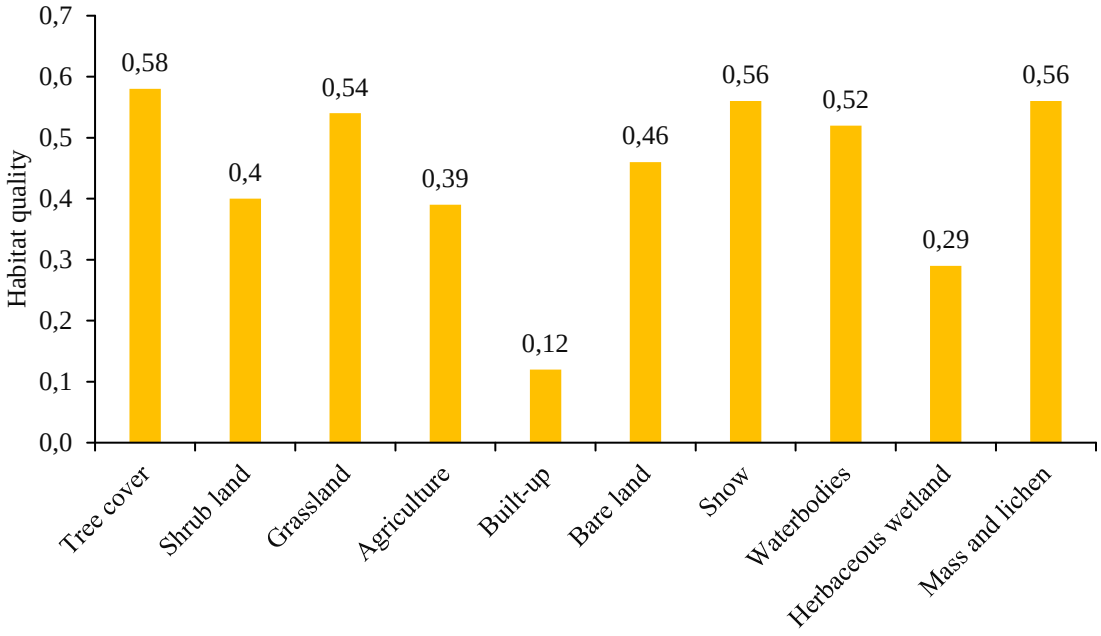


Fig. 7. Comparisons of habitat quality of the land uses in the study area

Conclusions

The study revealed that habitats located in the central parts of the province were the most favorable, while the northern parts, including the plains and coastal areas, were the least favorable. Forests were found to be the most desirable habitats, while build-up areas were the least desirable. The hotspot analysis indicated that hot and cold habitat spots accounted for 10.5% and 13.8% of the region, respectively, at a 99% confidence level. The study results can aid in identifying habitat quality and prioritizing conservation efforts for the study area's managers and planners.

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EXPLORING A MULTI-THEORETICAL LENS IN MIXED METHODS RESEARCH ON INSURERS BRAND POSITIONING

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Abstract
The main objective of this article is to explore a robust multi-theoretical framework that allows investigating the operationalization of Brand Positioning in insurance companies. This exploratory research aims to contribute to deepening the most appropriate theories to investigate Brand Positioning. Through a multi-theoretical lens, it may be possible to build a solid foundation for the application of mixed, quantitative and qualitative methods in this context. By operationalizing this multi-theoretical lens, it will be possible to find possible gaps between the Intended Brand Positioning of an insurer and the Perceived Brand Positioning of insurance consumers. After a preliminary literature review elaborated on the concept of Brand Positioning, the aim of this exploratory research is to identify theories that can form part of a robust multi-theoretical lens that serves as a basis for the application of mixed methods in any investigation into Brand Positioning. The results show 5 fundamental theories that are really useful in mixed methods approaches for operationalizing Brand Positioning in insurance companies: Stakeholder Theory, Service Dominant Logic Theory, Dynamic Capabilities Theory, Resource-Based View Theory and Positioning Theory. A proposal for the operationalization of this multi-theoretical lens in each procedural phase of Brand Positioning research is presented. This multi-theoretical lens can be useful in mixed methodologies, with triangulated approaches, between data from quantitative studies on "Perceived Brand Positioning" obtained from insurance consumers, and data from qualitative studies on "Intended Brand Positioning" obtained from insurance company managers.
Keywords: Multi-theoretical lens; Brand Positioning; Mixed Methods; Insurance Companies.

Introduction and justification of the research

According to the UN Agenda 2030, the objective of "Sustainable Development" is to strengthen the capacity of insurers to encourage the expansion of access to insurance services for all. The exponential growth of knowledge and technologies (Fuchs & Diamantopoulos, 2010; Kotler, 2022) has also contributed to the need for more research in the insurance sector. Insurance companies are a catalyst for a country's socioeconomic development (Chen et al., 2020). This investigation is justified by the importance of the conceptual and practical power of Brand Positioning (Aaker, 2023) and the positive impact it could have on the management of insurance companies' brands. Brand Positioning has presented some confusion among marketing professionals and academics (Mourad & Serralvo, 2018) and, in addition, in-depth analyses of brand positioning are rare (Lhotáková & Olšanová, 2013). The literature on brand positioning in the services sector has remained fragmented, contradictory and largely subjective in nature (Gomes et al., 2016). Mogaji et al. (2023) argue that more studies are needed that explore consumer perceptions in order to obtain a better understanding of the Brand Positioning between a brand and its various stakeholders. Through the previously reviewed literature, it was detected that there is a high number of studies that investigate the concept of brand positioning and that share it in a relatively confusing and divergent way (Fuchs & Diamantopoluos, 2010; Falkala & Keränen, 2014; Urde & Koch, 2014; Azmat & Lakhani, 2015; Blankson, 2016; Koch & Gyrd-Jones, 2019; Olsen et al., 2022; Renani et al., 2021; Saqib, 2021, 2023). In this context, the design of a basic, robust, multi-theoretical structure may prove to be crucial to best articulate and operationalize any investigation into brand positioning, through studies with a mixed approach, quantitative and qualitative.

Expected contributions

The theory should be understood as "glue" in this context, as it brings together several important elements for the study of the phenomenon of brand positioning and allows such theoretical "pieces" to be linked together (Thomas, 2011). The theoretical and conceptual frameworks explored in this research may help explain why a multi-theoretical base lens is very relevant and necessary for any investigation into brand positioning (Rodriguez et al., 2020). The purpose is to contribute to improving the theoretical basis supporting the Brand Positioning process of insurance companies. The aim is to identify the fundamental basic theories to be able to investigate how insurance consumers form their perception about Brand Positioning, as well as the fundamental basic theories to be able to investigate how insurance company managers make branding decisions to achieve a certain intended brand positioning.

Brand Positioning conceptual framework

The importance of developing the concept of positioning was highlighted by Beverland (2021), who credits the term "positioning" to Ries & Trout (1986). Positioning has received a lot of attention in recent years and has emerged as an influential paradigm in marketing management (Saqib, 2021). The concept of positioning is subject to considerable differences in interpretation, it is perhaps one of the most complex concepts in marketing, in addition to there being no mutual agreement, nor coherence, between academics and marketing professionals regarding the concept of positioning (Blankson & Kalafatis, 2004; Sair, 2014; Urde & Koch, 2014; Koch & Gyrd-Jones, 2019; Saqib, 2021). Positioning is a vital concept in building and maintaining a strong brand and constitutes a fundamental pillar in brand management (Fuchs & Diamantopoulos, 2010; Kapferer, 2012; Koch, 2014; Azmat & Lakhani, 2015). Having a differentiated positioning is essential for an organization to survive in highly competitive, globalized and technologically fast markets (Mourad & Serralvo, 2018), such as the insurance market, as consumers perceive a greater level of complexity when purchasing insurance services (Smeltzer & Ogden, 2002; Mogaji et al., 2023). The literature is clear about the importance of the concept of brand positioning and its central place in marketing management due largely to increased competition, similarity in offering and the superior level of imitation of traditional and non-traditional competitors (Mogaji et al., 2023). According to Saqib (2021), the limits of the positioning concept were often not clearly defined. The various terms associated with the concept of brand positioning, such as "position", "product positioning", "market positioning" are different terminologies that are "faces of the same coin" and complement each other (Saqib, 2021). Urde & Koch (2014) report a surprising imprecision and lack of a holistic view of the concept of brand positioning. Research on brand positioning is still scarce, according to Saqib (2021, 2023), and more research is needed to obtain a better general understanding and greater consensus on the concept of positioning. Positioning is defined as the act of projecting the company's offer and image to occupy a differentiated place in the target market's mind (Kotler et al., 2009). Brand positioning is deciding the desired perception or association of a brand by customers in the target market segment and developing a marketing program with the aim of meeting or exceeding the needs and demands of customers in that market (Cravens & Piercy, 2009). Brand positioning is also the way in which a product or service is defined in the minds of consumers, in relation to its attributes (Kotler & Armstrong, 2020). Brand positioning refers to the place an offer occupies in consumers' minds in relation to important attributes compared to competitors' offers (Kerin et al., 2010; Lovelock et al., 2014). Brand

positioning is the act of relating the facet of a brand to a set of consumer expectations, needs and desires (Kapferer, 2012). Positioning is making a market offering occupy a clear, distinct and desirable place in relation to competitors in the minds of target consumers (Kotler & Armstrong, 2020). Brand Positioning is seen as a management process, driven by internal and/or external requirements, that results in the articulation of an intended position for the brand in its target markets and in the minds of key stakeholders (Koch & Gyrd-Jones, 2019). Positioning allows brands to compete effectively in the market, appealing to customer needs and improving brand value (Castaneda-García et al., 2020; Cheung et al., 2020). Urde & Koch (2014) describe the concept of positioning in brand management, defining it as a "management process that seeks to establish a new position in markets and minds, or modify, or strengthen, an existing position". Fayvishenko (2018) and Saqib (2020), highlight that the term "brand positioning" lacks a shared and more consensual agreement regarding its meaning and application, both from the point of view of customer perception, or its application by insurance companies. Research has been carried out to advance the understanding of Brand Positioning (Blankson & Kalafatis, 2019; Iyer et al. 2019; Mogaji et al., 2023), where significant gaps have been detected, especially in the context of services (Mogaji et al., 2023). Iyer et al. (2019) emphasised that researchers need to deepen the theoretical basis for the formation of Brand Positioning.

4. Methodology

In methodological terms, a qualitative investigation was carried out to obtain a deep and contextualized understanding of the theoretical complexity relating to the brand positioning process. The first phase consisted of a literature review on the subject of Brand Positioning, based on the most relevant, most cited and best referenced articles available in the main journals and publications databases of Web of Science, Emerald, Scopus and Science Direct platforms. Based on the previous literature review, exploratory research was carried out to identify which theories might be most useful in the research of Insurance Companies' Brand Positioning. This in-depth exploratory research was based on an extensive and integrative literature review that covered any topics related to "brand attributes", "brand variables" or the "brand dimensions", analysing them in an effort to collect the most robust theories that have supported each piece of research related to this subjects related to brand positioning.

5. Results and findings

The main theories identified that can form part of a robust multi-theoretical lens are presented, as well as how they can be operationalised in research and how they relate to Brand Positioning (BP). The potential benefits that each theory can add to the investigation

are highlighted (Rodriguez et al., 2020). Exploring the combination of converging theories will allow us to address the complexity of the different BP concepts. The various aspects and theoretical dimensions related to BP, essential for the construction of the conceptual structure, are presented. In response to the lack of a procedural approach in the literature regarding BP, a review of some relevant processes is carried out regarding theoretical tools to investigate the dynamics of insurers' BP. As a result of this research, it was possible to identify and describe robust theoretical frameworks that could provide much better clarity to the approach, structure and vision of any future research in the field of Brand Positioning (Grant & Osanloo, 2016).

Resulting theories for a multi-theoretical lens in Brand Positioning research

5.1.1. Stakeholder Theory

Stakeholder Theory (ST) offers a more systemic view of insurance companies and emphasizes the complex relationships that occur within insurance companies, with the external environment and other stakeholders (Kujala et al., 2016; Erdiaw-Kwasie et al., 2017; Hurth, 2017; Olsen, 2017; Carvalho et al., 2020). According to ST, insurance company managers must carry out balanced management of the interests and expectations of their various stakeholders. Stakeholders refer to any group or individual who can affect or is affected by the achievement of organisational objectives (Freeman, 1984). The insurers' stakeholders must be all those who have or may have involvement in the activities carried out by each insurer (Carvalho et al., 2020). Stakeholder theory offers a new perspective on insurers, abandoning a view of insurers as closed and independent bodies, in favour of a more systemic view, useful for the dynamics of insurers' brand positioning. In light of ST, emphasis is placed on the complex relationships that occur in insurance companies, with the external environment and the remaining stakeholders (Kujala et al., 2016; Erdiaw-Kwasie et al., 2017; Hurth, 2017; Olsen, 2017; Barney & Harrison, 2018; Carvalho et al., 2020). According to ST, insurance company managers must carry out a balanced management of the interests and expectations of their various stakeholders (Omran & Ramdhony, 2015; Carvalho et al., 2020). Stakeholders are all those who have or may have involvement in the activities involved by an organization, without the need for reciprocity of impacts (Mitchell et al., 1997; Carvalho et al., 2020). Stakeholder Theory is based on three types of perspectives (Homburg et al., 2013) that, although distinct, support each other: i) the normative perspective; ii) the instrumental perspective, and iii) the descriptive/empirical perspective. The normative perspective specifies how insurance managers should act with regard to interested parties (Fontaine et al., 2006). The instrumental perspective links means

and ends, arguing that if certain practices are adopted by managers and insurers, certain results will be observed. The instrumental perspective of ST focuses on organizational results as a consequence of management behaviours with stakeholders (Donaldson & Preston, 1995; Fontaine et al., 2006; Homburg et al., 2013). A descriptive/empirical perspective is used to describe and explain the characteristics and behaviours of insurers (Freeman, 1999). According to ST, the importance and salience of stakeholders is proportional to the number and degree of attributes associated (Carvalho et al., 2020). These attributes will be used to determine who are the stakeholders that insurance companies should be most concerned about and in which they should invest more material and human resources, as well as defining strategies to satisfy their needs, expectations and interests (Carvalho et al., 2020). The Stakeholder Theory approach in the management of BP planned by insurers can help to detect the factors involved in the reconciliation of stakeholder interests by insurer managers, even in a highly complex environment such as the insurance market (Carvalho et al., 2020). The operationalization of ST could help to specify the decisions of insurers' managers regarding the distribution of resources, particularly when these decisions may prioritize a certain group of stakeholders, taking into account the context, importance and salience of each interested party (Carvalho et al., 2020). All these approaches to ST have in common the fact that they suggest the need and importance of taking into account more stakeholders than just those determined by traditional practices (Carvalho et al., 2020).

5.1.2. Resource-Based View Theory

The Resource-Based View (RBV) Theory considers the organization as a heterogeneous set of resources that includes assets, capabilities, processes, attributes, knowledge, which can be used to formulate and implement competitive strategies (Wernerfelt, 1984; Prahalad & Hamel, 1990). RBV Theory argues that it is more reliable to explore external opportunities by applying existing resources, than to acquire new skills for each opportunity that may arise. The RBV Theory is an approach that helps to explain why insurers must maintain sustainable competitive advantages, despite the fact that the competitive environment is very turbulent. According to the RBV Theory, an insurance company can be equivalent to the set of all resources it has. According to Wernerfelt (1984), resources are all material and immaterial assets permanently linked to an insurance company. Unlike traditional theories of industrial organization, which are based on the analysis of the competitive environment, RBV Theory has as its main focus the resources possessed by the insurer. Because many resources are specific to an insurer, and are not mobile or imitable, insurers can be described by a

heterogeneity in their resource base. Das & Teng (2000) emphasise the fact that certain resources are not negotiable, imitable or substitutable, since they are incorporated into insurers or mixed with other resources. In the operationalization of the RBV Theory, competencies, capabilities, skills and organizational knowledge are seen as sources of competitive advantages for insurers. Resources cannot be valued in isolation because their value is determined by interaction with market forces. Insurance companies' resources can be understood as: (i) tangible assets - properties, facilities, raw material stocks, among others; s(ii) intangible assets - brands, culture, technological knowledge, patents, accumulated experience, among others; and (iii) organizational capabilities - specific abilities of the organization as a whole or its parts (Collis & Montgomery, 1995). Resources are valuable and inimitable, and are made up of assets, knowledge and processes that allow insurers to implement strategies that improve their efficiency and effectiveness (Barney, 1991). A combination of DCs Theory and RBV Theory helps to operationalize BP based on the resources and attributes valued by the insurance consumers as a source of competitive advantage. Insurance companies are dynamic structures, which obviously understand the response capabilities from a structural point of view behind cyclical changes in society, but they must also prepare their internal and organizational structure to respond to these constant changes. The insurance market is not static and is constantly changing, driven by the environment and the capabilities they need to develop (Alford & Greve, 2017) and insurers need to systematically adapt their brand positioning. Although some resources may be transferable between insurers, in the context of market functioning, the process through which information and knowledge is managed is internal and specific to each organization. The challenge then arises from the organizational capacity to identify strategic assets that allow it to sustain competitive advantages, in a context of uncertainty, complexity and conflicts, internal and external to the organization, to define the intended brand positioning by each insurance company.

5.1.3. Dynamic Capabilities Theory

Teece & Pisano (1994) were the first to use the term “dynamic capabilities” presenting the concept as a source of competitive advantage supported by two key aspects: the dynamic nature of the environment in which insurers operate and the role that top management has in the context of these changes. For Teece et al. (1997), “Dynamic Capabilities” (DCs) were described as “the organization's ability to integrate, build and reconfigure internal competencies to respond to highly changeable environments”. It is this reconfiguration that insurance managers need to carry out in brand management if they find positioning gaps

within each brand dimension. For Eisenhardt & Martin (2000), DCs are integrated into insurance companies' processes that create value in dynamic markets through the manipulation of resources. This perspective is useful for BP investigations in the sense that insurers need to integrate and reconfigure different types of resources to adjust their BP according to the brand decisions they intend to make at each moment. This leads to the conclusion that in a very dynamic market, such as the insurance market, DCs are extremely important for insurance company managers. The literature on dynamic capabilities has evolved along two streams of research, according to Di Stefano et al. (2014), based essentially on articles by Teece et al. (1997) and Eisenhardt & Martin (2000). But to these, we can also add the work of Zollo & Winter (2002), who study routines and organizational learning based on Teece et al. (1997), thus forming the triad of essential articles for the area (Vogel & Güttel, 2012; Fukuzawa, 2015). Teece et al. (1997) conceptualize DCs Theory as routines to monitor and change internal competencies, which depend on highly routinized processes. On the contrary, Eisenhardt and Martin (2000) understand DCs as processes that should be little routinized at a strategic level, with simple structures that guarantee quick and agile responses. The value of DCs for the competitive advantage of insurers lies in the reconfiguration of the resources they create, and not in the capabilities themselves, highlighting that DCs are permitted, but not sufficient for an organization to achieve a competitive advantage. According to this theoretical approach, DCs Theory can help insurers reconfigure their assets to be more adaptable to changes in the market. Thus, competitive advantage comes from each insurer's ability to reconfigure existing competencies, making them more valuable to consumers and difficult for competitors to imitate (Wang & Kim, 2017). Jiang et al. (2015) define three main DCs: i) production capacity: associated with the efficient use of resources and the flexibility that allows dealing with the needs of insurance consumers (adaptation to market contingencies); ii) marketing capacity: effectively relate offers to insurance consumers with their real and emerging capabilities, obtaining the largest segment of market opportunities; iii) technological capacity: insurers tend to cooperate to have access to technological technologies due to increased competitive intensity and technological complexity. Resources are important in the performance of insurers, however, the difference in capabilities can influence the variation in performance between insurers (Griffith et al., 2006; Wu, 2007; Chien & Tsai, 2012; Falasca et. al, 2017). DCs help to explain the heterogeneity of insurers ' performance in different environments (Zott, 2003; Helfat et al., 2007), and define the requirement to reconfigure their strategic competencies in turbulent environments such as those of insurers (Teece et al., 1997; Eisenhardt & Martin,

2000; Rodenbach & Brettel, 2012). Mu (2017) concluded that marketing and operations capabilities influence the positive result between DCs and company performance. DCs are neither skills nor resources. More than resources, DCs refer to the organization's ability to adapt its base of processes and resources, including knowledge, in responding to changes in the market (Helfat et al., 2007; Wohlgemuth & Wenzel, 2016;). According to Khan et al. (2020), as DCs involves adaptation and change, because they can be considered as transforming resources into improving performance, at the same time as creating competitive advantages. In this sense, external guidelines ensure a set of DCs to combine, develop and explore existing resources (Monteiro et al., 2019). Bitencourt et al. (2020) state that DCs indicate antecedents in which resources appear as key elements for understanding the environment and proposing new solutions for changes in the market. In research, we have witnessed the combined operationalization of the Dynamic Capabilities Theory with the Resource-Based View Theory, where the set of competencies are considered processes, but static, while the DCs approach is dynamic and more related to the organization's ability to reorganize itself in the face of such as changes in the market (Fukuzawa, 2015; Albort-Morant et al., 2018). The DCs Theory is inseparable from the dynamism of the environment in which insurance companies operate (Teece et al., 1977; Wilhelm et al., 2015). In high-speed markets, such as the insurance sector, change is neither linear nor predictable because the structure of the insurance industry itself is unclear and the roles of market agents (customers, suppliers, competitors) are relatively ambiguous (Wilhelm et al., 2015). Wang & Ahmed (2007) argue that in very dynamic markets it is even more necessary to develop an organization's DCs, because they increase in complexity (Li, Easterby-Smith & Hong, 2019). It follows that in a very dynamic market, such as the insurance sector, the greater the importance of the organization's DCs and the more challenging it is for insurance company managers.

5.1.4. Service-Dominant Logic Theory

Kotler et al. (2021) point out a number of important aspects inherent to the Service-Dominant Logic (SDL) Theory and qualify it to potentially and exclusively become the central focus or “grand theory” of marketing (Kotler et al., 2021). Taking into account the warnings of Hunt et al. (2022) and Vargo et al. (2023), who call for the replication of this theory in the marketing sphere, as long as it is properly framed, it is considered that it makes sense to apply the foundations of SDL Theory in this investigation into BP in insurance companies. SDL Theory can serve as a theoretical framework to overcome the fragmentation of various concepts around BP that threaten intellectual cohesion in the marketing domain (Vargo et

al., 2023). Through SDL Theory, insurance consumers are understood as effective participants in insurance services in interaction with brands (Halliday, 2016). Through the SDL Theory approach in this research, its important contribution will be the operationalization of consumers as co-producers of the service and co-generators of value for insurers, and not just mere marketing instruments. According to Vargo et al. (2023), the SDL Theory is derived from marketing and represents a synthesis of reorientations in marketing. SDL Theory is broadly applicable to marketing in varied contexts (Vargo & Lusch, 2017) and can serve as a metatheoretical framework to overcome the increasingly extreme fragmentation between marketing strategy and marketing subdisciplines that threatens intellectual cohesion in this domain (Vargo et al., 2023). To support this theory, more theoretical frameworks and concepts of service exchange, resource integration, value co-creation, value determination in institutions and ecosystems can be developed (Vargo & Lusch, 2017), and thus can be part of a lens valuable multi-theoretical to be able to study the perception of brand positioning. The insurers managers will thus be able to make better branding decisions based on this brand positioning obtained from the perspective of the insurance consumer. According to Vargo & Lusch (2017), SDL Theory suggests that resources are operative and, therefore, are used and/or reused by consumers, breaking the supplier-consumer dichotomy. Therefore, we can see the whole logic of the service working in a network from actor to actor (Halliday, 2016). Applying SDL Theory, insurance consumers can be understood as effective participants in insurance services in interaction with brands (Halliday, 2016). SDL Theory can be applied as a parsimonious, realistic and transcendent theory of marketing and, more broadly, humane for reconciling opposing points of view between researchers (Hunt et al., 2022; Vargo et al., 2023). To apply SDL Theory in research on Brand Positioning, it is important to understand its fundamental premises, which are the following five axioms (Vargo & Lusch, 2016): i) Service is the fundamental basis of exchange. According to SDL Theory, all insurers deliver services. This means that the value delivered to the customer goes beyond the contractual conditions of the insurance itself and includes the purchasing experience, the interaction and contracting processes and the use of policies, such as travel assistance services or assistance to people; ii) The value is for multiple actors, always including the beneficiary. The value is the result of the interaction between the consumer and the insurer, as well as other actors involved in the production and delivery process of the insurers' global service. This means that the value perceived by the customer is unique and personalized, depending on the interaction of the insurance company; iii) All social and economic actors are resource integrators. SDL Theory highlights that all

social and economic actors are resource integrators, that is, they use available resources to create value for the customer. This means that insurers need to understand and manage resources to deliver a quality service, in accordance with the brand positioning they intend to achieve in the market; iv) The value is always unique and phenomenologically determined by the beneficiaries. Value is uniquely perceived by insurance customers and is determined by their own experiences and expectations. This means that each insurer must understand and meet customers' needs, desires and expectations in a personalized way; v) Value co-creation is coordinated through institutions generated by actors: value co-creation is the result of interaction between the insurer and other actors involved in the process of production and delivery of services provided by insurers. This means that an insurance company needs to manage these interactions in order to create value for the customer (Vargo & Lusch, 2016). To operationalize the SDL Theory, it is necessary to focus on the delivery of insurers' services, in addition to insurance, to meet the needs, desires and expectations of customers (Vargo & Lusch, 2016). Therefore, combining insurers' dominant services with insurance consumers' insights can operationalize SDL Theory and enable a better understanding of insurers' brand ecosystems. SDL Theory has been applied worldwide in service branding research, and also in many other domains, with wide dissemination in research (Ballantyne & Aitken, 2007; Merz et al., 2009; Ehrenthal et al., 2021). Through the SDL theory approach, an important contribution will be the operationalization of consumers as the insurance companies' services co-producers and co-generators of value for insurance companies.

5.1.5. Positioning Theory

Positioning Theory (PT) is an "interactionist concept" (Harré & van Langenhove, 1999). The positioning process includes identifying, defining and managing the perception that relevant audiences belong to a particular organization, product, person or idea (Mcvee et al., 2018). Three relevant lines of thought have emerged over time: i) strategic positioning; ii) positioning strategies, and iii) discursive positioning (Mcvee et al., 2018). The planning thus developed a framework for public relations and marketing that provides clear guidance for the company's communication management, which should identify and facilitate different lenses of that position in the minds of customers and other relevant stakeholders (Mcvee et al., 2018). Discursive positioning argues that social structure is more immanent than real and arises from fluid patterns of positioning. In social interactions, people use communication to explain their own positions, defend them and change them. As a consequence, positions are dynamic and always linked to specific relationships where they are tested and legitimized.

The concept of discursive positioning is instructive for a variety of fields and as a basic theory for marketing management and communications (Mcvee et al., 2018). According to PT, all forms of social organization dependent on positioning processes (Moghaddam, 2017; Van Langenhove, 2017; Mcvee et al., 2018; Lawson, 2022), such as guarantees as a form of social organization. The focus of PT is the social domain and necessarily depends on human beings and their interactions (Lawson, 2022). According to PT, social phenomena are composed of processes through which various elements are relationally organised into an organised and consistent system (Lawson, 2022). Operationalizing PT, an insurance company is constituted by the organization of available elements that is causal and irreducible to the set of all these elements considered separately. Simply because the organization always makes a difference and must be recognized as an essential characteristic of its entirety (Lawson, 2022). The approach obtained through PT is to take advantage of the meaning of the constitution of a social reality in the BP, in particular with regard to the insurance consumers as a central element in the formation of the BP. According to PT, the term "position" connotes something that can be occupied (or reinforced) and, in fact, the location of some item is generally described as the position of that item, or the position it occupies, or where it is positioned (Lawson, 2022). PT should "be seen as a starting point for reflecting on the many different aspects of the social sphere" (Van Langenhove, 2017). Positioning Theory offers numerous opportunities in BP research as it provides useful analytical tools (e.g., the positioning diamond) to examine how insurance managers position themselves and they position others (Mcvee et al., 2018), as, for example, insurance consumers position themselves. Positioning Theory "captures the continuous changes in how people perceive themselves and how others perceive them" (Baert, 2012). According to Koch & Gyrd-Jones (2019), it is important to highlight that PT will have to integrate the context, activities, positioning management choices and input factors necessary to achieve the "intended brand positioning" results. Positioning Theory encourages to follow an alternative path to studying BP in increasingly complex environments (Mcvee et al., 2018), such as facing insurance companies and, as such, can constitute a theoretical reference lens for researchers and marketing managers. The various aspects of PT operationalize BP's analytical framework, with theoretical tools to analyse insurance consumers perceptions of BP and interconnecting its organizational implications in insurance companies' branding decisions. Although brand positioning is not something new, PT's approach can help explain and deepen the process of developing insurance brand positioning.

Multi-theoretical lens applied to Brand Positioning research

Exploring the results obtained through a multi-theoretical lens, Figure 1 presents a summary proposal for their operationalisation in each phase of the brand positioning formation process, in both quantitative and qualitative research. We can see a proposal put forward for multiple incorporations of each of the 5 theories, as well as their operationalisation and combination, using mixed methods in potential triangular research, around the field of brand positioning.

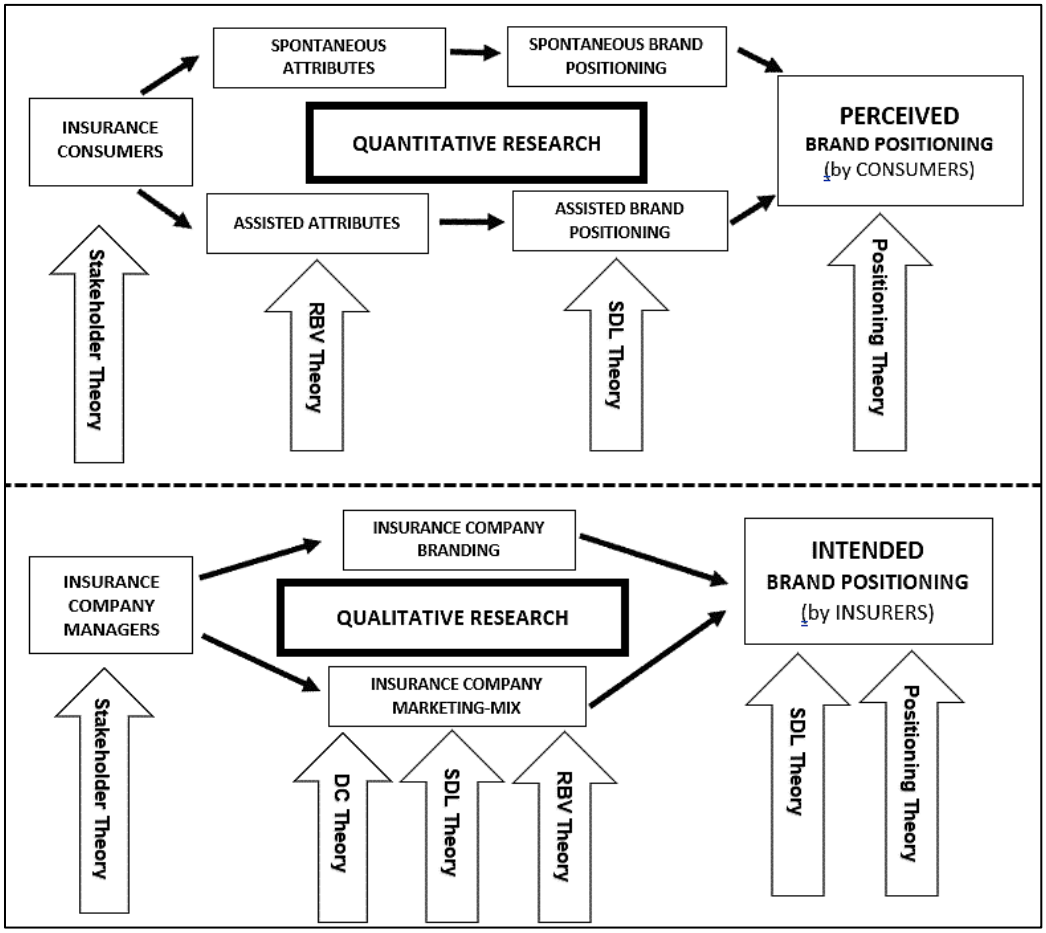


Figure 1: Application of multi-theoretical lens, in mixed methods research, on Insurers Brand Positioning

Source: author's development.

Conclusions

It has been possible to identify robust theories that are fundamental and appropriate to the research of Brand Positioning. The multi-theoretical lens presented includes 5 theories that have been identified as most relevant and assertive to the study of Brand Positioning. In mixed methods approaches, that combine quantitative and qualitative methods, based on the multi-theoretical lens presented, it will be possible to obtain better clarification in the

analysis data based on the evidence collected in quantitative studies, as well as a more robust foundation in the evidence and data collected in qualitative studies. From the multi-theoretical lens resulting from this research, it may be possible to carry out a more robust triangulation between the data from the qualitative studies, obtained from insurance company managers in order to delve deeper into the "Intended Brand Positioning", and the data from the quantitative studies, obtained from insurance consumers in order to delve deeper into the "Perceived Brand Positioning".

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INVESTMENT IN GOLD AND NUMISMATICS

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ABSTRACT
Gold is recognized worldwide as an investment vehicle. But despite its existence for thousands of years, its role as part of an investment portfolio is not well known. The critical review of the history of gold as a hedge against inflation will be the starting point of this paper, including other roles it has had over the centuries, both throughout the world and in Albania. We will also examine the factors influencing the price of gold, the growth of which over time makes this instrument quite attractive as an investment. The treatment of gold is accompanied by a review of demand and supply, where we will deal with the main components of each variable and their weight to the total. These dimensions will give us a clearer vision to continue with the main reasons for investing in gold.As another investment alternative, investments in old and new currency will be treated, the study of which is part of Numismatics, the science dealing with their study. Numismatics includes philately and the collection of banknotes, but our focus will be on the aspect of investments where gold or silver objects will be included. This alternative investment is a recent trend, which has started to be part of the portfolios of Albanian investors.We will explain the concept of numismatics including its history as a science and its importance in terms of the history of art and culture of a people. This study includes the identification of currencies, their physical and iconographic analysis. The role of modern scanning and advanced photography technology to document and analyze currencies helps to disseminate information and improve access to digital numismatic collections.
Interest in investing in gold and silver tools is growing, taking into account that these investments are associated with their own problems, seen in the prism of investing in gold.
Keywords: Investments, art, Numismatics, gold, risks

INTRODUCTION

Every company, family or individual attempts and aims to invest for profit. Investment portfolios are a collection or a compensation of different investment instruments. The tools or instruments that are included in an investment portfolio can be classified into many categories such as: shares, bonds, treasury bonds, bank deposits, real estate, etc. Given that Albania does not have a well-developed capital market, the opportunities to invest are small.Investment in financial instruments includes those made for the purchase of financial titles in the nature of various securities, while investment in shares and bonds, such as financial investment, is very limited in our country. Investment in real assets includes those made in the creation, expansion and modernization of real physical assets, which include real estate such as: buildings, apartments, shopping centers, residences, etc. This type of investment carries the disadvantage of a lack of liquidity, and at the same time requires a high initial investment to secure these opportunities.

An alternative form of investment is the purchasing of old and new coins, which does not require a relatively high initial investment. Banknotes and coins, apart from being an invention that led the economy towards modernization, also is an art in itself. Their design is authored by great art masters and their collection is followed by many fans.Other constituent elements of this investment are metals and precious stones such as: diamonds, sapphires, rubies, gold, silver, etc. This type of investment includes a number of benefits where, in addition to sound income, it also gives your portfolio a shine. The purpose of this paper is to highlight and promote the awareness of the advantages for investors oof investing in gold and silver coins. The main reason that leads investors to invest in gold or objects made from gold its hitorically sustained perceived value. After understanding the investment potential of gold and deciding a certain amount to invest, investors can choose the necesary manners of their investment. First, however, they must decide on its purpose, which are different for each individual investor.

CHAPTER I

1.1 HISTORY OF GOLD

1.1.2 The importance of gold over the centuries

The history of gold begins with Aliata, the king of the Lydians. They were a people located in the borders of present-day Turkey. The area was surrounded by large wealth of underground mineral deposits. In the 6th century BC, Aliateni decided to give gold a round, flat shape, thus bringing to life the first coins in human history. For the first time, people

discovered the unique advantages of gold: its lasting value, its qualities as a metal, its ease of transportation and above all, its rare beauty and luster. (Edlira Luçi, 2007)

The qualities of gold are listed as follows;

• high durability,

• inconsumable

• ability to withstand acidic corrosion,

• can remain for centuries under water without undergoing any essential changes

Gold has survived for millenia and continues to play an important role in all contemporary economies of the world, despite being small or large in size and power. The gold standard represents a mutual commitment by many countries to fix the price of local currencies according to a specified amount of gold reserves. Besides gold, other precious metals are also used to establish a monetary standard, such as is the silver standard in 1800. The Breton Woods system in 1946 created a system of fixed exchange rates that allowed governments to sell their gold. In addition, gold has served as a determinant of a people, nation and war efforts fates, upsetting the balance and tilting the scale toward the side where the largest amounts have been poured in. In 1999, 15 Central Banks of Europe declared that gold would remain an important element of their reserves. 1.1.3 The historical change in the price of gold and its influencing factors

Gold is a a time-tested popular investment option that has traditionally produced good returns. Since the only source of income from investing in gold is the difference between the selling price and the buying price, the emphasis on influencing factors makes it controversial as a source of investment during different periods of time.However, looking at the chart below, we notice that the price of gold tends to fluctuate. This fluctuation within a wide range can be justified by a long annual arc. However, history gives a negative answer to the question of whether this investment is safe regardless of its price. Let's specify the factors that affect the volatility of the price of gold in different periods.• A country’s economic well-being

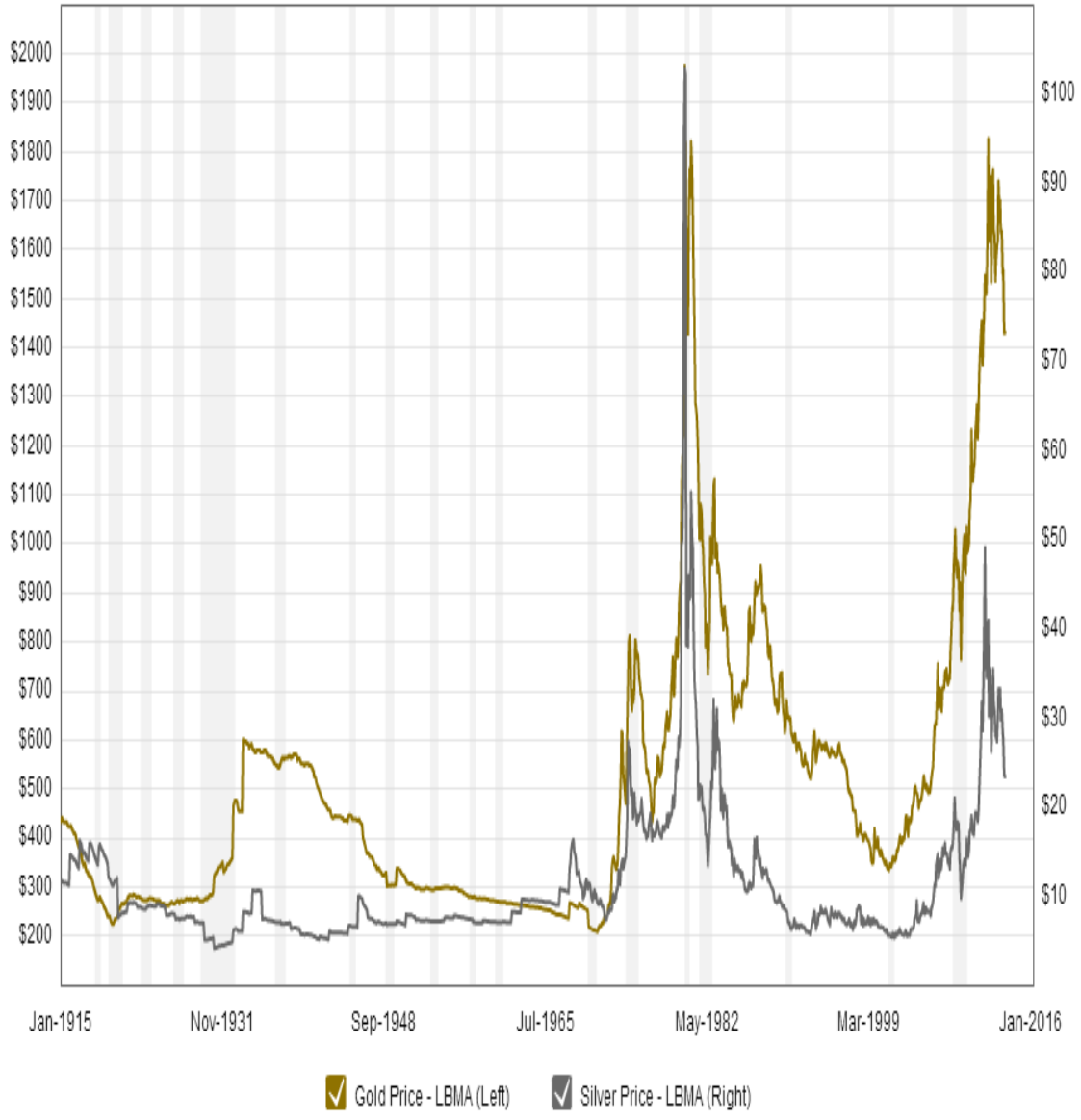
Apart from being an instrument of investment, gold has also been widely used for industrial purposes due to its high conductivity and resistance to corrosion. Economic growth due to the increase in production from various industries that use gold as an input and simultaneously an increase in income, leads to an increase in the demand for gold, thus bringing a slight increase in its prices.• Central Banks

These entities hold large amounts of gold. They buy and sell this precious metal according to the fluctuation movement of their currency and the general economic scenario. Often

drastic changes in gold prices are due to frequent transactions by these entities.• Supply from gold mines

A change in the supply of gold can change the price of gold. For example: if there is a sharp increase in production, the price is likely to fall. However, fluctuations in the price of gold occur due to changes in demand since the supply of gold is relatively stable.There are a number of other factors that affect the price of gold, such as: national emergency situations, per-capita income growth, governmental policies, etc. So gold, more than a store of high value, simply serves as a dynamic bubble, and when the bubble bursts, it usually reverts to prior values.

Chart 1: The price of Gold and Silver over a century



Burimi: London Bullion Market Association

CHAPTER 11

2.1 CURRENT GOLD SUPPLIES

The supply of gold is limited by nature itself. The four main components that serve to supply gold in the world are:

1. New gold mines: the amount of gold extracted from mines is relatively small. Gold supplies generally add 2% per year to the total gold stock. About ¾ of the mining supply comes from the 10 largest gold producing nations in the world, which are: South Africa, USA, Australia, Canada, China, Indonesia, Russia, Peru, Uzbekistan and Ghana. In general, new gold mines open when old ones close, because the countries where these mines are located place restrictions on their production. According to Thomas Reutres, the latest figures say that the total amount of gold on the planet is 171,300 tons, but not all agree on this figure. Different institutions estimate it to be from 155,000 tons to 2.5 million tons. All these figures are admittedly speculative and could be incorrect. But the good news is that the world will not run out of gold. To date, gold has simply changed shape and been recycled and not consumed. This means that if you have a wristwatch made of gold, this may be the same metal mined by the Romans some 2000 years ago.

2. Processed scrap: this includes the amount of gold that comes from the waste of jewelry or other industries where it is used, such as electronics or dental clinics, and the melting of other gold objects that may have been used for different purposes.

3. Sales by Central Banks: Today, gold occupies an important part of the foreign exchange reserves of various countries of the world. Keeping foreign exchange reserves is generally aimed at coping with unexpected situations caused by lack of liquidity in international markets. With the birth of the banking systems and especially the central banks, which also played the role of monetary policy makers, it was precisely these banks that managed gold. Central banks are a very important contributor to the supply of gold and will continue to be for the foreseeable future.

4. Loans in gold are given in the market of gold reserves for lending and borrowing purposes. We have an increase in the supply of gold every time we have an unlocking of these amounts of gold that were blocked in the form of guarantees.

2.2 GOLD DEMAND

The demand for gold has three main components:

1. Demand from jewelry industries: where does the biggest demand come from? In recent years, this demand has been increasing, even exceeding the amount produced by the mines,

the difference being covered by scrap supplies and the release of gold by various participants, who have used it as a guarantee for borrowing purposes.

2. Industrial applications: in addition to the jewelry industry, there is a significant demand from other industries such as the electronics industry, where it is used for the production of televisions, telephones, computers and other equipment.

3. Investors: the demand from investors varies from year to year, depending on the different circumstances of the markets, the economic cycle or current speculations.

.2.1.3 WHY SHOULD WE INVEST IN GOLD?

Today, almost every country in the world is based on a paper or electronic money system, the value of which is determined by the supply and demand for money and goods.

The question naturally arises: Is it worth investing in gold? It is without question a market in which it is worth taking steps forward. In cases of sales and purchases, it is about small profit margins, but if we look at the rate of price growth in recent years, in long terms, we understand that it is about for very fruitful investments. Investing in gold also offers:

Retains value in the long term: gold for the past 3,000 years of human history is the only product that has retained its value. For most of the history, it has served as the equivalent of money. It has proven its quality during various crisis situations, such as: wars, economic instability, etc. Since the year 2000, its price has increased by over 500%, therefore making it one of the best performing assets of the past decade. Both in times of abundance and in recession, it still continues to retain its value. (Hubbard, 1991)

Provides liquidity: gold is considered one of the most liquidable assets, which can be sold 24 hours a day in many markets around the world. It takes the same amount of time to trade as stocks and bonds as to trade gold, which makes the trading spread of gold and silver comparable to that of stocks and bonds. (Jermann, 2023) The gold market is very efficient and the 5 largest gold trading centers are: New York, London, Zurich, Tokyo, and Hong Kong that provide continuous trading 24 hours a day. The performance of gold prices is reported daily in major newspapers around the world along with the prices of stocks, bonds, bonos, etc. Gold trading, as mentioned above, is also done via electronic industries, uses in medicine, etc. Today, the world center of gold trade is Dubai, otherwise known as the city of gold. According to the Dubai customs authorities, gold is the most profitable export after oil. Undoubtely, its geographical position is an important factor, but this country has a great importance has for other commercial centers and jewelry producers, such as Hong Kong, Malaysia, Kuwait and India. Dubai does not tax gold, making it one of the countries with the cheapest price of gold in the world. Dubai is an important node in the so-called 'New Silk

Road' between the gold producing countries of Africa and other consumer countries, - says Malcolm Wall Morris, director of the commodity exchange. Gold is also traded on the stock exchange, its stock market being open from 6:00 a.m. to 11:00 p.m., and is one of the few markets in the world that can capture every time zone from Australia to the West Coast of the United States. United.It provides security: gold's value derives directly from its physical value, which is not like paper which only has nominal value, whereas gold has an exact physical value. Today or tomorrow gold will exist physically and therefore will have value. (Ligita Gaspareniene, 2018)It helps protect your savings against currency devaluations, thereby protecting your purchasing power. When the economy stutters and investors lose faith in the stock market, gold has its unique benefits. Low interest rates, a weak US dollar and distrust in the banking and financial sectors often lead people to invest in gold because of the potential and safety it offers. (Nawaz, 2013)Comfort: gold offers this quality with very high scores. An increase in price per gram immediately increases the value of your investment. With the emergence of Gold ETFs, the conveniences of holding gold in the short term have increased. In this way, instead of holding cash in the short term, a better alternative is to keep investing in Gold ETFs, which will be discussed in more detail below. (Nishad Nawaz, 2013)Portfolio diversification: regardless of whether investors are conservative or risk-aggressive, gold can play a very good role in diversifying your portfolio. (Shqipërisë, Numizmatika)The purpose of diversification is to protect the total value of the portfolio against fluctuations in the individual values of the instruments included in it. Its ability to diversify comes from the negative correlation it has with stocks and bonds. (Shqipërisë, Paraja dhe bankingu në Shqipëri, nga antikiteti në ditët tona, 2017)The economic forces that determine the price of gold may be different but also comparable to those forces that determine the price of most other financial assets. For example, the price of a share depends on the earnings and growth potentials of the company they represent, the price of a bond depends on the yield it offers, market interest rates, its security, etc. The percentage of gold allocation depends on many factors, but mainly the current market conditions, rates of inflation, deflation, stagflation, etc. An average 10-20% gold allocation in your portfolio is a smart choice in all circumstances.

CHAPTER III

3.1 NUMISMATICS

Banknotes and coins, apart from being an invention that led the economy towards modernization, also are an art in itself. Their design is authored by great art masters and their collection contains many fans, providing an alternative method of investing is to invest in

old and new coins. (Blanco, 2015)The science that deals with the study of past and modern monetary means is called 'Numismatics'. Its name derives from the word numisma, meaning 'factor of coins'. (Tim Pullen, 2014)In Albania there are several groups of individuals who deal with the collection of coins from different historical periods. Numismatics is divided into 3 main parts; (Antonio Carlos Alcázar-Blanco, 2021)

1-coins of the old world,

2-medieval coins,

3-coins of the new world.

The Bank of Albania has as one of its activities the sale of coins or banknotes with historical and cultural value. The Bank of Albania provides detailed information on its official website about the procedures for their sale for numismatic purposes. It provides information on the type of coins or banknotes, the period to which they belong, prices in Lekë for retail sales and differentiated prices for wholesale sales.

Today, metal coins and paper money are objects of collection for all numismatists in the world. Even in Albania, the Federation of Collectors of Albania has been created, in which enthusiasts of the field of collecting coins, banknotes and Albanian stamps join. In 1880, for the first time in the country Preng Bib Doda made it possible for the Albanian collection of gold coins collected by Ndoc Xhuxha to be exhibited numismatic event organized in the Vatican. Of course, this is one of the most important events in the history of Albanian numismatics.It is true that collecting is a special hobby that not everyone enjoys, but advancing in it is not entirely dependent upon one’s skills. Some state bodies should be attracted in this direction, creating special funds to promote collecting, especially among young people. For young people who want to invest in this field, they first need to have significant money to support it; secondly, they need to be constantly informed. But the most important thing is to have interest. You can also make new friends during this activity. Clients from Albania are mainly aged 35-45, and mostly businessmen, who also have a passion for this field.

Collecting coins and banknotes has been banned in many different countries around the world. Only three decades ago, collectors could refer to a small number of catalogues, basing pricing on dealer fees and other limited information, securing this information through personal contacts through other fellow collectors. (Chiang, 2022)There are books, brochures, websites and catalogs that discuss numismatics that provide specific information on these collectibles, such as prices or various forums for collectors. The circulation of these objects is low and this creates a high demand and satisfactory pricing. Also, the increase in the price

of gold in the world stock markets further increases the price of coins made of gold or silver, while the price of gold and silver move in parallel. (Parthajit Kayal, 2021)

Collecting is not only a hobby, but also an alternative method of investments from which one can profit from the difference between the sale and purchase prices. As long as their prices keep increasing, this continues to remain a good method to diversify portfolios. (Christian Pierdzioch, 15)

RECOMMENDATIONS

To derive the maximum benefits from investing in gold, investors should know that the gold market fluctuates like any other market. Therefore they must properly be informed on when to buy and sell gold at the right moment in order to prevent losses.Based on the well-known theory not to invest all eggs in one basket, we must understand that investing in gold also helps to diversify one's portfolio, and this is the reason that gold as an investment asset should occupy a significant part of investor's portfolio.The allocation of gold in an investors' portfolio should not comprise more than 10%-25% of the total.Investors should always be informed about investment alternatives offered to learn what is really happening in the market.Encouraging tier two banks to help further develop gold trading and educate the public about the benefits of investing in gold.

CONCLUSIONS

Regardless of whether you are a conservative investor or aggressive in your approach to risk, precious metals can take up a significant portion of your asset allocation.Investing in gold serves as a hedge against inflation, whose price, although volatile in the short term, maintains its value in the long term by serving as a hedge against the erosion of purchasing power.The factors that influence the price of gold are not only evaluated in terms of the relationship they have with it, but also with the proportion of how much they influence its price. This is the general perspective that affects the price of gold and the success of investors, making gold an attractive alternative for them.Gold plays an important role not only for investors' returns, but it significantly affects the economic, political and social situations of different countries.It serves as a safe haven in times of social, economic and political crises. It has often been called a "crisis product" because it tends to outperform investors during periods of global tension. It does not lose value, regardless of market collapses, and always having a perceived value. Thus, investing in gold, including gold and silver coins, is a must in all types of portfolio management if you want protection, safety and growth of your money, all at the same time.

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THE ECONOMY OF KAZAKHSTAN

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Resume
Kazakhstan is important for global energy markets because it has significant reserves of oil and natural gas. With sufficient export opportunities, Kazakhstan could become one of the world's largest oil producers and exporters in the next decade. But Kazakhstan's strategic aspiration is to become a modern, diversified economy with high added value and a high-tech component, well integrated into the global economy. The energy sector is seen as a good foundation for achieving this goal. The prospect of Kazakhstan's economy is closely linked to further integration into international economic relations, the use of unique reserves of energy and mineral resources, extensive export opportunities for industrial and agricultural products, optimal use of the country's transit potential, as well as the availability of highly qualified specialists in various fields. During the Soviet period, Kazakhstan was an agrarian, raw material supplier of the former Soviet economy, where the main role was played by the military industry.
Keywords: Agrarian, export, international economic relations, Kazakhstan, Soviet economy

THE ECONOMY OF KAZAKHSTAN

Annotation
The article discusses the current state and problems of the development of the industry of the Republic of Kazakhstan. The impact of the global crisis and the sharp decline in oil prices on the economic development of the country is analyzed. The author considers the importance and main directions of diversification of the economy of Kazakhstan. The basic vectors of the development of the oil industry on an innovative basis are determined.
Key words: development, economy, efficiency, innovation, oil industry.

Introduction

The main economic content of more than 10 years of independence was the transition from centralized command planning to a market system. Kazakhstan has made significant progress in implementing complex political, economic and social reforms aimed at creating a democratic State with a market economy. The main objective of Kazakhstan's current structural policy is to diversify and strengthen the oil sector. For this purpose, development agencies, research centers have been created, and the creation of technology parks and research centers is also being considered. Despite hereditary obstacles, the country has achieved impressive economic growth over the past five years thanks to increased oil exports, economic reforms and sound fiscal policy. This growth is accompanied by stable inflation, a budget surplus, a strengthening of the national currency and a decrease in the unemployment rate, which led to a significant increase in real GDP to one of the best indicators since the country's independence.The foreign exchange reserves of the National Bank and the National Fund reached USD 14.4 billion in 2004, representing an increase of 66.3%. In the same year, the minimum wage increased by 32% and the average wage by 21.4%, while real incomes and pensions also increased. Kazakhstan's current leaders are striving for its integration into the global economy, which is expected to lead to new opportunities in the global market.

Keywords: CIS, economic reforms, National Bank, National Fund, political reforms, social reforms, USA.

The main part

After gaining independence in 1991, Kazakhstan had an extensive resource base and a skilled workforce. However, the key factor was the rapid departure from the failed policies of the past. Under the leadership of Kazakhstan, a transformational course was adopted, as a result of which the country moved from a planned to a market economy in ten years. Extensive reforms have been carried out, including de-monopolization, privatization, debt restructuring, price liberalization, customs reform and tax restructuring. The Securities and Exchange Commission was established, a new public procurement process was introduced, and the banking system was reformed.The United States recognized Kazakhstan as a market economy country in March 2002. The privatization of most of the economy has taken place, but restructuring of sectors, including telecommunications, is required. The financial system is introducing innovations, including private pension funds and the national fund for the preservation of oil wealth. Unemployment is just as high, but lower than in other countries. The reforms took place against the background of domestic political stability and the promotion of democratic reforms. The United States supports Kazakhstan's efforts through the Houston Initiative to develop a modern market economy, with a focus on small and medium-sized enterprises.Kazakhstan's investment potential today is based on its natural resources, mainly minerals and raw materials, which account for more than half of the country's gross product. The exploitation of fields such as Kashagan will allow Kazakhstan to become one of the world's leading producers of hydrocarbons. Despite this, the Government's priority is to attract foreign direct investment in industry, agriculture, innovation and processing sectors for sustainable growth and reduction of dependence on raw materials industries. Kazakhstan pursues a policy of ensuring a stable macroeconomic environment and improving the investment climate, including reducing tax rates and creating favorable business conditions. To provide future generations with reserves, a National Fund was created, and the National Development Bank was established to lend to investment projects. The "Strategy of Innovative Industrial Development until 2015" has been adopted in order to further diversify the economy.In 1991, Kazakhstan was the main supplier of raw materials to the USSR economy, providing only 42% of the local market. After the collapse of the USSR, the country faced the challenges of a market economy, which led to a sharp decline in industrial and agricultural production in the period from 1992 to 1995. However, Kazakhstan still has significant scientific and technical potential for the development of industry and economy. In 1991, production included a wide range of products, from electricity to canned goods.In 1992, Kazakhstan, using only 16% of the labor force in

agriculture, was able to generate 38% of national income, which indicates the high mechanization and relative efficiency of this sector. The country's agricultural capabilities are impressive: 82% of the territory is used for agriculture, and Kazakhstan ranks sixth in the world in terms of the area of plowed fields. Corn and wheat production is also impressive, with production levels surpassing many other countries. In 1992, work began on reforming the economy on market principles, which intensified by the end of 1993. This period was also characterized by the formation of a multi-layered economy. By the end of 1995, there were 91300 economic enterprises operating in Kazakhstan, of which 73400 belonged to the non-public sector. Non-public sector industrial enterprises produced 30.4% of total industrial output and 38.9% of gross agricultural output in 1995. Small and medium-sized businesses are actively developing in the republic. At the beginning of 1996, 21,300 enterprises and organizations were registered, employing 147,200 people. The privatization process also contributed to business development: from 1993 to 1995, 9,000 enterprises were privatized, and as part of the total privatization program, which ended by the end of 1995, 2,000 enterprises were sold at auction, mainly in the service sector. More than 93% of large agricultural enterprises have been privatized. 60% of the capital of privatized enterprises has been transferred to the contractual management of local and foreign companies. Kazakhstan is actively looking for new ways to overcome the economic and social crisis, including focusing on improving the basic sectors of the economy and improving the use of domestic infrastructure.Kazakhstan plays the role of an intermediate zone for the transportation of natural gas from Central Asia to Russia. The vast territory, diverse climatic and geographical conditions, as well as low population density make the problem of transport in Kazakhstan more important and significant. Despite significant improvements in transport infrastructure during the Soviet regime, including the expansion of the railway network to 14,500 km, the construction of 82,000 km of paved roads, the creation of 108,000 km of air routes and 4,000 km of inland navigable waterways, the main mode of transportation remains automobile, which is not always effective. The share of rail transport in cargo transportation was only 12%, and passengers – less than 20% on intercity routes, even in the best years**.**

Conclusion

Today, Kazakhstan has developed ties with Azerbaijan through all types of modern transport, ensuring the delivery of goods from European and Asian countries to the provinces of China and Southeast Asian countries. Sea routes through Iran and mixed communication with Turkey to Azerbaijan have been established. The Great Silk Road has been restored thanks to a short railway laid in 1996 to Iran and the borders of Turkmenistan. Together with

China, the Druzhba station was opened, which has become a major transport hub for millions of tons of cargo from around the world. Railway electrification and airport development, including Almaty Airport, are also actively underway. Additional investments are required to accelerate these activities. Kazakhstan exports oil and gas resources, chemical products, grain, steel and electrical equipment to neighboring countries such as Azerbaijan and Russia, and imports petroleum products, polymers, components and building structures from Azerbaijan and Russia.

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ASSESSMENT OF HEAVY METAL CONCENTRATION OF SURFACE WATER USING GEOCHEMICAL METHOD OF WATER ANALYSIS: THE CASE OF YENAGOA METROPOLIS OF BAYELSA STATE, NIGERIA

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ABSTRACT
The need for water quality becomes important as the demand for water is increasing, on the basis of the increasing demand. The study used geochemical, geological and GIS methods to determine and understand the spread and concentration of surface water which was used to interpret the adverse effect to humanity**.** Five water samples were collected from Epie creek and Swali to determine their water suitability. The samples were analyzed with the aid of atomic absorption spectrophometer. The analytical results indicate the following ranges of concentration for the heavy metals; Zn (0.075 - 0.181mg/l), Fe (0.311 – 0.523mg/l), Pb (0.003 – 0.09mg/l), Cr (0.002 – 0.09mg/l) and Mn (0.055 - 0.114mg/l) when compared with the standards recommended by WHO (2011), the water samples were above the permissible limit except for Zinc (Zn) whose concentration is below the permissible limit. Based on the findings, this study offers the required information that sanitary system should be adopted in the area, especially hazard dumping of refuse in surface water should be discarded. The study also recommends that government needs to act fast by ensuring the water in the area should be treated before using for domestic work purposes.
KEYWORDS: Heavy metal, surface water, Yenagoa, Bayelsa state, geochemical method, water analysis

INTRODUCTION

The chemistry of the surface water within the study area, analyzed from the laboratory samples, showed that all parameters from all the surface water samples were above the WHO (2011) permissible limits except Zinc in all the locations. The pollution index for both heavy metal pollution, evaluation index and degree of contamination indicated that 30% of the sample are low and 70% are high which imply that Epie Creek is polluted. It shows an anthropogenic contribution of heavy metals from by-products of automobiles exhaust, leakages from water tanks, marine dumping, and burning of gasoline waste materials may have increase the concentration of these metals in the surface water of Epie Creek.Arokoyu and Ukpere (2014) argued that surface water refers to all forms of water which occurs in liquid or solid (ice) form and which are found on the earth's surface. They include oceans, seas, rivers, lakes, lagoons, rivulets, oasis, ponds and swamps; and sometimes, stagnated water or pool of water after heavy down pour, run-off and flood water (Jonah, 2017). Surface water quality refers to the condition of the surface water at any point in time. According to Narayanam (2011), the definition of surface water quality of a body of water includes the physical, chemical and microbiological status of the water in terms of level of occurrence of physical, chemical, microbial and biological parameters in the water. The higher the level of concentration of any of these physicochemical and micro-biological parameters, the lesser or poorer the quality of the water. The water quality is weighted against acceptable laid down national and international standards. Surface water quality is one of the most critical environmental concerns in many parts of the world. Manahan (2012), stated that surface water consists of all the water that flows through landmasses like creeks, springs, lakes, rivers and oceans. A stream is a system involving mainstream rivers and tributaries that transports a one-way flow of large amounts of particulate and dissolved load from both anthropogenic and natural sources. At any point, the chemistry of surface water of a river reflects several noteworthy influences, including atmospheric inputs, the lithology of the basin, anthropogenic inputs and climatic conditions, Bricker and Jones, (2010).Natural (erosion) and anthropogenic activities affect the quality of regional surface water. Khan *et al*, (2016), Gani *et al*, (2016). According to Finnvelden *et al* (2012), crop waste, degradable solid waste and food waste contribute to the organic content of surface water. Recent research has increasingly focused on planning new monitoring strategies, in which multivariate statistical techniques such as PCA and hierarchical cluster analysis (HCA) have emerged. Kumar *et al* (2014). These methods have been used to assess the effectiveness of surface water quality monitoring networks, plans to increase the number of examining

stations and select the basic parameters of water quality.This study is centered on the rural areas of a region that is underlain by sedimentary rock strata which is characterized by porous loamy and alluvial soils, high water tables. It is also prone to flooding, marshy and wet environments which promote the growth and spread of pathogens. The area is known for environmental pollution due to crude oil spills, gas flaring, series of artisanal refining activities, use of poor built traditional pit-latrines and wastes disposal into surface water bodies. The study used geochemical, geological and GIS methods to determine and understand the spread and concentration of surface water which was used to interpret the adverse effect to humanity**.**

AIM AND OBJECTIVES OF STUDY

The aim of this study is to use geochemical methods of analysis to determine the concentration and level of toxicity of heavy metals in surface water of the study area. Thus, the objectives of the study are:

1. To compare heavy metal concentration of surface water in the various study locations with respect to standards values
2. In order to interpret the effect of concentration and the toxicity level with respect to prevailing environmental standard.

METHODOLOGY

The study centers on examining access to water quality in Yenagoa LGA in Bayelsa State. It involves both social analysis and experimentations (laboratory analysis of water samples) of the water in the five communities that constitutes the area (Akenfa, Agudama-Epie, Edepie, Opolo and Swali). In other words, it is both a social survey and experimental study with focus on field observations, examination of certain anthropogenic activities that threaten the collection ion of water samples and laboratory analysis by weighing the expected results against the international standard (WHO's maximum acceptable permissible level).

Data Collection

Surface water sample were collected from five (5) sampling stations in Epie Creek in Yenagoa Local Government area of Bayelsa State. The creek is serving as a dumpsite for individuals, marketers, and households staying within the area and the sampling point were determined using the Global position System (GPS); the samples were collected at 10 cm to 15 cm depth using decontaminated 75cl capacity plastic bottles in five different surfaces. Collected samples were acidified with concentrated nitric acid to a pH below 2.0 to minimize precipitation and adsorption on container walls. The samples were kept at 4C in an ice-

container and transported to the laboratory for analysis. They were analyzed for Zn, Pb, Mn, Cr, Fe using atomic absorption spectrophotometer. The Samples were taken from Akenfa, Agudama-Epie, Edepie, Opolo, and Swali. These five locations were picked because they are within the central areas of Yenagoa and they are among the most populated areas in the metropolis that have huge conspicuous municipal co-mingled indiscriminate waste dumps in the Epie creek and the location coordinate were taken. The map of the study area, showing sampled points is shown in Figure 1.

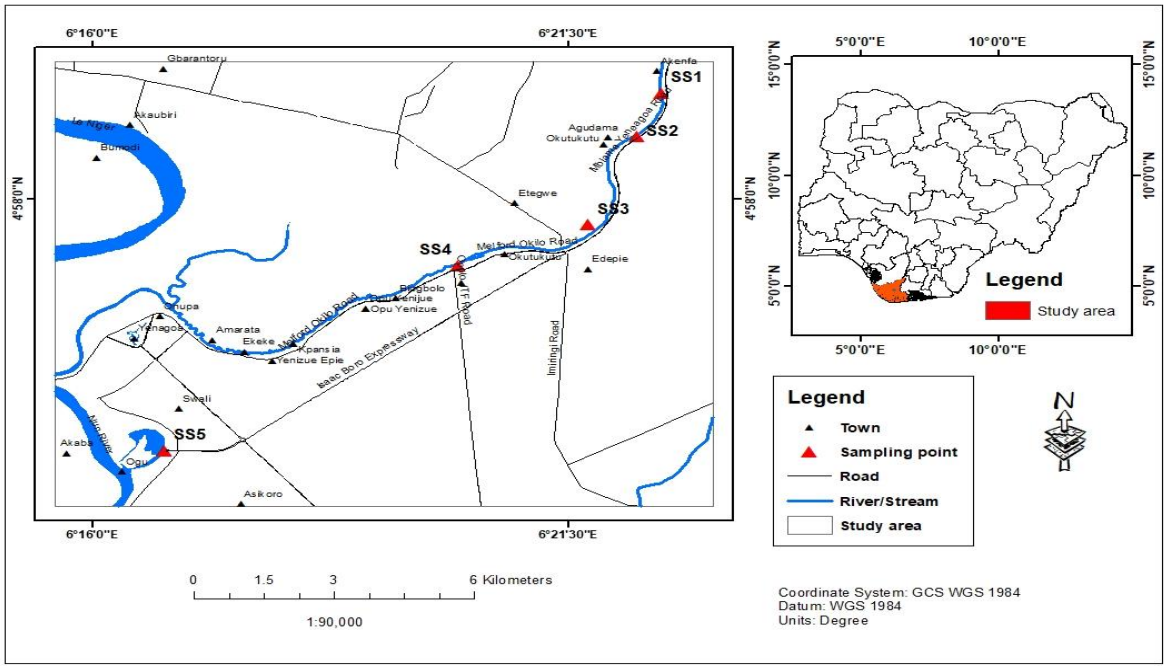


Figure 1: Map Showing Sampled Points

Equipment Used

The following Equipment were used in the field: Field Notebook and Pen, GPS (Global Positioning System), five 75cl Plastic bottles, masking Tape, permanent Marker, concentrated nitric acid.

Assessment of Surface Water Contamination

Water has the capability to record the history and indicate the degree of contamination. To access the degree of contamination for giving heavy metal requires that the pollutant metal concentration to be compared with an unpolluted reference material (geochemical background). The reference material represents a benchmark to which the metal concentration in the polluted samples are compared and measured. Many authors have used

the average crustal abundance data as references baselines and such degree contamination are as follows Contamination Index, and Heavy Metal Evaluation.

Heavy Metal Evaluation Index (HEI)

The Heavy Metal Evaluation Index (HEI) is a method used to assess the overall quality of water with respect to heavy metals. It is similar to the Heavy Metal Pollution Index (HPI) in that it provides a quantitative measure of the concentration of heavy metals in water, but the HEI takes into account the toxicity of each metal and weights them accordingly.The HEI method was developed by Edet and Offiong in 2002 and has been used in various studies to evaluate water quality. The method involves calculating a weighted sum of the concentration of each heavy metal in the water sample, where the weight is determined by the toxicity of the metal. The toxicity of each metal is determined by reference to toxicity data in the literature, and the weights are assigned according to the degree of toxicity.

The WHO (World Health Organization) released guidelines on drinking water quality in 2011, which included recommendations on the maximum permissible levels of heavy metals in drinking water. These guidelines are used as a reference for the evaluation of water quality using the HEI method.

Overall, the HEI method provides a useful tool for assessing the overall quality of water with respect to heavy metals. It takes into account the toxicity of each metal, which can vary widely, and provides a single index value that can be used to compare water samples and track changes in water quality over time.

HEI is calculated from the following equation

$$\text{HPI} = \sum_{i=1}^{n} {Hc}/{Hmac}$$

Hc is the monitored value of the i^{th} parameter and H_{mac} is the minimum admissible concentration of the i^{th} parameter.

Degree of Contamination (Cd)

The degree of contamination takes into consideration both the number of parameters that exceed the upper permissible limit or guide values of potentially harmful elements and the concentration exceeding these limit values (Backman *et al*., 1997). To determine the degree of contamination (Cd) this is computed separately for each sample of water analyzed as the sum of water contaminant factor of the individual components exceeding the upper permissible values.

Generally, the Cd is a summary of the combined effects of the several quality parameters considered harmful to household water. In this study all detected values were used in computing the contaminant index.

Cd is calculated the following equation:

$$C_d \sum_{t=1}^{n} C_{f_i}$$

C_{f_i} = represent the contaminant factor for the component and is calculated from the equation

$$C_{f_i} = \frac{C_{A_i}}{C_{N_i}} - 1$$

Where C_{A_i} = analytical value of the i[th] component and C_{N_i} = upper permissible concentration of the i[th] component (N denotes the normative value).

RESULTS AND DISCUSSION

Results of Heavy Metal Analysis

Results of heavy metal analysis of surface water from the area under study are presented in Table 1 below. The results were compared with the 2011 World Health Organization (WHO) standard for heavy metals in water.

Table 1: Results of Heavy metal analysis of Surface Water in the Study Area

Lat	Long	Sample Code/Locations	Zn	Pb	Mn	Cr	Fe
$4^0$59’31” N	$6^0$22’35” E	SW1 AKENFA	0.173	0.042	0.055	0.01	0.42
$4^0$58’54” N	$6^0$22’44” E	SW2 AGUDAMA-EPIE	0.075	0.052	0.078	0.08	0.411
$4^0$57’38” N	$6^0$21’18” E	SW3 EDEPIE	0.085	0.003	0.063	0.002	0.311
$4^0$57’03” N	$6^0$20’14” E	SW4 OPOLO	0.181	0.09	0.103	0.06	0.523
$4^0$54’24” N	$6^0$16’50” E	SW5 SWALI	0.11	0.078	0.114	0.09	0.341
		Min	0.075	0.003	0.055	0.002	0.311
		Max	0.181	0.09	0.114	0.09	0.523
		Mean	0.1248	0.053	0.0826	0.0484	0.4012
		WHO (2011)	3	0.01	0.1	0.05	0.3

** All results are in mg/L

Graphical Representation and Interpretation of parameters

Zinc (Zn)

The concentration of Zinc in samples varies from 0.08 mg/L to 0.18 mg/L with an average value of 0.1248 mg/L as presented in Fig 1 below. The permissible limit of Zinc given by WHO (2011) is 3.00 mg/L, hence, the water in the study area is below the permissible limit making it safe for drinking and irrigation purposes. Zinc is an essential element for body growth and development however, drinking water containing high levels of Zinc can lead to stomach cramps, nausea and arteriosclerosis.

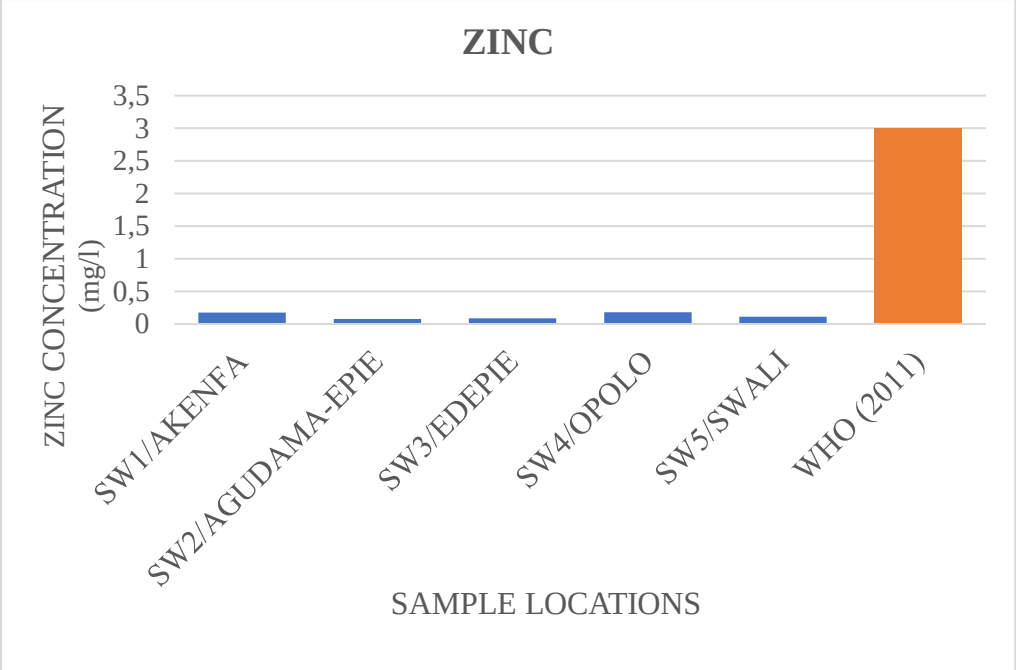


Figure 1: Concentration of Zinc in Surface water across the study area.

Lead (Pb)

The concentration of Lead in samples varies from 0.003 mg/L to 0.09 mg/L with an average value of 0.053 mg/L as presented in Fig 2 below. When compared with the permissible limit of WHO (2011) given as 0.01 mg/L, the concentration of Lead in surface water in the study area is much higher than the permissible limit in all locations except SW3/Edepie, thus, making it unsuitable for consumption and Irrigation purposes. High concentration of Lead in drinking water can lead to cardiovascular effects, increased blood pressure and incidence of hypertension, decreased kidney function, reproductive problems (in both men and women). Lead also destroys the IQ of Infant babies.



Figure 2: Concentration of Lead in Surface water across the study area.

Manganese (Mn)

Results presented in Fig 3 below show that the concentration of Manganese in surface water varies from 0.065 mg/L to 0.114 mg/L with an average value of 0.0826 mg/L. The WHO (2011) standard permissible limit for Manganese is put at 0.1 mg/L, the water is suitable for drinking and Irrigational Purposes in all areas except SW4 Opolo and SW5 Swali since it falls below the WHO permissible limit.

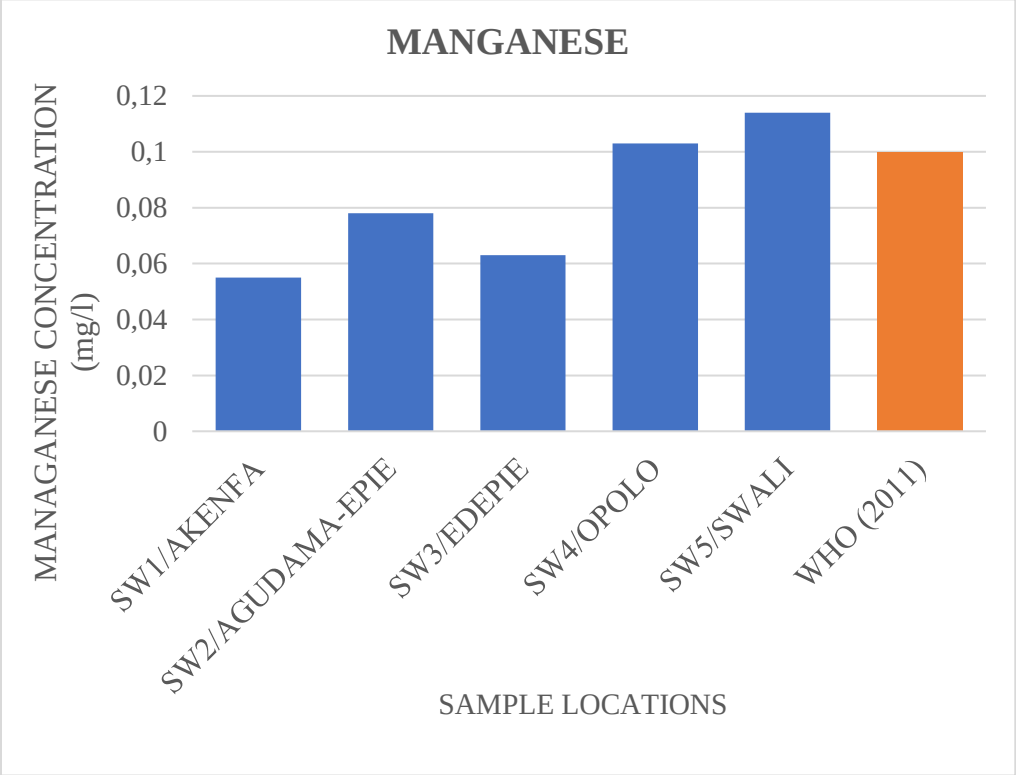


Figure 3: Concentration of Manganese in Surface water across the study area.

Chromium (Cr)

Results as presented in Fig 4 below show that the concentration of Chromium in surface water varies from 0.002 mg/L to 0.09 mg/L with an average value of 0.0484 mg/L. When the result is compared with the standard permissible limit of WHO (2011) of 0.05 mg/L, it can be said that the water is not suitable for drinking and irrigation purposes in all areas except locations SSW2 Akenfa and SW3 Edepie.

Chromium is an essential element in human diet, exposure to higher concentrations of Chromium can result in gastrointestinal disorders, hemorrhagic diathesis and convulsions. Chromium is also carcinogenic.

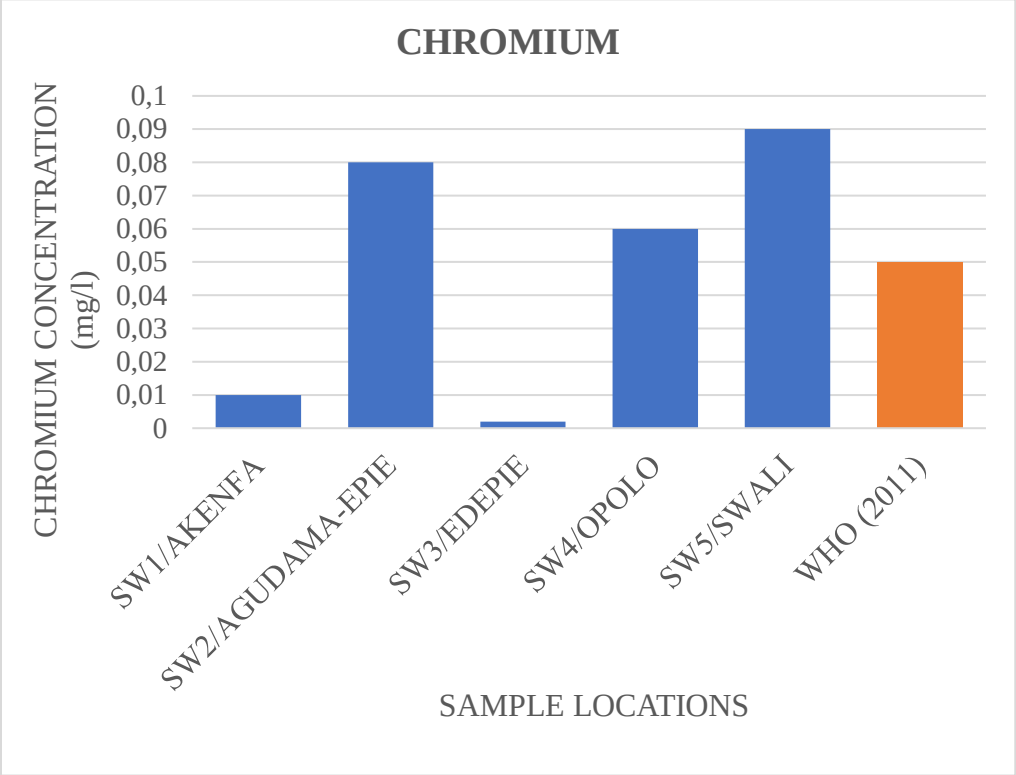


Figure 4: Concentration of Chromium in Surface water across the study area.

Iron (Fe)

The concentration of iron in surface water varies from 0.31 mg/L to 0.52 mg/L with an average value of 0.4012 mg/L as presented in Fig 5 below. The WHO (2011) permissible limit of Iron in drinking water is given as 0.30 mg/L, the water in the study area is greater than the permissible limit in all samples, thus, making it unsafe for drinking and irrigation purposes.

The presence of iron can corrode the water, give off an offensive smell and cause coloration of water. High iron concentration can be due to un-sanity disposal refuges and damages the storage tanks.

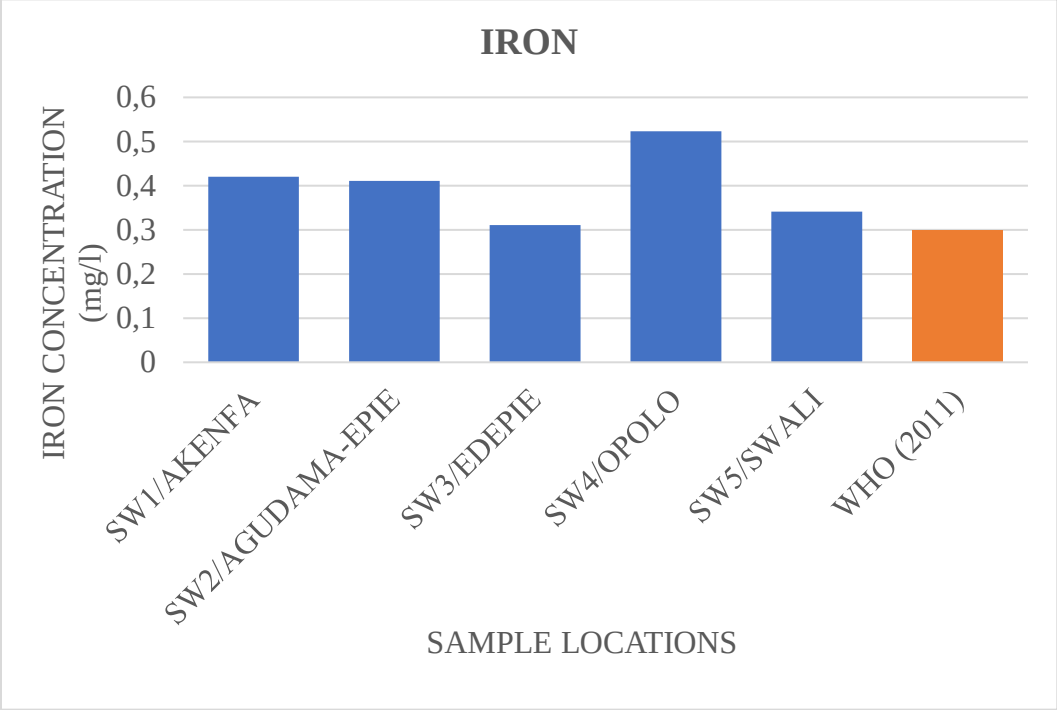


Figure 5: Concentration of Iron in Surface water across the study area.

Percentage concentration of heavy metals

The chart showed that percentage of average concentration heavy metal in decreasing order of Fe>Zn>Mn>Pb>Cr. Iron had the highest average concentration of 60%, followed by Zn with an average concentration of 25%, Manganese had an average concentration of 8%, followed by Lead which had an average concentration of 6% and lastly Chromium with an average concentration across the area under study with 1%.

A graphical presentation of the average percentage concentration of heavy metals is given in a pie chart presented in Figure 6 below.

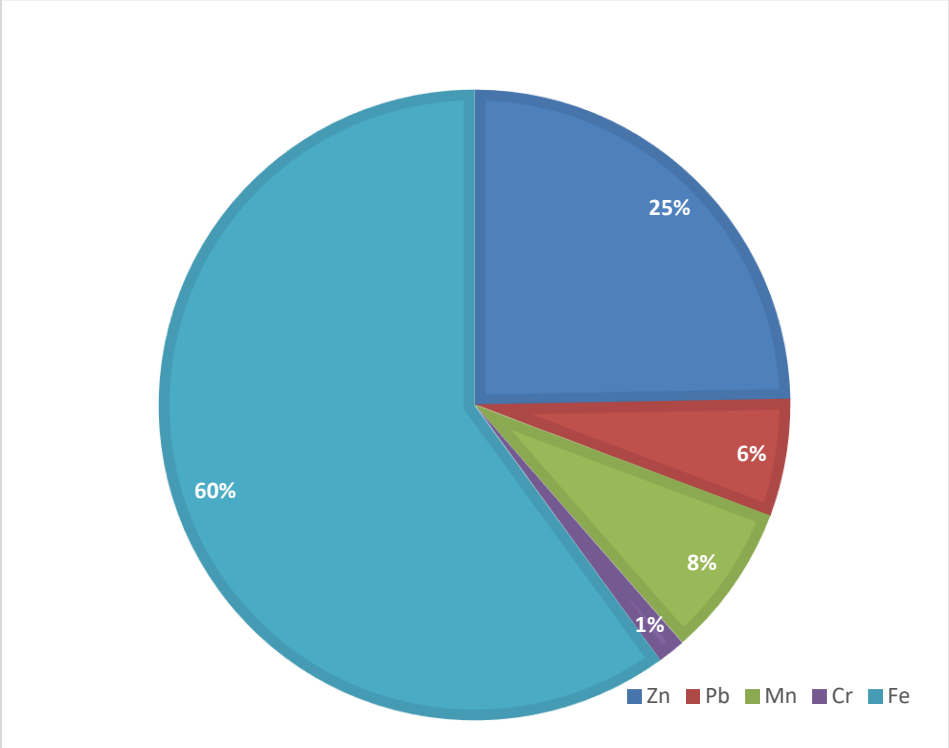


Figure 6: Percentage of mean concentration of heavy metals in surface water across the area under study.

SUMMARY AND CONCLUSION

The chemistry of the surface water within the study area, analyzed from the laboratory samples, showed that all parameters from all the surface water samples were above the WHO (2011) permissible limits except Zinc in all the locations. Surface water samples were analyzed in the laboratory for Zn, Fe, Pb, Cr and Mn. Zinc (Zn) concentration all the samples fall within the permissible limit of WHO (2011) except for Iron (Fe) and Lead (Pb) concentration was above the permissible limit of WHO (2011) in all locations thus indicating higher concentration of iron and lead in the study area. Chromium (Cr) concentration in Locations SW1 Akenfa and SW3 Edepie was below the permissible limit of WHO (2011) and the others locations SW2 Agudama-Epie, SW4 Opolo and SW5 Swali was above the permissible limit of WHO (2011) and Manganese (Mn) concentration in Locations SW1 Akenfa, SW2 Agudama-Epie, SW3 Edepie was below the permissible limit of WHO (2011) and locations SW4 Opolo and SW5 Swali was above the permissible limit of WHO (2011). In areas where the chemistry of water does not fall within the permissible limit for potable water set by the Guidelines for Drinking Water Quality by WHO (2011) treatment; is recommended. The calculated pollution index for both heavy metal pollution, evaluation index and degree of contamination indicated that 30% of the sample are low and 70% are high which imply that Epie Creek is polluted.

RECOMMENDATIONS

1. This study offers the required information that sanitary system should be adopted in the area, especially hazard dumping of refuse in surface water should be discarded.
2. Government needs to act fast by ensuring the water in the area should be treated before using for domestic work purposes.

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A REVIEW OF PROPOSED INVERTER CONTROL STRATEGIES TO REDUCE THE IMPACT OF INVERTER-BASED RESOURCES ON DISTANCE PROTECTION

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SUMMARY
This paper describes the inverter control methods that have been proposed in the literature to reduce the negative impact of Inverter-Based Resources (IBR) on distance protection. These methods can be originated by the effect of short-circuit contributions from the IBR on the apparent impedances seen by distances functions or on the relay algorithm to identify the faulted phases(s). The analyzed methods are based on: a) change of setpoint for the angle of positive-sequence current; b) definition of setpoints for the angles of current based on behavior of Synchronous Generators (SG); c) emulation of angles of SG currents using virtual impedances; d) emulation of modules and angles of SG currents; e) injection of negative-sequence currents with suitable angles to improve the identification of faulted phase(s); simultaneous improvements of inverter control strategy and distance relay algorithm; g) injection of second harmonic currents and use of a distance protection based on second harmonic quantities. A final summary of the main similarities and differences among the analyzed methods is shown.
Keywords: Distance protection, Inverter-interfaced generation, Inverter-based resources, IBR control.

INTRODUCTION

Full-converter wind generation and photovoltaic plants are the most known examples of Inverter-Based Resources (IBR) that have been recently connected to synchronous grids. A basic description of IBR control can be found in (R Teodorescu, M Liserre, 2011). This type of protection can have a negative impact on distance protections of transmission lines in the nearby of the IBR (Behnke, 2020); (Zhao et al., 2022); (Pradhan et al., 2022); (Quispe et al., 2020); (George & Naidu, 2022); (Xie et al., 2022)], and a well-known reason for this is the absence of negative-sequence current in the IBR contribution to the short-circuit. Despite this fact, some grid codes still do not require the injection of negative-sequence current from the IBR (e.g., (GAQSIQ, 2012) but there is tendency to include this requirement in the grid codes (e.g., IEEE, 2021); (VDE, 2018)). A way to improve the performance of distance relays in presence of IBR is by modifying the protective devices to deal with the behavior of IBRs during faults; this topic is not under the scope of this paper. On the other hand, another way to face the problem is by modifying the short-circuit contributions from IBRs, and this paper shows a summarized review about the proposed control strategies to do it.

RESEARCH AND FINDINGS

Description of the problem

There are two main types of reported failures of distance protections for lines connecting IBR with the synchronous network. One of them is mainly related to the apparent impedance seen by this protective function for resistive faults, and it is originated by the differences between the behavior of the current from the IBR and the current from the synchronous network (especially regarding the angles of both currents). That is, the distance protection can fail because it sees unexpected apparent impedances due to unexpected currents originated by the difference between contributions of currents from IBR and synchronous network. The second type of failure is mainly related to the proper identification of the faulted phase(s), which depends on an auxiliary algorithm of the distance protection that is useful to select the faulted loop for the proper calculation of apparent impedances. That is, the distance protection can fail because the identification of faulted phase(s) is wrong (because of IBR currents), and consequently the apparent impedances are not the expected ones for the real occurred fault. Manufacturers of protective relays have been actively looking for solutions to these problems, but that perspective is completely different from the one of this paper. This document is focused on the research related to possible improvements of IBR control to modify the IBR contribution during short-circuits with the specific goal of improving the behavior of distance protections in the nearby transmission lines.

Proposed methods, based on improving the IBR control.

Seven methods proposed in the literature are analyzed here. Five methods are exclusively based on improvements for the IBR control, whereas the remaining ones also require changes in distance protection design. One method is based on the injection of second harmonic current. 6 methods are based on emulation of features of Synchronous Generator (SG) short-circuit currents. One of them also modifies distance protection.Change the control reference for the angle of positive sequence-current (Ma et al., 2021).This method is based on the obtainment of an angle of the short-circuit current from the IBR equal to the angle of the short-circuit current from the grid. This control strategy fixes I_{d-} to zero and sets I_{q+} and I_{q-} (+ for positive sequence and – for negative sequence) depending on the voltage drop measured. Once I_{q+} is obtained, the control strategy is focused on regulating the ratio between I_{q+} and I_{d+}. (many IBRs are based on a dq decomposition, which obtains the components I_q and I_d from the set of three-phase currents).To control the angle of the IBR current, this method is based on analytical deductions that use the local voltages and currents, as well as the line impedance and an equivalent of the synchronous grid. On the other hand, this method is based on assuming the fault type as known; for this purpose, the phase identification scheme proposed in (Hooshyar et al., 2016) is applied in this method.The authors show results for asymmetrical fault types, in different fault locations. Such results highlight that the line reactance between the relay location and the fault point can be computed with more accuracy using the proposed method instead of a traditional one (in the simulated conditions).Create new control references for angles of currents based on synchronous generator behavior (Banaiemoqadam et al., 2020).In this control method, the reference for the angle of the negative-sequence current is firstly computed and, from it, the reference for the angle of the positive-sequence current is later determined. The fault type is known using the phase identification method used in (Hooshyar et al., 2016), which is based on sequence voltages.On the other hand, two options to obtain the angle of the negative sequence current were proposed: The first one method proposes to select the angle of the negative sequence current under the assumption that the IBR is substituted with a synchronous generator (SG) of the same rated power and perform a simulation. The second option is to model the angle of the negative sequence current to function properly in the worst fault case, it is, a fault located at the reach of the distance zone with the highest resistance possible fault value and perform test calculating the angles of both line sides. The last one option requires to make iterative tests to find the optimal angle of the negative sequence current. When both negative sequence current angle calculation methods are implemented, the behavior of distance

protection improves when an asymmetrical fault is applied, getting better results with the second one calculation of negative sequence current angle method.

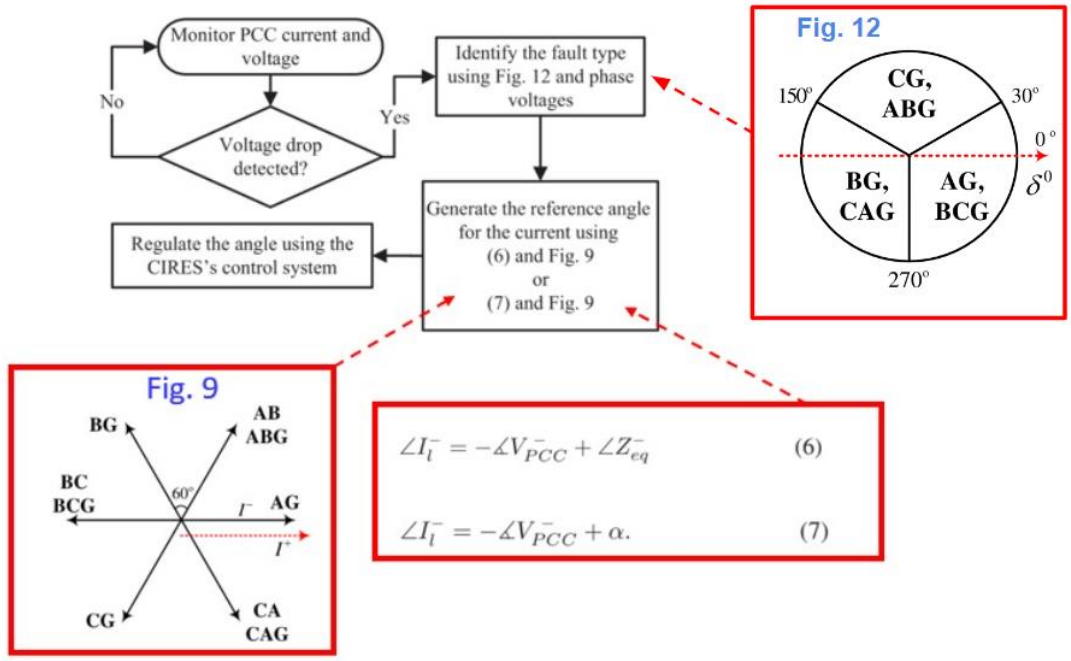


Figure 1 Summary of proposed method. [$\boldsymbol{\delta_0}$=phase lead of the negative-sequence voltage over the zero-sequence voltage] (Banaiemoqadam et al., 2020).

Emulate the angle of synchronous generator currents using virtual impedance (Banaiemoqadam et al., 2021).This method removes the effect of fault resistance and improve the proper identification of the faulted phase(s) controlling the angles of positive and negative sequence currents using a virtual impedance as shown in Figure 2.

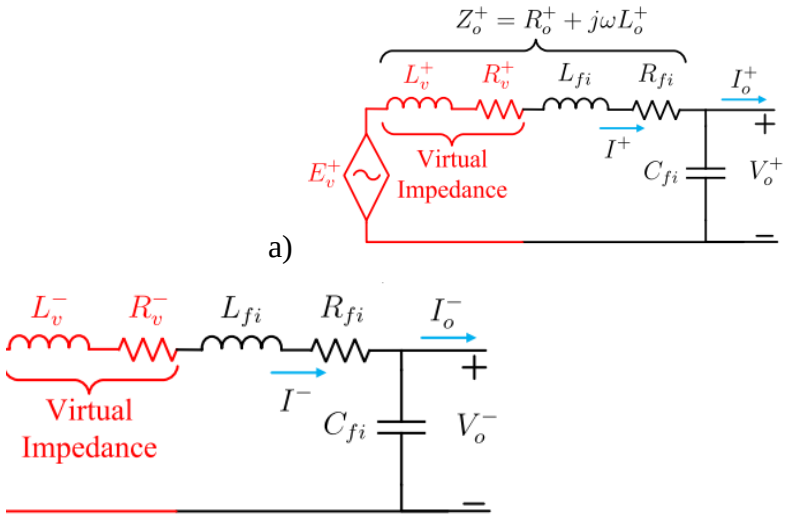


Figure 2 Equivalent circuits of an IBR with the control proposed in (Banaiemoqadam et al., 2021). a) positive-sequence; b) negative-sequence; figures taken from.

The value of the virtual impedance changes adaptively to set the angles of positive and negative sequence currents to follow the pattern shown in Figure 1, and complies with the most recent network codes. The type of fault is identified using the control scheme developed in (Hooshyar et al., 2016). Distance zones, as detection of fault phase and directional element improve their performance for asymmetrical faults.

Inject negative-sequence currents with suitable angles to improve the identification of faulted phases (Azzouz & Hooshyar, 2018).The paper introduces an improved control scheme designed to enable precise operation of current angle-based phase selection element without necessitating upgrades to relay hardware or software. To achieve this goal, the control scheme uses sequence voltages to identify the type. Once the fault type is identified, the reference angle of the negative-sequence output current is generated to force the angle difference between sequence currents to be into their respective zones following Figure 1, complying with the most recent network codes which require a negative sequence current injection by the inverters.. The authors show results for asymmetrical fault. Such results highlight that the type of faults is detected accurately by the current-based faulted phase identification algorithms of the protection relays.

Emulate modules and angles of short-circuit currents from synchronous generators (Kelly et al., 2021).In this paper, the authors emulate both the angles and amplitude ratios of the short-circuit currents of synchronous generators in the IBR. To do that, they perform a simulation replacing the IBR for a SG of the same size, get the amplitudes and angles of the phase short circuit currents, use the angles obtained in the simulation as references in control schemes and emulate magnitudes behavior of SG short circuit currents (IBR currents are limited 1 p.u) (See **Hata! Başvuru kaynağı bulunamadı.**). Faults were simulated in the middle of the line and at the protection limit of the relay, obtaining that the distance protection worked properly. However, successful emulation of synchronous generator behavior is achieved if the relay closest to the IBR meets the following conditions:

• The faulted phase voltage does not shift much with respect to its pre-fault angle.

• The faulted phase current lags the faulted phase voltage by approximately the line impedance angle.

These conditions may make the developed control scheme unsuitable for many failure events. Additionally, the simulations were performed without fault resistance, so the cases in which the distance protection is more prone to fail are not simulated.

Table 1 IBR current references. Table taken from: (Kelly et al., 2021).

Fault Type	I_a (p.u.)	I_b (p.u.)	I_c (p.u.)
A-G	1∠ -85°	1∠ 95°	0
B-C	0.5 ∠ 180°	0.5 ∠ 180°	1 ∠ 0°
B-C-G	0.5 ∠ -150°	0.5 ∠ 150°	1 ∠ 0°
A-B-C-G	1 ∠ -115°	1 ∠ 125°	1 ∠ 5°

Collaborative method between control scheme and distance protection (Chao et al., 2024).

This paper develops a control scheme in the IBR whose function is to keep the angle of the negative sequence current constant. Assuming that this angle is constant, the distance protection analytically calculates the optimum tilt angle of the distance characteristic curve to operate properly during nonmetallic LL faults. The proposed method requires adjusting only the negative-sequence control scheme. As a result, the positive-sequence current of IBRs can be set independently for different reactive power support strategies, could being adapted to different grid codes. The simulation results show the proper and quickly functionality of distance protection during nonmetallic LL faults on outgoing lines of IBRs.

Inject second harmonic (Yang et al., 2023).

This method is based on the injection of currents of second harmonic, by the IBR, during faults. Thus, the IBR control strategy must be modified to perform such an injection, and the distance protection should be also modified to use the second harmonic instead of fundamental components (apparent impedances seen by distance functions are traditionally based on the first harmonic). As there are no second harmonic current sources at the synchronous grid side, the effect of fault resistances on the apparent impedance can be suppressed since it is based on second harmonic quantities. The authors show results for different fault types, in different fault locations. Such results highlight that the distance between the relay location and the fault point can be computed with more accuracy using the proposed method instead of a traditional one (in the simulated conditions).

ANALYSIS OF THE ANALYZED METHODS

The following important aspects can be highlighted from the methods found:

The methods 1, 2, 3, 4, and 5 are based on the inclusion of modifications only in the IBR control strategies, whereas the methods 6 and 7 also require changes in the distance functions. This fact can be considered a drawback of methods 6 and 7 since the possible implementation of them seem to be more difficult.

There are also differences regarding the problem that are intended to be solved by the analyzed methods: a) avoiding angular differences between currents at both line-ends of the

protected line in order to improve the behavior or the apparent impedances seen by the distance function, as in case of methods 1, 2, 3, 5 and 6; b) improving the accuracy of the fault type (faulted phases) identification algorithm related to the distance function, as in case of method 4; c) facing both problems, as in case of method 3.

Methods 1, 2, 3 and 4 need that the IBR identifies the fault type for test in order adapt the control strategy accordingly. The other analyzed methods do not need this step.

Methods 1, 2, 3,4 and 6 were formulated to be compatible with one of the latest grid codes, the German Grid Code. This grid code indicates that the negative sequence of the inverter should behave as a constant impedance with an angle of approximately 90°. This requirement is since synchronous generators have this behavior for unbalanced faults. The other analyzed methods do not mention this key point related to this topic.

A summary of the above analysis can be seen in Table 2

Table 2 Summary of main characteristics of the analyzed methods.

Method	Research motivation		Need of modify 21		Need of identifying FT		Compliance with VDE Std		Fault types for tests				
	Zapp	FT identification	Yes	No	Yes	No	Yes	No	1ϕ	2ϕ	2ϕ-g	3ϕ	3ϕ-g
M1	x			x	x		x		x	x	x		
M2	x			x	x		x		x	x	x		
M3	x	x		x	x		x		x	x	x		
M4		x		x	x		x		x	x	x		
M5	x			x	x			x	x	x	x	x	x
M6	x		x			x	x			x			
M7			x			x		x	x	x	x	x	x

FT: Fault type
Zapp: Apparent impedance
21: Distance protection
VDE Std: German Grid Code

CONCLUSIONS

This paper presented a review of the different control schemes proposed to improve the performance of distance protection in systems with the presence of IBRs. The articles found are focused on solving mainly two problems: One of them is mainly related to the apparent impedance seen by this protective function for resistive faults, and the second one is mainly related to the proper identification of the faulted phase(s).During this review it was found that there is not much documentation about such solutions of control schemes to improve the performance of distance protections. The solutions found have important differentiating characteristics such as the type of faults to which they can be applied, the research motivation, the need to know the type of fault and the compliance with the German Grid Code. Finally, some of the methods found require modification of the distance protection whose performance is to be improved, which makes them less convenient than the other methods.

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ŞAH İSMAİL HATAİ VE ANA DİLİ EDEBİYATIMIZDAKİ YERİ

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Özet
Şah İsmayıl Hatai (1487-1524) Azerbaycan'ın sosyo-politik tarihinde ve Azerbaycan edebiyatında tanınmış şahsiyetlerden biridir. 1501 yılında kendisini şah ilan eden Şah İsmayıl, Azerbaycan dilini devlet dili düzeyine çıkarmayı, askeri ve diplomatik yazışmalarda dilimizi hakim dil olarak kullanmayı başardı. Şah İsmail hem de şairdi, Hatai mahlası ile şiirler yazardı. Hatai'nin ikinci büyük rolü seleflerinden farklı olarak Divan'ı ana dilinde yazmasıdır. Genel olarak eserlerinin çoğunu Azerbaycan diliyle yazan (çok azı Farsça ve Arap dillerinde yazılmıştır) şair farklı türlerde: aruz ve hecada çeşitli eserler yarattı.Eserlerini lirik ve destan türünde yazan şairin, ana dilinde yazdığı "Divan"ın yanı sıra "Nasihatname" ve "Dehnâme" adlı eserleri de bulunmaktadır. Derin hümanizmiyle, insana büyük değer veren tasavvuf düşüncesinin, insanı mükemmelleştiren sevginin ve özgünlüğüyle öne çıkan tabiat tasvirlerinin teşvikine adanmış şiirler onun yaratıcılığının temelini oluşturur. Yaratıcılığına ahlaki ve eğitimsel içerikli şiirler hakimdir. "Nasihatname" mesnevisi hümanist görüşleri ve ahlaki-eğitimsel içeriğiyle öne çıkan geniş çaplı bir eserdir.Aruzla yazdığı gazelleri ağırlıklı olarak aşk teması üzerine yazılmış olması ve Arapça-Farsça kökenli kelimelerin nadiren kullanılmasıyla öne çıkmıştır.Hatai'nin ana dil edebiyatındaki özel rolü, Azerbaycan edebiyatındaki "Dehneme" yazma geleneğini seleflerinden farklı olarak Azerbaycan dilinde yazması ile ilgiliydi (Hatai'den önce Maragali Ovhadi aynı başlıkla Farsça ele almıştı). Eserde Arapça-Farsça kökenli kelimeler ve kutsal kitabımızın ayetleri kullanılsa da anlaşılırlığı ve sadeliği ile ön plana çıkmaktadır. Aruzla yazılmış olmasına rağmen tüm misralarda sadece Türkçe kelimeler içeren kısımlar bulunmaktadır:Hatai'nin eserlerinin ağırlıklı olarak kendi ana dilinde yazılmış olması ve aynı zamanda ana dil edebiyatının gelişimine etkisi nedeniyle büyük önem taşımaktadır.

Anahtar kelimeler: Azerbaycan edebiyatı, Hatai, anadil edebiyyatı, aruz, mesnevi.

ŞAH ISMAIL HATAI AND HIS PLACE IN OUR NATIVE LANGUAGE LITERATURE

Abrstct
Shah Ismayil Hatai (1487-1524) is one of the well-known figures in the socio-political history of Azerbaijan and Azerbaijani literature.Shah Ismail, who declared himself shah in 1501, succeeded in raising the Azerbaijani language to the level of the state language and using our language as the dominant language in military and diplomatic correspondence.Shah Ismail was also a poet, he wrote poems under the pseudonym Hatai. Hatai's second major role is that, unlike his predecessors, he wrote the Divan in his native language. In general, the poet, who wrote most of his works in the Azerbaijani language (very few were written in Persian and Arabic languages), created various works in different genres: aruz and syllabary.The poet, who writes his works in lyric and epic genres, has works called "Nasihatname" and "Dehnâme" as well as "Divan" written in his native language. Poems dedicated to the promotion of the idea of Sufism, which gives great value to humans with its deep humanism, love that perfects humans, and depictions of nature that stand out with their originality, form the basis of his creativity.His creativity is dominated by poems with moral and educational content. "Nasihatname" masnavi is a large-scale work that stands out with its humanist views and moral-educational content.His ghazals written with aruz stood out because they were written mainly on the theme of love and rarely used words of Arabic-Persian origin. Hatai's special role in native language literature was related to the fact that he wrote the "Dehneme" writing tradition in Azerbaijani literature in Azerbaijani language, unlike his predecessors (before Hatai, Maragali Ovhadi had discussed it in Persian with the same title). Although words of Arabic-Persian origin and verses of our holy book are used in the work, it stands out with its understandability and simplicity. Although it is written in aruz, all verses contain parts containing only Turkish words.Hatai's works are of great importance because they were mainly written in his native language and also because of their impact on the development of native language literature.
Keywords: Azerbaijani literature, Hatai, native language literature, aruz, masnavi.

GELİŞME

Genel olarak eserlerinin çoğunu Azerice yazan (çok azı Farsça ve Arapça yazıltır) şair, ilk kez ağırlıklı olarak hece ölçüsüne yönelerek beyit, garayli, varsagı ve bayat türlerinde de çeşitli muhtevada eserler meydana getirmiştir. Hatainin tek amacı sağlam siyasi-ideolojik temele dayalı bir devlet inşa etmek ve halkını bu devletin etrafında sıkı bir şekilde birleştirmekti ve şunlar eserlerinde ana cizgi gibi tasvir ediliyordu. Şah İsmayıl Hatayi'nin edebiyatda ikinci büyük rolü seleflerinden farklı olarak Divan'ı ana dilinde yazmasıdır. Eserlerini lirik ve destan türünde yazan şairin, ana dilinde yazdığı "Divan"ın yanı sıra "Nasihat" ve "Dehnâme" adlı eserleri de bulunmaktadır. Ana dilinde yazmayı tercih eden şairin derin hümanizmi ile öne çıkan; insana büyük değer veren tasavvuf görüşünün, insanı mükemmelleştiren sevginin ve özgünlüğüyle öne çıkan tabiat tasvirlerinin yer aldıgı şiirleri onun yaratıcılığının temelini oluşturur.

“Nasihatname” hümanist görüşleri ve ahlaki-eğitimsel içeriğiyle öne çıkan geniş çaplı bir eserdir. Eserlerinde genel olarak ahlaki ve eğitici içerikli şiirleri tercih etmiştir:

“Sufi isən, alıb-satma,
Halalına haram qatma,
Yolun əyrisinə getmə,
Doğru yola nəzər eylə”.

Ağırlıklı olarak aşk konusunu işleyen gazeller Aruz nazım şekliyle yazılmış olsa da Arapça-Farsça kökenli sözcüklerin nadiren kullanılmasıyla öne çıkmaktadır.

Şah İsmayıl Hatayi'nin ana dil edebiyatındaki özel rolü, Azerbaycan edebiyatındaki "Dehneme" yazma geleneğini seleflerinden farklı olarak ana dilinde yazması ile ilgiliydi (Hatayi'den önce Maragali Ovhadi aynı konuyu Farsça ele almıştı). Hatayi'nin "Dahname" eserinde Arapça-Farsça kökenli kelimeler ve kutsal kitabımızın ayetleri kullanılsa da anlaşılırlığı ve dil sadeliği ile ön plana çıkmaktadır. Öte yandan, eserin incelenmesi sırasında araştırmacılar, ödünç alınan birimler ile ulusal dilin sözcük birimleri arasındaki uyumluluğu yüksek düzeyde değerlendirmişler (1, s.447). Hatta aruz ölçüsü ile yazılmış olmasına rağmen tüm beyitlerinde sadece Türkçe kelimeler içeren kısımlar da bulunmaktadır:

“Hər gözüm əgər olursa yüz göz,
Bir yüzüm əgər olarsa, yüz-yüz,
Səndən kəsəməm o gözlərimni,
Sallam ayağına yüzlərimni”.

Öte yandan kendi ana dilinde yazılan bu eser, seleflerinden farklı olarak yapı ve şekil bakımından da daha mükemmel kabul edilmektedir (1, s.445).

Genel olarak şiirin ölçü ve ya vezin gereği olarak, hece ölçüsünde yazmış olduğu şiirlerde Aruz ölçüsündekilerle nisbetde Arapça-Farsça kelimeler daha azdır, basit lehçeye uygun kelime ve deyimler kullanılmıştır (1, s. 451).

SONUÇ

Ş.İ. Hatai, eserleriyle sadece sanatsal düzeyde değil, resmi dil gibi ana dilinin gelişmesinde büyük rol oynadı. Hem aruz vezinli şiirlerini, hem divanını, hem de hece ölçüsü ile yazmış oldugu şiirlerinin çoğunu ana dilinde kaleme alan şair, böylece: kalemini her yerde kılıç gibi sınadı; hem destansı hem de lirik eserler yazdı. Hece veznindeki şiirlerini divan edebiyatına kazandırarak edebiyat tarihinde "ilk divan şairi" olarak değer kazanmıştır (1, s. 426). O, sadece parlak zekası ve kılıcının gücüyle değil, aynı zamanda kaleminin büyüsüyle de Azerbaycan'ın sosyo-politik, edebi ve kültürel tarihinde önemli bir rol oynamıştır. Dolayısıyla Hatayî hem ana dilde eser yazması, hem de kendisinden sonraki ana dil edebiyatının gelişimine etkisi açısından büyük önem taşımaktadır.

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COMPUTER SIMULATION OF FLUID MOVEMENT STABILITY IN TANKS UNDER PERIODIC LOADS

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SUMMARY
The paper introduces a technique for analyzing the stability of fluid movement within reservoirs subjected to periodic forces. It assumes the fluid in the reservoir behaves ideally, being both incompressible and non-vortical in response to external loads. The velocity potential is derived from solving the boundary value problem associated with the Laplace equation. By applying the third Green's formula, integral equations are obtained, facilitating subsequent numerical analysis. This approach necessitates solving a system of singular integral equations to determine the unknown basis functions, which represent the fluid vibration modes within the rigid shell. Enforcing the dynamic boundary condition yields to a system of differential equations, forming a set of Mathieu equations. The study examines the stability of the solution, revealing insights into regions and parameters associated with unstable motion.
KEYWORDS: ideal incompressible liquid, forced vibrations, stability, Mathieu equations.

INTRODUCTION

Shells and shell structures with compartments partially filled with liquid are widely used in various branches of modern industry, such as transport, chemical engineering, rocket and space engineering. The design of reservoirs containing various fillers requires a careful study of the liquid behavior in them under operating conditions. These structures are used as fuel tanks for rockets, storage tanks for oil, fresh water and other substances, including potentially dangerous explosive liquids. When these tanks are subjected to intense external loads, there is a risk of liquid spillage, which can lead to very dangerous consequences. It is important to note that the development of each new spacecraft involves the design of new fuel tanks. Usually, these tanks are designed as shells of revolution, partially filled with liquid. To date, the use of tanks in the form of cylindrical shells with rounded edges Hudramovich (2019), Bochkarev (2022), toroidal and coaxial shells Karaev (2020) is widespread. The most accurate assessment of the strength of tanks filled with liquid under the influence of intense external forces can be obtained from complex, full-scale field experiments. However, conducting such experiments is expensive and often very risky. In this regard, virtual experiments are gaining popularity in scientific research as a safe and more effective alternative method. Currently, a number of effective methods of computer modeling of dynamic processes have been developed. Among them there are methods of finite Smetankina (2023) and boundary Gnitko (2019) elements, methods of finite volumes Lampart (2005)? and methods of decomposition into series Malykhina (2019). The first step in dynamics simulation of tanks is to determine the frequencies and modes of their own oscillations. This aspect was studied in Karaev (2020), Kumar (2022), Smetankina (2023). In Kumar (2021), Choudhary (2021a) the development is done of analytical methods to analyze vibrations in baffled shells filled with liquid. Membrane coatings for vibration damping are considered in Choudhary (2021b), Sierikova (2023). Fundamental frequencies of cylindrical shells at low gravity are defined in Smetankina (2023). The study presented by Karaev (2020) focused on the natural frequencies of toroidal and coaxial cylindrical shells, while in Kumar (2022) and Sierikova (2021) the issue of reducing slosh with the help of rigid baffles was considered. Theoretical and experimental studies of the stability of cylindrical shells were carried out in Balas (2023), Murawski (2020), Krutchenko (2017), Liu (2020), Sierikova (2022). To tune from unwanted resonant frequencies, it is necessary to study the entire frequency spectrum of natural oscillations, at different filling levels of fuel and different levels of load. The fundamental modes and frequencies are then used as basic functions in forced vibration study.

RESEARCH AND FINDINGS

Rigid shells of revolution partially filled with liquid are considered. Let $\boldsymbol{V}(V_x, V_y, V_z)$ be the liquid velocity vector, then the incompressibility condition takes the form div$\mathbf{V} = 0$. The potentiality condition of motion leads to the existence of a scalar potential Φ of the liquid velocity, $\boldsymbol{V} = \text{grad}\Phi$, and Φ satisfies to the Laplace equation. The following boundary value problem is formulated

$$\nabla^2\Phi = 0, \boldsymbol{P} \in \Omega, \frac{\partial\Phi}{\partial \text{n}} = 0, \boldsymbol{P} \in S_1, \frac{\partial\Phi}{\partial \text{n}} = \frac{\partial\xi}{\partial t}, p - p_0 = 0, \boldsymbol{P} \in S_0, \quad (1)$$

concern to the unknown potential Φ, and function ζ(*x*,*y*,*t*), which describes the free surface motion. Next, the unknown functions are represented as series:

$$\zeta(r,\theta,t) = \sum_{l=0}^{m} \cos(l\theta) \sum_{k=1}^{n} d_{kl}(t)\zeta_k(r), \quad (2)$$
$$\Phi(r,\theta,z,t) = \sum_{l=0}^{m} \cos(l\theta) \sum_{k=1}^{n_2} d_{kl}(t)\varphi_k(r,z).$$

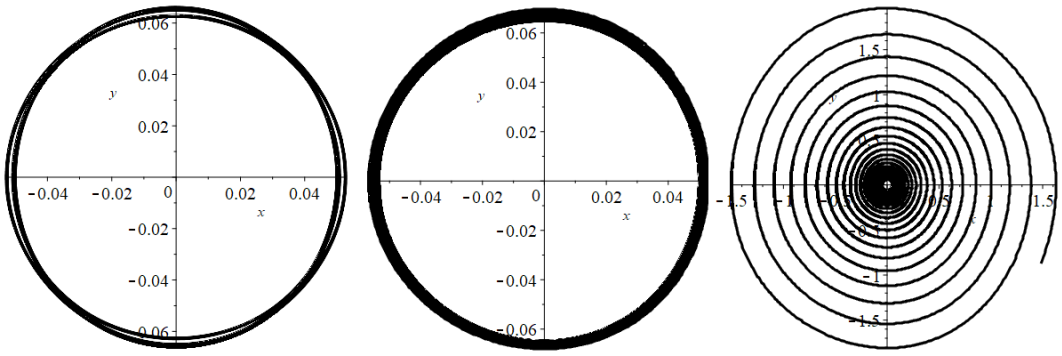
Using the third Green's formula, boundary value problem (1) is reduced to a system of one-dimensional singular integral equations with respect to the basic functions, Gnitko (2019). The effective numerical method has been used for solving the one-dimensional integral equations Karaev (2021). After determining the unknown functions, substitute them in series (2) and in the linearized dynamic boundary condition

$$p - p_0 = -\rho_l \left[\frac{\partial\Phi}{\partial t} + a_x(t)x + (g + a_z(t))\zeta\right] \quad (3)$$

and come to the system of incoherent Mathieu differential equations.

As a numerical example, a conical liquid-filled shell is considered under harmonic loads $a_x(t) = a_h \cos(\omega_h t), a_z(t) = a_v \cos(\omega_v t)$.

The conical shell has the next geometrical parameters: R_1=1 m, R_2=0.6 m, α = π/3. Here R_1 is free surface radius, R_2 is bottom radius, α is the cone vertex angle. The filling level is 0.692 m. The sloshing frequencies are evaluated. We get that the lowest frequency corresponds to the first harmonic *l*=1, ω_{11}=1,254 Hz, as in Gnitko (2016). Estimate the free surface movement for different values a_h, a_v and ω_h, ω_v. First, consider the vertical loads only. Phase portraits of these movements are shown in Fig. 1.



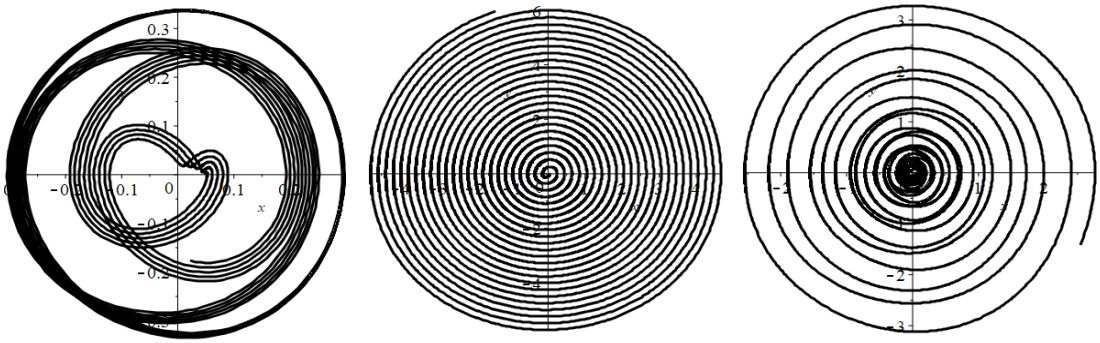
a b c

Figure 1 – Phase portraits of fluid movement under vertical loads

Here Fig. 1,a corresponds to $a_h = 0, a_v = 1, \omega_v = 1$, for Fig. 1. 1,b, and 1,c there are $a_h = 0, a_v = 1, \omega_v = 1.254$ and $a_h = 0, a_v = 1, \omega_v = 2.508$, respectively.

From the above results, one can see that in the first two cases the movements are stable, but at $\omega_v = 2.508$ Hz there is an unlimited growth of the amplitude, which corresponds to the case of parametric resonance (the frequency of the forcing force is equal to the twice fundamental frequency).

Next, coupled vertical and horizontal loads are considered, that is, horizontal loads are added. As a result of the calculations, the phase portraits shown are obtained, Fig.2.



a b c

Figure 2 – Phase portraits of fluid movement under coupled loads

The following load parameters are considered:

a) $a_h = 0.1, a_v = 1, \omega_h = \omega_v = 1Hz$; b) $a_h = 0.1, a_v = 1, \omega_h = \omega_v = 1.254Hz$;

c) $a_h = 0.1, a_v = 1, \omega_h = \omega_v = 2.508$.

Note that in this case the appearance of another resonance associated with the horizontal load is observed.

CONCLUSION

Thus, a technique has been developed that allows investigating the stability of fluid motion in the shells of revolution. The most interesting motions with ω_v near the first fundamental frequency were investigated. In the future, it is planned to study the influence of the elasticity of the tank walls and damping effects of internal partitions.

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INFLUENCE OF EDUCATION ON ECONOMIC OUTCOMES

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Abstract
This economic analysis employs a comparative approach utilizing two linear regression models to examine the influence of educational variables on unemployment rates. Model 1 explores the relationship between unemployment and academic staff numbers, while Model 2 incorporates multiple predictors including student population, university count, and academic staff. Model effectiveness is assessed through model fit measures, regression coefficients, assumption checks, and Q-Q plots. The findings suggest that investment in academic staffing may be inversely related to unemployment rates, although a nuanced understanding is required due to the complexity of the relationship between higher education infrastructure and unemployment. Model 2 demonstrates a stronger explanatory power, indicating the importance of a multifaceted approach to education and its connection to the labor market. While some multicollinearity is observed, it does not significantly impact the model's validity. These findings offer insights for policymakers to consider both the quantity and quality of educational institutions in addressing unemployment, emphasizing the need to align educational outputs with labor market demands. The statistical robustness of Model 2 is confirmed by Q-Q plots, enhancing confidence in its predictive capacity.
Keywords:education, human capital, educational variables, unemployment rates, correlation analysis, economic outcomes

ВЛИЯНИЕ ОБРАЗОВАНИЯ НА ЭКОНОМИЧЕСКИЕ РЕЗУЛЬТАТЫ

Аннотация
В этом экономическом анализе используется сравнительный подход с использованием двух моделей линейной регрессии для изучения влияния переменных образования на уровень безработицы. Модель 1 исследует взаимосвязь между безработицей и численностью профессорско-преподавательского состава, в то время как модель 2 включает множество предикторов, включая численность студентов, количество университетов и профессорско-преподавательский состав. Эффективность модели оценивается с помощью показателей соответствия модели, коэффициентов регрессии, проверок допущений и графиков Q-Q. Полученные результаты свидетельствуют о том, что инвестиции в академический персонал могут быть обратно пропорциональны уровню безработицы, хотя требуется детальное понимание из-за сложности взаимосвязи между инфраструктурой высшего образования и безработицей. Модель 2 демонстрирует более сильную объяснительную силу, указывая на важность многогранного подхода к образованию и его связи с рынком труда. Хотя наблюдается некоторая мультиколлинеарность, это существенно не влияет на валидность модели. Эти результаты позволяют политикам учитывать как количество, так и качество образовательных учреждений при решении проблемы безработицы, подчеркивая необходимость приведения результатов образования в соответствие с требованиями рынка труда. Статистическая надежность модели 2 подтверждается графиками Q-Q, что повышает уверенность в ее прогностической способности.
Ключевые слова:образование, человеческий капитал, образовательные переменные, уровень безработицы, корреляционный анализ, экономические результаты

БІЛІМ БЕРУДІҢ ЭКОНОМИКАЛЫҚ НӘТИЖЕЛЕРГЕ ӘСЕРІ

Түйін
Бұл экономикалық талдау білім беру айнымалыларының жұмыссыздық деңгейіне әсерін зерттеу үшін екі сызықтық регрессия моделін қолданатын салыстырмалы тәсілді пайдаланады. 1-үлгі жұмыссыздық пен оқытушылар саны арасындағы байланысты зерттейді, ал 2-модель студенттердің көлемін, университет көлемін және оқытушылар құрамын қоса алғанда, бірнеше болжағыштарды қамтиды. Модельдің өнімділігі үлгі сәйкестік индекстері, регрессия коэффициенттері, жорамал сынақтары және Q-Q графиктері арқылы бағаланады. Нәтижелер жоғары білім беру инфрақұрылымы мен жұмыссыздық арасындағы қарым-қатынастың күрделілігіне байланысты егжей-тегжейлі түсіну қажет болғанымен, академиялық қызметкерлерге инвестициялар жұмыссыздық деңгейімен кері байланысты болуы мүмкін екенін көрсетеді. 2-модель білім берудегі көп қырлы көзқарастың маңыздылығын және оның еңбек нарығына қатынасын көрсететін күштірек түсіндіру күшін көрсетеді. Кейбір мультиколлинеарлылық болғанымен, бұл модельдің жарамдылығына айтарлықтай әсер етпейді. Бұл нәтижелер саясаткерлерге жұмыссыздық мәселесін шешу кезінде білім беру мекемелерінің санын да, сапасын да ескеруге мүмкіндік береді, білім беру нәтижелерін еңбек нарығының талаптарымен сәйкестендіру қажеттілігін көрсетеді. 2-үлгінің статистикалық сенімділігі оның болжау қабілетіне сенімділікті арттыра отырып, Q-Q графиктерімен расталады.
Кілттік сөздері:білім, адами капитал, білім беру айнымалылары, жұмыссыздық деңгейі, корреляциялық талдау, экономикалық нәтижелер

Introduction

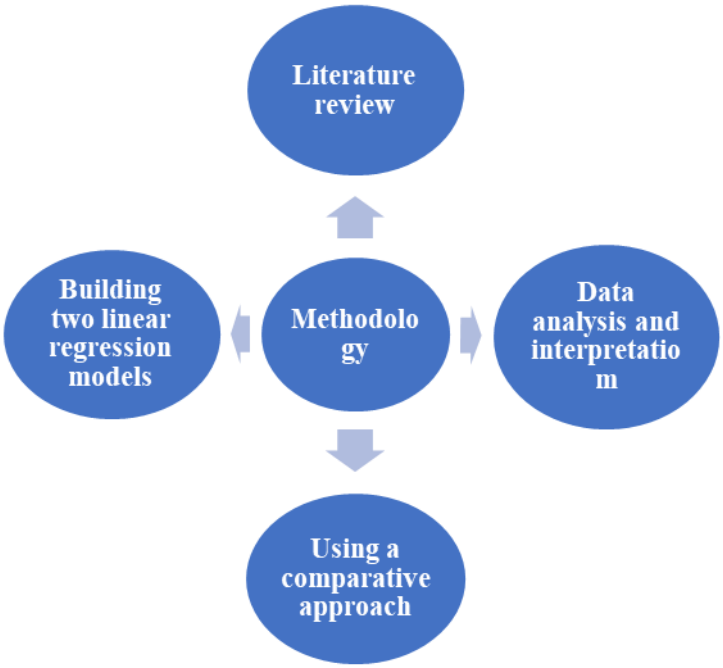
The most distinctive feature of our economic system is the growth in human capital. Without it there would be only hard, manual work and poverty except for those who have income from property (Schultz, 1961). Among the most significant social institutions is education. It is recognized as one of the primary development mechanisms and is put to demanding tasks. As a result, there is usually a strong correlation between economic performance and educational quality. There are many different interdependencies and causal pathways that characterize the dynamic and complex relationship between education and economic results. A common theory used to explain labor market outcomes is human capital theory. The fundamental tenet of the idea is that human resource investments are undertaken with the goal of increasing productivity, which in turn boosts job opportunities and income. People gain skills through formal education or work experience, and these skills raise their employability and, consequently, their potential wages. While education is the key to future financial success and personal fulfillment, the level of knowledge, skills, and talents of the labor force that produces goods and services determines how much production can grow and, consequently, how much the economy can expand. Human capital is unique in that it cannot be separated from the individual; investments in human capital are any expenses that result in an individual's skills and abilities being improved, which in turn increases labor productivity. In addition to gaining domain-specific knowledge, people can also develop critical thinking, problem-solving, and adaptability through formal education, career training, and lifelong learning programs. Moreover, education is a driving force behind economic change, especially when it comes to the shift to a knowledge-based economy. The need for skilled labor, particularly in STEM (science, technology, engineering, and mathematics) fields, is growing in an era of rapid technological advancement and digital disruption. This is changing the dynamics of the labor market and increasing the demand for ongoing upskilling and reskilling initiatives. Societies may open up new opportunities for innovation, entrepreneurship, and sustainable development by investing in education, especially in STEM and digital literacy.Education has an enormous influence on economic results, and these benefits reverberate throughout the larger socioeconomic landscape and go well beyond individual success stories. Indicators of economic well-being such as income levels, employment rates, productivity increases, and inventive capacity are strongly correlated with educational attainment. Higher rates of economic growth, increased resilience to shocks to the economy, and increased competitiveness in the global marketplace are typically seen in nations with higher educational attainment.

Literature review

Examining studies that have been published in a variety of academic domains, including public policy, education, sociology, and economics, is essential to comprehending the complicated relationship that exists between education and economic outcomes.In accordance with Angus Maddison (1991), a nation's rate of economic growth is directly correlated with the percentage of its population that holds a college degree. It was also discovered by him that a country's gross domestic product increases by 0.35% for every 1% increase in education investment. According to findings from the Organization for Economic Cooperation and Development (OECD) published in 2004, a country's gross domestic product can rise by 3-6% when the average length of time citizens spend in school is raised by one year. The important nexus between education and economic performance is thoroughly examined in Hanushek and Kimko's (2000) work. The study's conclusions show that, across 31 countries, there is a significant positive association between the rise of macroeconomic indexes and academic achievement in math and science. Their ground-breaking study examines the relationship between education spending and growth, productivity, and economic prosperity. They emphasize the importance of educational outcomes in predicting economic consequences, such as academic success and cognitive ability. By accounting for markers of educational quality, such as years of education adjusted for learning achievement or scores on standardized tests, their approach provides a more nuanced understanding of how education drives economic growth.1The essential relationship between education and economic performance is examined in Sianesi and Van Reenen's seminal work (2003). Their study sheds light on how various productivity and economic growth indicators are affected by expenditures in human capital and educational programs. The labor market dynamics, creative potential, and long-term economic performance are all impacted by educational interventions, as Sianesi and Van Reenen clarify. The aforementioned study highlights the significant impact of education on economic growth and identifies potential policy levers for enhancing the quality and relevance of educational initiatives to promote sustainable and equitable development.A nation's "knowledge capital," or the cognitive capacities of its citizens, is a significant factor in determining its long-term economic growth, according to Hanushek, E. A. & Woessmann, L. (2015). Applying rigorous economic and empirical analysis, this concept is thoroughly examined in terms of causal explanations. The principal results demonstrate exceptional robustness and hold similar significance for developing and established countries. Because cognitive skills are so crucial, it is feasible to project the economic benefits that improved

cognitive skills will provide to various countries worldwide. Realistic educational advancements require multiples of GDP, as seen by the immense historical effects of increased knowledge capital.Agasisti and Bertoletti (2022) provide the results of a long-term study that examines the relationship between higher education and economic growth in various regions of Europe from 2000 to 2017. Their research clarifies the part higher education plays in fostering sustained regional economic growth and offers valuable details on the nuances of this relationship. Using empirical research, Agasisti and Bertoletti investigate the connection between spending on higher education and several indicators of economic growth, including GDP per capita, employment rates, and innovation capacity. Their findings, which offer empirical support for the positive benefits of higher education on regional economic performance, highlight the importance of policies aimed at enhancing access to and the quality of higher education.The literature assessment has, in the end, revealed a convincing story about the dynamic interaction between economic growth and education. A confluence of theoretical frameworks, empirical data and statistical analysis paints a clear picture of how important education is to the advancement and prosperity of society.

Methodology



During the research work, we relied on a wide range of literary sources, including the works of such authors as Angus Maddison, Hanushek, E.A & Woessmann, L, Sianesi and Van Reenen. Analyzing the content and conclusions of the resources, we tried to try on our own

approach and interpret the available information, as well as draw our own conclusions. This approach made it possible to develop a methodology, as well as select appropriate methods for carrying out research work.The methodology of the presented economic analysis involves a comparative approach using two linear regression models to understand the impact of educational variables on unemployment rates. The models' effectiveness is evaluated through model fit measures, regression coefficients, assumption checks, and Q-Q plots. Model 1 explores the relationship between unemployment and academic staff numbers, with a moderate R^2 indicating a reasonable model fit, and significant autocorrelation suggesting a potential temporal dependency in unemployment data. Model 2 is a multivariate regression including the number of students, universities, and academic staff, achieving a high R^2 and exhibiting no significant autocorrelation, which points to a strong explanatory power and independent residuals. Both models are checked for multicollinearity, with Model 2 showing some interdependencies among predictors, although within acceptable limits. Q-Q plots are used to visually assess the normality of residuals, with closer alignment in Model 2 suggesting better adherence to regression assumptions. The economic analysis distills these statistical findings to infer the relationship between educational infrastructure and employment levels, providing insights for policy formulation.

Findings and discussion

Figure 1 provides an illustration of descriptive statistics for several variables: unemployment data , number of students , number of universities, number of acad.st.

Data	**Unemployment**	**Number of Students**	**Number of Universities**	**Number of Academic Stuff**
N	13	13	13	13
Missing	0	0	0	0
Mean	8582	548924	129	38745
Median	8571	571691	125	38275
Std.dev.	225	57096	9.76	1807
Minimum	8114	459369	116	36307
Maximum	8972	629507	149	41635
Shapiro-Wilk W	0.979	0.929	0.826	0.921
Shapiro-Wilk p	0.973	0.334	0.014	0.258

Figure 1–Descriptives

Note: complied by authors

The arithmetical mean approximates at 8,582 with the median exhibiting proximity at 8,571, signifying a symmetrical distribution profile of unemployment data. The standard deviation, quantified at 225, indicates a moderate concentration of data points around the mean, suggesting limited dispersion. The range, delineated by the maximum and minimum values, is moderately constrained. Furthermore, the Shapiro-Wilk test yields a W statistic of 0.979 and a corresponding p-value of 0.973, confirming adherence to the normal distribution at a conventional significance level, thereby reinforcing the homogeneity of the unemployment data. The mean student population is reported at 548,924, while the median escalates to 571,691, hinting at a left-skewed distribution—a greater density of values below the mean. The observed standard deviation stands at 57,096, underscoring a broader variance in the student population count. Nonetheless, the Shapiro-Wilk p-value of 0.334 surpasses the standard alpha level of 0.05, negating a significant deviation from normalcy despite the larger range of values.The average number of universities is documented as 129, juxtaposed with a median of 125. This slight divergence may reflect a right-skewed distribution. The dispersion, as measured by the standard deviation, is 9.76, indicating a moderate spread across the dataset. Notably, the Shapiro-Wilk test indicates a p-value of 0.014, affirming a statistically significant deviation from a normal distribution, suggesting the presence of anomalies or non-uniformity in the data. The mean of academic staff counts is 38,745 with a median just marginally lesser at 38,275, which could suggest a minor right skew. The dispersion, represented by a standard deviation of 1,807, points to a modest degree of spread in the data. The Shapiro-Wilk test delivers a W statistic of 0.921 and a p-value of 0.258, which does not demonstrate a substantial departure from a normally distributed population.In synthesis, the descriptive statistics elucidate a varied degree of distributional characteristics and dispersions among the examined variables. The unemployment and student population figures display more pronounced normal distribution tendencies, whereas the variables representing the number of universities and academic staff exhibit indications of skewness and a significant departure from normality, respectively. Figure 2gives a description that outlines the key findings from a bar graph representing the volume of services provided by educational organizations across four indicators: total, budget, population, and enterprises.

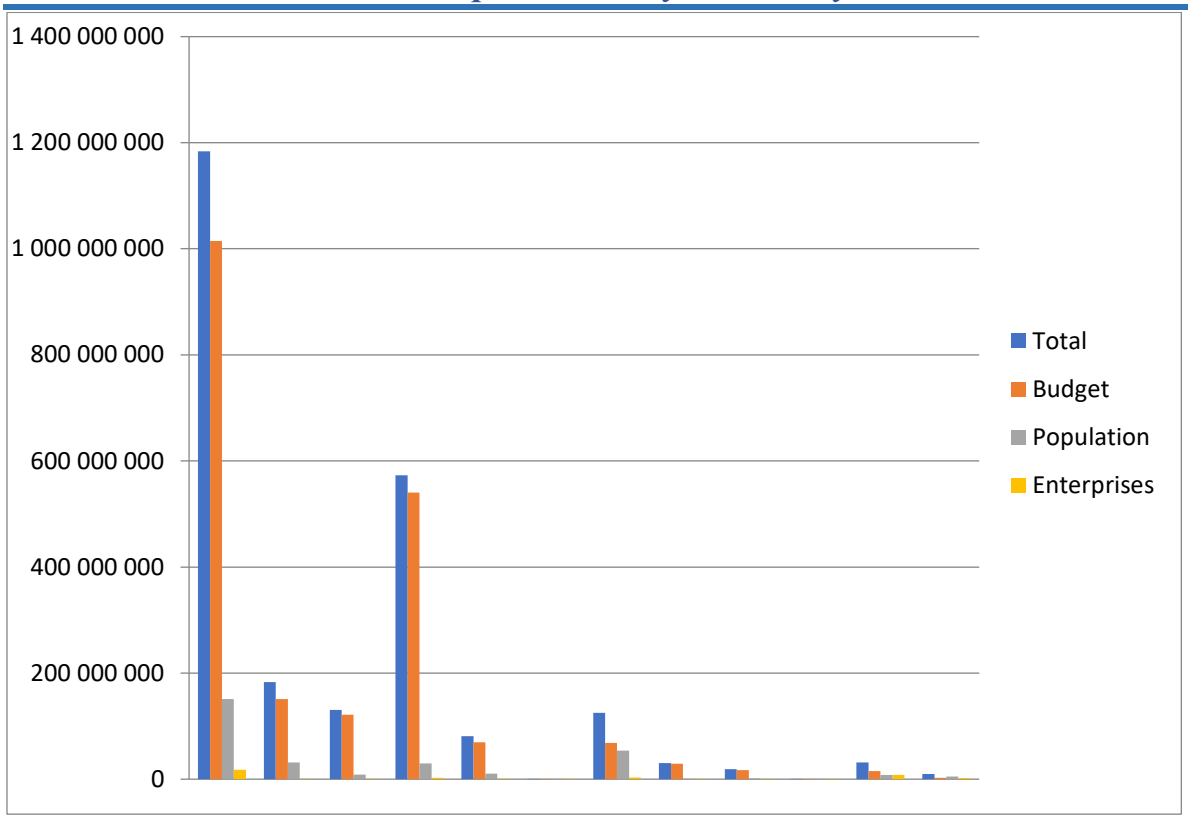
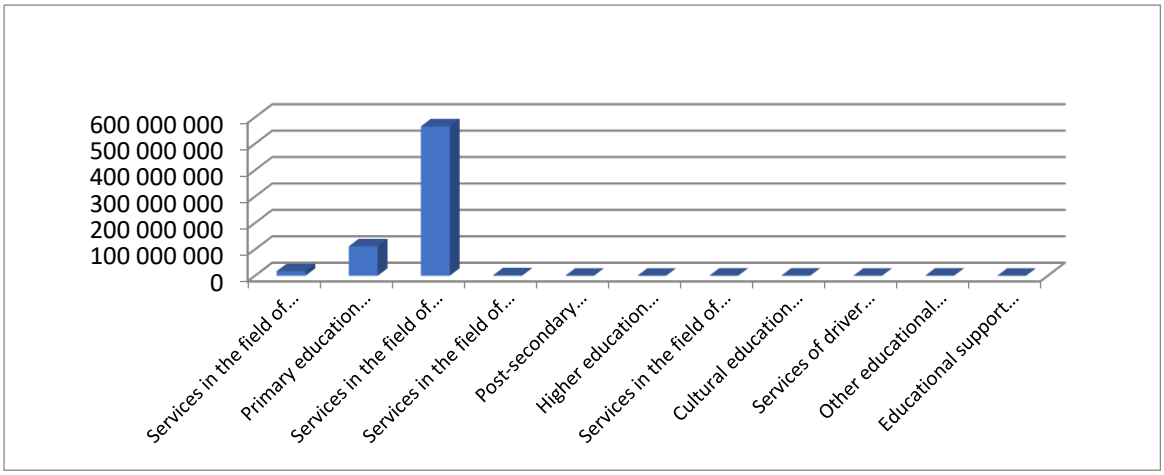


Figure 2 - The volume of services provided by educational organizations

Note: complied by authors The bar graph above depicts the volume of services provided by educational organizations across four indicators: total, budget, population, and enterprises. The highest volume, totalling 1,183,571,427, was observed in the total category. Specifically, the Services in the field of basic and general secondary education accounted for the largest portion, reaching 572,805,361. Conversely, the volumes for budget, population, and enterprises were comparatively lower. For budget allocation, Services in the field of basic and general secondary education also dominated with a volume of 540,440,584. In terms of population served, the highest number was attributed to higher education services, totalling 54,049,924. Finally, for enterprises utilizing educational services, the highest volume was recorded for other educational services not included in other groupings, amounting to 8,156,695.

Figure 3provides an overview of the data presented, which focuses on basic and general secondary education services for the reporting period.

Figure 3 - Basic and general secondary education



Note: complied by authors

Figure number 3presents data on basic and general secondary education services for the reporting period. It is evident that Services in the field of preschool education and training recorded the highest volume at 565,885,967, significantly surpassing other categories. Following closely behind is Primary education services, with a volume of 111,631,194, although notably lower than preschool education. Subsequently, Services in the field of preschool education and training registered a lower volume of 17,109,631 compared to the previous two categories. The remaining services exhibited even lower volumes, none exceeding 2,000,000.

Figure 4provides an overview of the data presented in the graph, focusing on higher and postgraduate education services for the reporting period.

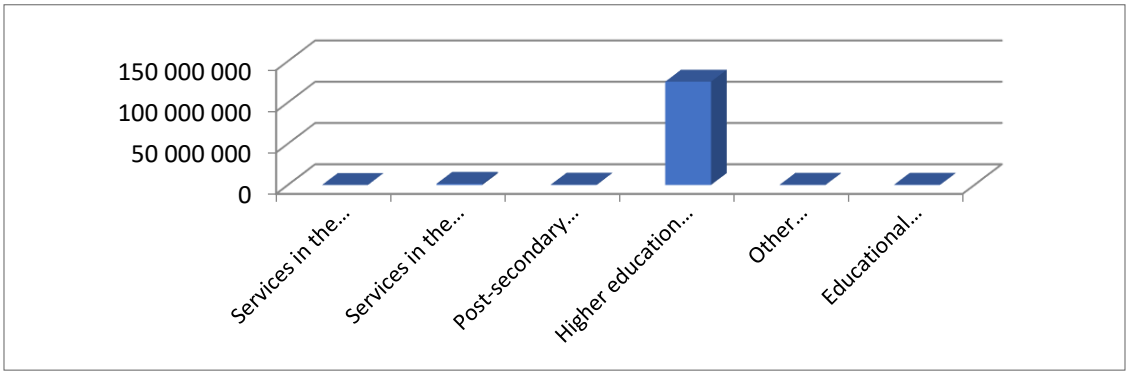


Figure 4 – Higher and postgraduate education

Note: complied by authors

The graph illustrates data on higher and postgraduate education services for the reporting period. The highest education services recorded the most significant volume at 125,232,778, showcasing a substantial gap compared to other categories. Specifically, Services in the field

of technical and vocational secondary education had a notably lower volume at 1,480,310. The remaining categories failed to surpass a volume higher than 500,000.

Figure 5provides insights into employment population by different employment statuses, focusing on three indicators: total including women, total including men, and total for both genders.

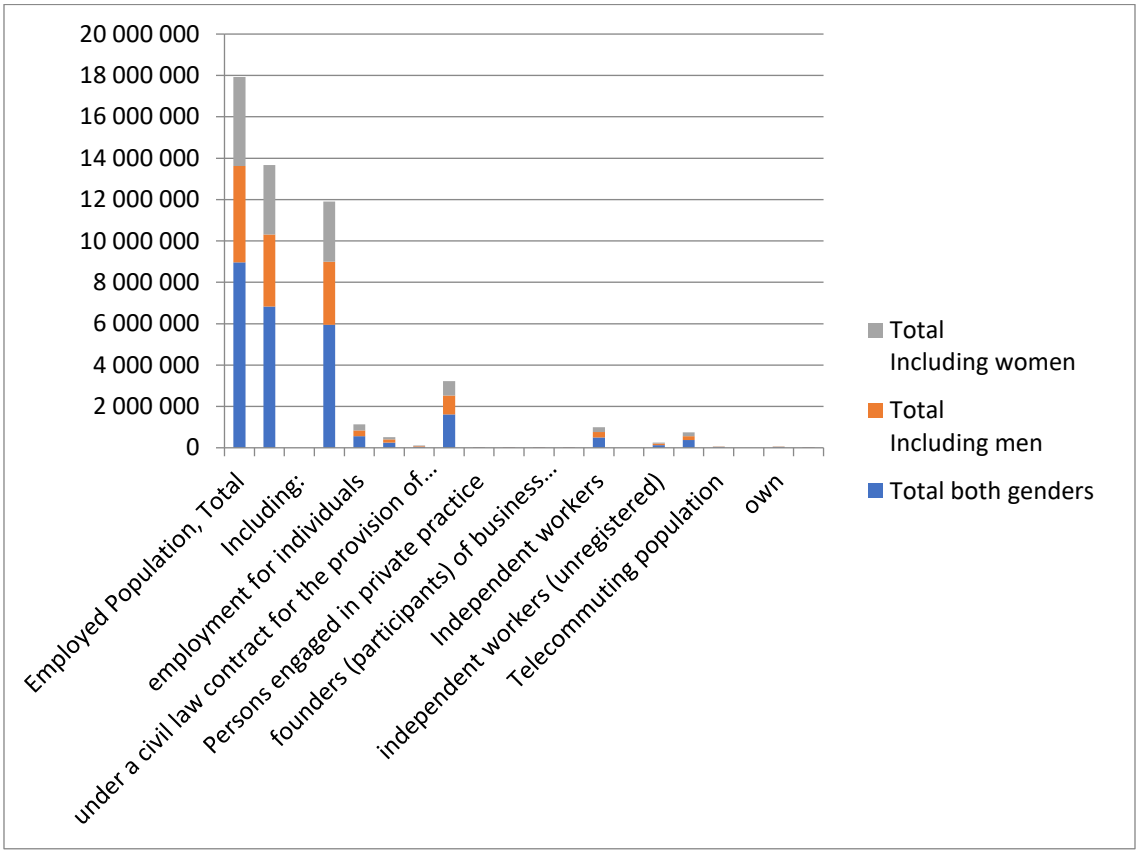


Figure 5 –Employed population by employment status

Note: complied by authors

This graphic provides insights into employment population by different employment statuses, with a focus on three indicators: total including women, total including men, and total for both genders. The data reveals that the highest numbers are observed in the category of total both genders, as expected. When examining specific factors within each indicator, it is evident that for women, the highest numbers are found in total employment population (4,302,696), number of employees (3,356,251), and employment in organizations (2,914,890). Comparatively, men exhibit slightly higher figures, with total employment population reaching 4,662,840, number of employees at 3,474,635, and employment in organizations totaling 3,073,508. Other factors within these indicators do not surpass the 1,000,000 mark.

Figure 6provides information about employed population focusing on five indicators related to rural and urban population, including men and women.

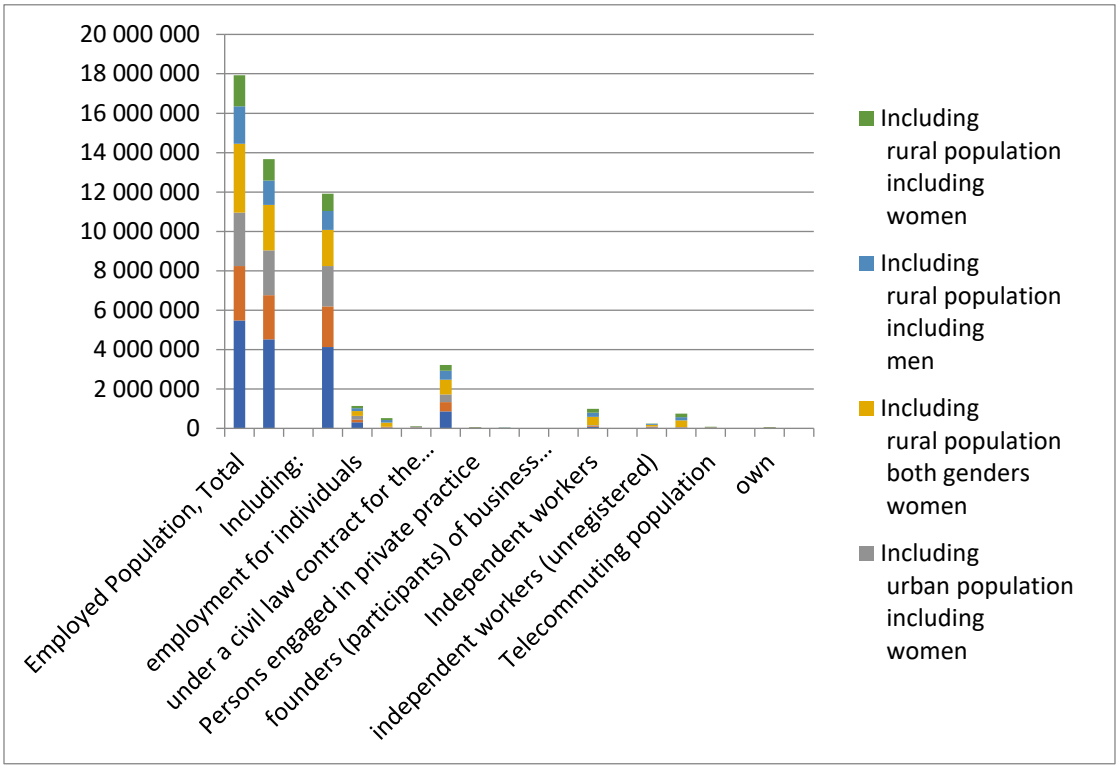


Figure 6 –Employed population by employment status

Note: complied by authors

Moving to the analysis of graph number 2, which presents five indicators: rural population including women, rural population including men, total for both genders, urban population including women, and urban population including men. Similar to graph 1, the highest numbers are observed in total employment population, number of employees, and employment in organizations for all five indicators. Specifically, the urban population both genders recorded the highest figure at 5,476,990, with men (2,762,401) and women (2,714,589) contributing to this total. In contrast, the rural population both genders reached 3,488,546, with men at 1,900,439 and women at 1,588,107. Other factors within these indicators do not exceed 1,000,000.

Figure 7illustrates the distribution of employees by type of work.

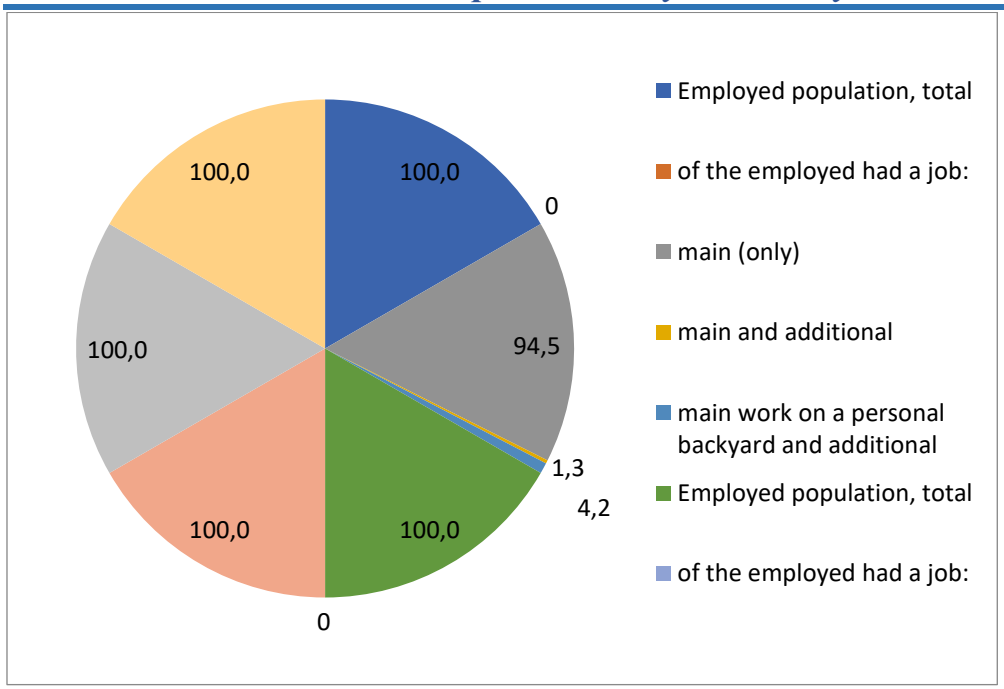


Figure 7 –Distribution of the number of employees by type of work

Note: complied by authors

Based on the information provided, the pie chart illustrates the distribution of employees by type of work. The data indicates that five indicators—employees with a main job only, employees with a main job and additional work, employees with main work on a personal backyard and additional work, and employees with additional work only—all have equal percentages. However, when comparing these indicators with the "main" indicator, the percentage difference is not significantly lower, unlike the remaining indicators.

Next, in figure 8 there is a drawing of employed population by type of economic activity.

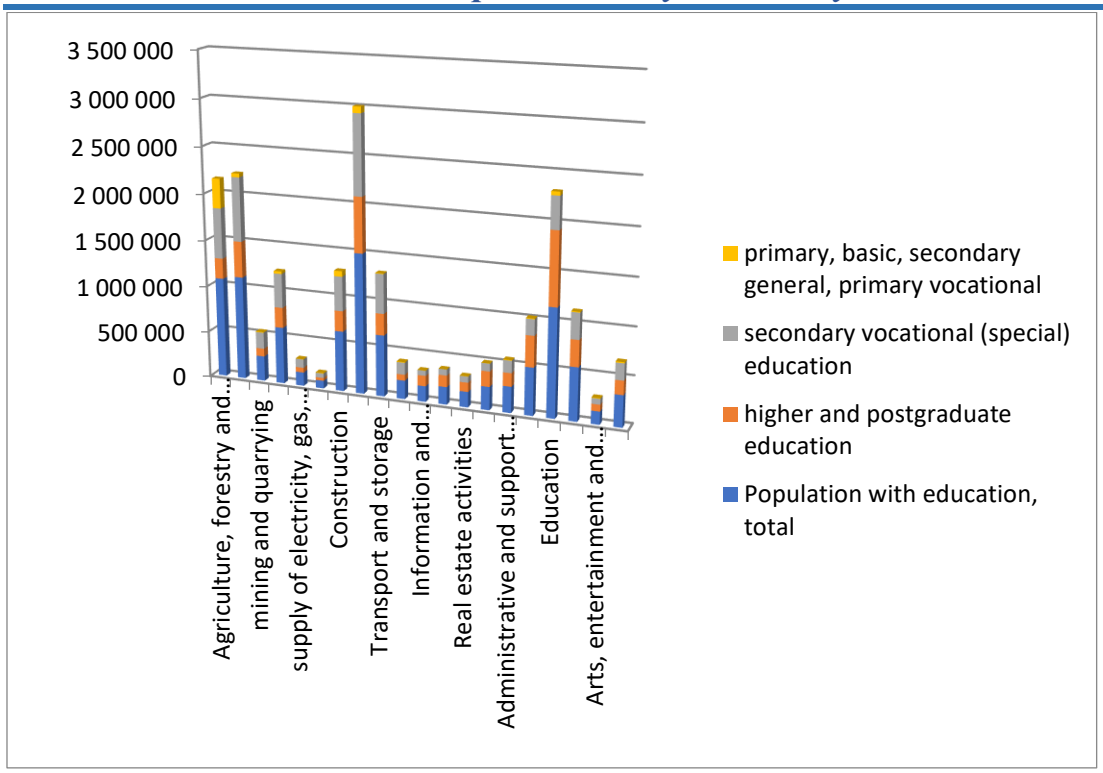


Figure 8 –Employed population by type of economic activity in the main job and level of education

Note: complied by authors

This graphic provides information about employed population by type of economic activity in the main job and level of education, according these indicators : primary, basic, secondary general, primary vocational, secondary vocational (special) education, higher and postgraduate education, Population with education, total. For Population with education the highest number was in Agriculture, forestry and fisheries (1.078.224), industry (1.114.093), Wholesale and retail trade; repair of cars and motorcycles(1.503.225) , education (1155526) the rest is not higher than (700.000) . We can compare with secondary vocational (special) education : industry (685647) , Wholesale and retail trade; repair of cars and motorcycles(845880), next is higher and postgraduate education , the rest of them didn't get the number higher than 600.000, which if we compare with previous two much lower is the higher and postgraduate education the highest number: education 775.378 , Wholesale and retail trade; repair of cars and motorcycles 590,150 , the rest is not higher than 400.000 , a the lowest number had primary, basic, secondary general, primary vocational the highest number was only in Agriculture, forestry and fisheries (317.321) , the rest is not higher than 40000.

PLOTS

Next there is a figure 9 that showsa Quantile-Quantile (Q-Q) plot used to assess whether a given dataset follows a particular probability distribution, such as the normal distribution. Quantile-.Quantile (Q-Q) plots, which compare the standardized residuals of a dataset to the expected quantiles if the data were normally distributed. A perfect alignment along the reference line would suggest that the data are normally distributed

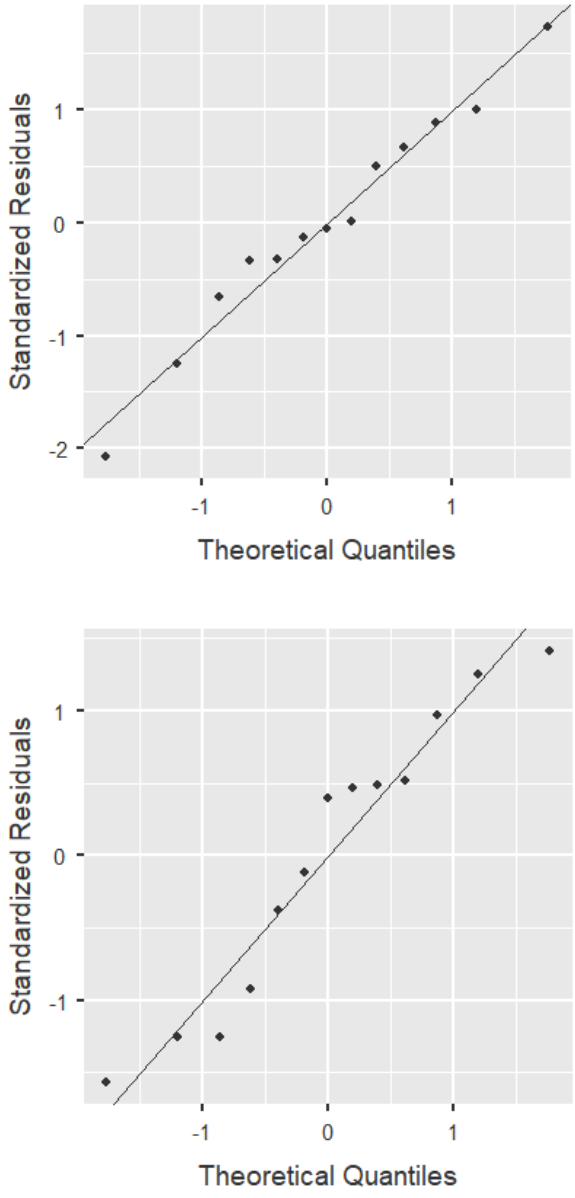


Figure 9 - Q-Q Plots

Note: complied by authors

Figure 10provides description analysis four Quantile-Quantile (Q-Q) plots, each depicting the distribution of residuals from a dataset compared to a normal distribution.

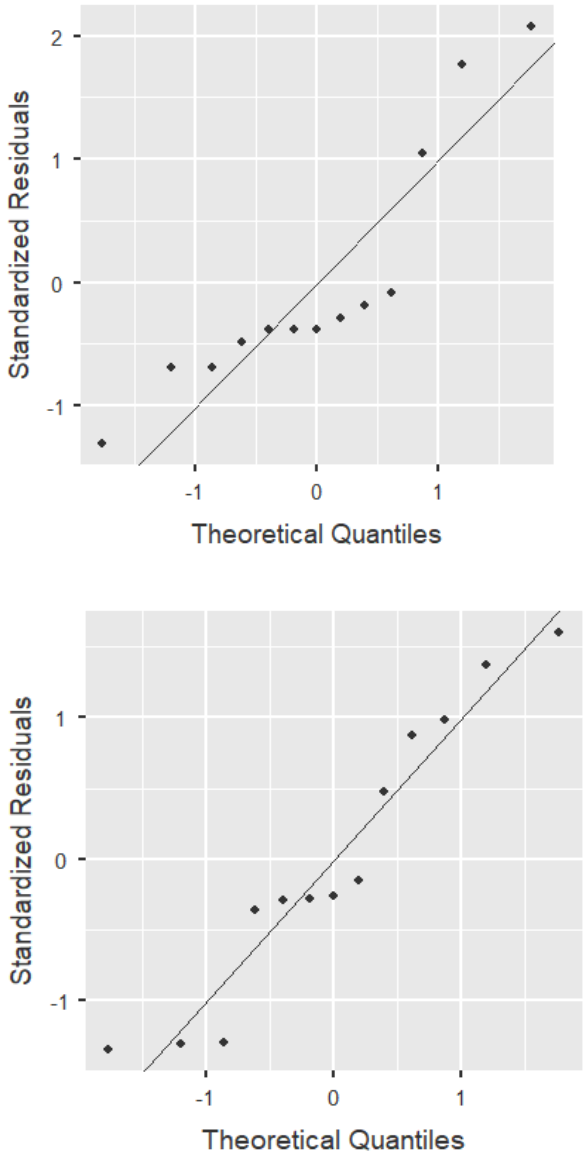


Figure 10 - Q-Q Plots

Note: complied by authors

First Q-Q Plot: The points lie very close to the reference line, which indicates that the residuals are well-aligned with a normal distribution. There is a slight deviation in the lower tail, but this is minor. Second Q-Q Plot: Similar to the first, the data points in this plot adhere closely to the reference line, but with a small deviation at the lower tail. This suggests the residuals are mostly normally distributed. Third Q-Q Plot: The points on this plot show a more pronounced deviation from the line in the upper tail, indicating the presence of outliers or heavy tails in the distribution of the residuals. Fourth Q-Q Plot: In this plot, the points deviate from the reference line in both tails, more so in the lower tail, suggesting that the residuals may not be normally distributed and that there could be outliers or skewness in the data. The Q-Q plots generally indicate that the residuals from the data are approximately

normally distributed, particularly in the central quantiles. However, the deviations observed in the tails of the third and fourth plots suggest that there may be issues with outliers, skewness, or kurtosis that could affect analyses that assume normality (e.g., parametric statistical tests). It would be prudent to investigate further the data associated with these deviations to understand the nature of the distribution and consider data transformation or non-parametric methods if necessary.

Figure 11 is going to give an information about the correlations that provide insights into the relationships between educational institutions' presence and staffing and employment levels. Further analysis is warranted to understand the causal nature of these relationships.

		Unemployment	**Number of Students**	**Number of Universities**	**Number of Academic Stuff**
Unemployment	Pearson's r	-			
	df	-			
	p-value	-			
Number of Students	Pearson's r	-0.034	-		
	df	11	-		
	p-value	0.911	-		
Number of Universities	Pearson's r	-0.867	0.484	-	
	df	11	11	-	
	p-value	<.001	0.094	-	
Number of Academic Stuff	Pearson's r	-0.623	-0.001	0.623	-
	df	11	11	11	-
	p-value	0.023	0.996	0.023	-

Figure 11 - Correlation matrix

Note: complied by authors

In an empirical inquiry assessing correlations among variables pertaining to educational and employment metrics, the dataset elucidates several statistically significant relationships. The negative correlation coefficient of -0.867 between unemployment and the number of universities intimates a pronounced inverse relationship, substantially supported by a p-value less than 0.001, which denotes a high statistical significance. Similarly, unemployment and the number of academic staff are moderately inversely correlated with a coefficient of -0.623

and a p-value of 0.023, reinforcing the statistical significance of this finding. Conversely, the correlation between the number of students and the number of universities, while moderately positive at 0.484, does not manifest statistical significance with a p-value of 0.094, marginally exceeding the conventional threshold. The relationship between the number of students and academic staff reveals a negligible correlation coefficient of -0.001, accompanied by a p-value of 0.996, indicating no significant association. Moreover, the positive correlation of 0.623 between the number of universities and academic staff is marked by statistical significance, as evidenced by a p-value of 0.023. This suggests a substantial likelihood of an actual association between these educational metrics. Collectively, these correlations provide insights into the interplay between educational institutions' presence and staffing, and employment levels, although further analysis is warranted to decipher the causal nature of these relationships.

Figure 12provides regression coefficients and related statistics for a linear regression model.

Predictor	**Estimate**	**SE**	**t**	**p**	**Model**	**R**	**R²**
Intercept	11587.1849	1140.3191	10.16	<.001	1	0.623	0.388
Number of Academic Stuff	-0.0776	0.0294	-2.64	0.023			

Figure 12 -Linear regression model

Figure 13describes the insights gained from analyzing correlations among variables related to educational institutions' presence, staffing, and employment levels. It acknowledges that these correlations offer valuable information about how these factors interact with each other.

Autocorrelation	**DW Statistic**	**p**		**VIF**	**Tolerance**
0.249	0.954	0.012	Number of Academic Stuff	1.00	1.00

Figure 13 - Autocorrelation

Figure 14provides information of Q-Q plots representing the distribution of residuals from two separate linear regression models.

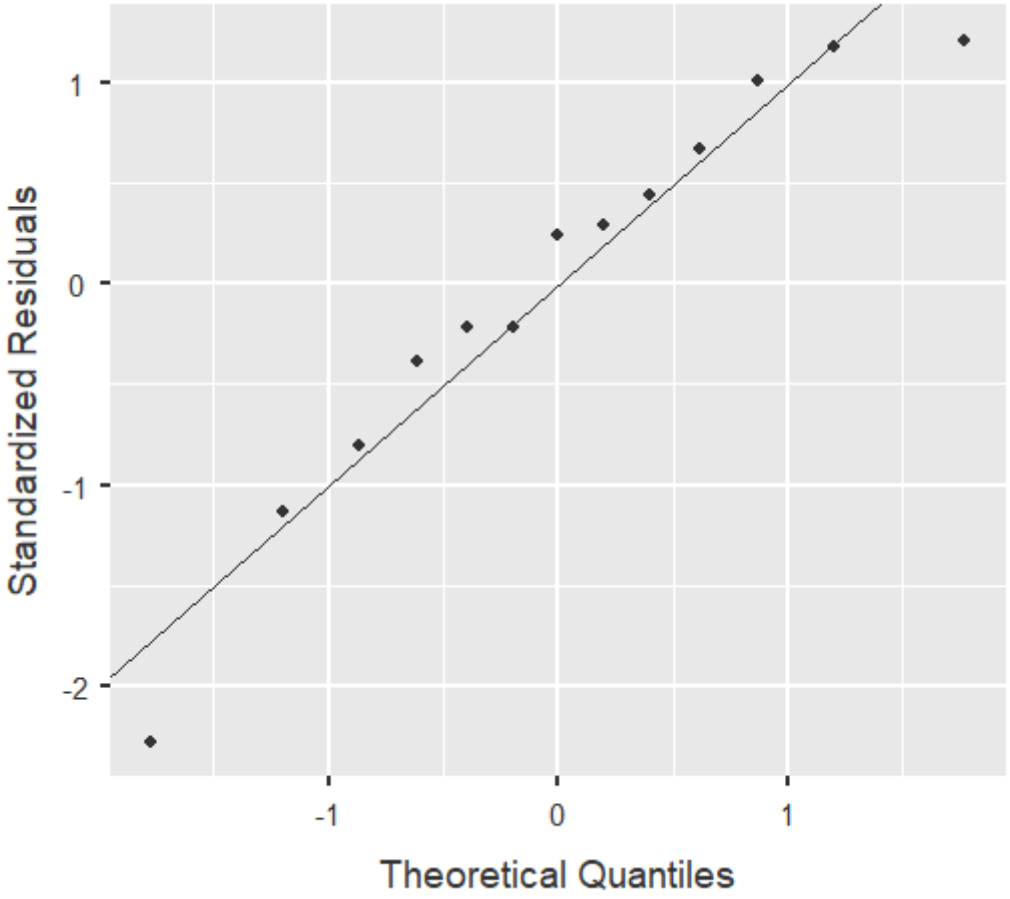


Figure 14 - Q-Q Plot

Note: complied by authors

The Q-Q plots provided for analysis represent the distribution of residuals from two separate linear regression models. These models are compared based on their model fit measures, coefficients, and checks for underlying statistical assumptions. It indicates a moderate fit with an R of 0.623 and an R^2 of 0.388, explaining approximately 38.8% of the variance in unemployment. The regression coefficient for the number of academic staff is -0.0776, with a standard error (SE) of 0.0294. This negative value indicates that as the number of academic staff increases, unemployment slightly decreases. The significance of this coefficient is confirmed by a p-value of 0.023. A Durbin-Watson statistic of 0.954 and a p-value of 0.012 indicate a small but significant level of positive autocorrelation in the residuals. The Variance Inflation Factor (VIF) for the number of academic staff is 1.00, and the tolerance is also 1.00, indicating no collinearity issues.

Next figure number 15provides regression coefficients and related statistics for a linear regression model.

Predictor	**Estimate**	**SE**	**t**	**p**	**Model**	**R**	**R^2**
Intercept	10328.34953	396.5770	26.04	<.0.01	1	0.977	0.955
Number of Students	0.00220	3.57e-4	6.18	<.0.01			
Number of Universities	-28.28971	2.6690	-10.60	<.0.01			
Number of Academic Stuff	0.01774	0.0126	1.41	0.193			

Figure 15 – Linear regression model

Note: complied by authors

Figure 16 provides a table and information related to diagnostic tests of assumptions in regression analysis.

	VIF	Tolerance	Autocorrelation	DW Statistic	p
Number of Students	1.62	0.616	-0.210	2.25	0.630
Number of Universities	2.65	0.377			
Number of Academic Stuff	2.03	0.492			

Figure 16 - Assumption Check

Note: complied by authors

Figure 17an interpretation of two regression models, each corresponding to a QQ plot.

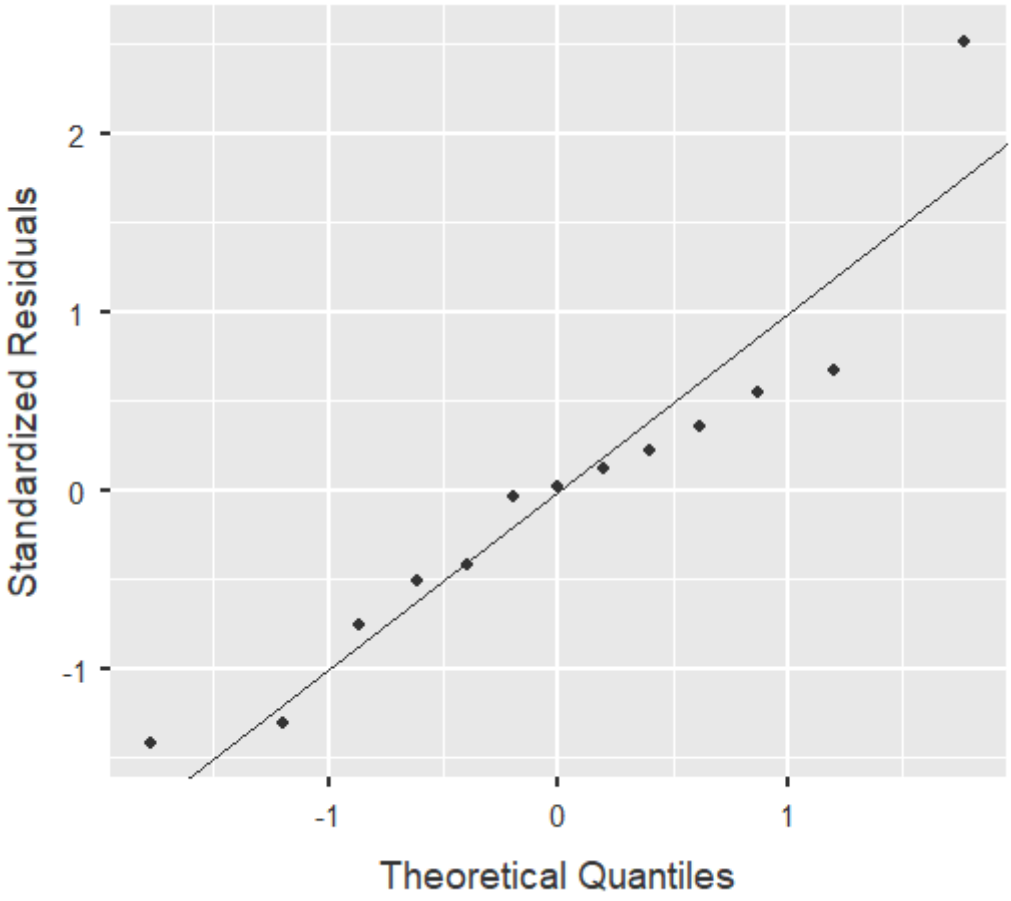


Figure 17 - Q-Q Plot

Note: complied by authors

This model demonstrates an excellent fit with an R of 0.977 and an R^2 of 0.955, accounting for 95.5% of the variance in unemployment. The model includes three predictors: the number of students, the number of universities, and the number of academic staff. The coefficients for the number of students and the number of universities are significantly different from zero, as indicated by p-values less than 0.001. However, the coefficient for the number of academic staff is not significant (p = 0.193), suggesting it does not have a clear predictive relationship with unemployment in this model. The Durbin-Watson statistic of 2.25 with a p-value of 0.630 suggests no significant autocorrelation in the residuals, which is an improvement over the first model. There are signs of potential collinearity as evidenced by VIFs greater than 1 (but less than the common threshold of 5 or 10), and the lowest tolerance value is 0.377, which, while not indicative of severe collinearity, suggests moderate interdependence between predictors.

Model 2, corresponding with QQ Plot 2, is the better-fitting model with higher R and R^2 values, indicating a stronger relationship between the predictors and unemployment. The absence of significant autocorrelation in Model 2 suggests that the residuals are more independently distributed compared to Model 1, which is also reflected in the more aligned Q-Q plot. However, Model 2 does present a more complex predictor dynamic, with some level of multicollinearity observed, which could affect the stability of the regression coefficients. The Q-Q plots visually support these findings. The plot from Model 1 shows some deviations from normality, especially in the tails, which is consistent with the moderate model fit and the detected autocorrelation. In contrast, the plot from Model 2 exhibits a closer alignment with the reference line, signaling that the residuals from this model are more normally distributed and therefore more likely to meet the assumptions of linear regression. Economically, the two regression models offer insights into the factors that potentially influence unemployment rates.

Regression Model 1 (associated with QQ Plot 1) indicates a moderate inverse relationship between the number of academic staff and unemployment. This could suggest that an increase in academic employment, potentially reflecting greater investment in education, has a beneficial impact on overall employment levels. However, with 38.8% of the variance in unemployment explained, this model leaves a substantial proportion of variability unaccounted for. The presence of autocorrelation suggests that unemployment rates might be influenced by previous values of unemployment, indicating a potential trend or cycle in the data that the model does not capture. Regression Model 2 (associated with QQ Plot 2) has a much stronger explanatory power, indicating that the combination of the number of students, universities, and academic staff provides a near-complete picture of the factors affecting unemployment rates. The significant coefficients for the number of students and universities imply that these variables are influential, which could reflect broader economic phenomena. For instance, a higher number of students may correlate with higher education levels, which could improve employment rates. Conversely, the negative coefficient for the number of universities could suggest that while a higher education infrastructure is available, it may not be directly translating into employment, possibly due to mismatches between education and labor market needs.The lack of autocorrelation in this model is a positive indicator that the residuals are independent of each other, meaning the model's predictions are not influenced by serial patterns in the data. This implies that the model's predictors are capturing the primary variations in unemployment without being affected by unmodeled trends.The potential multicollinearity observed in Model 2, while not severe, could indicate

that the predictors are somewhat interrelated, which is reasonable considering that the educational variables might be expected to correlate with each other. However, since the VIFs do not exceed common thresholds, the multicollinearity does not appear to significantly undermine the model's validity.In conclusion, from an economic perspective, Model 2 suggests that the educational factors—embodied by the number of students and educational institutions—have a significant relationship with unemployment, which could guide policymakers in understanding the role of education in economic development. The model implies that investment in educational infrastructure alone might not suffice; there needs to be an alignment with market demands and job availability to ensure that education translates into employment. The better alignment of residuals with the expected quantiles in QQ Plot 2 corroborates the statistical robustness of this model, enhancing confidence in these economic interpretations.

CONCLUSION

There is an indication that investment in academic staffing is inversely related to unemployment rates, which suggests that increased employment in the education sector may have a positive effect on overall employment. The significant negative coefficient for the number of universities in the second model indicates a complex relationship between higher education infrastructure and unemployment, suggesting that simply increasing the number of universities may not directly decrease unemployment rates. The high R^2 value in Model 2 demonstrates that the combination of the number of students, universities, and academic staff explains a significant portion of the variance in unemployment rates, which may point to the importance of a multifaceted approach to education and its connection to the labor market. The lack of significant autocorrelation in Model 2's residuals indicates a more reliable model compared to Model 1, as it suggests that the model's predictions are not influenced by prior values of unemployment, thus providing a clearer picture of the current factors influencing unemployment rates. The moderate multicollinearity in Model 2 does not significantly impact the model's validity but does highlight the interconnectedness of educational variables, which should be considered when interpreting the model's coefficients. The findings could guide policymakers to consider not just the quantity of educational institutions but also the quality and relevance of education to current labor market demands. It underscores the necessity for aligning educational outputs with employment opportunities. The Q-Q plots for Model 2 confirm the statistical robustness of the model, with residuals displaying a normal distribution, enhancing the trustworthiness of the model's predictive capacity.

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INVESTIGATING PATTERNS AND TRENDS IN EDUCATIONAL DEMAND: A STATISTICAL EXPLORATION OF ALBANIA'S EDUCATION LANDSCAPE

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ABSTRACT
Higher education is the basis of the economic development of a country. The demand for higher education in Albania has suffered a continuous decline in recent years. In public higher education, the phenomenon of filled quotas and branches that are in danger of being closed is appearing. Graduates are tending not to choose natural science and teacher majors, they are inclined to majors related to IT, business, medical sciences, and engineering. Many faculties are at risk in terms of their continuity. In this paper, we will analyze the demand for higher education in the country in particular for the University of Tirana as the oldest and largest in the country. The demand for education is influenced by various economic, social, and infrastructural factors. In this paper, it has been chosen that the analysis and forecast for the demand for higher education will be carried out with Grey models because the range of data we have is not very large. The Grey GM(1,1) model will be used to forecast the demand for higher education in general as well as the demand for public and private HEIs in the country. The data for analysis and forecasts were obtained from INSTAT for each academic year.
Keywords: Higher education, forecast, grey model, demand.

INTRODUCTION

Higher education in Albania began with the creation of the State University of Tirana in September 1957. During communism, the education system in general, including the university system, had deep ideological bases. This ideological and centralized system also ensured the absorption of graduate students in the public system. As such, the communist system seemed to create a security of operation and a guarantee of employment, which is now rarer. In 1990, Albania had only 14,000 students. The change of the system in 1990 was followed by mass emigration, from which even the higher education system could not escape. After 1990, almost half of the lecturers and researchers of the state universities left Albania. But in recent years, along with the increase in the number of non-state universities, the number of young lecturers employed in them as teachers and researchers, who have been educated abroad, has also increased. Although this number of academic staff has increased, compared to the countries of the region and developed countries, Albania remains behind.The massification of education seems to be a worldwide phenomenon because today's service societies create opportunities for all [1]. In principle, no one has the right to impose on the individual to select or determine for him what type of education he should receive, where he should study, or which cycle of studies he should continue [2]. The key issue of the expansion process, then and today, is how to have a quantitative increase, without suffering a qualitative decrease. The years 1994-'99 were characterized by the further expansion of the system and especially by the expansion of profiles of universities at the national level, thus gradually losing their specific identity and profile. The new law on higher education, in 1999, came as a necessity to allow and regulate the development of the higher education system and all its components. In the academic aspect, the concepts of organized curricula are the basic concepts of the process of Bologna. In 2003, Albania officially entered the Bologna process. The involvement of the private sector after 2000 brought good management experience in the higher education sector, which had not existed before in Albania. The new managerial practices introduced by the private sector exerted a significant influence on the regulatory process of higher education, as well as on the spread of these practices in state HEIs.The national strategy for higher education of the Albanian government (2008-2013) expressed the urgent need for universities to increase their role in the social and economic development of the local and regional environment. To achieve this goal, the main action proposed by the strategy was the establishment of regional development centers by public institutions of higher education. [3]. Higher education institutions in Albania are public and private. Currently, a total of 59 institutions of higher

education operate in the territory of Albania, 15 public and 44 non-public [4]. Among them, 19 enjoy university status, 12 public and 7 non-public. The number of programs offered is a total of 1560, of which 700 are offered by public HEIs and divided by level of study, are: about 650 Bachelor programs, about 250 professional masters, about 350 Scientific masters and about 100 cycle programs third, Doctorates and long-term specializations [5].

MODEL IDENTIFICATION

Grey system theory has been active in various fields of economics and society since it was proposed [6] [7]. Grey prediction is the main topic in grey system theory, and grey prediction models can achieve excellent performance in small-sample data prediction [8]. The GM (1,1) model is a grey system model that is widely used in various fields because of its computational efficiency rather than other grey system theories. The GM(1,1) model is commonly known as the First Order One Variable Grey Model, which makes predictions using time series data [9]. GM(1,1) is a method used for forecasting a limited amount of short-term data that produces an accurate forecast model without the need to consider the statistical distribution of the processed data [10]. Grey modeling approach assumes that the process can be represented by certain generic partial differential equations according to the order of the process. Then using accident data, the model parameters are estimated [11], [12]. This modeling strategy requires only four data points to predict future event [13].

Forecasting according to the Grey model GM(1,1) passes according to [14], [15] in the following steps:

1. We present the original time series data of the number of records as time sequence N(0) where:

$N^{(0)} = (N^{(0)}(0), N^{(0)}(1), N^{(0)}(2),..., N^{(0)}(t))$, *t≥4* *(1)*

2. By taking the first order of accumulation at $N^{(0)}$*, generate a new series of 1-Accumulated Generating Operation with the symbol:*

$N^{(1)} = (N^{(1)}(0), N^{(1)}(1), N^{(1)}(2),\ldots, N^{(1)}(t))$, t≥4 *(2)*

where $N^{(1)}(k) = \sum_{i=1}^{k} N^{(0)}(i)$.

The GM(1,1) model is a first-order differential equation that is written in the language of the given variable as:

$$\frac{dN^{(1)}(k)}{dk} + aN^{(1)}(k) = b \qquad (3)$$

The solution of this differential equation in the closed interval [k-1.k], after integration gives the solution in the form:

$$N^{(0)}(k) + a\int_{k-1}^{k} N^{(1)}(k)dk = b \qquad (4)$$

3. Calculating the values of the new variable $X^{(1)}(k)$ as the arithmetic mean of two consecutive values of the second step series as:

$$X^{(1)}(k) = \frac{X^{(1)}(k-1)+X^{(1)}(k)}{2}, k = 2,3,\dots,T \qquad (5)$$

*4.*For each pair of variable values $N^{(0)}(k)$ and $X^{(1)}(k)$ applies the differential grey equation which $X^{(1)}(k) = \int_{k-1}^{k} N^{(1)}(k)dk$, $k = 2,3,\dots,T$ takes form:

$$N^{(0)}(k) + aX^{(1)}(k) = b \qquad (6)$$

Where a is the developer coefficient, and b is the grey input variable.

5. Least square methods are used to estimate parameters a and b.

6. Under the initial conditions such as $N^{(0)}(0) = N^{(0)}(1)$, the solution of the grey differential equation *GM (1,1):*

$$N^{(1)}(k) = (N^{(0)}(1) - \frac{b}{a})e^{-a(k-1)} + \frac{b}{a} \qquad (7)$$

7. Use Inverse Accumulated Generating Operation to get the forecast value of the initial variable.

$$N^{(0)}(k) = N^{(1)}(k) - N^{(1)}(k-1), k = 2,3,\dots,T \qquad (8)$$

Validity of predictions

During time series forecasting, various indicators are used to reveal the accuracy of the method used for forecasting. In our analysis, we will use relative indicators such as Absolute percentage error (APE) and Mean absolute percentage error (MAPE) [15] [16], which are given by the formulas:

$$APE = 100 * \frac{|N_{obs}-N_{fit}|}{N_{obs}} \qquad (9)$$

$$MAPE = 100 * \frac{1}{k}\sum_{i=1}^{k} \frac{|N_{obs}-N_{fit}|}{N_{obs}} \qquad (10)$$

where N_{obs} are observed values, N_{fit} are fitted value and k number of fitted values.

Lower values of MAPE indicate higher accuracy, while higher values indicate lower accuracy. A MAPE of 5% implies that, on average, the predictions are 5% off from the actual values.

EMPIRICAL ANALYSIS

3.1 The situation of demand for education in Albania

The analysis of the demand for education in general and for higher education in particular, in Albania, combines multiple data sources to explain the change in enrollments at different levels of education over the years. The data related to registrations for the years 2018-2022 were obtained from INSTAT.

The table below shows the number of registrations at the country level for each level of education.

Table 3: Number of registration for each level

		In 9-year education		In secondary education		
School / academic year	In Kindergarten	In primary school	Middle school	High school and Social-Cultural	Professional	In higher education
2018-19	78942	167104	139426	95359	21289	139043
2019-20	77858	162170	132709	89869	19664	130264
2020-21	71332	158528	127958	88965	19024	123797
2021-22	72384	154140	123998	85188	18279	123880
2022-23	69750	146962	120313	79032	16813	121352

Source: INSTAT (2024)

At all levels of education, there is a decrease in the number of registrations from year to year, below are calculated the average rates of decrease for each year in the number of registrations in terms of value and percentage.

Table 4: Average drop numbers

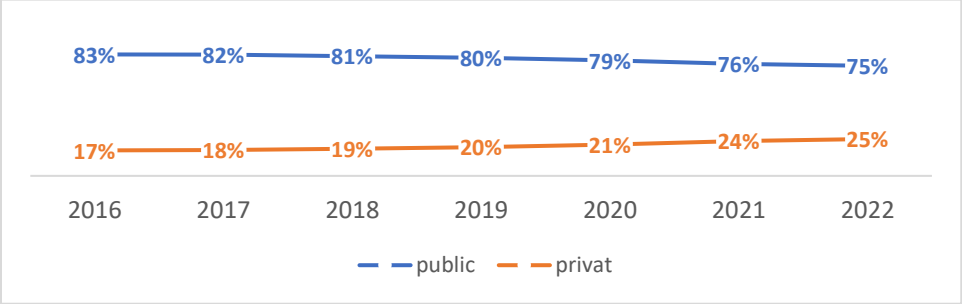
Level	**Drop in value**	**Drop in percentage**
Kindergarten	2386	1.20%
Primary school	4831	1.30%
Middle school	4694	1.60%
High school	3734	1.86%
Professional	3734	2.40%
Higher education	4177	1.40%

Source: Author's calculation

Vocational secondary education had the highest rate of decline with 2.4% per year. In Albania, young people are inclined to continue high school with the prospect of continuing

their studies at university to obtain a bachelor's degree. In recent years, education leaders are supporting professional education by collaborating with international partners to increase the quality of curricula, infrastructure and orientation toward the labor market [17], [18].The higher education market is divided into education provided by public HEIs and private HEIs. Private higher education has attracted the attention of graduates every year [19]. The competitiveness of higher education institutions is a well-studied topic in many countries of the world, as it constitutes an important part of the strategic management of HEIs, identifying competitive advantages, as well as creating new advantages [20]. The characteristics of the university play an important role in the selection of graduates [21]. This category can be further classified into various indicators including quality of programs, training, lecturers, university reputation, services, university location, tuition fees, student support policies, etc. Based on our calculations for the last few years, public education has lost 8% of graduates who have chosen to continue their studies in private HEIs, and this trend is presented in the Fig 1.

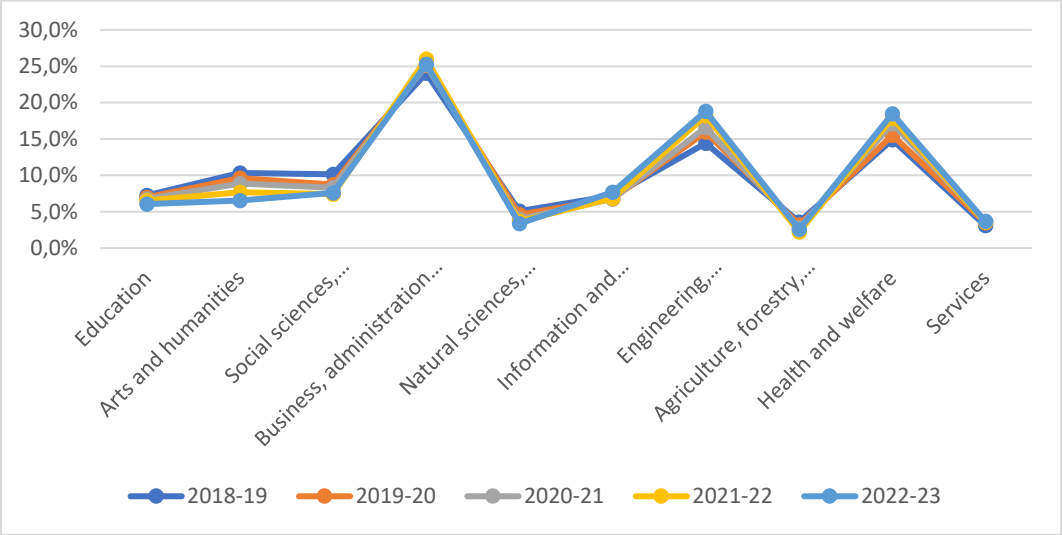
Figure 3: Share of public and private higher education



Source: INSTAT

In some private HEIs, teaching takes place in English and this has been a reason to attract more graduates. This group of graduates has two reasons for this choice. First, graduates who have completed their studies in private institutions in the English language prefer to continue their higher studies in the same language. The second reason is that graduates prefer to pursue a bachelor's degree in English, to be prepared to carry out an exchange during this cycle and, moreover, to continue their master's studies in other countries outside Albania. Regarding the branches selected for bachelor's studies, business, engineering and medical sciences remain preferred by the graduates. Their trend for the last few years is presented in Fig.

Figure 4: Percentage of Fields of Study



Source: Author's calculation About 25% of students pursue their university studies in the Business, Administration, and Law branches and their trend has not changed in years. The distribution percentage of the normalized study branches for each year is presented in the table.

Table 5: Percentage of Fields of Study

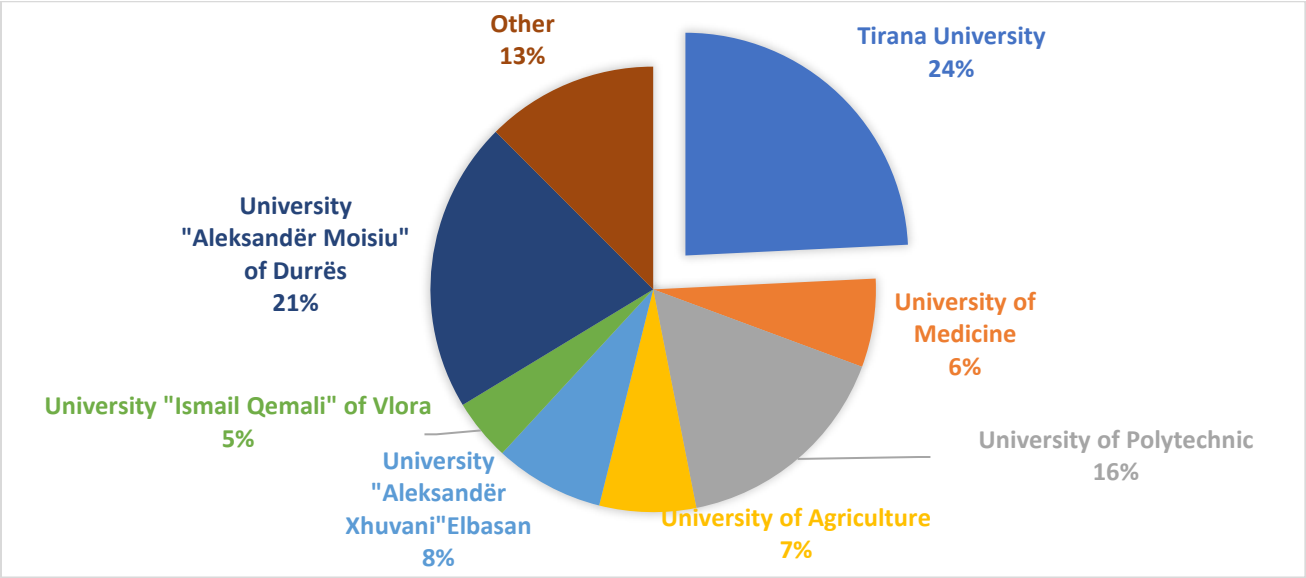
Fields of Study/Years	2019-20	2020-21	2021-22	2022-23	2022/2018
Education	-11.0%	-8.3%	-3.5%	-10.5%	-27.3%
Arts and humanities	-14.4%	-14.3%	-15.1%	-20.3%	-44.8%
Social sciences, journalism and information	-23.6%	-10.9%	-11.7%	0.2%	-34.5%
Business, administration and law	-2.2%	-5.0%	3.3%	-4.9%	-8.2%
Natural sciences, mathematics and statistics	-18.4%	-21.1%	-8.1%	-12.3%	-42.5%
Information and communication technologies	-12.8%	-6.5%	1.4%	9.0%	-7.2%
Engineering, manufacturing and construction	3.6%	-1.2%	8.9%	1.2%	14.1%
Agriculture, forestry, fisheries and veterinary	-20.2%	-20.2%	-24.8%	10.9%	-37.8%
Health and welfare	-2.6%	4.7%	4.2%	1.4%	8.2%
Services	6.1%	-0.1%	-4.4%	1.9%	3.9%

Source: Author's calculation

In the table 3, the first three columns show the percentage of year-over-year change in enrollments according to the fields of study, while the last column shows the changes in enrollments in the year 2022-2023 compared to the year 2018-2019.The biggest decline

during this period was in the fields of Arts and humanities and Agriculture, forestry, fisheries and veterinary with 44.8% and 37.8% respectively. The drop in the demand for education in the field of Education is very concerning, which for the year 2022-2023 is 10.5% less than the previous year or 27.3% less than the year 2018-2019. The number of registrations in Natural Sciences, Mathematics and Statistics has a decrease of 42.5% in the year 2022-2023 compared to the year 2018-2019. For the same periods, the branches Engineering, Manufacturing and Construction and Health and Welfare have an increase in the number of registrations of 14.1% and 8.6% respectively. Of course, the dilemmas facing higher education in the country are: Which educational fields will have more demand in the future and which less demand? Are universities preparing for the challenges of the time?For public HEIs in terms of registrations for the year 2022-2023, the University of Tirana holds the largest share with 24% of registrations, followed by "Aleksandër Moisiu" University of Durrës (UAMD) and the University of Polytechnic with 21% of 16% respectively. The distribution of enrollments for this academic year is presented in the Fig. 3, where universities that have less than 5% of enrollments are not presented, but are placed together in the "other" category. Unlike UT, UAMD offers two-year study programs and for the academic year 2022-2024, 16% of students belonged to this program.

Figure 5: Distribution of registrations according to public HEI year 2022-2023



Source: Author's calculation

UT remains HEI with the largest share of education and scientific research in the country. UT consists of seven faculties: the Faculty of Economics, the Faculty of Foreign Languages, the Faculty of History and Philosophy, the Faculty of Natural Sciences, the Faculty of Social Sciences, the Faculty of Law and the Institute of European Studies. From a study done by

[22], UT academic staff share different attitudes regarding the use of technology and the need they have for advancements and why they have high confidence in UT.

3.2 Higher education demand forecasts with Grey models

R studio was used to estimate the GM(1,1) model. For evaluating models and making predictions in R studio, you need the library (GreyModel) [22], [23]. The parameters of the models and the value of MAPE for the three series, total number, number in public and private IAL are:

Table 6: The estimate parameter

Value	Total number	Public	Private
a	0.0228	0.0423	-0.0521
b	140570.6	119948.5	21512.86
MAPE	1.8%	2.2%	2.2%

Source: Author's calculation

The MAPE value for the grey model for the total number of students in higher education is 1.8%, which implies that, on average, the predictions are 1.8% off the actual values. Moreover, this value is less than 10%, which indicates a very accurate forecast. To have a comparative measure for this time series, moving average with two terms and single exponential smoothing was used, whose MAPE values are 10% and 12% respectively, showing us that the best predictions are made by the GM(1,1) model. The MAPE value for the grey model for the other two series of numbers in public and private HEIs is 2.2%, which implies that, on average, the predictions are 2.2% off the actual values, and these predictions are also strongly accurate. The estimated values for the next 4 years for the total number and the two public and private sectors are presented in the table:

Table 5: The forecast value

Year	Total	Public	Private
2024	115674	83716	33692
2025	113057	80246	35494
2026	110499	76919	37393
2027	107998	73730	39393

Source: Author's calculation

From the predictions made by the Grey GM(1,1) model, it can be seen that the total number of people enrolled in higher education will continue to decrease and this decrease is reflected

in public universities. On the other hand, it can be seen that even though the number of enrollments in universities continues to decrease, private universities will continue to have an increase in demand from Albanian high school graduates.

CONCLUSIONS

Higher education in Albania in recent years has suffered a continuous decrease in the demand for higher education. This declining demand is the result of many economic and social factors. For years in Albania, the birth rate has been below the replacement level, and therefore, in recent years, it has been reflected in a decrease in the demand for education at all levels from lower secondary education to upper secondary education, this will consequently lead to a decrease in the number of graduates. On the other hand, some graduates are inclined to continue their studies abroad, negatively affecting the demand for higher education in the country. In this situation, higher education providers in the country must precede the emptying of the auditoriums with concrete measures. In this paper, as part of the research and excellence project of the University of Tirana, we analyzed the demand for higher education in the country for both public and private HEIs. UT as the oldest is also the largest public HEI in the country, but even in it, we have branches that have a minimum number of students. Graduates prefer to pursue higher studies in economics, IT, medical sciences, and engineering. At this point, UT should become more attractive by opening new branches that are a collaboration between several faculties and have curricula that are as current as possible and closer to the labor market. In this paper, the Grey model was used for predictions, due to the small nature of the data and being disconnected from external factors. The estimated GM(1,1) models had a good fitted value. Forecasts according to this model show that the demand for higher education in the country will continue to decrease in general. In public HEIs, the demand will continue to decrease, while in private HEIs it will continue to increase. This should be a moment of reflection for public HEIs, which should become more attractive in terms of their academic offer and infrastructure.

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ENHANCEMENT OF CONVECTIVE HEAT TRANSFER WITH NONUNIFORM DISTRIBUTION OF PARTICLE VOLUMETRIC CONCENTRATION IN NANOFLUID

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Abstract
The current numerical study deals with improving a thermal system's convective heat transfer performance using a nanofluid containing copper oxide nanoparticles dispersed in a base fluid of 60:40 (by mass) ethylene glycol and water mixture (60:40 EG/W) with particle volumetric concentration ranging from 0 to 5%. The heat removal system involves nanofluid flow through a long rectangular duct whose bottom surface is maintained at a uniform heat flux with uniformly distributed pin fins on the top surface. The novelty of the present investigations is to study the effect of nonuniformity of volumetric particle concentration on the heat transfer rate from the system. Three models with the linear, exponential, and stratified distribution of volumetric particle concentration are considered. It is observed that selecting a profile that controls the distribution of particle volumetric particle concentration plays an important role in harnessing the system improvement factor. Irrespective of the type of model, the maximum value of the system improvement factor increases with an increasing average volumetric concentration linearly. Based on the results obtained in the present investigations, nonuniform distribution of nanofluid in an exponential manner gives rise to a maximum increase in Nusselt number in comparison to that with uniform volumetric concentration of nanofluid. Hence, exponential model seems to play a better role in augmenting thermal performance of the thermal system under consideration.

NOMENCLATURE

Ac	cross-sectional area of a pin fin, $\pi d^2/4$, m^2
A_r	channel aspect ratio, H/L
A_s	upper/lower surface area of the channel, W.L, m^2
B_e	controlling parameter in Eq.37
B_L	controlling parameter in Eq.36
c_p	specific heat at constant pressure, J/kg.K
d	pin fin diameter, m
H	channel height, m
h	convective heat transfer coefficient, $W/m^2.K$
h_o	heat transfer coefficient of the channel surface exposed to the ambient, $W/m^2.K$
h_d	fin surface convective heat transfer coefficient, $W/m^2.K$
h_L	upper surface convective heat transfer coefficient, $W/m^2.K$
H	channel height, m
i	x-direction grid point
j	y-direction grid point
k	thermal conductivity of nanofluid particles, W/m.K
L	channel length
k_{bf}	thermal conductivity of base fluid or pure fluid, W/m.K
m	maximum number of grids in x-direction
n	maximum number of grids in y-direction
n_o	total number of pin fin
Nu	average Nusselt number, hH/k_{bf}
Nu_L	average lower surface Nusselt number, h_L H/k_{bf}
N_o	dimensionless heat transfer coefficient of the channel surface exposed to the ambient, h_oH/k_{bf}
N_f	dimensionless heat transfer coefficient of fin, $\sqrt{\frac{h_d k_d}{d}}\frac{H}{k_{bf}}$
P	Peremeter, πd, m
Pe	Peclet number, Re.Pr
Pr	Prandtl number, $\mu c_p/k_{bf}$
q"	heat flux at lower surface of the channel, W/m^2

Re	Reynolds number, $\rho u_m H/\mu$, $u_m H/\nu$
T	fluid temperature, K
T_i	fluid temperature at inlet, K
T_m	mean fluid temperature at any axial location, K
T_α	free stream temperature, K
u	axial velocity, m/s
u_m	mean axial velocity, m/s
U	dimensionless axial velocity, $u/u_m = 6Y(1-Y)$
x	axial coordinate along the direction of flow
X	dimensionless axial length, x/H
y	vertical coordinate normal to the direction of flow
Y	dimensionless vertical height, y/H
Y_o	controlling parameter in Eq.3 and Eq.38
W	channel width

Greek symbols

θ	dimensionless fluid temperature, $k_{bf}(T-T_i)/Hq''$,
θ_∞	dimensionless free stream temperature $k_{bf}(T_\infty - T_i)/Hq''$
θ_m	dimensionless mean fluid temperature $k_{bf}(T_m - T_i)/Hq''$
$\theta_{L,m}$	maximum lower wall temperature of the channel
μ	dynamic viscosity, $N.s/m^2$
ν	kinematic viscosity, m^2/s
ρ	fluid density, kg/m^3
λ	thermal conductivity ratio, k/k_{bf}
Φ	variable area ratio, $A_c(x)/A_s$
Φ_o	fixed area ratio, $\frac{n_o \pi d^2}{4WL}$
ζ_o	ratio of Nusselt number with fin to that without fin
ζ	ratio of Nusselt number with variable fin density to Nusselt number with uniform fin density
ζ_{nf}	ratio of Nusselt number with nanofluid to that with pure fluid
ζ_{nn}	ratio of Nusselt number with nonuniformly distributed nanofluid to that with uniformaly distributed nanofluid.

Introduction

A nanofluid is a suspension of nanometer-sized particles in a conventional base fluid which significantly enhances the heat transfer characteristics of the original fluid. It is important to note that use of nanofluids incurs little or no penalty in pressure drop. Over a decade ago, researchers focused on measuring and modeling the effective thermal conductivity. Recently a number of important research works on convective heat transfer have been published in the open literatures on the augmentation of heat transfer using nanofluids.

A systematic review of literature on researches on nanofluid has been presented by Kakaç and Pramuanjaroenkij[1]. They have reviewed about 70 articles and the survey reveals that further theoretical modeling and experimental works on the effective thermal conductivity of nanofluids are needed. They also have suggested that further investigation is required for the treatment of nanofluids as a two-phase flow since slip velocity between the particle and base fluid plays important role on the heat transfer performance of nanofluids.Siddique et al[2] have recently reviewed the literatures on heat transfer with nanofluids. They[2] have discussed about the agreement and possible reasons of disagreement among the models proposed by many authors[3-25]. As mentioned above, a large number of papers presented the study on the heat transfer enhancement in channels with various geometrical configurations. However, none of these papers reported on the heat transfer enhancement using nonuniform distribution nanofluid. In the present study, it has been intended to incorporate the concept of variable nanofluid concentration and subsequently, observer its effect on heat transfer augmentation.

Mathematical Formulation of the Problem Statement of the problem

In order to investigate the effect of variable nanofluid concentration, steady-state fully developed laminar flow of an incompressible Newtonian fluid through a channel, as shown in Fig. 1, has been considered. For the formulation of the problem, thermally developing forced convection flow has been assumed with constant average properties except for the thermal conductivity. It is also assumed that the channel is large in both the stream-wise *x*-direction and the span-wise *z*-direction (perpendicular to the x-y plane), compared to the cross-flow *y*-direction which is the height of the channel, H. The length of the channel in the stream-wise *x*-direction is L. The flow is considered to be hydrodynamically symmetric across the mid-plane(x, y=H/2). In order to enhance heat transfer rate, fins are employed on the upper surface of the channel and also, a nanofluid containing copper oxide nanoparticles dispersed in water has been used. The problem can then be considered as two-dimensional in the (*x*, *y*) plane with channel width W in the span-wise *z*-direction. The primary objective of the present work is to investigate whether variable nanofluid concentration leads to some

encouraging results exhibiting enhanced thermal performance of the thermal system under consideration. For this, three models, namely, linear model, exponential model and stratified model, have been considered in the present analyses.

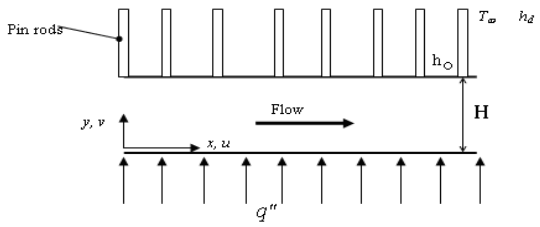


Fig.1. Physical model and the coordinate system

Governing Equations and Boundary Conditions

Dimensionless form of x-direction momentum equation is,

$$U = 6Y(1-Y) \tag{1}$$

Dimensionless form of the Energy equation is,

$$PeU\left(\frac{\partial\theta}{\partial X}\right) = \frac{\partial}{\partial Y}\left(\lambda\frac{\partial\theta}{\partial Y}\right) \tag{2}$$

The set of governing equations are to be solved for simulating the flow situation with the specified boundary conditions. The boundary conditions in the present problem are:

1) Inlet (x=0) : u=u(y), T=T_i (inlet temperature) (3)

3) Lower surface (0 <x < L, y=0) : u=0 and $-k\left.\frac{\partial T}{\partial y}\right|_{x,y=0} = q''$ (4)

4) Upper surface (0 <x <L, y=H) : u=0 and

assuming large fin length, it can be written,

$$-k\left.\frac{\partial T}{\partial y}\right|_{x,y=H} = \left\{(1-\Phi o)h_o + 2.0\Phi o\sqrt{\frac{h_d k_d}{d}}\right\}\left(T(x,y=H)-T_\infty\right) \tag{5}$$

Thermal boundary condition at the lower surface of the channel, can be nondimensionalized as

$$\lambda\left.\frac{\partial\theta}{\partial Y}\right|_{X,Y=0} = -1 \tag{6}$$

While the dimensionless form of the thermal boundary condition at the upper surface of the channel, Eq.(5), is expressed as

$$-\lambda \left.\frac{\partial \theta}{\partial Y}\right|_{Y=1} = D\left[\theta|_{Y=1} - \theta_{\alpha}\right] \quad (7)$$

Where, $D = [(1-\Phi_o)\, N_o + 2\, \Phi_o\, N_f]$ (8)

Nusselt number on the lower surface of the channel can be determined from the convection equation, $h_L(T|_{y=0} - T_m) = q''$ which is nondondimesionalized as

$$Nu_L = \frac{1}{\lambda\left(\theta|_{Y=0} - \theta_m\right)} \quad (9)$$

Similarly, Nusselt number on the upper surface, is determined from the following convection equation, $-h_U(T|_{y=H} - T_m) = -k \left.\frac{\partial T}{\partial y}\right|_{x,y=H}$

(10)

Dimensionless form of Eq.(10) is

$$Nu_U = \frac{\left\{\frac{\partial \theta}{\partial Y}\right\}_{Y=1}}{\theta|_{Y=1} - \theta_m}$$

(11)

Where, $\theta_m = \int_{Y=0}^{Y=1} U\theta \;\; dY$

(12)

Finite Difference Formulation

Having specified the governing equations and the boundary conditions, it is necessary to construct a finite difference formulation of the equations. Rectangular grids with grid size ΔX in horizontal (axial) direction and ΔY in vertical direction have been considered. Total number of grids in x-direction is m and that in y-direction is n.. Correspondingly, number of grid points in x and y directions are m+1 and n+1 respectively. Hence, ΔX=L/m and ΔY=H/n. The dimensionless equations for energy, momentum, lower surface thermal boundary condition and upper thermal boundary condition have been descritized using three-point central differencing in the transverse direction (Y-direction). Whereas, two-point differencing has been used in the axial direction (X-direction).

The finite difference equation for momentum equation, Eq.(13) is:

$U_{i,j} = 6Y_{i,j}\,(1-Y_{i,j})$

(13)

The finite difference equation for energy equation, Eq.(14) is:

$$a_{i,j}\theta_{i,j-1} + b_{i,j}\theta_{i,j} + c_{i,j}\theta_{i,j+1} = d_{i,j}\theta_{i,j}$$

(14)

Where,

$$a_{i,j} = \frac{\lambda_{i,j} + \lambda_{i,j-1}}{2\Delta Y^2}$$

(15)

$$b_{i,j} = -\frac{2\lambda_{i,j}}{\Delta Y^2} - \frac{PeU(i,j)}{\Delta X}$$

(16)

$$c_{i,j} = \frac{3\lambda_{i,j} - \lambda_{i,j-1}}{2\Delta Y^2}$$

(17)

$$d_{i,j} = -\frac{PeU(i,j)\theta_{i-1,j}}{\Delta X}$$

(18)

In the present analysis, the Thermal conductivity model of nanofluids presented by Vajjha and Das [25] has been used. The model is:

$$\lambda(i,j) = \frac{k_p + 2k_{bf} - 2\psi\left(k_{bf} - k_p\right)}{k_p + 2k_{bf} + 2\psi\left(k_{bf} - k_p\right)} + \frac{1}{k_{bf}}\left(5\times10^4\right)\beta\psi\left(\rho_{bf}\right)\left(C_p\right)_{bf}\sqrt{\frac{\kappa T(i,j)}{\rho_p d_p}}\,f\left(T,\psi\right)$$

(19)

Where,

$$f\left(T,\psi\right) = \left(2.8127\times10^{-2}\ \psi + 3.917\times10^{-3}\right)\left(\frac{T}{T_o}\right) + \left(-3.0669\times10^{-2}\psi - 3.91123\times10^{-3}\right)$$

(20)

where κ is the Boltzmann constant ($\kappa = 1.381\times10^{-23}\ J/K$), T_o is a reference temperature ($T_o = 273K$), $\left(C_p\right)_{bf}$ is the specific heat of the base fluid, ρ_{bf} is the base fluid density, ρ_p is the density of the nanoparticle and d_p is the nanoparticle diameter.

The finite difference equation for thermal boundary condition at the lower surface of the channel is:

$$-\lambda_{i,1}\theta_{i,1} + \lambda_{i,1}\theta_{i,2} = -\Delta Y$$

(21)

Hence, the coefficients in the descritization equation for lower surface are:

$$a_{i,j} = 0$$

(22)

$$b_{i,j} = -\lambda_{i,1}$$

(23)

$$c_{i,j} = \lambda_{i,1}$$

(24)

$$d_{i,j} = -\Delta Y$$

(25)

Similarly, finite difference equation for thermal boundary condition at the upper surface of the channel is:

$$-\frac{\lambda_{i,n}}{\Delta Y}\theta_{i,n-1} + \left(\frac{\lambda_{i,n}}{\Delta Y} + D\right)\theta_{i,n} = D\theta_{\alpha}$$

(26)

Hence, coefficients in the descritization equation for upper surface are:

$$a_{i,j} = -\frac{\lambda_{i,n}}{\Delta Y}$$

(27)

$$b_{i,j} = \frac{\lambda_{i,n}}{\Delta Y} + D$$

(28)

$$c_{i,j} = 0$$

(29)

$$d_{i,j} = D\theta_{\alpha}$$

(30)

Descritization equation for Nusselt number on the lower surface is:

$$Nu_L = \frac{1}{\lambda_{i,1}(\theta_{i,1} - \theta_{m,i})}$$

(33)

Nusselt number on the upper surface,

$$Nu_U = \frac{\lambda_{i,n}\left(\frac{\theta_{i,n}-\theta_{i,n-1}}{\Delta Y}\right)}{\theta_{i,n}-\theta_{m,i}}$$

(34)

where, $\theta_{m,i} = \sum_{j=1}^{j=n} U_{i,j}\theta_{i,j}\Delta Y$

(35)

In the present analyses, instead of using a uniform value of Ψ, variable Ψ(Y) has been considered using different Ψ versus Y profiles.

Conclusions

A model has been developed to study thermal performance and optimization of relevant thermogeometric parameters involved in a convective cooling system. The model has successfully been used to carry out the present analyses. The present study has been intended to analyze the effect of nonuniform distribution of particle volumetric concentration (ψ) on system improvement factor(ξ_{nn}). Three models with linear, exponential and stratified distribution of ψ have been considered in the present analyses. Based on the results obtained in the present investigations, nonuniform distribution of nanofluid in an exponential manner gives rise to a maximum increase in Nusselt number in comparison to that with uniform volumetric concentration of nanofluid. Hence, exponential model seems to play better role in augmenting thermal performance of the thermal system under consideration.

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FRENCH EDUCATION IN THE SOUTHWEST - COCHINCHINA OF VIETNAM IN THE EARLY 20TH CENTURY

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Abstract
After completing the invasion of Vietnam, the French colonialists began to conduct measures to govern including education. French education was carried out in both Vietnam and Indochina, but in Cochinchina (including the Southwest - Cochinchina) the French colonialists built a separate education system. That education system allowed France to bring French educational programs into Vietnam, teaching Vietnamese people. The implementation of the French educational program has some positive effects as Vietnamese people know Western science and technology, but besides that, the elements of colonial rule and submission to the French are also emphasized. This made the Vietnamese colony, including the Southwest - Cochinchina, increasingly dependent on the French government, contributing to the consolidation of French rule in Vietnam in the early twentieth century. The transformation of Vietnamese education in the early twentieth century under the influence of French education is a clear demonstration of the imposition of colonialism everywhere in the world.This article aims to study the French education in the Southwest - Cochinchina (Vietnam) thereby clarifying the distinctive features of the French education system built in Vietnam. This study also shows the changes in education that the French colonialists carried out in the Southwest - Cochinchina (Vietnam).
Keywords: French education, the Southwest – Cochinchina, Vietnam, French colonialists

INTRODUCTION

Vietnam in the 19th century was a French colony. That is why education brought by the French colonialists had a profound influence in Vietnam, including the western provinces of Cochinchina. Here, France quickly abolished the old education systems and established a new education system that was beneficial to the government. The most typical example of this policy is that France quickly replaced Confucian education with European education. The school system is also gradually changing and developing in all aspects. However, in the process of establishing that education, elements beneficial to the colonial cause were also installed in the educational program, including in the western region of Cochinchina (Cooper, 2004). It can be seen that French education in Cochinchina in general and the western provinces of Cochinchina in particular is typical of a transformation between old and new education. It is typical of the cultural and educational interference between Vietnam and France in the 19th and 20th centuries.

RESULT AND DISCUSS

The process of French colonialism establishing and organizing education in Southwest - Cochinchina

In 1879, a decree on educational reform in Cochinchina was issued, dividing the main curriculum into three levels.

- Level 1 is taught for three years, teaching French, Quoc ngu (Vietnamese) and Chinese.
- Level 2 is studied for three years, each week will spend two hours for Chinese and Vietnamese, the remaining for French.
- High school will study for four years with many contents, taught in French such as Math, geometry, algebra, painting, geography, chemistry, physics, History...

The educational policy and 10-year three-level curriculum are implemented quite seriously and long-term, the main language is French.

In 1906, France reformed the education system for all of Indochina and Cochinchina by establishing the Indochina Academic Agency to unify, direct and manage local education (Vu, 2012).

The French set up a council to improve indigenous education, study all issues related to creativity, or reform education.



Image 1: A French primary school in Indochina

Source: *Thompson, V., & Adloff, R. (1947)*

The curriculum is supplemented with the latest content of Western science and common practical knowledge. By this period, education in Vietnam in general and the Western Cochinchina region in particular had strong Western education characteristics (Thuan & Gia, 2021).Education at this time was divided into three levels: level one was elementary schools, level two was elementary colleges, level three was high school, with two education systems including French schools and French schools for indigenous people. The French curriculum in Indochina is almost the same as in France, for French students and a few Vietnamese students.The period 1917-1945 marked the second round of educational reform by establishing the French-Vietnamese curriculum, opening with the event that on December 21, 1917, Governor General of Indochina Albert Sarraut signed a decree promulgating general regulations of the entire political system of Indochina. The document is considered an educational code, 282 pages thick, with the goal of unifying the indigenous education system, moving forward to abolish the old education system, including its application in the western provinces of Cochinchina (Ha, 2004).The education system at this time was divided into three levels, the first level was elementary schools, the second level was elementary colleges, the third level was high school (baccalaureate), with two educational systems including French schools and French schools. native. The French curriculum in Indochina is almost the same as in France.With the second round of educational reform, the introduction of the national language into primary schools has helped children quickly learn to read and

write, much better than previously learning Chinese characters that were difficult to remember. The curriculum includes both natural sciences and social sciences with a highly systematic nature. In addition to high schools, France also established vocational schools so that students with difficulties after completing primary school can learn a trade and find a job to make a living.

Some comments about french education in the southwest - cochinchina of vietnam in the early 20th century

Education during the French period lasted nearly a century with many different opinions.It can be affirmed that the process of building French-Vietnamese education by the French colonialists in Vietnam in general and the Southwest in particular has created important changes in the quality of education in many different directions. That education has both successes and limitations. In essence, this is a colonial education, colonialism is a typical characteristic. However, objectively speaking, the education that the French colonialists built was scientific in that the education system was modeled after the progressive Western education model. We cannot deny what the French colonialists did for Vietnamese education.They introduced a completely new education that contributed to eliminating Confucian education and overcoming the limitations of this education. In addition, France has made strong changes towards modernization of education. Students at that time were directed towards many different professions and were exposed to many new subjects. The subjects of study are no longer limited as before but are of a mass nature.French-Vietnamese education has brought our people to absorb cultural and ideological flows with Western knowledge, thereby raising awareness, especially the spirit of self-reliance when the country's fate is in danger. Thanks to that, this education trained a team of patriotic intellectuals who contributed to the economic and social development of Vietnam during the colonial period. Among them were those who later became the core and leaders of the Vietnamese revolution during the struggle for national liberation (Kelly, 1977). However, French-Vietnamese education is colonial education, so it is difficult to avoid limitations. Its main purpose is still to train people to implement.French ruling policies, not to improve people's knowledge. This is a self-interested education, serving the purposes of French colonial rule, creating classes of followers and promoting the French government apparatus. The educational program has many points that distort and distort historical reality, obscuring Vietnamese cultural identity among the younger generation.

Whether the education system that the French colonialists built in Vietnam in general and the Southwest in particular is considered a success or failure, worthy of praise or

condemnation depends on each person's worldview and historical awareness. In the second half of the 20th century, many historians such as Nguyen Dang Tien, Le Van Giang,...also viewed French education as quite one-sided and subjective. French-Vietnamese education is one of the parts of Vietnam's educational history, a premise and a basis for later stages of education. In particular, that education has left many valuable lessons for Vietnamese education in the process of developing and modernizing the current education system.

Therefore, in 1905, Phan Boi Chau said that French education "only teaches French writing, French speaking, and temporary slavery to France" (Burlette, 2007). However, the unexpected positive side of France is the creation of an intellectual class with university degrees, mastering advanced science and technology. After Vietnam gained independence, it became a qualified and professional human resource to serve the new state.



Image 2: Medical activities in French schools in the West of Cochinchina (vaccination)

Source: *Thompson, V., & Adloff, R. (1947)*

1. CONCLUSION

The Western region of Cochinchina is considered a "colonized" land of France, this is one of the lands that received the earliest French education in the whole of Indochina (only after

the Eastern provinces of Cochinchina). It can be affirmed that French education here is one of the important parts of Franco-Vietnamese education that is completely controlled by the French colonialists. In the early stages, French education in the West of Cochinchina was part of the Cochinchina education system. Later, this area and the East of Cochinchina were part of the French education system in Indochina. The education system that the French colonialists established in Western Cochinchina - Vietnam as well as throughout Vietnam had colonial colors, that process changed the face of Vietnamese education from Chinese influence to European education (Kelly, 1977). That education has negative aspects, but still does not contain positive and progressive features. That is a lesson about education for educational development in Vietnam today.

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IDENTIFYING THE FACTORS AFFECTING PROCESSING AND STORAGE OF GARRI IN BOMO CLAN OF SOUTHERN IJAW LOCAL GOVERNMENT AREA

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ABSTRACT
The study identified the factors affecting processing and storage of garri in Bomo Clan of Southern Ijaw Local Government Area of Bayelsa state. The study employed a descriptive survey design using a well-structured questionnaire which was administer to respondents in the study area. 7 communities were selected randomly in Bomo clan and 10 questionnaires were administered to cassava farmers in each selected community. The data was presented and analyzed using simple descriptive statistical tools such as table, frequency and percentage. It was founded that most of respondents engaged in cassava farming are females, in the age range of 46-55 years, married, with secondary school level in education qualification and have been in garri production for above 10year with the percentage being 70%, 42.85%, 65.71%, 48.57% and 42.29% respectively. Most of the respondents says the followings with their respective percentage; fund is a problem in garri production (42.86%), strongly agreed that garri processing is time consuming (55.71%), strongly agreed that cassava storage do not last long after harvesting (68.57%), disagreed that garri don't last long in storage (55.71%), strongly agreed that garri processing needs improved equipment (38.57%), agreed that cassava processing is a risk to human health (51.43%) and strongly agreed that sieved garri has better texture quality (64.29%). Therefore, Government should support garri farmers by providing the developed machines for garri production, creating training programs and educating the garri farmers in this area.

INTRODUCTION

Background of the Study

Garri is a popular food item in Nigeria and other West African countries made from cassava tubers. Cassava (Manihot esculenta Crantz), is a perennial woody shrub also known as yuca, manioc, or tapioca, Cassava grows up to a height of 4m depending on the type of specie or variety. It is from the spurge family (Euphorbiaceae) from the American tropics. It plays a vital role in global food security and serves as a staple food crop for millions of people in tropical and sub-tropical regions according to IITA News and Events (2018), says cassava is rich in carbohydrates, calcium, vitamins B and C and essential minerals. It provides dietary fiber, vitamin C, vitamin B-complex, and small amounts of calcium, iron, and phosphorus. It is cultivated throughout the tropical world for its tuberous roots, from which cassava flour, breads, tapioca, a laundry starch, garri, fufu, and an alcoholic beverage are derived while the leaves of cassava are also used as vegetables in native soups and the peels are used in feeding livestock.

Cassava probably was first cultivated by the Maya in Yucatan (Encyclopedia Britannica). It originated from the Northwestern region of South America, specifically the Amazon Basin and was introduced to Africa in the Congo Basin by the Portuguese around 1558.In Bomo clan, Southern Ijaw Local Government Area, many people have engaged themselves in selling and trading cassava that is processed in one way or the other mainly garri production.Statement of Problem The state of the problem of garri in Bomo clan is a complex issue that encompasses various challenges and opportunities related to the processing and storage of garri. The basic problems of processing storage and of garri in Bomo clan are the following;

Most garri producers are after their income, they don't really take hygiene into considerations. The research will look into proper hygiene of garri production.Due to the weather of Southern Ijaw Local Government Area that is always humid, research is to look at appropriate percentage of moisture content under which garri can be stored and it will not mould.Garri that is sieved will control a good price in the market therefore this work will look at production of well sieved garri with a good texture.The research will also look at the effect of heat on the health of farmers that are producing garri, because it is believe that continuous exposure to high temperature can easily leads to high blood pressure.

Objectives of the Study

* The main objective of the study is to identify the factors affecting processing and storage of garri in Bomo clan Southern Ijaw Local Government Area.

* The specific objective of the study includes;

i. Assessment of traditional garri processing methods in the study area.

ii. Looking at the environmental factors affecting garri processing in the study area

iii. Identifying the processing and storage facilities in the study area

Significance of the Study

Garri is a staple food in many parts of Nigeria, its processing and storage play a crucial role in ensuring food security and availability throughout the year. Garri serves as a major source of sustenance for a significant portion of the population in Southern Ijaw Local Government Area. By understanding the factors that affect its processing and storage, measures can be implemented to ensure a consistent and reliable supply of this essential food product. This is particularly important in regions where garri is a dietary staple, as disruptions in its production or availability can have significant impacts on food security and nutrition. Most of the indigenes of this study area are into cassava farming (Garri production).

Research Questions

Factors affecting the processing and storage of Garri in Southern Ijaw Local Government Area can be influenced by several key elements, which can lead us to some important research questions.

1. Are the environmental conditions, such as temperature and humidity, have impact on the drying and storage processes of garri?

2. Does the quality of cassava tubers used in the processing, as well as the methods employed during production have an effect on the quality of garri?

3. Does the traditional processing and storage methods be able to produce a sustainable quantity and quality of garri for the population of the study area?

PICTORIA EXPLANATION OF PROCESSING CASSAVA INTO GARRI AND STORAGE IN BOMO CLAN.



Figure 1: Fresh Cassava tubers

Source: From Field



Figure 2: Washing of peeled cassava

Source : From Field



Figure 3: Hand grating of Cassava

Source: From Field



Figure 4: Cassava Grating Machine

Source : From Field



Figure 5: Cassava Pressing Machine

Source: From Field



Figure 6: Seiving of Garri

Source: From The Field



Figure 7: Frying of Garri

Source: From the Field



Figure 8: Bagging of Garri

Source: From the Field



Figure 9: Bagged Garri

Source: From the Fiel

RESEARCH METHODOLOGY

Research Design

In this project descriptive research survey design was used to build this project work. The choice of this research design was considered appropriate because of its advantages of identifying attributes of a large population from a group of individuals. The design is suitable for the study.

Population of the Study Population of the study is a group of persons or aggregate items, the research interest is getting information on the factors affecting the processing and storage of garri. 70 selected residents in Bomo clan, Southern Ijaw Local Government Area of Bayelsa state was selected randomly as the population of the study.

Sampling Size and Technique

The samples for this study were collected randomly from seven communities under the case of study using random sampling technique. Each community contains ten respondents which made the 70selected residents in Bomo clan. The names of the selected communities are shown below;

Table 1; Selected communities and their population

NO:	NAMES OF COMMUNITY	POPULATION
1	Ekowe	10
2	Peremabiri	10
3	Diebu	10
4	Polobubou	10
5	Opuama	10
6	Eniwari	10
7	Igbumatoru	10
TOTAL		70

Source: field survey 2024

Source of Data

Data for this study was collected from two (2) sources; primary data and secondary sources. The primary data was obtained through the use of structured questionnaire which was administered and collected from the respondents while the secondary source refers to data that are collected from the organizational report, textbooks journals etc. Instrument for Data Collection

One of the major instruments used in collecting data for this research work is a well-designed questionnaire. Their responses will help to provide solution to this research which was formulated for this study; it was structured in two forms. Section A, for personal data while Section B was the research questionnaire collected in order to obtain authentic and reliable information in their various residents which will be useful for this research work. It should be noted that the above mentioned instrument fall under the primary data. Secondary data, these were the already existing data that helps in obtaining more information about the topic they include journals, textbooks, etc.

Method of Data AnalysisThe collected data was analyzed with a simple descriptive statistic method such as percentages and frequency. Tables were used to analyze the respondents' data.

DATA PRESENTATION AND ANALYSIS

Data Presentation

This chapter presents the analysis and discussion of the findings to the study. The data is presented and analyzed in a tabular form. Presentation of finding has been organized in accordance with the study objective. Ten copies of the questionnaires were distributed to each selected community of which the total number of 70 copies were collected.

Analysis of Data

The frequency of the respondent questions that where admitted and their respective valid percentages are shown below.

SECTION A

Table 2; Gender of the respondent

Gender	Frequency	Valid percentage
Male	21	30%
Female	49	70%
TOTAL	70	100%

Source: field survey, 2024

From the table above 21 representing 30% were male while 49 representing 70% were female respondent. Therefore, majority of the respondents were female.

Table 3; Age of the respondents

Age range	Frequency	Valid percent
18-25	2	2.86%
26-35	9	12.86%
36-45	12	17.14%
46-55	30	42.86%
56 and above	17	24.29%
TOTAL	70	100%

Source: field survey, 2024

The above table describes the Age distribution of the respondents. It realized that 2 representing 2.86% are 18-25years, 9 respondents representing 12.86% are 26-35 years, 12 respondents representing 17.14% are 36-45 years, 30 respondents representing 42.86% are 46-55 years and 24.29% represent 17 respondents who are above 55 years. It evidently shows that majority of the respondents are in the range of 46-55years old.

Table 4; Marital status of the respondent

Marital status	Frequency	Percentage
Single	1	1.43%
Married	46	65.71%
Divorce	12	17.14%
Widow/Widower	11	15.71%
TOTAL	70	100%

Source: Field survey, 2024

From the above table, 1(1.43%) was single in marital status, 46(65.71%) was married, 12(17.14%) was divorced and 11(15.71%) was widow/widowers. We discovered that majority of the respondents was married.

Table 5; Educational qualification of respondents

Educational qualification	Frequency	Valid percent
Primary education	28	40%
Secondary education	34	48.57%
Tertiary education	6	8.57%

No formal education	2	2.86%
TOTAL	70	100%

Source: field survey 2024

The table above indicates the educational qualification of the respondents. 28(40%) respondents was primary level, 34(48.57%) was secondary level, while tertiary education level was 6(8.57%) and respondents with no formal education was 2(2.86%) Therefore, majority of the respondents are secondary levels.

Table 6; How long have you been in Bomo clan?

Years range	Frequency	Valid percentage
1-2	1	1.43%
3-5	2	2.86%
6-10	12	17.14%
Above 10years	55	78.57%
TOTAL	70	100%

Source: field survey, 2024

From the above table, majority of the respondents have been in Bomo clan for above ten years.

Table 7; How long have you been into garri production?

Years range	Frequency	Valid percentage
1-2	9	12.86%
3-5	13	18.57%
6-10	17	24.29%
Above 10years	31	44.29%
TOTAL	70	100%

Source: field survey 2024

The above table shows the number of years the respondents have been into garri production. It shows that 9 respondents have been in garri production in the range of 1-2years, 13 respondents in the range of 3-5years, 17 respondents in the range of 6-10years and 31 respondents are above 10years in garri production. Therefore, majority of the respondent have been in garri production for above 10years.

SECTION B

Table 8; Fund is a problem in garri production

Respondents	Frequency	Valid percentage
Strongly agreed	22	31.43%
Agreed	30	42.86%
Disagreed	13	18.57%
Strongly disagreed	5	7.14%
TOTAL	70	100%

Source: field survey 2024

From the above table, majority agreed to the statement which state that "fund is a problem in garri production".

Table 9; Garri processing is time consuming

Respondents	Frequency	Valid percentage
Strongly agreed	39	55.71%
Agreed	18	25.71%
Disagreed	12	17.14%
Strongly disagreed	1	1.43%
TOTAL	70	100%

Source: field survey, 2024

The above table shows that majority of the respondents strongly agreed that "garri processing is time consuming".

Table 10; Cassava do not last long in storage after harvesting

Respondents	Frequency	Valid percentage
Strongly agreed	48	68.57%
Agreed	19	27.14%
Disagreed	3	4.29%
Strongly disagreed	0	0%
TOTAL	70	100%

Source: field survey, 2024

The above table shows the respondent rate of to the statement "Cassava storage do not last long after harvesting".

Table 11; Garri don't last long in storage

Respondents	Frequency	Valid percentage
Strongly agreed	2	2.86%
Agreed	9	12.86%
Disagreed	39	55.71%
Strongly disagreed	20	28.57%
TOTAL	70	100%

Source: field survey, 2024

The above table shows the respondents rate to the statement "garri don't last long in storage".

Table 12; Garri processing needs improved equipment

Respondents	Frequency	Valid percentage
Strongly agreed	27	38.57%
Agreed	27	38.57%
Disagreed	14	20%
Strongly disagreed	2	2.86%
TOTAL	70	100%

Source: field survey 2024

The above table shows the respondents rate to the statement "Garri processing needs improved equipment".

Table 13; Cassava processing is a risk to human health

Respondents	Frequency	Valid percentage
Strongly agreed	17	24.29%
Agreed	36	51.43%
Disagreed	12	17.14%
Strongly disagreed	5	7.14%
TOTAL	70	100%

Source: field survey, 2024

The above table shows the respondents rate to the statement "Cassava processing is a risk to human health".

Table 14; Sieved garri has better texture quality

Respondents	Frequency	Valid percentage
Strongly agreed	45	64.29%
Agreed	22	31.43%
Disagreed	3	4.29%
Strongly disagreed	0	0%
TOTAL	70	100%

Source: field survey, 2024

The above table shows the respondents rate to the statement "Sieved garri has better texture quality".

What are the major problems associated with garri processing and storage?

The following problems were identified from the respondents;

1. The use of traditional cassava graters mostly cause injury to the processor, it rust quickly and are difficult to keep clean. It is very slow and labour intensive to use.

2. When frying, the operator sits sideways by the fireplace and this brings bad health condition due to the heat from the fire.

3. Garri processing can consume time.

4. Lack of finance to purchase the newly developed equipment or machines for processing garri, which results to the use of traditional equipment.

5. Temperature and high humidity in Bomo clan affect the stored garri.

6. **There is lack of hygiene and pests control in stored garri environment.**

What would you need to improve garri processing and storage?

The respondents made a suggestion on the following ways to improve garri processing and storage;

1. Government should support farmers by bringing advance technology such as new processing and storage equipment.

2. Extension programs should be created to educate garri farmers in Bomo clan for new innovations on how to process and store garri for long period.

3. There should be medical support made available for garri farmers due to health issues.

4. Since the Bomo clan area is always humid, government should provide electricity which will enable the storing of garri more efficiency.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary of Findings

This research identifies the factors affecting processing and storage of garri in Bomo clan of Southern Ijaw local government area. From the study carried out, the following was discovered;

1. Fresh cassava roots have a very little storage life, and needs to be processed into durable and resilient forms soon after harvest.
2. The operator sits sideways by the fireplace while frying, and this brings discomfort and various health disorders owing to heat of frying equipment and the operator's sitting arrangement. The respondents wish for government assistance in this aspect to provide a good mechanical garri fryer.
3. Proper sieving of garri has a better texture quality.
4. The way of frying garri found in Bomo clan took a longer time to fry the production to dryness.
5. Garri processing can consume time, in terms of pealing, washing de-watering, sieving and frying which need to develop.
6. Lack of finance to purchase the newly developed equipment or machines for processing garri, which results to the use of traditional equipment.
7. In terms of storage, factors like temperature and high humidity always affect the life span of the garri due to Bomo clan humid environment.
8. **There is lack of hygiene and pests control in stored garri environment.**

Conclusion

This research work reveals the present factors affecting the processing and storage of garri in Bomo and how these problems can be solve. It was discovered in the findings that cassava have a shorten storage time, sieving can improve the garri quality, the adopted garri processing processes like pealing, washing, dewatering and frying found in Bomo clan are stressful and can consume time. But when introducing the developed machines for these processes, these problems can be minimized. In term of storage, all garri processor should understand the environment where the garri is stored and maintain hygiene. Therefore, government should support garri farmers by providing the developed machines for garri production and educating the farmer in this area.

Recommendations

Base on the finding of this study, the following recommendations were made;

1. Shorten the fresh cassava storage time: The shorter the storage time of mature cassava, the higher the starch content of cassava and the higher content of garri. In particular, cassava is more suitable for processing within 4days of after harvesting.

2. Choose suitable garri processing machine: With the development of science and technology, modern garri processing method is more acceptable. Like the cassava peeler which help in reducing the time consumption and stress of human. Also the mechanical fryer is capable of tripling the production efficiency within a short space of time.

3. Wish for government support: The develop machines for garri processing maybe a little expensive to acquire by the local processors, but the government can intervene by subsidizing price of these machines to support, encourage and motivate the processors. Also, government can support the local processors by providing the developed machines.

4. All garri processors should adopt good sieving which is related to the garri quality.

5. It is important to practice personal hygiene and cleaning for the garri storehouse.

6. Do not store the garri sack bag directly on the bare ground or too close to the wall. Instead, lay the inside of the sack bag with nylon before pouring in the garri (to retain dryness and freshness) place the sack on a wooden slab and position it not too close to the wall. In this process the stored garri will last longer.

7. There should be extension programs to educate and train garri farmers in Bomo clan on good hygiene in there storehouse and free medical treatment should be taken care off

Limitation of the Study

Wide range would have been taken care of but was limited by some factors as follows;

1. The major problem encountered was the inability to give adequate co-operation from the respondents. This made things difficult for me to get the data required in order to make my findings. This really wasted my time during the research period.

2. Also finance acted as a hindrance during the period of this study. The cost of transportation for the number of days this research work was carried out becomes a problem to me.

3. Time factor also contributed to my great test problems, there was time given to carry out the research

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POZITIF PSIKOTERAPI ILE DEPRESYONUN ELE ALINMASI: VAKA SUNUMU

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Özet
Bu olgu sunumunda Pozitif Psikoterapi ile depresyonda olan bir bireyin terapi sürecinin nasıl ilerleyeceğinin incelenmesi hedeflenmiştir. Çalışmanın hedefi göz önüne alınarak pozitif psikoterapi envanterleri detaylı bir şekilde paylaşılmıştır. Danışan ile çalışırken psikoloğun uygun gördüğü envanterler uygulanmıştır, sonuçlar aşağıda belirtilmiştir. Envanterler sayesinde danışanla ilgili daha çok bilgi toplanmış pozitif psikoterapi ile tedavi planı belirlenmiştir. Depresyon dünya geneline bakıldığında oldukça sık görülmektedir. Çökkünlük ve keyifsizlik öne çıkan özelliklerindendir. Bilişsel işlev bozukluğu hastalığın gidişini ve tedaviye yanıtını etkilemektedir. Bu çalışamanın amacı depresyonda olan bir bireyin tedavi yöntemlerinden biri olan pozitif psikoterapiyle iyi veya kötü yönde ilerleyip ilerlemeyeceğini gözlemlemektir. Türkçeye uyarlanarak 'çökkünlük' olarakta belirlenen depresyon bireyde iki şekilde de kendini göstermektedir. Depresyonun başlangıcı olarak kabul edilen sendrom adıyla semptomların görüldüğü ilk aşamadır ve tedaviye daha yatkın bir dönemdir. Bu aşama hastalık kavramı adı altında değildir. İkinci aşama ise hastalık adı altında semptomların tedavi edilmediği/edilemediği dönemdir. Bu çalışmada depresyon ve pozitif psikoterapi detaylı bir şekilde açıklanmıştır.
Anahtar Kelimeler: Pozitif Psikoterapi, depresyon, olgu sunumu

Bu çalışmanın amacı pozitif psikoterapi perspektifinden depresyon duygudurum bozukluğu tanı kriterlerini karşılayan bir vakanın terapi sürecini olgusal olarak açıklamaktır. PPT'nin depresyona bakış açısı ile kullanılan teknikler hakkında bilgi vermektir. 1970'lerde ve 1980'lerde Prof. Dr. Nossrat Peseschkian'ın geliştirdiği pozitif psikoterapi yeni sayılabilen hümanist ekoller kökenli bir psikoterapi türüdür. 20'den fazla kültürde kültürlerarası gözleme dayanan bu yöntem çatışma merkezli ve kaynak odaklı kısa süreli bir psikoterapi yöntemidir (Çiydem, 2022).

Depresyon

Depresyon, adı altında çeşitlere ayrılmakla beraber davranışsal olarak da yaşamda durağanlık, isteksizlik ve duygusuz davranışlar, konuşmada yavaşlama, negatif bir yaşam ve bireyde özgüvensizlik ve aşağılık duygusu gibi hayatı olumsuz bir şekilde etkileyen duygudurumsal bozukluk olarak tanımlanır. Kişi bulunduğu konum her ne olursa olsun keyif almaz. büyük bir keyifsizlik halindedir. geleceğe karşı bir umut beslemiyordur. yaşamı sadece günleri geçirmek için yaşar. birey öz-bakımıyla ilgili harekete geçmez. bedeni ona rahatsızlık vermez, halinden memnundur. fizyolojik olarak incelediğimizde kişi uyku problemleri, yeme bozukluğu, cinsel aktivasyon azlığı, agresyon gibi sorunlarla karşı karşıya gelmektedir. birey hayatındaki sorumlulukları yerine getiremez, bunları yapacak gücü ve enerjiyi kendinde bulamaz. depresyon genelde fizyolojik veya farklı bir psikiyatrik rahatsızlıklarla komorbidite göstermektedir. aynı zamanda diğer psikiyatrik tedavilere göre intihar oranı en yüksek tanı depresyondur. kişi hayata bağlayan hiç bir yaşam aktivitesiyle ilgilenmediği için kendini boşlukta ve yaşamı boş olarak tanımlar. kendini hiç bir yere ait hissetmez ve sosyal çevre ve ailesine karşı iletişim sorunları olan ve ayak uyduramayan bir birey olarak yaşamı sürer. (Savrun, 1999).Türkçeye uyarlanarak 'çökkünlük' olarakta belirlenen depresyon bireyde iki şekilde de kendini göstermektedir. depresyonun başlangıcı olarak kabul edilen sendrom adıyla semptomların görüldüğü ilk aşamadır ve tedaviye daha yatkın bir dönemdir. bu aşama hastalık kavramı adı altında değildir. ikinci aşama ise hastalık adı altında semptomların tedavi edilmediği/edilemediği dönemdir.bu duruma akuttan kroniğe evrildiği dönem veya aşamadadır. majör depresif bozukluk, bipolar bozukluk depresyonu, distimik bozukluk ve daha fazlası olarak kendi içlerinde benzer semptomlara sahip olmasına rağmen kendi içlerinde uluslararası çapta kabul edilip ayrılmışlardır. (Algül, 2015; Rosgersvd, 2012; Uğur, 2008).

POZİTİF PSİKOTERAPİ(PPT)

Pozitif kelimesi olumlu olarak düşülmektedir fakat 'positum' bütün, var olan, gerçek olan anlamını taşımaktadır. Genel olarak bütün yönleri görmek de denilebilir. Positum

Latinceden gelmektedir. Mevcut kapasiteler ve kaynakları, geliştirilebilir ve üstesinden gelinmesi gereken engeller olarak gelişilmesini sağlar. Pozitif yorum ve pozitif yorum anlamı olarak içinde ayrılır. Pozitif yorum içinde derin empati, yeni anlam bulma süreci, pozitif ima barındırır. Pozitif yorum anlamı ise umut vermek, daha çok seçenek bulmak, bakış açısını genişletmek ve geliştirmek, tekrar düşünme sürecini uyarmak ve cesaretlendirmek şeklindedir.

Pozitif yorumu örneklendirmek gerekirse depresyon için, derin duygusallıkla çatışmalara tepki verme yeteneği.

- Psikoz için, aynı anda iki dünyada yaşama kapasitesi.
- Depresyon derin bir duygusallıkla yanıt verebilme kapasitesi
- Obezite ise yemek yoluyla tatmin olma ve sevgi eksikliğinin yerini alma yeteneği şeklinde örneklendirebiliriz.

PPT'ye göre temel yetenekler;

Pozitif Psikoterapi içinde iki temel kapasite bulunduruyor, ve bu kapasitenin her bireyde var olduğuna inanıyor. Biri sevme kapasitesi duygusallık adı altında diğeri ise bilme kapasitesi rasyonelite adı altına olmaktadır. Bunlar birincil ve ikincil kapasite olarak da adlandırılıyor. Birincil kapasiteler, bağlanma kapasitesi, ilişki kurma ve sürdürme, önemli kişiyi model alarak öğrenme. İkincil kapasiteler, ilişkileri organize eden sosyal normlar, eğitimin ile oluşan, iletişim kavramları ve değerler olarak incelenir. Yani biri duygusal geçmişimiz, 0-3 yaş arasındaki önemli kişiler ile kurulan ilişki, birincil yetenekler, diğerlerini nasıl severiz/sevgiyi nasıl almayı tercih ederiz biri ise rasyonel geçmişimiz, 3-7 yaş arası önemli kişi, kültür, toplum ile ilişkide gelişir, diğerlerine nasıl öğretiyoruz, nasıl öğretilmesini tercih ediyoruz şeklindedir.

PPT'de kullanılan envanterler;

Pozitif psikoterapi içerisinde denge modeli, farklılaşma envanteri, dörtlü model boyutları, soyağacı gibi envanterler bulundurur. Bunlar terapiyi şekillendirmesinde ve danışanı anlamayı ve konuşmaya teşvik edici envanterlerdir. Danışanın terapiden daha fazla verim alması ve farkındalığını daha da artırmak için doğu hikayeleri adlı kitaptan danışana uygun hikayeler anlatılabilir. Bu da pozitif psikoterapinin terapi yöntemlerinden biridir**.**

Anadolu Psikiyatri Derg 2019; 20(özel sayı.1):108-111 Denge Modeli:

Pozitif psikoterapinin bakış açısına göre her birey yaşamını dört boyutta yaşar. Pozitif psikoterapide beden, başarı, kişisel ilişkiler ve fantezi açısından insan yaşamı ve insan varlığının dört boyutu bakımından kavramsallaştırılmıştır (Sarı, 2015).

Şekil.1 Denge Modeli

Beden

Fantezi **Başarı**

Temas

Bu modelin temel amacı bireyin gündelik hayatı hakkında sistematik bilgi edinmek ve hangi alanlara kaçıp savunma mekanizmaları geliştirdiğini, hangi alanları ihmal ettiğini somutlaştırmaktır.

Pozitif Psikoterapi'de uygulanan denge modelinin kısaca baktığı perspektif bireyin yaşamının 4 alanının somutlaştırılmasıdır. Bu alanlar şöyle açıklanmaktadır:

Beden: Bireyin bedensel durumunu yani uyku ve beslenme düzenini, spor alışkanlıklarını, güncel öz bakımını ve kendi bedensel rutinlerini öğrenmeyi hedeflenmektedir (Çorbacı, 2022).

Başarı: Temelde bireyin akademik veya kariyerine bakılırken, bireyin başarı olarak değerlendirdiği yada değerlendirildiği alanlara değinilmektedir.

İlişkiler: Bu alan iki temel alan özelinde derinleştirilir. Bireyin ailesi ve yakın çevresi ile temasına bakılan alanda görüşme sıklıkları ve ilişkilerin derinliklerine bakmak hedeflenmektedir.

Maneviyat (Fantezi): Bireyin günlük yaşamından uzaklaşıp soyut bir alana geçtiği, resim müzik, dizi ve film gibi alanlara yönelmesini maneviyat alanı temsil etmektedir. Bunun yanında kişinin inanç sistemine derinlemesine girilmesi hedeflenmektedir.

Terapi Sürecinde Kullanılan 5 Basamak;

1-) Gözlem/Mesafe: Gözlemin amacı hastanın içerisinde bulunduğu durumuna analizini içermektedir. Hastanın durumunun soyuttan somuta , tanımlayıcı bir duruma gelmesini gelmesini hedeflemektedir. Böylelikle genellemelerin önüne geçilir ve hastaya özgü bir yaklaşım somutlaştırılmış olur. Ayrıca hasta içerisinde bulunduğu duruma bir adım geriden bakma imkanı bulur bu duruma da mesafe koyma adı verilmektedir (Peseschkian, 2020).

2-) Envanter Yapma Basamağı: Envanterlerin kullanıldığı basamak hasta odaklı olmaktadır. Temel amaç hasta hakkında belirli bir formata sadık kalarak bilgi edinmektedir. Kullanılan envanterler, tutumlar, davranış biçimleri ve yetenekler hakkında sistematik olarak tanımlanmasını sağlamaktadır (Peseschkian, 2020).

3-) Durumsal Cesaretlendirme: Her bireyin birçok pozitif özelliği bulunmaktadır. Bu özellikler zaman zaman yeterli övgüyü görmemekte, zaman zamanda danışanın kendini beğenmiş olarak görülme korkusundan hak ettiği yeri görmemektedir. Bu basamakta bu bireysel yeteneklerin fark edilip, güçlendirilmesine çalışılmaktadır (Peseschkian, 2020).

4-) Sözelleştirme: Önceki evrelerde, olması gerekli güvenli terapötik ortam hazırlandıktan sonra, bu evrede hasta ile çatışma yaratan süreç üzerinde çalışılmaya başlanır. Danışanın çatışma süreçleri pozitif psikoterapi envanterleri kullanılarak çözmesine yardımcı olmaya çalışılır. Bu evre en uzun süren evredir çünkü hastanın çatışma süreçleri sonuçlanana kadar devam etmektedir (Sarı, 2015).

5-)**Hedefleri Genişletme Evresi:** Bu evrede hastanın geliş hedeflerine ulaştıktan sonra gelecekte (kısa-orta-uzun vadede) hayatını ne şekilde sürdürmek istediği şekilde hedefler koyup, hedeflerin üzerinde durulmaktadır. Bu evrede psikoterapide danışanın kendi kendinin terapisti olması da amaçlanmaktadır. Böylece kişi terapiyi bıraktıktan sonra bile kendi sorunları ile mücadele yöntemleri geliştirebilecek bir konuma gelmektedir (Sarı, 2015).

Olgu Sunumu

Danışan A.B. 26 yaşında bekar KKTC'de ikamet eden öğretmenlik yapan bir kadındır. Toplamda 12 seans görüşülmüştür. Yapılan ilk görüşmede depresyon duygudurum bozukluğu düşünülmüş, psikiyatri ve ilaç eşliğinde terapi sürecine başlanmıştır.

Geliş Şikayetleri*;* Yaklaşık bir ayrdır süren keyifsizlik, mutsuzluk ve hayattan keyif alamamak.

Şikayetinin Öyküsü*:* Danışan babasının mesleği dolayısıyla (asker) orta okul ve liseyi istememesine rağmen KKTC'de okumuş. Üniversitede aile zoruyla sınıf öğretmenliği okumak zorunda kalmış. Üniversite bitiminden sonra yine aile zoruylaKıbrıs'a geri dönmüş. Ailesinin kararlarını itiraz etmemiş ve maruz kaldığı baskıdan dolayı kendini çok sıkışmış hissettiğini söylemektedir. Yapmakta olduğu işinden mutlu olmamakla beraber son zamanlarda artan öfke kontrol problemleri ve yoğun intihar düşünceleriyle terapiye başvurmuş psikiyatrist eşliğinde görüşmelere başlanmıştır.Danışanın belirttiği herhangi bir tıbbı bozukluk yoktur. Buna ek olarak herhangi bir madde kullanım öyküsü bildirilmemiştir.

Danışanın Geçmiş Yaşam Öyküsü

Danışan babasının mesleği gereği sürekli yer değiştirmek zorunda kalmış ve bundan dolayı uzun süreli ilişkiler kuramamış bu durumun yalnız hissetmesini arttırdığını söylemektedir. Küçüklükten beri baskıcı bir ailede büyüdüğünü kendi fikirlerini hiç ifade edemediğini belirtmiştir. Danışan yapılan görüşmelerde yaşadığı hayatın kendi karalarını ve isteklerini yansıtmadığını bu nedenle öfkesini başka yerden çıkartmak istediğini öfke patlamaları yaşadığını belirtmiştir. Anne babasına olan öfkesini kardeşlerinden çıkartıyor.Danışanın çocukluk ve okul hayatına yapılan sorgulamalarda ilişki problemlerinin olduğu gözlemlenmiştir. Gerek okul hayatında gerekse ailevi yaşantısında sağlıklı ilişkiler yürütmekte zorlandığı gözlemlenmiştir. Danışan geçmişinden bu yana kendisini yalnız

hissettiğini belirtip süreğen bir şekilde bu yalnızlığı geçmişinden bugüne getirdiğini söylemiştir. Babasının memur olmasından kaynaklı olarak çocukluğundan beri sürekli yer değiştirmek zorunda kalması var olan ilişki problemlerine daha da derinleştirdiğini düşündürtmüştür.

Öykünün Teknik Özetlemesi

-Çatışma olduğu düşünülen yetenekler

İtaat: Ailesine karşı fazla uyumlu olduğu için öne çıkan özelliklerinde itaati görüyoruz.

Kibarlık: Kendi isteklerini ailenin geri planında tuttuğu için kibarlığın fazla geliştiğini görüyoruz.

Açık sözlülük: Kendini tam anlamıyla ifade edemediği mesleğinden mutsuz olduğu ve dile getiremediği açısından açık sözlü olmadığını görüyoruz.

Umut: Geleceğe karşı umudunun olmadığını ve intihar düşüncelerinin olduğunu görüyoruz.

İlişki: arkadaş arayışı olduğunu ve yalnız hissettiğini duyduğumuz için ilişki arayışında olduğunu görüyoruz.

-Kişilik Tipi

Danışan Birincil tiptir.

-Çatışma İçeriği

Semptom: Yoğun intihar düşünceleri, mutsuzluk, keyifsizlik, çökkün duygu durum.

Güncel çatışma: Üniversiteyi bitirip Kıbrıs'a geri gelmesi.

Temel çatışma: Çocukluktan gelen yer değişikliği ve güvenli ilişki kuramama. Kendi kararlarını alamadığı ve baskı altında büyümesi.

Sevgi &kabul: itaat ve uyum.

- **-** **Denge Modeli**

Beden: Beden alanında spor yapmıyor, dışarı çıkmıyor, hijyeni yerinde fakat ekstra bir bakım yapmıyor.Başarı: Sınıf öğretmeni olarak çalışıyor, sevmediği bir mesleği yapmasına rağmen kendini mesleğinde başarılı buluyor.Temas: Ailesiyle olan teması aynı evde yaşamlarına rağmen oldukça zayıflamıştır. Arkadaşlık ilişkilerinde de teması oldukça zayıftır uzun süreli arkadaşlıkları yoktur. Fantezi: çalışmadığı saatler dışında dizi-film izlemek ve müzik dinlemek oldukça fazladır. Öz yıkım düşünceleri olmasına rağmen danışanın geleceğiyle ilgili kurduğu hayaller oldukça fazladır.

Denge modelinin yorumlanması

Danışanın denge modeline verdiği puanlara ve yaptığı yorumlara bakıldığında beden ve temas alanının ihmal edildiği fantezi alanına kaçıldığı gözlemlenmektedir. Başarı alanında danışana göre normal seyrettiği görülmüştür.

TARTIŞMA

Bu olgu sunumu, Pozitif Psikoterapi ile depresyonda olan bir bireyin terapi sürecinin nasıl ilerleyeceğini hedeflediği için faydalar sunabileceği öne süren teorik literatürü desteklemektedir. Vaka çalışması, bir aydır keyifsizlik, mutsuzluk ruh hali içerisinde olan depresyon tanısının da konulduğu danışanın depresyonunu azalmada ve farkındalığını arttırmadaki etkinliği için ön kanıtları sağladığı düşünülmektedir. Danışanın geliş şikayetlerinin ilerleyen seanslarda azaldı ve olumlu yönde değiştiği gözlemlenmiştir. Ali Eryılmaz'ın (2016) yaptığı çalışmada depresyon tanısı alan bireylerde, çalışma bulgularına göre ilişki, itaat, güven, sabır, zaman ve umut yeteneklerini az düzeyde kullanmaktadır. Depresyon tanısı alan bireyler denge modeline göre depresyonla baş etme adına bedenleri çok fazla kullanırken; çalışma boyutunu daha az kullanmaktadır. Araştırma neticesine göre pozitif psikoterapi temelli depresyona müdahale önerisinde bulunulmuştur.Depresyon da olan bir bireyin çökkünlük ve keyifsizlik belirtileriyle birlikte kendini ortaya koyması zor olduğundan terapi süreçleri olumsuz yönde etkilenmektedir. Pozitif psikoterapi oldukça zengin envanterlere sahip oluşundan danışan hakkında daha çok bilgiye sahip olmayı kolaylaştırmaktadır. Danışana envanterlerden bazıları uygulanmış olup, envanterler sayesinde nasıl bir yapıya ve karaktere sahip olduğunu öğrenmekteyiz. Bu durum terapi sürecini daha kolay bir şekilde ilerletmemize de yardımcı olmaktadır. Danışanın da envanterler sayesinde farkındalığının geliştiği gözlemlenmiştir. 12 seanslık bir terapi sürecinde depresif belirtilerde gerileme olmamıştır. İyilik halinde artış gözlemlenmiştir, çökkün duygu durumda azalma görülmüştür. Danışan yaşam amacı belirlemek, hayata anlam yükleyebilme konusunda zorluk yaşamaktaydı, terapi sonrasında bu durumun iyiye gittiği gözlemlenmektedir. Depresyonun olumsuz etkileri seanslar ilerledikçe ortadan kalkmaya başlamıştır.

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PEYZAJDA KÜLTÜREL STİLLER: TARİHSEL TASARIM KONSEPTLERİ AÇISINDAN 'TURQUERIE AKIMI'

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ÖZET
Türk pavilyonları; tarihsel dizi, film, roman ve kostümlü dramalarda sıkça yer verilen peyzaj unsurlarıdır. Bu eserlerde sıkça gözlemlenebilen Türk pavilyonları, çeşitli tarihsel anlamlara işaret etmektedir. Çalışmada Türk pavilyonlarının tarihsel kullanım alanları ve kültürel deneyimlerdeki yeri ele alınmaktadır. Kavramsal çerçeve açısından peyzaj tasarımcısı ve tarihçi Laurie Olin'in tarihsel peyzaj tasarımları yaklaşımına başvurulmaktadır. Olin'e göre peyzaj tasarımlarında; çalışılan konum ve bağlamda gelişen tarihsel olayların, seçimlerin, kullanımların, geleneklerin, insan davranışları hakkındaki emsal bilgilerin ve kültürel deneyimlerin dikkate alınması gerekmektedir. Çünkü stil ve tarz adı altında bu hususların tarihsel peyzaj tasarımlarına özensizce uygulanması, çeşitli yanılsamalar ortaya çıkarmaktadır. Bu yanılsamalarda Türk pavilyonlarının, oryantalist bir bakış açısıyla sergileyici peyzaj düzenlerine dahil edildiği görülmektedir. Türk pavilyonları, tarihsel anlamda Türk kültürünün ürünleri olarak temsil edilirken bu ürünlere yönelik yapılandırılan oryantalist bakış açısının yarattığı egzotizm, kurgusal anlamda Batı'nın uzak diyarlara ilişkin mitlerini güçlendirmektedir. Bu ikonografinin büyük ölçüde Batı'daki oryantalist mitleri sürdürdüğü belirtilmektedir. Türk pavilyonlarının erken tarihsel örneği, on sekizinci yüzyıl Britanya'sındaki mimari form şeklindeki yapılardır. Çeşitli kaynaklarda aktarılan bilgilere göre bu pavilyonların, Doğu'yu imgesel bir gerçeklik olarak organize ettiği ve baskın imaj sergilediği kaydedilmiştir. Günümüzde ise bu akım, yerini modern bir anlayışa bırakmıştır. Modern bağlamda EXPO sergilerindeki Türk pavilyonları bu akımla karşılaştırılmalı olarak irdelenmektedir. EXPO örneklemindeki Türk pavilyonlarının tarihsel açıdan kültürün tanıtılması, paylaşılması ve topluluklar arasındaki rizomatik bağların öne çıkarılması amacıyla kullanıldığına işaret edilmektedir. Bu bağlamda, çalışma kapsamında Türk pavilyonlarına yönelik örnek tarihsel bakış açıları tartışılmaktadır.
Anahtar kelimeler: Tarihsel tasarım konseptleri, EXPO, Turquerie akımı

CULTURAL STYLES IN LANDSCAPE: 'TURQUERIE MOVEMENT' IN TERMS OF HISTORICAL DESIGN CONCEPTS

ABSTRACT
Turkish pavilions are landscape elements frequently featured in historical TV series, movies, novels, and costume dramas. Turkish pavilions, which can be frequently observed in these works, point to various historical meanings. In the study, the historical usage areas of Turkish pavilions and their place in cultural experiences are discussed. In terms of the conceptual framework, landscape designer and historian Laurie Olin's historical landscape design approach is used. According to Olin, in landscape designs; Historical events, choices, uses, traditions, precedent information about human behavior, and cultural experiences that develop in the location and context under study need to be taken into account. The careless application of these issues to historical landscape designs under the name of style creates various illusions. In these illusions, it is seen that Turkish pavilions are included in the exhibition landscape layouts from an orientalist perspective. While Turkish pavilions are historically represented as products of Turkish culture, it is stated that the exoticism created by the orientalist perspective structured towards these products strengthens the fictional West's myths about distant lands. It is stated that this iconography largely perpetuates Orientalist myths in the West. The earliest historical example of Turkish pavilions is the architectural form of buildings in eighteenth-century Britain. According to the information provided in various sources, it has been noted that these pavilions organize the East as an imaginary reality and display the dominant image. Today, this movement has been replaced by a modern understanding. In the modern context, Turkish pavilions in EXPO exhibitions are examined in comparison with this movement. It is pointed out that the Turkish pavilions in the EXPO sample were historically used to introduce and share culture and highlight the rhizomatic ties between communities. In this context, exemplary historical perspectives on Turkish pavilions are discussed.
Keywords: Historical design concepts, Turkish pavilions, EXPO, Turquerie movement

INTRODUCTION

Landscape is where natural and cultural elements come together and provide interaction between people and their physical environment. Landscape is a concept that is generally concerned with the physical structure, the layout, and the use of an area. Cultural landscape is a concept with many historical layers that evolves through design and use. Cultural landscape embodies associations and uses that evoke a sense of history of a particular place (Çöteli, 2012). Physical features of cultural landscapes can include trees, buildings, roads, paths, urban furniture, water bodies (basically any element that expresses the cultural values and history of an area). According to UNESCO, the cultural landscape is defined as "the integrated works of nature and human" that show the evolution of settlements over time under the influence of the physical constraints and/or opportunities offered by the natural environment and successive social, economic, and cultural forces (Tosun, 2008). In other words, a cultural landscape is a historically significant asset that shows evidence of human interaction with the physical environment.Cultural landscapes also include intangible elements such as land uses and human relationships that influence the development of the landscape. Cultural styles used in landscape design include design elements specific to particular periods, geographies, or cultures (Karakaya Aytin et al. 2021). These styles allow landscape architects and designers to organize spaces by referring to a specific theme or historical period.Historical design concepts are frequently used in architecture, interior design, landscape design, and other disciplines of art and design. This concept refers to design approaches that incorporate architectural styles, decorative elements, or landscape design elements from past eras. It usually refers to an approach that refers to a specific historical period, style, or culture and emphasizes these elements in the design process. For example, classical architecture emphasizes symmetry, proportion, and order (Erarslan, 2016). Gothic architecture is characterized by high arches and stained-glass windows inspired by medieval Europe (Arargüç, 2016). Baroque and rococo movements are conveyed with elements such as overly ornate decoration, curved lines, gold leaf (Halıcı ve Yurttaş, 2022). Anatolian architecture includes domes, tiles, geometric patterns, and ornaments inspired by eastern cultures.The Turquerie movement, considered as one of the historical design concepts, points to the focal point of this study. In general terms, this movement refers to a long historical process in which contradictory feelings against the orientalist 'Turkish image' were exhibited and emulation of Turkish culture was experienced in various fields of art and design. In this context, the word orientalist used in the definition of the movement, in the discourse of Edward W. Said (1978), implies the hegemonic relationship in which

Eastern culture is exploited by Western culture. Since the 16th century, the imitation of orientalist figures, which has become a popular fashion, is approached from a critical perspective.

It is reported that the Turqueire movement is seen in gardens, paintings, portraits, fancy dress and costumes, uniforms, interior decoration, and theater plays (Magleby, 2009). One of the concrete examples of this trend is the Turkish tent that was positioned at the entrance of Henry Hoare's garden in Stourhead from the 1760s to 1792. Magleby (2009) explains this example in detail in his study on the Turquerie movement. It is explained that the Turkish tents in eighteenth-century Britain were permanent structures designed to resemble portable Turkish tents, as in the case of the Stourhead Turkish Tent. This tent overlooked a lakeside garden and had a panoramic view. The garden pavilion type of Turkish tent is said to be a reference to Topkapi Palace and the nightly entertainments of Tulip Age Istanbul.

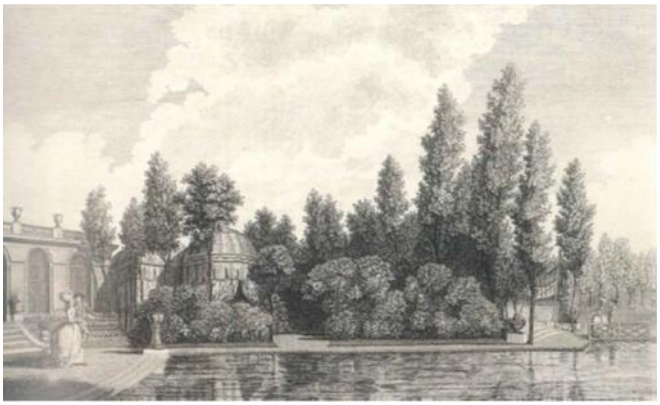


Figure 1. Turkish Pavilion in the garden (Paris,1779), engraving by Antoine-Victor-Germain Michault (Williams, 2015)Pavilions are a kind of garden pavilion element (Magleby, 2009, p.40). Magleby examines the Turqueire movement in detail as a landscape style. The landscape style was a garden style that can be characterized as "artificially created nature" or artificial copying of nature. Pavilions are hollow, sheltered semi-enclosed garden pavilions structured to shelter in nature, resting in the garden, and staying in the shade. It is stated that Turkish pavilions emphasized entertainment and the imaginary world. The common thoughts on this subject during the period are as follows: *"If it is possible to create a dreamland out of a landscaped garden, why not... It is this quest that gave birth to Turquerie"*. The image of the tent, which was imitated with paintings on copper coatings, actually increased the permanence of the Turkish pavilions. In this way, they took the form of semi-permanent structures in the landscape. It is reported that the Turqueire motifs in these structures generally include crescents, stars, crossed swords, four-panel curtain ties,

picturesque paintings, Istanbul paintings, floral fabrics, rosewater pitchers, color contrasts, stripes, embroidered stalactites, gooseneck wall arches, velvets, satins, embroidery, waxed canvases, cushions, flamboyant garden furniture, gilded paints, majestic domes, enamels, peyke tips, and headpieces decorated with sorghum (Williams, 2015). Garden areas or interiors arranged in the style of the Turkish pavilion are thought to indicate prestige, status, and wealth in this period. It is explained that this understanding continued to be influential in the West for long historical periods.



Figure 2. Room designed as a Turkish pavilion, left (Londra, 1826), Cabinet Maker's and Upsholster's Guide (Williams, 2015., s.202). Pavilion dome design, entrance stalactites and decorations used in Harry Potter and the Deathly Hallows Part 1, right (URL1)



Figure 3. Lady Sybil (Actress, Jessica Brown Findlay) and the Turkish Trousers, Downtown Abbey TV series, Season 1 Episode 4, ITV, United Kingdom (URL2, 3)

In the above fantasy movie Harry Potter and the Deathly Hallows Part 1, the designs make an analogy with the semiotic elements of the Turquerie movement (Figure 2). The pavilion here is set in a landscape area. The structure also bears traces of the bohemian style with its four-panel curtain decorations. In another example, there are direct references to the Turquiere movement in the clothes of the historical period series. The widespread fashion during this historical period, when Westerners were interested in Turkish clothing and

culture, is reflected in the dress codes of the series (Figure 3).Bahar Suzan Yolaç (2012), in her study on the Turquerie movement, investigates the Turquerie phenomenon in nineteenth-century America. By Turquerie, Yolaç refers to the adoption of elements of Turkish culture, especially in interior design. Instead of using a strict formal analysis to exemplify Turquerie, Yolaç relies on the periodicals and newspapers of the period to define the phenomenon and the archives they recorded about it. Within the framework of this study, Yolaç analyzes the characteristics of the Turquerie movement. Although various studies on Europe typically reduce the Turquerie movement to simple exoticism, Nebahat Avcıoğlu discusses such views in her Turquerie and the Politics of Representation (2011). Avcıoğlu argues that the movement, which was widely observed in Europe in the eighteenth century, came to America much later, especially in the late eighteenth century, because in the preceding years, America was busy establishing its national unity and cultural identity. After independence, America favored the neo-classical style, which best expressed the virtue and rationality of the new republic. In some sources, the Turquerie movement is described as an art and culture movement popular in Europe in the 18th century (Stein, 1997). In other studies, Turquerie is considered as an attempt to depict a certain style based on the phenomenon called Turkish style (Rininger, 2011). However, certain studies emphasize that Turquerie has become a complex term rather than a simple Turkish design style (Monson, 2021). According to these complex meanings, 'Turquerie was not a style; rather it was a theme that provoked a variety of responses in different places throughout the 18th century (Williams, 2014).



Figure 4. Woman in Turkish Dress Sitting on a Sofa, Jean Etienne Liotard, Switzerland 1751–52 (URL4).

By emphasizing France and the 18th century, he exemplifies the eclectic and interconnected nature of European responses to Turkish culture. Many of these elements gradually blurred

away from the Turquerie movement into a more homogeneous style of Orientalism. In this transformation, parrots, Chinese vases with porcelain bowls and Indian identities playing various musical instruments began to be incorporated into the movement. For this reason, it is not possible to trace the movement one-to-one. However, a semiotic analysis of this design concept can be presented by conducting archival research through art productions and written sources.



Figure 5. A hand fan from the Turquerie movement. Tophane Fountain in Istanbul, Europe, 19th century (URL5).

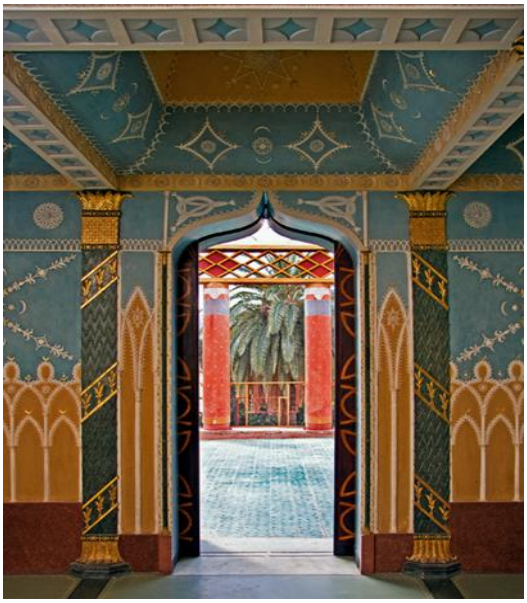


Figure 6. Turkish Hall, door to the courtyard, and Turquerie wall decorations in Villa Favorita, Palermo Italy (URL 6).

The influence of Turquerie has manifested itself in many branches of art and culture as well as landscape architecture. It was also seen in many branches of art and culture in Europe and reflected in different ways over time. This movement is an important cultural phenomenon that reflects Europe's curiosity and exoticized perception of the East (Tez, 2015). Historical information and indicative details reflecting this phenomenon continue in various art fields,

designs, and media sectors such as television and cinema. It is observed that these indicators refer to Turkish culture in areas where they are used stereotypically.

Among the elements of the Turquerie movement:

1. Turkish pavilions: The visual impact of Turkish tents and Turkish-influenced structures was an important element of 18th- and early 19th-century Western European gardens. Tents were probably chosen as a reference for Turkey, as the Turkish army was famous for its quality tents (Ruoff, 2011).

2. Buildings emulating Turkish culture and style (or Turkish architecture): Pavilions include "mosques" and pavilions. The Yıldız Palace (Istanbul), Dolmabahçe Palace (Istanbul), Schönbrunn Palace (Vienna), Çırağan Palace (Istanbul), Kuskovo Palace (Moscow) represent important buildings that demonstrate the influence of the Turquerie style on buildings and pavilions. These buildings combined the aesthetic and architectural elements of Anatolia with the rich architectural tradition of Europe to create a unique and eye-catching style



Figure 7. 20-meter-long Turkish three-pole tent from 1730, made of satin, cotton, and gilded leather. (URL 7)



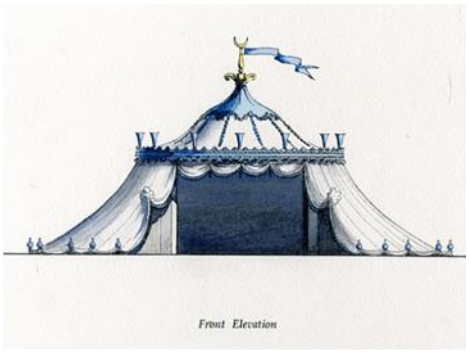


Figure 8. In striking contrast to the neoclassical style of the royal pavilion in Hagaparken Park are the Sultan's Copper Tents, designed by Louis Jean Desprez. It is reported to have been colored in the Turqueire painting style on copper sheets (URL 8, 9)

King Gustav III of Sweden commissioned Swedish architect Olof Tempelman to build a royal pavilion at Hagaparken in Stockholm. The Sultan's Copper Tents, designed by French painter Louis Jean Desprez between 1787 and 1790, are located in this park (Figure 8). This structure, which is said to have been originally built as a set of three buildings for the palace guards, stands out as a particularly prominent construction among the huge greenery of the Swedish park.

Decoratively painted, covered with copper plates, imitating the headquarters of a sultan, this painting can only be considered by the West as another adaptation of Turquerie. Similar to other aristocrats in Europe, Gustav was eager to embrace the wave of sophisticated and worldly Orientalist culture (to them, everything oriental) that elevated one's elite status in society.



Figure 9. England Surrey, Cobham, Painshill Park, Turkish tent, Henry Keene's design of the Turkish tent used when rebuilding Painshill (URL 10)

3. Turkish Architectural Style and Gardening: It was associated with the residences, palaces and extensive gardens of aristocrats and the wealthy in various parts of Europe. The influence of this style was especially visible in large cities and central locations where royal palaces were located.

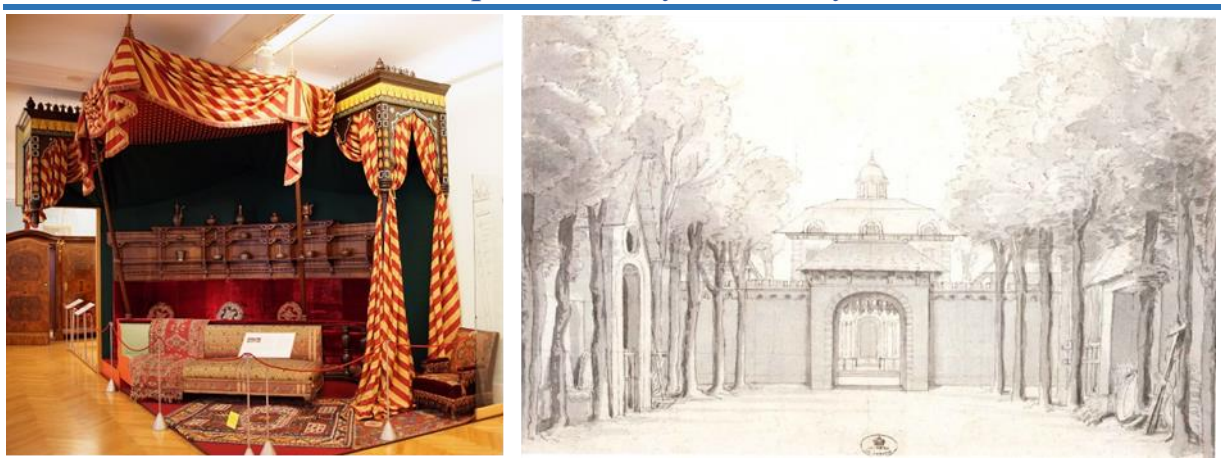


Figure 10. The study of Crown Prince Rudolf of Austria, decorated in Turquerie style in 1881, left (ULR 11). Palace Gardens, stage design for Acte turc, the fourth entry in Andre Campra's play L'Europe galante, Jean Berain, c. 1697, right (Williams, 2015)

4. The fashions of the period were fashionable, Princes used to organize Turkish masquerade balls and remained in vogue throughout the 18th century. Porcelain figurines in Turkish costumes were produced.

5. Turkish art and music: In 1782, Wolfgang Amadeus Mozart composed the opera "The Abduction from the Seraglio (German: Die Entführung aus dem Serail)" to depict several expressions of Turquerie in various cultural connections of the period. The opera's instrumentation is enriched with instruments essential to Turkish music.

6. Turkish cuisine, is included. These elements have found a place in European culture in general (Davies 2000; Findley 2005)

At the beginning of the 19th century, signs of the 18th-century European outlook reemerged, but it was a fad that gave way to other interpretations, such as Orientalism, that reflected the interests and attitudes of the new era.

2. CULTURAL STYLES AND TURQUERIE

Cultural styles used in landscape design include design elements specific to various cultures, periods, and geographical regions (Gülgün et al. 2007): Classic Garden design, which includes design elements inspired by the ancient Greek and Roman periods, adopts an approach where symmetry, proportion, and order are at the forefront. This style usually features smooth lawns, columns, sculptures, round pools, and geometric arrangements. Renaissance gardens, inspired by Renaissance Italian Garden design, this concept is characterized by symmetrical arrangements, terraced gardens, sculptures, fountains, and axes. Perspective landscapes and geometric arrangements play an important role. English garden style offers a natural and pastoral look. Chinese Garden: The Chinese Garden style

offers a scenic and symbolic view. This style often features asymmetrical arrangements, fountains, stone bridges, rock gardens, bonsai trees, and pagoda structures. Turkish garden style stands out as a reflection of Turkish culture and historical heritage. Water plays an important role in Turkish gardens. There are usually water elements such as ornamental pools, fountains, fountains, and water channels. These water elements both offer an aesthetic appearance and create a feeling of coolness and peace. Various plant species are usually used in Turkish gardens. Colorful flowers, vines, trees, and shrubs enrich the aesthetic appearance of the garden. In addition, fruit trees and green areas can often be found in gardens. Geometric arrangements are common in Turkish gardens. Rectangular, square, or symmetrical patterns are combined with various plant arrangements and paths. These arrangements give the garden a regular and balanced appearance. Turkish gardens usually have shades and seating areas. Wooden gazebos, pergolas, or sitting areas under tall trees provide a cool and relaxing environment. Stonework and decorations are often used in Turkish gardens. Stone walls, stone paths, mosaics, and various sculptures enrich the appearance of the garden. Detailed stonework can also be seen on garden gates and fountains. The Turkish Garden style has features that provide a natural and aesthetic appearance, as well as practicality and tranquility. These features reflect Turkish culture and lifestyle.

2.1. Cultural and Artistic Movements in Historical Landscape Designs

According to Landscape Architect Laurie Olin (2000), there is little that is natural in cultural landscapes, especially gardens, and parks, but some of the greatest artifacts of this kind elicit a response from those who experience the space from other perspectives that they appear 'natural'. In addition to these, *"Another aspect of landscape design is invention, that is, the creation of something new that did not exist before and that engages both our imagination and our senses. That such a composition does not necessarily look new or surprising is not the same as being unnatural or even reactionary".* Even though we rarely have the chance to spend time with nature nowadays, people need to hike, fish, and recreate in nature.

Landscape designs convey various messages to those who experience the space without the need to produce narrative-like words. One of the landscape applications where these messages are carried, or various cultures are introduced in the landscape is pavilions. Pavilions are the general name given to ornate structures built by architectural designers (Petschek and Gass, 2011). Pavilions, which are structured to create shade in landscape designs, to create social areas or to carry out various activities, have an important place in terms of Turkish culture (Redford, 2000).

Olin argues that the Turkish pavilions are a product of the exotic rush in Western culture (2000, p.292). Exotic pavilions provide a chance to get to know the culture they represent. In other words, it is understood that these structures are not only designed to please their owners and visitors but also to witness non-European traditions and their closeness to nature. In this context, pavilions can add aesthetic, dynamic, social, mobilizing, and colorful value to landscapes. In this context, leisure time spent in the pavilion can be a means of establishing a close relationship with nature, a means of socializing with people, and has effects that vary according to creative use.

Based on the archival research, the semiotic qualities representing the Turquerie movement are listed below. Accordingly, the semiotic characteristics of garden pavilions reflecting Turkish culture are listed as follows:

- Macro areas painted in mosaic style: These areas are more often found in garden pavilions than in pavilions. It refers to the copying of a mosaic pattern reminiscent of Turkish tiles. The name mosaic is given to all works composed of small inlaid pieces, whether they are made of stone, wood, ivory, enamel, or any other natural material. Part of the Topkapi Palace was paved with "fine marble in mosaic workmanship "12 and another account uses almost the same expression: "Iznik ceramics from the 17th century are called Iznik Çini in Turkish". Mosaic paintings reflect authentic Turkish culture and aesthetics. They are usually painted in blue and white colors.
- Large painted domes whose ceiling terminates at a point structured in the Turkish style: The exterior appearance of these domes is characterized by the painting of the building material, copper. The imitation of Turkish culture and aesthetics is noted.
- Flowers and sharp-edged leaves on the tiles: In addition to these, there are trees, cypresses *(Cupressus sp.)*, vines *(Vitis sp.)*, tulips *(Tulipa sp.)*, and carnations *(Dianthus caryophyllus).*
- Glyphs representing Turkish culture: crescent, stars, tulips.

The criteria and indicators described above point to the Turquiere movement in general. It is concluded that this historically outdated design approach has been replaced by the modern design and art practices of the Neo-Classical Turkish Republic.

2.2. Turkish Culture in Expo Pavilions

Expo is used to refer to international exhibitions organized on a significant scale around the world. These exhibitions are usually organized around a specific topic or theme and allow participating countries or companies to showcase their products, technologies,

culture, and innovations. Expos are usually planned and organized on a large scale. Expos are organized to promote the cultural, economic, and technological potential of a country or city, encourage international cooperation, and create new commercial opportunities. Expos host visitors from around the world and are usually open for several months (Pirli and Yazici, 2022). Participants can visit the stands of different countries, attend various events, watch cultural performances, and learn about new ideas. Garden shows are often a visual feast for the visitor. Garden exhibitions, which provide visitors with an opportunity to learn about the natural and cultural heritage of countries, are an important part of Expos. They help make Expo a global meeting place, allowing visitors to discover the diversity and richness of many countries (Tezcan and Polat, 2020). The most accurate source for understanding the place of Turkish pavilions in the modern sense is the Expos. Expos focusing on Turkish culture, history, and art can have elements of the Turquerie movement. Turkish culture can be promoted in Expo pavilions in various ways (Architectural design, traditional arts, and crafts, cultural performances, cuisine, and food culture etc.) These examples provide ideas on how different aspects of Turkish culture can be promoted in the pavilions of the Expo.

3. CONCLUSIONS AND SUGGESTIONS

Expos are defined as cultural sharing events. The history, culture, artistic and technological heritage of the countries participating in the Expos are exhibited. Thus, it provides opportunities for international cooperation. The Turquerie movement, which is the subject of the study, emerged in Europe in the 18th century. It depicts admiration for Turkish culture, art and lifestyle. This movement; has shown itself in many fields such as architecture, garden art, fashion, music, painting, and interior architecture. Thus, it influenced the aesthetic perception of Europe. Characteristic elements of Turkish architecture, such as domes, tiles, and geometric patterns, can be seen in the design of buildings in various cities of Europe.In terms of landscape architecture, the Turquerie movement introduces Anatolian Garden culture to Europe (such as water features in gardens, native plant species, garden architectural structures). As a result, the Turquerie movement is a period that reflects Europe's interest in the Turks in terms of historical design concepts. The Turquerie movement plays a role in the modern, cultural, and aesthetic evolution of the Expo.

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KENTLERİN OLUŞUM KURGULARININ OKUNABİLİRLİĞİNDE SUYUN ÖNEMİ: KIZILÇULLU SU KEMERLERİ

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ÖZET
Kentlerin tarihsel geçmişindeki ekonomik, sosyal, kültürel ve politik özellikleri yansıtan tarihi yapılar ve çevreler, ait oldukları medeniyetlerin simgesel değerlerini oluşturmaktadır. Bu değerler kentlerin oluşum kurgularında önemli bir yere sahiptir. Kentlerin oluşum kurgularına yönelik olarak suyun varlık konumları ise yapılı çevreler açısından referans ve odak alanlarına işaret etmektedir. Buna göre suyun varlık konumları, günümüz kentlerinin tarihsel bilgilerini, antropolojik anlamda topluluk yaşantıları ve coğrafik okunabilirliklerini sağlayarak insan ve doğa arasındaki köprüyü oluştururlar. Buna göre suyun varlık konumları insanların coğrafi bölgelere uyumunu kolaylaştırmıştır. Bu argümandan hareketle çalışmada ele alınan Kızılçullu Su Kemerleri, İzmir Kadifekale ve çevresindeki önemli su varlık konumunda bulunmaktadır. Buradaki su kemerleri, MÖ 133-MS 395 yıllarında, İmparator Agutus döneminde Romalılar tarafından kurulan ilk şehre, su taşımak amacı ile yaptırılmıştır. Kızılçullu Su Kemerleri aynı zamanda bir toplumun geçmişini günümüze aktarmada da önemli bir yere sahip olan ve simgesel özellik taşıyan tarihsel yapıdır.Çalışmada bu tarihsel yapı, "Kentlerin okunabilirliğini sağlayan özellikler, yapıların da okunabilirliğini sağlayabilirler" savından yola çıkılarak irdelenmektedir. Buna göre, çalışmadaki ana kurguyu oluşturan kent ve su unsurlarının önemi vurgulanarak Kızılçullu Su Kemerleri'nin ve çevresinin geçmişten günümüze değişimi üzerinde durulmaktadır. Bu hususta bahsi geçen tarihsel yapının; işlevsel dönüşümü, Kevin Lynch'in kent imgesi ögelerine bağlı olarak sorgulanmaktadır.
Anahtar kelimeler: Kent okunabilirliği, Suyun önemi, Kızılçullu Su Kemerleri, İzmir

THE IMPORTANCE OF WATER IN THE READABILITY OF CITIES' FORMATION DESCRIPTIONS: KIZILÇULLU AQUEDUCTS

ABSTRACT
Historical buildings and environments that reflect the economic, social, cultural, and political characteristics of the historical past of cities constitute the symbolic values of the civilizations to which they belong. These values have an important place in the formation of cities. The presence of water in terms of the formation of cities points to reference and focus areas in terms of built environments. Accordingly, the existence of water forms the bridge between humans and nature by providing historical information about today's cities, anthropological community lives, and geographical legibility. Accordingly, the availability of water has facilitated the adaptation of people to geographical regions. Based on this argument, Kızılçullu Aqueducts, which are discussed in the study, are important water resources in İzmir Kadifekale and its surroundings. The aqueducts here were built to carry water to the first city founded by the Romans between 133 BC and 395 AD, during the reign of Emperor Agutus. Kızılçullu Aqueducts are also a symbolic historical structure that has an important place in transferring the past of society to the present. In the study, this historical structure is examined based on the argument that "The features that ensure the readability of cities can also ensure the readability of buildings." Accordingly, the importance of the city and water elements that constitute the main fiction in the study is emphasized, and the change of Kızılçullu Aqueducts and its surroundings from past to present is emphasized. The historical structure mentioned in this regard; Its functional transformation is questioned depending on Kevin Lynch's urban image elements.
Keywords: Urban readability, Importance of water, Kızılçullu Aqueducts, İzmir

INTRODUCTION

The formation of cities has been an important evolutionary process in human history. Water is fundamental to building and sustaining cities. The establishment of the first civilizations near rivers, the increasing demand for water as a result of urbanization and population growth, and the construction of numerous water works around the world are indicators that the importance attached to water is not new. Water is critical to the environment and human life in urban areas. In this direction, people prefer settlements close to water resources. Cities develop around rivers, lakes and seas, and the resources provided by water *(such as drinking water, irrigation, fishing etc.)* support the growth of cities (Pirli and Gülgün, 2022). Istanbul has historically grown around waterways such as the Bosphorus and Golden Horn, relying on the transport and trade advantages offered by water.Cities as living spaces are ecosystems. They contain many natural and cultural elements and their interactions (Karadağ, 2009). Urban functions imply a different way of living and organizing space than rural (Özgür, 2024). The city has a specific population. It has a more complex structure than rural life. Güneş (2010), with reference to Hatt and Reiss, states the following; they mention that historically it is difficult to determine precisely when and how cities emerged and developed. The first reason for this difficulty is attributed to the fact that the information on ancient cities based on archaeological studies is largely incomplete (Oktay et al., 2015). The relationship between city and habitat is important for understanding the changes in the function of river corridors and the changes in rivers. In order to understand the changes in the use of river banks from the past to the present, it is necessary to carefully analyze the changes in the cities. It is an important cornerstone to realize that the city has a semantic context in addition to its functionality. Because spaces attract people not only visually or in terms of the functions they provide, but also in terms of the meaning they convey. Many factors (such as economic, social and cultural, demographic, environmental, infrastructure and transport, etc.) are effective in the formation of cities. These factors are important factors that shape the urbanization process and determine the physical, social, and economic structure of cities. Researching the historical adventures of cities means thinking about the present of cities by learning historical experiences. The emergence of cities, their characteristics as settlement types, the way they were governed, the evolution of planning and types of housing, etc., began to be passed on to new generations, and soon it was realized that the study of urban history was functional for today's generations, and such research began to spread.

The presence of water points to areas of reference and focus in terms of the built environment in terms of fictions of urban formation. Accordingly, the existence locations of water forms the bridge between humans and nature by providing historical information, anthropological community life, and geographical legibility of today's cities. This situation shows that the location of water assets facilitates the adaptation of people to geographical regions.



Figure 1. Parco degli acquedotti, Rome/Italy (URL1) – Roman aqueduct near Jericho (URL2)

Within the framework of this study, studies have been carried out on the introduction of factors influencing the formation of cities from the past to the present. Sources related to the Kızılçullu aqueducts in İzmir province, which are the material of the study, were scanned and water structures in cities were analyzed. The contributions of these buildings to the development and design of the city are explained. The impact of the historic building on the urban design was read in terms of Lynch's urban design elements.

2. FORMATION FICTIONS OF CITIES AND KEVIN LYNCH

Cities have been created and developed as a result of many factors interacting in the historical process. The complexity and interaction of these factors have enabled each city to have a distinct identity and contributed to the cities becoming important centers throughout history. The fact that there are no or very few obstacles on the surface of the land significantly increases the possibilities of shaping it during city building. A city built on a plain has more opportunities for growth than others. People living in such cities cannot feel and see the character and general form of the city (Bayhan, 1969). According to Tekkanat and Turkmen (2018); in cities built on sloping terrain, roads cannot be constructed as easily as in a plain city. The positioning of elements such as buildings, squares, and roads are determined according to the degree and direction of slope. In the periods when the idea of defense was at the forefront, some cities were built on hills. The hill settlements generally start from the top and develop downwards to encircle the hill. However, according to the

sunshine, wind, and preferred view, suitable parts of the slopes show more development and density. The cities built in the valleys generally form masses on the routes of intercity transport routes. The main axis dividing the city is the same transport road. As the valley is narrow, the city spreads along the length of the valley and partly rises towards the slopes of the hills, forming a concave cross-section. When a river or stream passes through the valleys, the valley can divide the city into two parts. The valley settlement is under the influence of the sunbathing opportunities determined by the nearby high hills. For this reason, some settlements in small and narrow valleys develop towards the slopes to get rid of the shadow of the hills and to have a view overlooking the valley. Waterfront cities can be built on a variety of topographies, including flat land, hills and valleys. However, the common feature in all of them is that the facade of the settlement faces the water, that is, it faces the water surface. The slope of the surface of the city, which descends towards the water, is a situation that increases the visibility of the buildings. It is seen that many physical factors significantly affect the urban form, but when it comes to the city; searching for the counterpart of the urban form means not only tracing a physical manifestation but also analyzing and understanding the chain of events and historical fiction that create this physicality.

Environmental factors affecting the formation of cities (Kurt, 2020):

1. Topography and Geographical Location:

- Topography *(landforms)* is important in the formation of cities. Mountains, valleys, plains, and coasts affect the formation of cities.
- Geographical location determines the city's climate, water resources, and transport facilities.

2. Climate and Weather Conditions:

- The climate is effective in the formation of cities. Weather conditions such as temperature, precipitation, and wind affect the quality of life in cities.
- Water resources are important in the formation of cities. Cities develop around rivers, lakes, seas, and cities.

3. Natural Resources and Green Spaces:

- Forests, parks, gardens and green areas improve the environmental quality of cities.
- Water corridors are effective in the formation of cities. Riverbanks, ponds, and coastal areas increase the attractiveness of cities.

4. Pollution Sources:

- Factors such as industrial zones, traffic, and energy production negatively affect the environmental quality of cities.
- Factors such as air pollution and water pollution reduce the quality of life in cities.

2.1. Readability of Cities and Kevin Lynch

Urban planner Kevin Lynch (1965), in his book "Image of the City", evaluates urban image elements under five headings: *paths, edges, districts, nodes, and landmarks.* Lynch focussed on the physical relationships within the city and presented the spatial determinants of the urban image as elements (Eraydın, 2016). According to Lynch, the perceptibility of these five elements individually and their ability to form a whole with the way they come together are important elements for the healthy execution of a strong urban image and thus the psychological relationship between humans and the environment. The definitions of these concepts analyzed in terms of the city are as follows (Şahin Körmeçli and Seçkin Gündoğan, 2022):

1. Paths: Streets, pedestrian roads, public transport areas, canals, and railways constitute roads from urban images. People can understand the elements with historical features by moving on the roads. Roads form the texture of the city in the image of the person. Physical characteristics of roads such as their width, paving material, and slope are among the elements that enable people to move fast. The roads forming the street texture are among the factors affecting the use of space and accessibility.
2. Edges: Shores are elements such as the boundaries of the territory, building facades, walls. Edges function as boundaries between two regions (Lynch, 2010). When there is no vehicle and pedestrian traffic on the streets, individuals focus on building facades, so the architectural forms, features, details, and design of buildings gain importance by creating an edge (Lynch, 2010; Çelikyay, 2017). In addition to building facades, roads, water elements, and walls, different plant species arranged on the roadside also create a sense of space and show an edge feature (Çelikyay, 2017).
3. Districts: Small or large parts of the city which have a character differentiated from its surroundings. It forms larger parts of the city compared to other image elements (Lynch, 2010). These are the areas that constitute medium or large-scale parts of the city and are felt to be entered into. Regions are perceived as two-dimensional spaces. For this reason, a city is seen as synonymous with the neighborhood or district in which it is located (Hofmann, 2012; Öğçe, 2020).

4. Nodes: These are important points differentiated in the urban space. These can be gathering areas where uses are concentrated, intersections, small squares, transport hubs, or city centers, which are defined as the transition points of the city.

5. Landmarks: These are the differentiating elements in the urban space. They are elements that can be seen and symbolized from a distance such as buildings, signposts, trees, equipment, or hills that are accepted as reference points. These landmarks, which reflect the historical urban texture and are inherited from the past to the present, are important for the protection of urban identity.

By creating a readable mental map, the urban image gives people a sense of emotional security and makes the urban experience more meaningful (Lynch, 2015). The readability and shaping of the city in the mind depends on the establishment of a network of relationships between the components of the city image (Şahin Körmeçli and Seçkin Gündoğan, 2022). According to Lynch (1960), legibility is the condition that parts of the city will be recognized through the city itself and that they will be organized in a coherent texture. If the city can be legible, it can be visually grasped by creating a texture with identifiable symbols. Thus, a legible city will be an area whose regions, borders, and roads can be easily distinguished and grouped in a large-scale texture (Lynch, 1960). After Lynch, other researchers have attempted to develop these concepts, proposing a more generalized view of urban elements as points, lines, areas, and surfaces (Montello, 2018; Kaya and Akdemir, 2021).

Environmental information coding stored in the mind is usually through urban images; buildings, streets, sculptures, fountains, parks, topographic natural data, etc. (Öztürk, 2016). Studies on the evaluation of urban images guide planning and design actions by different professional disciplines. In addition to having an image value, historical environments also attract attention with the materials used in their construction and meticulous workmanship (Ahunbay, 2017; Öğçe 2020).

2.2. Water-Related Structures in Cities

There are important examples of water structures, the first important examples of which were encountered in 3000 BC, especially in Anatolia, which has hosted many civilizations (Güngör, 2021). Dams from the Hittite Period, dams, canals, and cisterns from the Urartu Period in Eastern Anatolia, dams from the Hellenistic, Roman, and Early Byzantine Periods in Western and Southern Anatolia, waterways and aqueducts built to bring water from long distances, open and closed cisterns, dams from the Seljuk and Ottoman Periods, waterways and aqueducts from this period have made Türkiye an important open-space museum in

terms of water structures (Öziş, 2008; Güngör, 2021). Structures related to water in cities are as follows; canals, aqueducts, pools, cisterns, fountains/public fountain, shadirvans, hammams…Firstly, canals were constructed to utilize water more efficiently in cultivated lands. By 2750 BC, terracotta pipes and masonry galleries were used to bring clean water and remove dirty water. In the following years, different civilizations built many dams and waterways. These structures were built with regular filling stones without mortar. The development of water structures was generally limited to waterways, canals, and dams until the Roman Period. In the Roman period, the construction of waterways accelerated with the developing construction techniques aqueducts were built to bring water from long distances and cisterns were built to store water. Sebils are structures built to distribute water for the free use of those who are outside. In addition, water scales and maxims were also started to be used as auxiliary water structures in the transmission of water. The first bath structures are also found in the Roman period (Güngör, 2021). Hammams are structural spaces built for bathing people by heating water. (Ertuğrul, 2009). Cisterns built to accumulate groundwater and rainwater were used for drinking water supply or irrigation in agriculture. With the transition to settled life, cisterns, which were started to be built for irrigation of fertile lands far from natural water resources, were also used to accumulate drinking water with the increase in population. The most monumental examples of cisterns built in various shapes and sizes since ancient times are found in the Roman and Byzantine periods. These open or closed water tanks were used for storing and resting the water brought by waterways and arches (Güngör, 2021).



Figure 2. The Basilica Cistern Museum – Yerebatan Sarnıcı, Istanbul/Türkiye (URL 4)

In Antiquity, various systems were tried for the transmission of water when the water sources were far from the cities. These are open canals, canals, and tunnels carved into rock slopes and covered over, pipes made of various materials (Yaprak, 2009). Waterways and aqueducts; in the ancient period, which are transported and transmitted by very modern methods today, are transmitted to settlements by the creation of various systems such as open

channels, closed channels, channels, and tunnels carved into rock slopes and covered with tunnels and pipes made of various materials (Ürer, 2013). In other words, aqueducts are stone structures that allow water to be transported between two highlands (Figure 3).

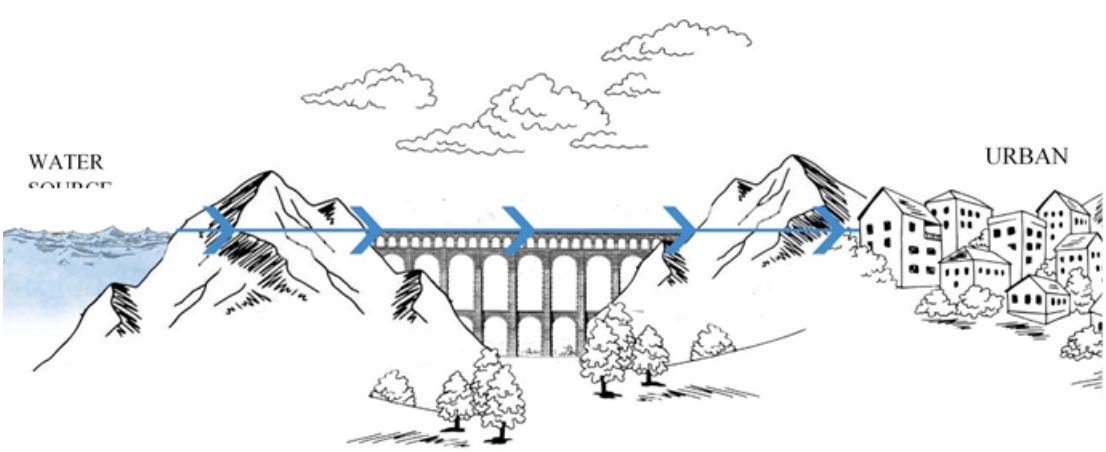


Figure 3. Principle of operation of aqueducts – illustrations are arranged (URL 4)

It is thought that the waters transmitted to the settlements with various systems in the ancient period overcame the valleys by creating two different systems. In the aqueduct transportation system, it is generally aimed to be transported to the desired area by laying water pipes on the arches (Ürer, 2013).



Figure 4. Aqueduct of Valens – Bozdoğan Kemeri, Fatih/Istanbul, Türkiye (URL 4)

It is known that four waterways delivered water to Smyrna (name of old Izmir). The first of these is the Akpinar Waterway, which has taken its place near the ancient city. During the reign of Emperor Titus, when M. Ulpius Traianus, father of the future Emperor Traianus, was Governor of Asia, an aqueduct was built in 79-80 AD, reaching the Temple of Zeus Akraios. (Ersoy, 2015). Aqueducts have documentary features both in terms of their architectural design and as an indicator of the investments made to meet the water needs of a city (Yetkin ve Yılmaz 2023).

3. THE CHANGING STRUCTURE OF IZMIR CITY HISTORY AND KIZILÇULLU AQUEDUCTS

İzmir, where different ethnic groups have lived together throughout history, has a rich architectural heritage with traditional residences, commercial buildings, historical and religious buildings, as well as water structures. Due to its geographical location and environmental factors, it has been a special meeting point between European and Asian cultures. It is known that the city, which was founded in 300 BC in Kadifekale (Mount Pagos), used the seashore as a harbor. Founded between Kadifekale and the inner harbor at the end of the 4th century BC - beginning of the 3rd century BC (Hellenistic Period) and inhabited uninterruptedly until today, İzmir still preserves the traces of the Hellenistic, Roman, Byzantine, Principalities and Ottoman periods respectively (Alatepeli, 2022).

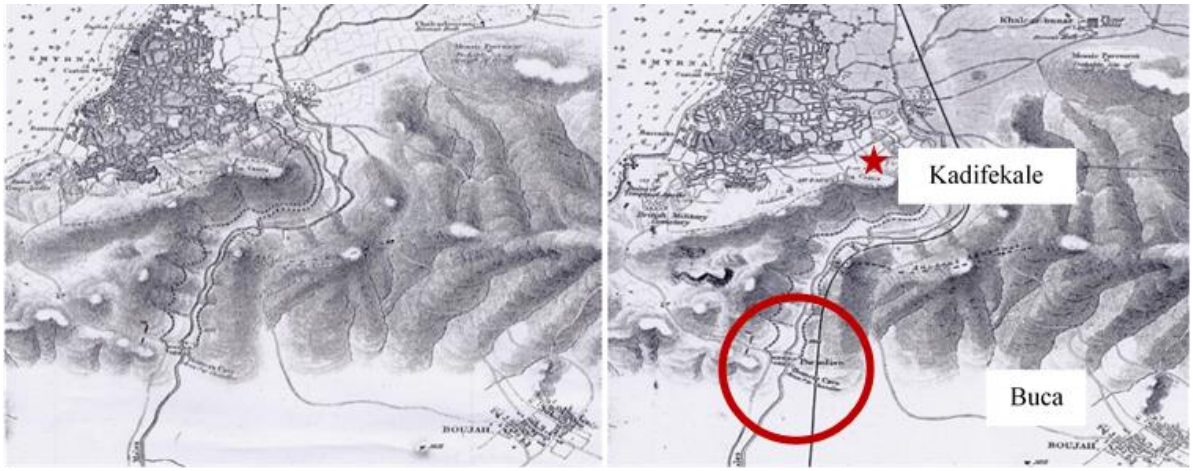


Figure 5. 1834 nautical map of Izmir Port and its surroundings drawn by Captain Richard Copland and 1860 map showing the Izmir-Aydın railway line and the Yeşildere Valley (Izmir Metropolitan Municipality, 2020)



Figure 6. Kızılçullu Aqueducts covered in the study (Google Earth)

Kızılçullu Aqueducts (also known as Paradiso), one of the most important water structures of İzmir, is one of the important engineering structures of its period. It is one of the rare surviving examples of a water system built to meet the city's need for clean drinking water.

It was built by the Romans to carry water to the first city established in and around Izmir Kadifekale (Buca Municipality, 2024).

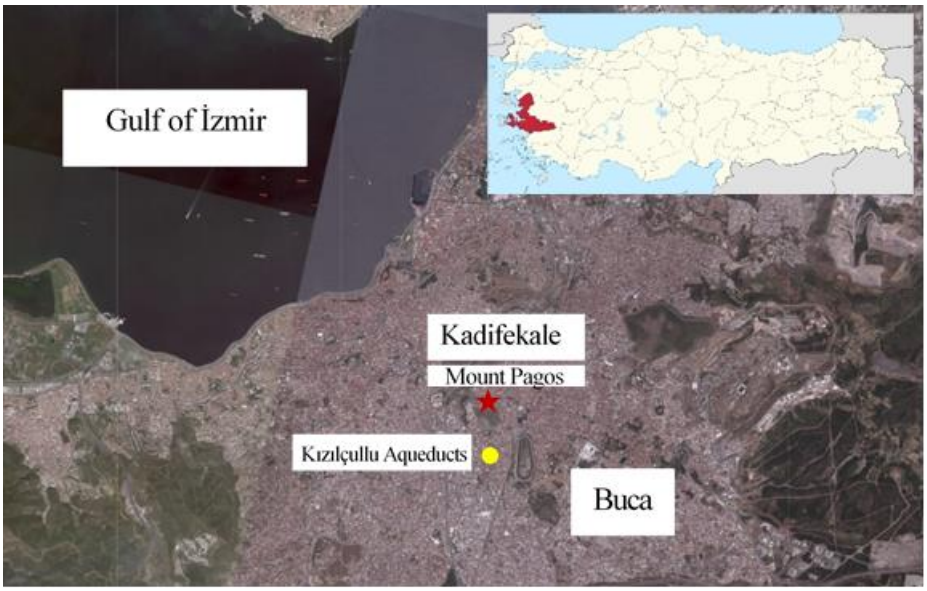


Figure 7. Kızılçullu Aqueducts today

It is stated that these arches conveyed the water coming from the large and small springs in the south of Buca, and that the arches located in the Yeşildere Valley, at the foot of Pagos (Kadifekale) mountain were built to regulate the flow of water coming to the city (URL 5).



Figure 8. Panoramic photo of Kızılçullu Aqueducts

There are two Roman period inscriptions on the subject. In the first one, dated 79-80 AD, Mulpius Trianus, who served as the governor of the period, writes that these arches were built to bring water to the temple of Zeus Akraios on the mill hill. In the inscription dated 1010-1011 AD: Baebius Tulus repaired the aqueducts. Based on the dates of these inscriptions, it is stated that Kızılçullu Aqueducts, which crossed the Kemer Stream and delivered water to Değirmentepe and distributed it to the city of that period, were built in the Early Roman period. It was used for many years after undergoing various repairs. (URL 5).In the past, only a few thousand people could live within the walls of the city of Izmir. For this reason, a new and large city was founded at the foot of Kadifekale around 300 BC at the latest (URL 9). The water brought by aqueducts from different water sources to the

city, which developed around the Meles Stream, is collected in the cistern inside Kadifekale and distributed from there (Figure 9). With a water storage capacity of up to 2650 cubic meters, the cistern can meet the water needs of approximately 15,000 people. Carried by 20 elephant legs, it has an arched and cruciform superstructure. A passage with a staircase was built on the north wall to allow entry and exit for reasons such as cleaning and repair. The cistern has attracted the attention of travelers throughout history with its ancient water engineering and architecture: Kâtip Çelebi wrote, *"The old castle has a cistern with 40 pillars and underground"*, while Robert De Dreux, a Frenchman who visited Izmir in the same century, wrote, *"I saw a very beautiful cistern here. The cistern is built on vaults just like churches"*. The 18th-century traveler and archaeologist Richard Chandler wrote, *"There is a large cistern, the roof is arched and should be supported by buttresses"* (URL 4). The cistern, whose ruins are found today, has a rectangular plan and was built with rubble stone and brick. The plan has 7x6 rows of columns and the square columns are joined by a round arch above (Yaprak, 2009).



Figure 9. Cisterns of Kadifekale (URL 8)

It is known that places and people in cities affect each other in various ways. This interaction may sometimes vary depending on natural conditions, on time (both in terms of period and process), and sometimes on administrative practices.

4. CONCLUSION AND SUGGESTIONS

As historical buildings carry the culture of nations from the past to the present, they are cultural assets that shed light, guide, and pride for future generations. These artifacts are concrete monumental resources that come to the fore to learn about the lifestyle, culture, traditions, beliefs, understanding of art, aesthetic taste, and the level of civilization reached by civilizations. For the continuity of culture, these monuments should be meticulously preserved and passed on to future generations. This study emphasizes the contribution of Kızılçullu Aqueducts as a historical monument in İzmir to the development of the city with its historical, architectural, and structural features and functionality. Lynch defines three

formal components (identity, structure, and meaning) for the sense of perception of an environment. In this context, to read the founding period of the city, environmental and time-dependent requirements are specified; these elements are identity, structure, meaning, harmony, transparency, and legibility.Water structures in cities have an important place in Turkish culture and social life. Kızılçullu aqueducts, which are considered the study area, can be considered paths and landmarks in Lynch's urban image elements. Although the city developed near the valley where the water is located, the historical elements (İzmir developed around Kadifekale) supported the development of the city. With technological developments, the aforementioned water structures, which lost their function with the transportation of water to the houses, started to lose their importance. One of the most important steps in the preservation of water structures, which have an important place in our architectural heritage, is accurate and comprehensive documentation.

The information that emerges from research linking the past and present contributes to understanding urban memory and interpreting its future. The meanings associated with the built environment affect social values and social life in relation to the history and identity of the city. The state of the existing urban images that constitute the physical infrastructure of the area will guide the planning and design works to be produced in the future. In this direction, a strong and good city image strengthens the sense of belonging and psychological satisfaction within the urban environment.Ensuring the continuity of water structures, which represent water culture and have problems today, and transferring them to the future as an architectural heritage will be an important contribution in this sense. Measures should be taken for the protection of water structures, which are important architectural elements of the historical city center, in order to extend their lifespan. Viewpoints and observation terraces can be proposed to present the aqueduct as a historical monument and emphasize it as a landmark in the city silhouette.

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TÜRKİYE VE SİNGAPUR'DA İNGİLİZCE ÖĞRETMENİ YETİŞTİRME VE ATAMA SİSTEMLERİNİN KARŞILAŞTIRILMASI

Faik KUMBARACI

Bünyamin AĞALDAY

ÖZET

Bu çalışmanın amacı, Türkiye ve Singapur'da İngilizce öğretmeni yetiştirme ve [12]atama süreçlerinin karşılaştırılmasıdır. İngilizce öğretmeni yetiştirme konusunda iki ülkenin benzerlikleri ve farklılıkları ortaya konacaktır. Araştırmanın yöntemi olarak nitel yaklaşım ve doküman analizi deseni benimsenmiştir. Bu bağlamda konuya ilişkin makaleler, tezler, dergiler, kitaplar ve ülkelerin eğitim bakanlıklarının web sayfalarında bulunan dokümanlar, veri toplama araçları olarak ele alınmıştır. Yapılan çalışma sonucunda Türkiye ve Singapur'da İngilizce öğretmeni yetiştirme ve istihdam süreci arasında benzerlikler ve farklılıklar olduğu saptanmıştır. Türkiye'de İngilizce öğretmenliği yapabilmek için üniversitelerin İngilizce Öğretmenliği bölümlerinden mezun olmak gerekmektedir. Buna ek olarak İngiliz Dili ve Edebiyatı, Mütercim-Tercümanlık, Amerikan Kültür ve Edebiyatı vb. bölümlerden mezun olan öğrenciler pedagojik formasyon sertifika programına katılarak öğretmenlik yapabilmektedir. Gerekli şartları sağlayan öğretmen adayları sırasıyla Kamu Personeli Seçme Sınavı'na, Eğitim Bilimleri Sınavı'na ve Öğretmenlik Alan Bilgisi Testi'ne katılım sağlamak zorundadır. Sınavda başarı sağlayan adaylar mülakata girmeye hak kazanır. Mülakat sonrasında öğretmen adayları Milli Eğitim Bakanlığı tarafından belirlenen kontenjanlara başarı sırası gözetilerek istihdam edilir. İngilizce öğretmenliği kadrolarında açık olması durumunda milli eğitim müdürlükleri İngilizce öğretmenliği yapmak üzere ücretli öğretmen görevlendirebilmektedir. Singapur'da ilkokul seviyesinde İngilizce öğretmenliği yapabilmek için herhangi bir bölümden diploma ve ilgili dilde iyi bir yeterlilik gerekmektedir. Ortaokul kademesinde İngilizce öğretmenliği yapabilmek içinse İngilizce, Dil Bilim, Hukuk vb. bölümlerden mezun olunması gerekmektedir. Gerekli şartları sağlayanlar giriş yeterlilik sınavında başarılı olduktan sonra zorunlu sözleşmeli öğretmenlik stajına katılma hakkı elde etmektedir. Sözleşmeli öğretmenlik stajını başarıyla tamamlayan öğretmenler ulusal eğitim enstitüsüne kaydedilmektedir ve "Lisansüstü Eğitim Diploması (PGDE)" adı verilen tam zamanlı bir programa dahil edilmektedir. Yapılan çalışmanın, İngilizce öğretmeni yetiştirilmesi ve ataması konusunda yeni çalışmalara ışık tutacağı öngörülmektedir.

Anahtar Kelimeler: Türkiye, Singapur, İngilizce Öğretmeni, Yetiştirme, Atama.

GİRİŞ

Günümüzde İngilizce evrensel iletişimde ortak dil olarak kabul görmektedir (Kasap, 2019). Gedikoğlu (2005) bilgi toplumunun günümüzdeki dilinin İngilizce olduğunu belirtmiştir. Eğitimden ekonomiye, sağlıktan hizmet sektörüne, teknolojiden turizme, hemen hemen her alanda İngilizce bilmenin fark yarattığı bilinmektedir. Bir başka çalışmada Koru ve Akesson (2011) günümüzde İngilizce bilmenin bilgisayar kullanmak kadar temel bir gereklilik haline geldiğini vurgulamıştır. Bu durum İngilizce öğretiminin önemini vurgulamaktadır. İngilizce öğretmeni yetiştirme programları ve İngilizce öğretmeni istihdamı İngilizce öğretiminde rol oynayan faktörler arasında sayılabilir. Bu durum, bahsi geçen konular üzerinde çalışmalar yapılması gerektiğini göstermektedir.PISA sınavı, öğrencilerin okulda öğrendikleri bilgileri gerçek hayata uyarlama becerilerini ölçmektedir (MEB, 2020). 2022 PISA sonuçları incelendiğinde Singapur'un seksen altı ülke arasından birinci sırada yer aldığı görülmektedir (OECD, 2024). Türkiye ise bu sınavda seksen altı ülke arasından otuz altıncı sırada yer almaktadır. Bu bağlamda, aradaki farkın sebeplerinin araştırılması, Türkiye'de olası eğitim problemlerinin önüne geçilmesine katkıda bulunacaktır.

Singapur'un, uluslararası öğrenci değerlendirme sınavı olan PISA'daki başarısı dikkatleri Singapur eğitim sistemi üzerine çekmiştir. Eğitim politikalarının sonuçları hakkında bilgi sunan PISA, Singapur eğitim sistemine yönelik tüm dünyada merak uyandırmıştır (Levent & Yazıcı, 2014). Singapur'un PISA sınavındaki başarısı göz önüne alınarak Singapur eğitim sistemi incelenmek üzere tercih edilmiştir.

AMAÇ

Bu çalışmanın amacı Türkiye ve Singapur'da İngilizce öğretmeni yetiştirme ve atama sistemlerinin karşılaştırılmasıdır. İngilizce öğretmeni yetiştirme konusunda iki ülkenin benzerliklerinin ve farklılıklarının ortaya konması hedeflenmektedir. Bu bağlamda aşağıdaki sorulara cevap aranmaktadır:

1. Türkiye'de uygulanan İngilizce öğretmeni yetiştirme sistemi nasıldır?
2. Türkiye'de uygulanan İngilizce öğretmeni atama sistemi nasıldır?
3. Singapur'da uygulanan İngilizce öğretmeni yetiştirme sistemi nasıldır?
4. Singapur'da uygulanan İngilizce öğretmeni atama sistemi nasıldır?
5. Türkiye ve Singapur'da uygulanan öğretmen yetiştirme ve atama sistemleri arasında benzerlikler ve farklılıklar nelerdir?

KURAMSAL ÇERÇEVE

Türkiye'de öğretmen yetiştirme süreci lisans eğitimi ile sağlanmaktadır. Bu nedenle öğretmen yetiştirme sürecinden Yükseköğretim Kurumu sorumludur. Öğretmen olmak

isteyen öğrenciler üniversite sınavının ilk kademesi olan Temel Yeterlilik Testi(TYT)'ne katılırlar. Ardından seçecekleri branşa göre üniversite sınavının ikinci kademesi olan Alan Yeterlilik Testi(AYT)'ne katılırlar. Örneğin İngilizce öğretmeni olmak isteyen bir öğrenci İngilizce Alan Yeterlilik Testi'ne katılım sağlar. Merkezi iki sınava(TYT, AYT) ek olarak bazı branşlar (Beden Eğitimi, Müzik, Resim) için üniversiteler kendi bünyelerinde yetenek sınavı gerçekleştirmektedir. Sınavlarda başarılı olan öğrenciler eğitim fakültelerinde yer alan öğretmenlik bölümlerinde lisans eğitimlerine başlamaktadır.İngilizce Öğretmenliği bölümünde, eğitim bilimleri ve öğretmenlik alan bilgisi derslerinin yanı sıra seçmeli dersleri de içeren ortak bir müfredat uygulanmaktadır. Üniversite derslerine ek olarak son sınıf öğrencilerine gerçek yaşam tecrübesi oluşturmak üzere "öğretmenlik uygulaması" adı altında staj dersleri verilmektedir. Bu dersle birlikte öğretmen adayları okullarda görev alarak tecrübe kazanmaktadır. Bunun yanı sıra Eğitim Fakültesi mezunu olmayan öğrenciler de pedagojik formasyon alıp öğretmen olabilmektedir. İngiliz Dili ve Edebiyatı, Mütercim-Tercümanlık, Amerikan Kültür ve Edebiyatı vb. bölümlerinden mezun olan öğrencilerin eğitim fakültelerinden alınan pedagojik formasyon eğitimi sertifika programı ile birlikte öğretmenlik yapabildiği bilinmektedir. Türkiye'de öğretmen ataması, öğretmen adaylarının Kamu Personel Seçme Sınavı(KPSS)'na katılması ile gerçekleştirilmektedir. Öğretmen adayları KPSS'ye ek olarak Eğitim Bilimleri Sınavı ve Öğretmenlik Alan Bilgisi Testi'ne katılmak zorundadır. Bu sınavlardan 60 puan ve üzeri alan katılımcılar mülakata girmeye hak kazanır. Mülakat sonuçlarının açıklanmasından sonra öğretmen adayları, Milli Eğitim Bakanlığı tarafından açıklanan kontenjanlara başarı sıralamasına göre yerleştirilir. Boş kalan kontenjanlara norm fazlası öğretmenler Milli Eğitim Müdürlükleri tarafından görevlendirilir. Görevlendirme için yeterli personel olmaması durumunda bu kontenjanlara ücretli öğretmen alımları gerçekleştirilmektedir.

Bu bağlamda Türkiye'de İngilizce Öğretmenliği bölümü müfredatı araştırma kapsamına dahil edilmelidir. Türkiye'de İngilizce Öğretmenliği lisans programının içeriği aşağıdaki tabloda sunulmuştur:

Tablo 1. Türkiye'de İngilizce Öğretmenliği Bölümü Lisans Programı Müfredatı (YÖK, 2018)

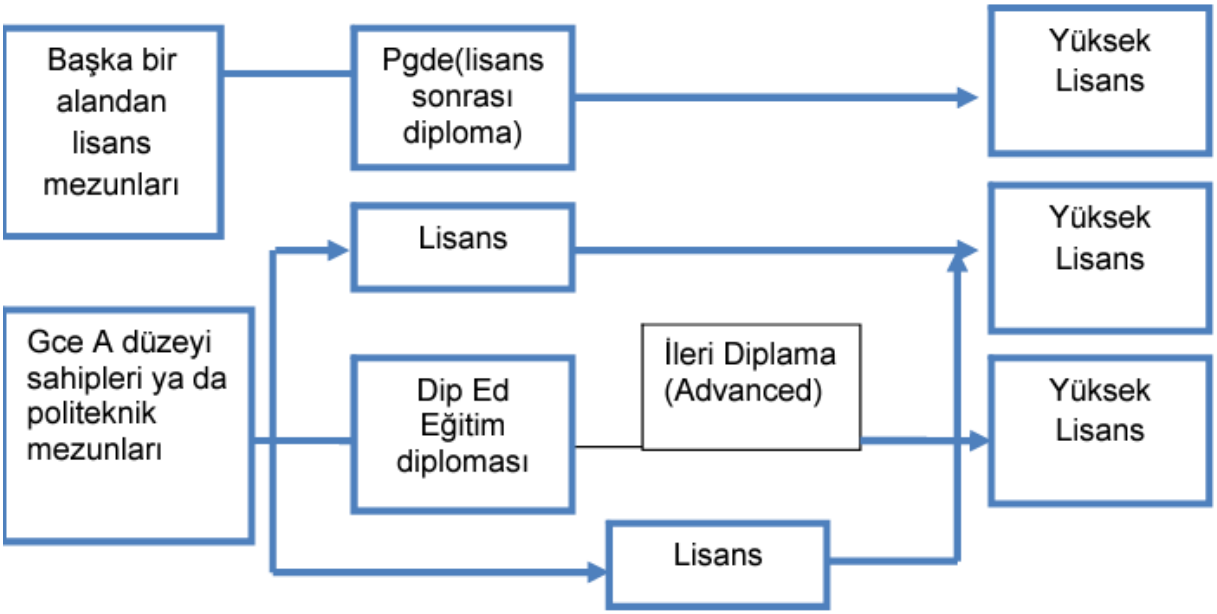
	1.Yarıyıl	**2.Yarıyıl**	**3.Yarıyıl**	**4.Yarıyıl**
1. ve 2. Sene	Eğitime Giriş	Eğitim Psikolojisi	Öğretim Teknolojileri	Türk Eğitim Tarifi
	Eğitim Sosyolojisi	Eğitim Felsefesi	Öğretim İlke ve Yöntemleri	Eğitimde Araştırma Yöntemleri
	Atatürk İlkeleri ve İnkılap Tarihi	Atatürk İlkeleri ve İnkılap Tarihi	Seçmeli 1	Seçmeli 2

3. ve 4. Sene	Yabancıl Dil 1	Yabancı Dil 2	Seçmeli 1	Seçmeli 2
	Türk Dili 1	Türk Dili 2	Seçmeli 1	Seçmeli 2
	Bilişim Teknolojileri	Okuma Becerileri 2	İngilizce Öğrenme ve Öğretim Yaklaşımları	İngilizce Öğretim Programları
	Okuma Becerileri 1	Yazma Becerileri 2	İngiliz Edebiyatı 1	İngiliz Edebiyatı 2
	Yazma Becerileri 1	Dinleme ve Sesletim 2	Dilbilimi 1	Dilbilimi 2
	Dinleme ve Sesletim 1	Sözlü İletişim Becerileri 2	Eleştirel Okuma ve Yazma	Dil Edinimi
	Sözlü İletişim Becerileri	İngilizcenin Yapısı		
	5.Yarıyıl	**6.Yarıyıl**	**7.Yarıyıl**	**8.Yarıyıl**
	Sınıf Yönetimi	Eğitimde Ölçme ve Değerlendirme	Öğretmenlik Uygulaması 1	Öğretmenlik Uygulaması 2
	Eğitimde Ahlak ve Etik	Türk Eğitim Sistemi ve Okul Yönetimi	Özel Eğitim ve Kaynaştırma	Okullarda Rehberlik
	Seçmeli 3	Seçmeli 4	Seçmeli5	Seçmeli 6
	Seçmeli 3	Seçmeli 4	Topluma Hizmet Uygulamaları	Seçmeli 6
	Seçmeli 3	Seçmeli 4	Seçmeli 5	İngilizce Öğretiminde Sınav Hazırlama
	Çocuklara Yabancı Dil Öğretimi 1	Çocuklara Yabancı Dil Öğretimi 2	İngilizce Öğretiminde Ders İçeriği Geliştirme	
	İngilizce Dil Becerilerinin Öğretimi 1	İngilizce Dil Becerilerinin Öğretimi 2	Çeviri	
	Dil ve Edebiyat Öğretimi 1	Dil ve Edebiyat Öğretimi 2		

Tablo 1'de görüldüğü üzere İngilizce Öğretmenliği bölümü müfredatında 16 Meslek Bilgisi dersi, 12 Genel Kültür dersi ve 32 Alan Eğitimi dersi bulunmaktadır.

Singapur'da ise öğretmen yetiştirme süreci Nanyang Teknoloji Üniversitesi'nde bulunan ve özerk bir enstitü olan Ulusal Eğitim Enstitüsü'nün sorumluluğundadır. Singapur'da öğretmen olmanın adımları Aksoy (2013) tarafından tablo haline getirilmiştir:

Tablo 2. Singapur'da Uygulanan Öğretmen Eğitimi Modeli (Aksoy, 2013)



Tablo 2'de görüldüğü üzere olan GCE-A (General Certificate of Education Advanced Level) sahibi adaylar 4 yıllık lisans programına alternatif olarak 2 yıllık Dip Ed (Eğitim Diploması) programı ile de öğretmen olabilmektedir. Buna ek olarak başka bir alandan lisans diploması sahip adaylar Dip Ed'e alternatif olan 1 yıllık PGDE (Lisansüstü Eğitim Diploması) programı ile öğretmen olabilmektedir. Singapur'da İngilizce Öğretmeni atama sürecinde öğretmen adayları konuşma ve yazma sınavı içeren giriş yeterlilik sınavına tabi tutulurlar. Giriş yeterlilik sınavında başarılı olan adaylar mülakata girmeye hak kazanır. Uygulanan mülakatta olumlu sonuç alan adayalar 1 yıl boyunca uzman rehberliğinde sözleşmeli öğretmenlik yapmaktadırlar.

Türkiye ve Singapur'da öğretmen meslek bilgisi dersleri ise aşağıdaki tabloda sunulmaktadır:

Tablo 3. Türkiye ve Singapur'un Zorunlu Öğretmenlik Meslek Bilgisi Derslerinin Karşılaştırılması (Yazçayır & Yıldırım, 2021)

Türkiye Zorunlu ÖMB Dersleri	**Singapur Zorunlu ÖMB Dersleri**
Türkiye'de ÖYP arasında ÖMB derslerinin okutulduğu dönem ve yıllar farklılık göstermektedir.	***1.Sınıf Dersleri***
1.Eğitime Giriş 2.Eğitim Psikolojisi	1.Eğitim Psikolojisi I: Öğrenme-Öğretme Kuram ve Uygulamaları
3.Eğitim Felsefesi	2.Mesleki Uygulama ve Araştırma 1
4.Türk Eğitim Tarihi	3.Hizmet Öğrenmeye Yönelik Grup Çalışmaları
5.Eğitim Sosyolojisi	4.Singapur'da Eğitimin Sosyal Bağlamı
6.Eğitimde Ahlâk ve Etik	5.Okul Deneyimi
7.Okullarda Rehberlik	***2.Sınıf Dersleri***
8.Öğretim İlke ve Yöntemleri	6.Eğitim Psikolojisi II: Öğrenme-Öğretme Kuram ve Uygulamaları
9.Sınıf Yönetimi	7.İlköğretim Düzeyindeki Öğrenenlerin Öğretimi ve Yönetimi
10.Türk Eğitim Sistemi ve Okul Yönetimi	8.Ortaöğretim Düzeyindeki Öğrenenlerin Öğretimi ve Yönetimi 1
11.Öğretim Teknolojileri	9.Anlamlı Öğrenme İçin Teknolojiler
12.Eğitimde Ölçme ve Değerlendirme	10.Öğrenme ve Performansı Değerlendirme
13.Özel Eğitim ve Kaynaştırma	Öngörülen Seçmeli Dersler: 11.Dijital ve Medya Okuryazarlığı 12.Kodlama ve Uygulamalarla Bilgisayar Okuryazarlığı 13.Net Üretime Yönelik Dijital Okuryazarlık 2.sınıf düzeyinde öngörülen seçmeli ders kategorisindeki derslerden birini seçmek zorunludur.
	14.Eğitim Asistanlığı
	3.Sınıf Dersleri
	15.İlköğretimde Çeşitliliği Desteklemek
	16.Ortaöğretim Düzeyindeki Öğrenenlerin Öğretimi ve Yönetimi 2
14.Eğitimde Araştırma Yöntemleri	17.Eğitimsel Araştırma
	18.Araştırma Projesi
15.Öğretmenlik Uygulaması 1	19.Öğretmenlik Uygulaması 1
	4.Sınıf Dersleri
	20.Mesleki Uygulama ve Araştırma 2
16.Öğretmenlik Uygulaması 2	21.Öğretmenlik Uygulaması 2
	Aşağıdaki dersler BA ve BSc programlarındaki öğretmen adaylarının mezuniyet için karşılamaları gereken minimum akademik iş yükünü sağlayamadıklarında bunu karşılamaya yöneliktir.
	22.Çeşitlilik, Kapsayıcılık ve Yansıtıcı Uygulama
	23.Psikolojik Danışma Alanına Giriş
	24.Etkili Öğretim İçin Eleştirel Düşünme Becerileri
	25.Anlamlı Öğrenme İçin BİT'e Dayalı Bilişsel Araçlar
	26.Eleştirel ve Yaratıcı Düşünme
	27.Ölçme ve Değerlendirmede Eleştirel Perspektifler

Tablo 3'yi hazırlayan Yazçayır ve Yıldırım (2021) Türkiye'de Öğretmenlik Meslek Bilgisi zorunlu meslek derslerinin 16 adet olduğunu göstermiştir. Singapur'da ise ÖMB ders sayısı 27'dir.

YÖNTEM

Araştırmanın yönteminde nitel yaklaşım benimsenmiştir. Doküman analizi yapılarak veriler toplanmıştır. Doküman inceleme yöntemi, araştırmanın veri setini oluşturan çeşitli dokümanların temin edilmesi, gözden geçirilmesi ve analiz edilmesi olarak tanımlanmaktadır (Özkan, 2019). Bu bağlamda konuya ilişkin makaleler, tezler, dergiler, kitaplar ve eğitim bakanlığı internet sayfalarında bulunan dokümanlar özetlenmiştir.

BULGULAR

Birinci Alt Probleme İlişkin Bulgular

Türkiye'de İngilizce öğretmenliği yapabilmek için üniversitelerin İngilizce Öğretmenliği bölümlerinden mezun olmak gerekmektedir. Buna ek olarak İngiliz Dili ve Edebiyatı, Mütercim-Tercümanlık, Amerikan Kültür ve Edebiyatı, İngiliz Dil Bilimi, Çeviribilim, İngiliz Dili ve Kültürü bölümleri arasından en az birinden mezun olan öğrenciler pedagojik formasyon sertifika programına katılarak öğretmenlik yapabilmektedir (MEB, 2024). Atama sonrası boş kalan kadroları doldurmak üzere milli eğitim müdürlükleri "ücretli öğretmenlik" adı altında İngilizce öğretmeni görevlendirebilmektedir.

İkinci Alt Probleme İlişkin Bulgular

İngilizce Öğretmenliği bölümünden mezun olan ya da pedagojik formasyon sertifikası sahibi lisans mezunu öğretmen adayları sırasıyla Kamu Personeli Seçme Sınavı, Eğitim Bilimleri Sınavı ve Öğretmenlik Alan Bilgisi Testi'ne katılım sağlamak zorundadır. Sınavda başarı sağlayan adaylar sözlü mülakata girmeye hak kazanır. Mülakat sonrasında öğretmen adayları Milli Eğitim Bakanlığı tarafından belirlenen kontenjanlara başarı sırası gözetilerek istihdam edilir. İngilizce öğretmenliği kadrolarında açık olması durumunda milli eğitim müdürlükleri İngilizce öğretmenliği yapmak üzere ücretli öğretmen görevlendirebilmektedir.

Üçüncü Alt Probleme İlişkin Bulgular

Singapur'da öğretmen yetiştirme sistemine girmek için öncelikle Yükseköğretime Geçiş Sınavı(Advanced Level Examination-GCEA)'na katılmak gerekmektedir. Adaylar Yükseköğretim Geçiş Sınavı'na katıldıktan sonra Genel Kültür Testi'ne girmektedir. Bu sınavda da başarılı olan öğretmen adayları Ulusal Eğitim Kurumu (NIE) tarafından uygulanan mülakatlara katılım sağlamaktadırlar (Yazçayır & Yıldırım, 2021). Mülakat jürisini öğretim üyeleri ve okul müdürleri oluşturmaktadır. Mülakatlarda öğretmen adaylarının iletişim becerileri, öğretmenlik mesleğine ilgileri, öğrenme ve öğretme konularındaki isteklilikleri vb. konularda değerlendirmeler yapılmaktadır.

Dördüncü Alt Probleme İlişkin Bulgular

Singapur'da ilkokul seviyesinde İngilizce öğretmenliği yapabilmek herhangi bir bölümden diploma ve İngilizce alanında iyi bir yeterlilik gerekmektedir. Ortaokul kademesinde İngilizce öğretmenliği yapabilmek içinse İngilizce, Dil Bilim, Hukuk ve Sosyal Bilimler bölümleri arasından en az birinden mezun olunması gerekmektedir. Gerekli şartları sağlayan öğretmen adayları giriş yeterlilik sınavına tabi tutulur. İngilizce öğretmenliği için giriş yeterlilik sınavı iki parçadan oluşmaktadır. Bunlardan ilki konuşma sınavıdır. Konuşma sınavı 20 dakika sürmektedir ve aday, yazılı bir metni sesli bir şekilde okumak zorundadır. Okuma sınavının ardından aday ve sınav görevlisi birkaç dakikalığına İngilizce iletişim kurar ve konuşma sınavı bu şekilde tamamlanmış olur. Konuşma sınavının ardından 100 dakika süren yazma sınavı başlamaktadır. Yazma sınavında adaylara hayali bir durum verilmektedir ve adaylardan durumla alakalı 250-300 kelimelik bir metin yazmaları istenmektedir. Buna ek olarak 450 kelimelik açıklayıcı bir kompozisyon yazılması gerekmektedir. Sınav sonuçları test tarihinden yaklaşık olarak 4 hafta sonra açıklanmaktadır. Giriş yeterlilik sınavında başarılı olan adaylar zorunlu sözleşmeli öğretmenlik yapmaya hak kazanmaktadır (MOE, 2024).Sözleşmeli öğretmenlik stajını başarıyla tamamlayan öğretmenler ulusal eğitim enstitüsüne kaydedilmektedir ve "Lisansüstü Eğitim Diploması" (PGDE) adı verilen tam zamanlı bir programa dahil edilmektedir (MOE, 2024).

Beşinci Alt Probleme İlişkin Bulgular

Yapılan çalışma sonucunda Türkiye ve Singapur'da İngilizce öğretmeni yetiştirme ve istihdam süreci arasında benzerlikler ve farklılıklar saptanmıştır.

Türkiye'de öğretmen yetiştirme görevini 93 fakülte üstlenmektedir (Yazçayır & Yıldırım, 2021). Singapur'da ise öğretmen yetiştirme süreci, Nanyang Teknoloji Üniversitesi'nin bünyesinde eğitim alanında planlama ve politika oluşturma gibi amaçları olan Ulusal Eğitim Enstitüsü (NIE) tarafından üstlenilmektedir (Bayirli, 2020). Singapur'da, Türkiye'den farklı olarak öğretmen yetiştirme sürecinin başında adaylara mülakat yapılmaktadır (Sağlam & Kürüm, 2005).

Türkiye'de ve Singapur'da İngilizce öğretmeni atama konusunda merkezi sınavlar yapılmaktadır. Sınavda başarı gösteren öğretmen adaylarına iki ülkede de mülakat yapılmasına karşın Singapur'da İngilizce öğretmeni olmak isteyen adaylar yazma ve konuşma sınavına tabi tutulmaktadır (MOE, 2024).

Sonuç ve Öneriler

Çalışma sonucunda Türkiye ve Singapur'da İngilizce öğretmeni yetiştirme ve atama sürecinde benzerliklere ve farklılıklara rastlanmıştır. İngilizce öğretmenliği yetiştirme

sürecinde Singapur'da olduğu gibi Türkiye'de de öğretmenlik bölümü adaylarına mülakat yapılabilir. Öğretmen adaylarının mesleğe karşı motivasyonları yapılacak mülakatlarla değerlendirilebilir. Buna ek olarak İngilizce öğretmeni yetiştirme sürecinde öğretmenlik uygulaması dersi Türkiye'de yalnızca son yılda gerçekleştirilirken Singapur'da bu durum lisans eğitimi boyunca her yıl gerçekleştirilmektedir.

İngilizce öğretmeni atama noktasında Türkiye'de ve Singapur'da merkezi sınavlara ve mülakata yer verilmektedir. Buna karşın Singapur'da İngilizce öğretmeni olmak isteyen adaylar İngilizce yazma ve konuşma sınavına tabi tutulmaktadır. Bu durum İngilizce yeterliliğin değerlendirilmesi bağlamında Türkiye'de de gerçekleştirilebilir. Yapılan çalışma, Türkiye'de İngilizce öğretmeni yetiştirme ve atama konusunda yapılacak yeni çalışmalara katkı sağlayacaktır.

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PROSPECTIVE TEACHERS' VIEWS ON THE INTEGRATION OF AUGMENTED REALITY INTO PRESCHOOL EDUCATION: CONDITIONS, LIMITATIONS AND SUGGESTIONS

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ABSTRACT
Innovative practices and technology in education require the integration of new approaches, methodologies and tools into education to enhance teaching and learning experiences. These practices leverage advances in technology, pedagogy and educational psychology to create more engaging, interactive and effective educational environments. Augmented reality (AR) technologies create immersive, interactive and experiential learning environments by overlaying digital content onto the physical world. In the creation of these learning environments, the prior knowledge, awareness and opinions of teachers and pre-service teachers on this subject are of great importance. In this context, this study aimed to examine the views of pre-service preschool teachers on the use of AR in preschool education. The study included 45 pre-service preschool teachers. The data were collected with the "Preschool AR Preservice Teacher Interview Form" and evaluated by content analysis. As a result of the research, it was determined that pre-service teachers did not receive any training on AR, but they wanted to have information about the integration of AR into preschool education and to prepare activities for children in this regard. It was concluded that pre-service teachers stated that AR technology has advantages in terms of permanent learning, concretizing abstract concepts, facilitating learning, learning by doing-living, associating with daily life, being interesting, and active participation. On the other hand, it was determined that some pre-service teachers had concerns about the disadvantages such as causing technology addiction, focus and health problems in children, preventing socialization and communication, and having too much cost. As a result, it was determined that the majority of pre-service teachers suggested that training on AR should be provided during the undergraduate period, preschool classrooms should be supported with technological equipment in accordance with the requirements of the age, and AR applications and their use should be made widespread for preschool.
KEYWORDS: Augmented reality, preschool, technology.

INTRODUCTION

Innovative practices and technology in education require the integration of new approaches, methodologies and tools into education to enhance teaching and learning experiences. These practices leverage advances in technology, pedagogy and educational psychology to create more engaging, interactive and effective educational environments. Augmented reality technologies create immersive, interactive and experiential learning environments by overlaying digital content onto the physical world. In the creation of these learning environments, the prior knowledge, awareness and opinions of teachers and pre-service teachers on this subject are of great importance. In this context, this study aims to examine the views of pre-service preschool teachers on the use of augmented reality in preschool education. Within the scope of the research, answers to the following questions were sought:

1. Have you received training on augmented reality in preschool education?
2. Would you like to prepare activities using augmented reality technology in preschool education? Why?
3. Which are the activities in which augmented reality technology can be used in preschool education? Why?
4. What are the advantages of augmented reality technology in preschool education?
5. What are the disadvantages of augmented reality technology in preschool education?
6. What are teachers' suggestions for the use of augmented reality technology in preschool education?

MATERIALS AND METHODS

The study was designed in a qualitative design in order to determine and elaborate teachers' situations regarding the use of augmented reality technology in preschool education. Qualitative research is a research method that allows an in-depth and holistic examination of a subject or situation (Creswell, 2013; Yıldırım & Şimşek; 2011).

Participants

The study included 45 pre-service preschool teachers attending the fourth year of the preschool teaching undergraduate program. Of the pre-service teachers participating in the study, 30 (66.7%) were female and 15 (33.3%) were male. In terms of age, 39 (86.7%) of the pre-service teachers were between the ages of 18-24, 4 (8.9%) between the ages of 25-30 and 2 (4.4%) between the ages of 31-35. In terms of the technology owned by the pre-service teachers, all of them (100%) have a cell phone and internet connection. In addition, 20 of them (44.4%) have laptops, 8 of them (17.8%) have tablet computers and 5 of them (11.1%) have desktop computers. When it was analyzed whether the pre-service teachers

received any training on the use of augmented reality technology in preschool education, none of them (100%) received any training.

Measures

The data were collected using the "Preschool Augmented Reality Preservice Teacher Interview Form" developed based on the literature review. " was collected. In the first part of the form, there are questions about information such as age, gender, and technological tools that the pre-service teachers have. In the second part of the form, there are questions such as whether pre-service teachers want to prepare activities using augmented reality technology in preschool education, what is the reason for this? What are the advantages or disadvantages of augmented reality technology in preschool education?

Procedures

The research was conducted in the spring semester of the 2023-2024 academic year. During the data collection phase, one-on-one semi-structured interviews were conducted with volunteer pre-service teachers and the interviews lasted an average of half an hour.

Content analysis method was used to analyze the data obtained from the research. In content analysis, it is tried to reach concepts to explain the data obtained (Yıldırım & Şimşek, 2011). First of all, in terms of the confidentiality of the personal information of the pre-service teachers, the pre-service teachers were coded (PSTA1, PST2, PST3...) and the gender of the pre-service teachers was indicated in parentheses after coding. The data set was read over and over again, divided into meaningful sections and supported with verbatim quotations when necessary.

RESULTS

The reasons why pre-service teachers want to prepare activities using augmented reality technology in preschool education

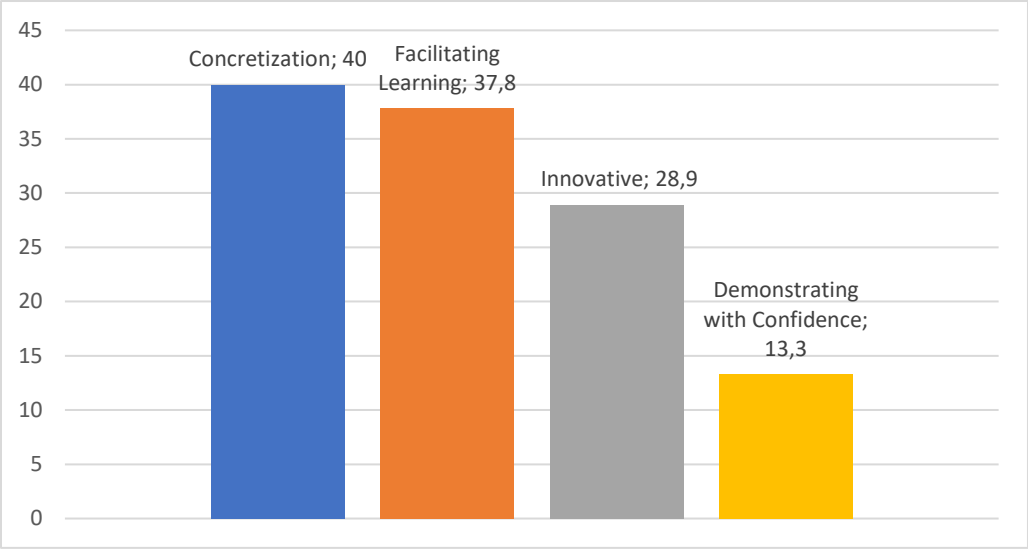


Figure 1. Pre-service Teachers' Reasons for Wanting to Prepare Activities Using Augmented Reality Technology All pre-service preschool teachers (100%) answered "yes" to the question "Would you like to prepare activities using augmented reality technology in preschool education?". When the findings in Figure 1 regarding the reasons why pre-service teachers would like to prepare activities using augmented reality technology were examined, it was found that 18 (40%) of them stated the reasons of "Concretizing abstract objects/concepts", 17 (37.8%) stated the reasons of "Facilitating learning", 13 (28.9%) stated the reasons of "Being an innovative application" and 6 (13.3%) stated the reasons of "Visiting places that are not possible to visit, showing dangerous situations safely". Some of the pre-service teacher statements regarding this are as follows:

"With augmented reality technology, children can easily see many things that they cannot see with their eyes, when there is no environment that they can easily distinguish, thanks to technological applications. For example, with simulation applications, they can easily do many things that they cannot do in reality." (PST3, Male)

"I do activities using this technology in order to make the subjects more understandable and to teach the concepts we teach more easily." (PST5, Female)

"Using the developing technology in the educational environment will facilitate learning by attracting children's interest more." (PST6, Female)

"It can easily provide access to things that children cannot reach at home, at school and in their surroundings during the pre-school period. I am sure that it will be very beneficial for the development of children and will facilitate their learning in the process." (PST8, Male)

"It allows children to see opportunities that do not exist, for example, they can see animals that do not exist in the country. They can gain experience as if they were living in a rainforest." (PST9, Male)

"Due to the age, children are closely related to technology and have interactions with it. Therefore, I would like to apply augmented reality with the children who come to my school and offer them something different by doing activities." (PST44, Female)

Activities in which augmented reality technology can be used in preschool education according to the opinions of pre-service teachers

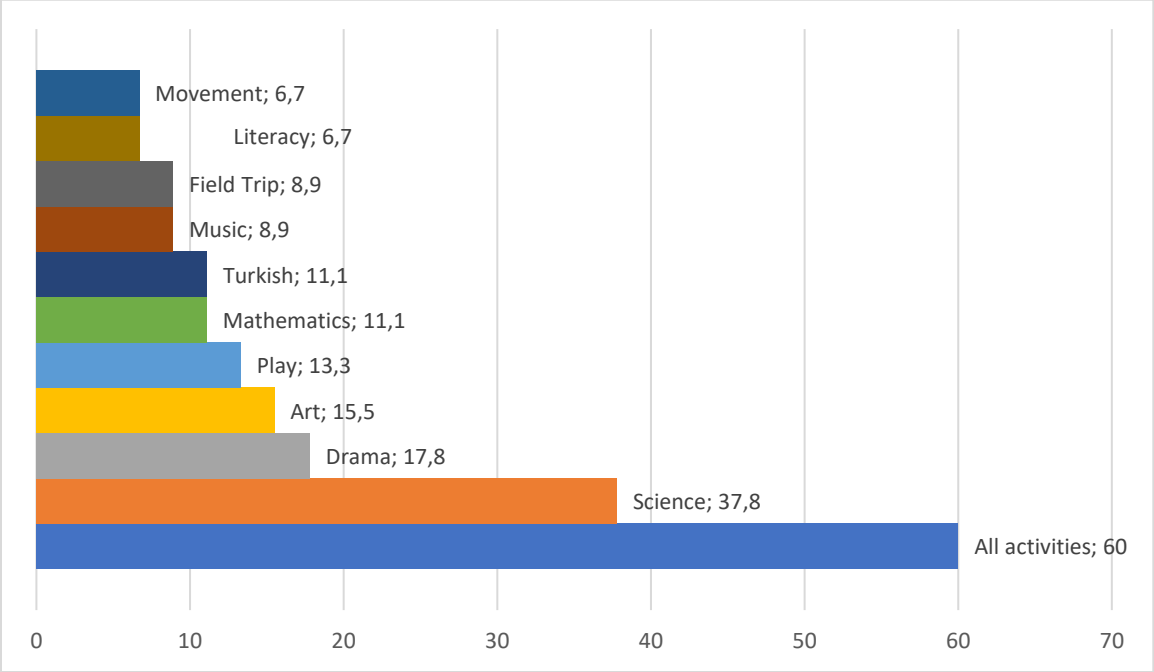


Figure 2. Activities in which Augmented Reality Technology can be Used in Preschool Education According to Preservice Teachers

Figure 2 shows that 27 (60%) of the pre-service teachers stated that augmented reality technology can be used in all activities, 17 (37.8%) in science activities, 8 (17.8%) in drama, 7 (15.5%) in art, 6 (13.3%) in games, 5 (11.1%) in math and Turkish, 4 (8.9%) in music and field trips, and 3 (6.7%) in literacy preparation and movement activities.

According to the opinions of pre-service teachers, activities in which augmented reality technology cannot be used in preschool education

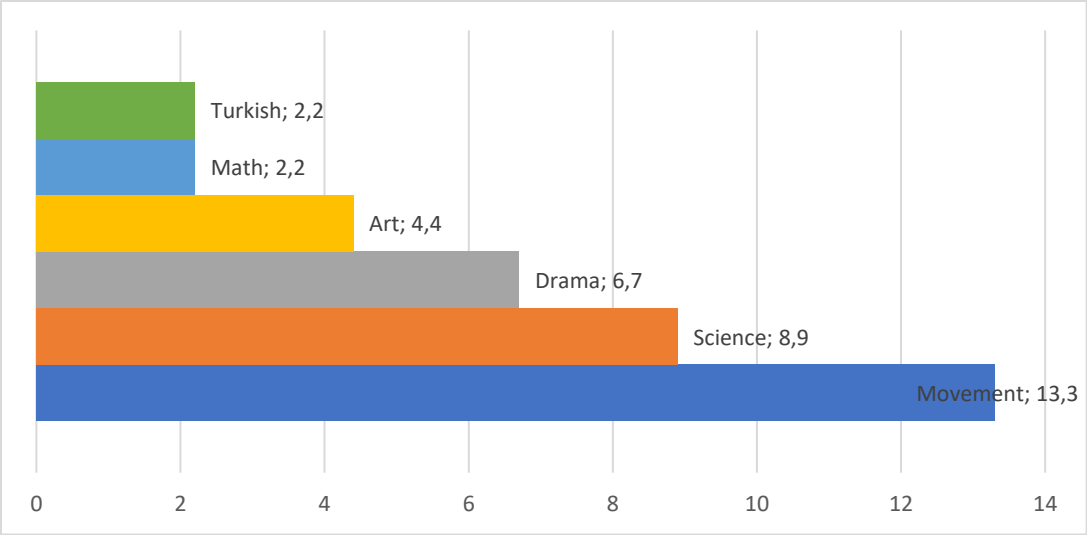


Figure 3. Activities in which Augmented Reality Technology cannot be Used in Preschool Education According to Preservice Teachers

When Figure 3 was examined, it was found that 6 (13.3%) of the pre-service teachers stated that augmented reality technology could not be used with movement, 4 (8.9%) science, 3 (6.7%) drama, 2 (4.4%) art, 1 (2.2%) mathematics and 1 (2.2%) Turkish activities. Some of the statements of these pre-service teachers are as follows:

"I don't think it would be very useful in Turkish activities because it is more important for children to speak themselves in terms of developing their language skills." (TC5, Female)

"It cannot be used in movement activities because it does not include movement because it depends on visuals." (S10, Female)

"I think it cannot be used in mathematics activities. Because I do not know how to use it in those activities and I could not reconcile augmented reality with mathematics activities." (Ss13, Female)

"I think that such activities such as painting, cutting and pasting in art activities should be done by the children themselves." (TA14, Male)

"I think it would be difficult to use it in science activities. Because science activities are more based on learning by doing and experiencing, it would be more accurate for them to learn first-hand." (Ss21, Male)

"I think it cannot be used in drama activity because in drama the child should be active." (Ss24, Female)

Advantages of augmented reality technology for preschool education according to pre-service teachers' views

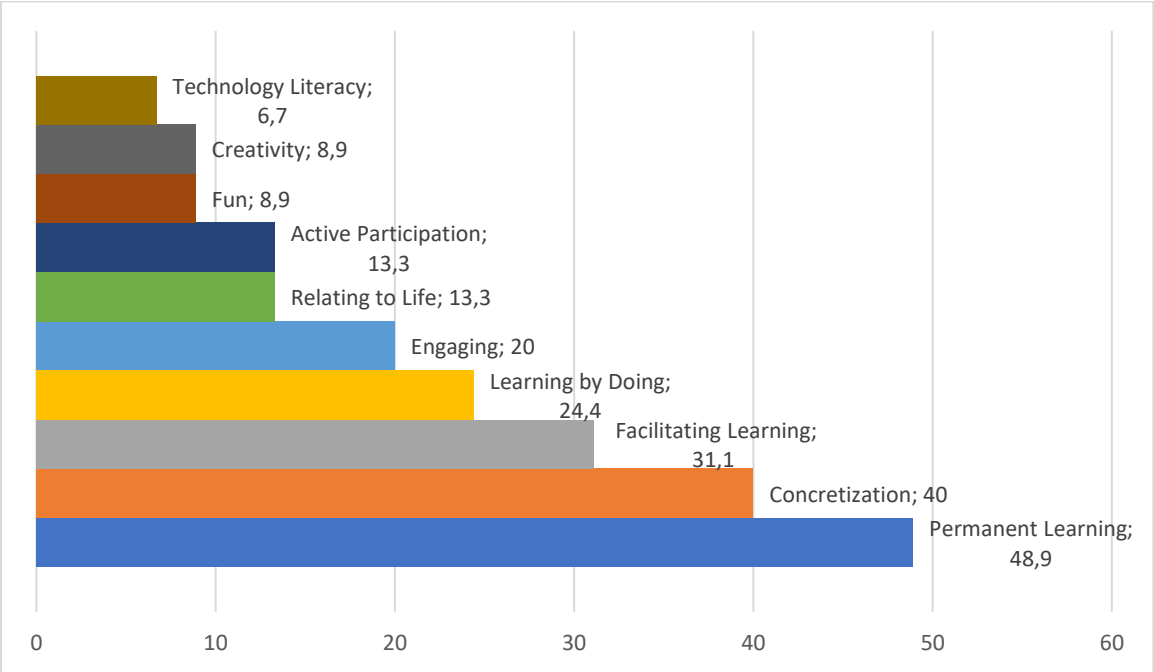


Figure 4. Advantages of Augmented Reality Technology for Preschool Education According to Preservice Teachers

When Figure 4 is examined, it is seen that 22 (48.9%) of the prospective teachers (48.9%) permanent learning, 18 (40%) concretizing abstract concepts, 14 (31.1%) facilitating learning, 11 (24.4%) learning by doing-living, 9 (20%) being interesting, 6 (13.3%) associating with daily life, 6 (13. 3%) active participation, 4 (8.9%) being fun, 4 (8.9%) developing creativity and 3 (6.7%) developing technology literacy. The statements of some pre-service teachers regarding this situation are as follows:

"With augmented reality, children can be used to show things that they cannot see in daily life, such as the distant view of the world, rotation, shape." (PST3, Male)

"When children see that it is different, they participate in the activities more willingly, it reinforces their sense of curiosity. These technologies can be used to make learning more permanent." (PST5, Female)

"It contributes to creating a fun learning environment based on concrete experience." PST41, Female)

Disadvantages of augmented reality technology for preschool education according to pre-service teachers' views

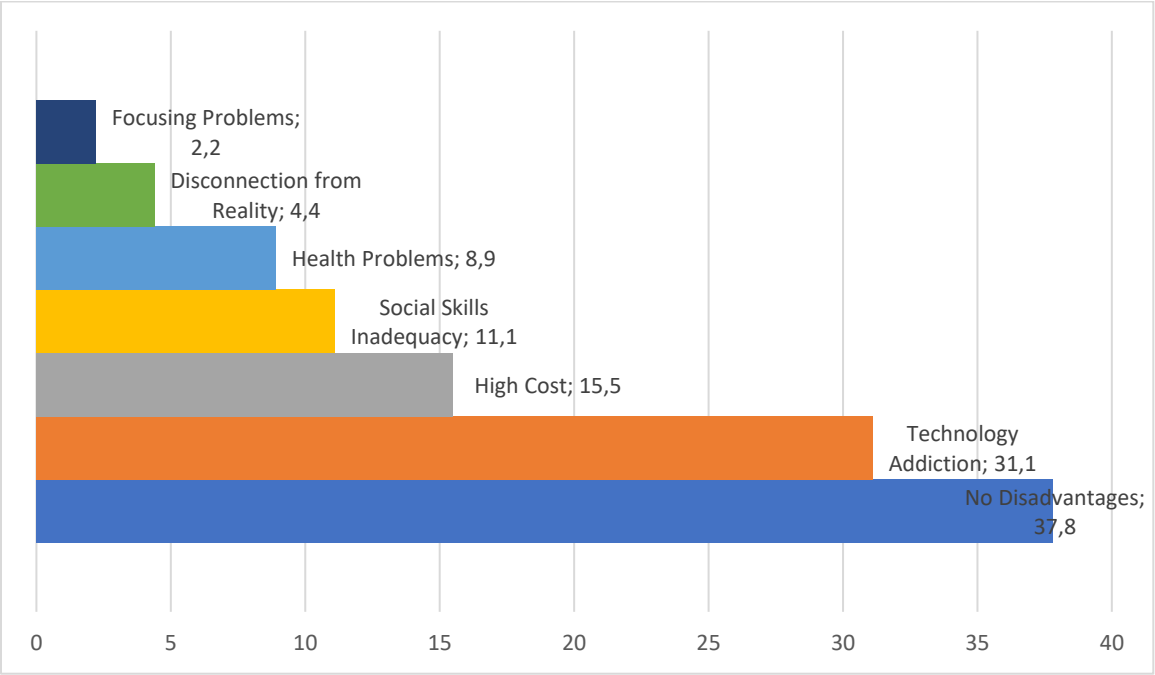


Figure 5. Disadvantages of Augmented Reality Technology for Preschool Education According to Preservice Teachers

When Figure 5 is analyzed, it is seen that 17 (37.8%) of the pre-service teachers stated that augmented reality technology does not have any disadvantages for preschool education. On the other hand, 14 (31.1%) of the pre-service teachers stated that it has disadvantages in terms of technology addiction, 7 (15.5%) in terms of high cost, 5 (11.1%) in terms of preventing social skills and communication, 4 (8.9%= causing health problems, 2 (4.4%) in terms of detachment from reality and 1 (2.2%) in terms of causing focusing problems. The opinions of some pre-service teachers regarding the disadvantages of augmented reality technology for preschool education are as follows:

"If it is applied in an uncontrolled and uncontrolled way without being supervised by experts, it can harm preschool children cognitively." (PST1, Male)

"Including too much technology in the educational environment where children can socialize together can prevent children from socializing and developing communication skills." (PST6, Female)

"Children may not be able to distinguish between real and virtual." (PST8, Male)

"It can cause screen addiction. In this case, children may want to play all the time." (PST12, Female)

"Since it will be costly, there may be problems in terms of its implementation in every classroom because the classrooms do not have this equipment." (PST17, Female)

"Economically, there may be problems in some regions. Schools with insufficient facilities may be disadvantaged compared to schools with adequate facilities." (PST19, Male)

"If the child is exposed to it intensively, it can be negatively affected in terms of eye health." (PST24, Female)

"Children may be confused between real and virtual life. This prevents them from distinguishing which is real and which is virtual. In excessive use, it may cause speech disorders, social skills deficiencies and health problems." (PST29, Female)

"I think that prolonged use can cause health problems such as headaches and technology addiction in children." (PST30, Male)

Suggestions of augmented reality technology for preschool education according to the views of pre-service teachers

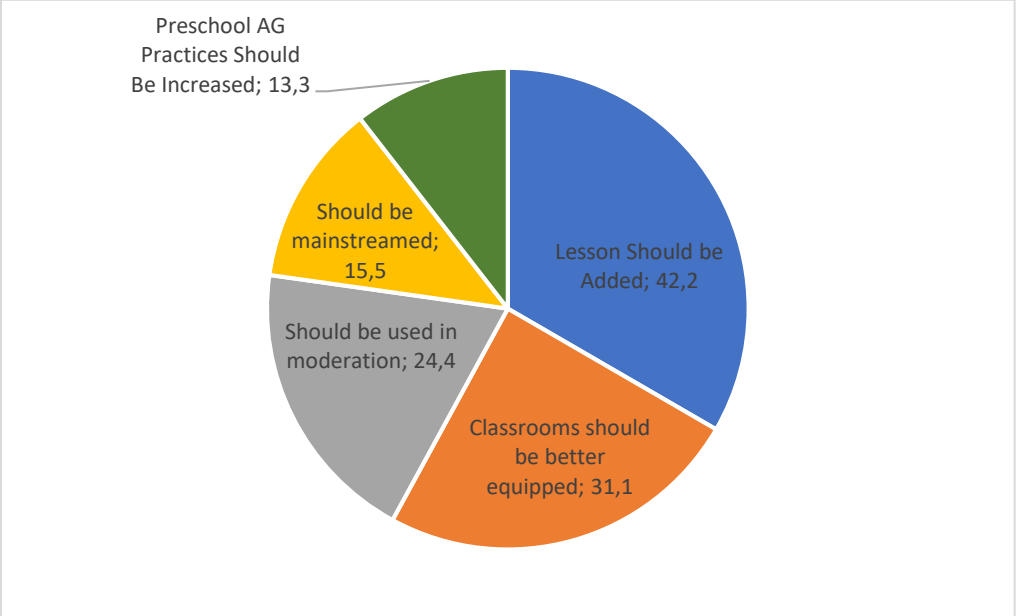


Figure 6. Disadvantages of Augmented Reality Technology for Preschool Education According to Preservice Teachers

When Figure 6 is examined, it was found that 19 (42.2%) of the pre-service teachers made suggestions for providing training, 14 (31.1%) for increasing classroom equipment, 11 (24.4%) for controlled/limited use, 7 (15.5%) for making it widespread, and 6 (13.3%) for increasing activities for pre-school. Some of the suggestions of pre-service teachers are as follows:

"I think the number of augmented reality applications prepared by experts for preschool children should be increased and the application should be made widespread. Also, lessons should be added to us at school." (PST1, Male)

"It should be used once a week or in a special interesting subject." (PST13, Female)

"I think that augmented reality technology should be used effectively in preschool education." (PST18, Male)

"It should be used, but not too much, that is, it should not be used in every activity." (PST33, Female)

CONCLUSION

As a result of the research, it was determined that pre-service teachers did not receive any training on augmented reality, but they wanted to have information about the integration of augmented reality into preschool education and to prepare activities for children in this regard. It was concluded that pre-service teachers stated that augmented reality technology has advantages in terms of permanent learning, concretizing abstract concepts, facilitating learning, learning by doing-living, associating with daily life, being interesting, and active participation in terms of its advantages in preschool education. On the other hand, it was determined that some pre-service teachers had concerns about the disadvantages such as causing technology addiction, focus and health problems in children, preventing socialization and communication, and having too much cost. As a result, it was determined that the majority of pre-service teachers suggested that training on augmented reality should be provided during the undergraduate period, preschool classrooms should be supported with technological equipment in accordance with the requirements of the age, and augmented reality applications and their use should be made widespread for preschool. Similarly, in a study conducted in Indonesia, it was concluded that teachers still have difficulties in implementing augmented reality, they have not received any training on AR use, some schools have minimal technology, and they need incentive training conducted by experts (Gestiardi et al., 2022). Yuen et al. (2011) state that many teachers and students are prejudiced against using AR due to the technical knowledge required to use and develop augmented reality applications. In order to overcome these prejudices, it is thought to be important to provide in-service trainings to teachers and to provide training to prospective teachers during their undergraduate education. As a matter of fact, in the study by Soylu (2019), in which the effect of the training program for augmented reality applications on the attitudes and opinions of pre-service preschool teachers was examined, it was determined that pre-service teachers' attitudes towards the use of technological materials in pre-school

education and their perceptions of information and communication technologies competence differed significantly after the training program. Kahriman-Pamuk et al. (2020) aimed to determine the views of preschool teachers and preservice teachers on preschool science activities created by integrating Augmented Reality (AR) technology. preservice preschool teachers participating in the study were given a six-week training on integrating AR into preschool science activities. As a result, pre-service teachers and teachers stated that children were happy in science activities integrated with AR. AR technology was identified as a particularly effective tool for attracting the attention of children who had not experienced this tool before. In this study, the participants stated that they experienced some technical difficulties in the implementation. For this reason, they underlined that appropriate training and technical support should be provided to teachers, and factors such as class size and the number of AR tools should be taken into consideration before incorporating AR into education programs.

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GEOGRAPHY IN PRESCHOOL PERIOD: STRUCTURE, CONTENT AND PROBLEMS

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ABSTRACT
Geography education in the preschool period covers a critical period of time when children begin to explore the world and understand their environment. Geography education in this period usually focuses on arousing children's curiosity, encouraging exploration and introducing basic geographical concepts. The basic geographical knowledge and skills acquired during this period support the learning of more complex geographical concepts at a later age, help children grow up as curious, conscious and knowledgeable individuals about the world, and enable children to make deeper connections with the world. In this context, the study focuses on the structure and content of geography education in preschool period and the problems related to geography education. Within the scope of the research, theses on geography education in preschool period, articles published in scientific journals, books, papers of various seminars and symposiums on the subject were analyzed by document analysis method. As a result of the research, it was determined that topics such as directions and map reading skills, topography and environmental awareness, countries and cultures, weather and climate, space and universe can be addressed in geography education in preschool period. It can be said that it is important to support preschool geography education with interactive methods such as games, activities and augmented/virtual reality to increase children's participation. In addition, nature walks and field trips in places such as parks, gardens, streets and wooded areas contribute to children's experience of natural and man-made environments. It is thought that it is important to increase the awareness of teachers, families and children about geography education in preschool period.
Keywords: Geography, preschool, environment.

INTRODUCTION

Geography is defined as a fundamental fascination, an exploration and giving order and meaning to the world (Bonnett, 2008). In this respect, geography, which is very important for all people (Brillante & Minkiw, 2015), is recognized as a science in which children develop awareness in their first years from birth to six years of age (Hewes, 1982). Children learn through their senses and experiences. They touch, feel, smell and taste things. They run, jump and climb. They play imaginary games and ask millions of questions. On their daily walks, these children begin to understand how people relate to the Earth, how the environment changes, how weather changes the character of a place, and how one place relates to another through the movement of people, things and ideas. Children's everyday play and experiences form the basis of the geographical knowledge they will learn at school (Fromboluti & Seefeldt, 1999). Developing a sense of place through geographical experiences helps to build the social and emotional foundation that children need and will one day use as adults. Through their interactions with the environment and with each other, children develop and strengthen their geographical literacy skills and see themselves as capable social beings (Brillante & Minkiw, 2015). In this context, the study focuses on the structure and content of geography education in preschool period and the problems related to geography education.

Methodology

Within the scope of the research, studies on geography education in preschool period were analyzed by document analysis method. Document analysis is a scientific research method that can be defined as the collection, review, questioning and systematic analysis of various documents such as publications, books, records, scans and surveys as the primary source of research data (Karataş, 2015; Patton, 2002).

Conclusion and Discussion

Geography Education in Preschool

Preschool children's early geography experiences, such as actively exploring places and manipulating objects in the environment, help children develop their cognitive skills and begin to understand the world around them (Brillante & Minkiw, 2015). Catling and Willy (2010) state that children develop geographical inquiry and skills by learning concepts such as place, space, environmental impact, sustainability, connectedness, cultural diversity and awareness, scale, physical and human processes (Figure 1).



Figure 1. Key concepts of geography (Catling & Willy, 2010).

Preschool geography education is the study of the physical and human characteristics of the Earth. It provides children with a cultural perspective on current events, geographical landmarks, world cultures and economic geography. Children can learn about how humans interact with their environment, including observing the effects of climate change and global warming. They can understand the different regions of the world and their diverse climates, resources, landforms and inhabitants. They can also develop an understanding of different cultures from around the world and how they influence each other. Teaches children how to read maps and identify geographical locations and places on a map. They can have a greater understanding of our planet and its many wonders (https://spires.co/online-geography-tutors/primary/how-to-improve-my-childs-primary-geography-skills).Geography education has five basic components: (1) location, (2) place, (3) human-environment interaction, (4) movement, and (5) territory. The first step of preschool geography education is "location". This concept involves saying exactly where an object is in the world. The starting point of preschool children's understanding of location is body awareness. This awareness develops as children begin to understand how much space the shape of their body takes up, where different body parts are located, how the body moves, how sound is part of the body. In this way, they learn that they are in relationship with other people and physical things. When they learn how their bodies move, they will lay the foundation for learning directions and positions later in life. The more opportunities children have to run and move, the better their ability to keep track of their location and position. In addition, in order to develop children's

sense of location, they should be provided with address information such as the color of the building they live in, the number of floors, the name of the neighborhood they live in, and the streets (Fromboluti & Seefeldt, 1999).

The second step of preschool geography education is "place". As with people, different places may have many things in common, but they may also have different characteristics, none of which are similar to each other. Children should be made to realize the physical characteristics of the place they are in, which are different from or similar to other places, with an inductive approach based on the region, neighborhood and environment they live in. These experiences form the basis for understanding the sense of place. Therefore, sense of place is based on both the experiences children have and the integrity of the education they receive. When preschool educators plan different activities to develop a sense of place in children, all children have many opportunities to interact with their peers and the environment, to form deep psychological and physical connections with people and places. On the other hand, the differences and similarities of the people living in these places, their languages, house and building features can be emphasized. Children can learn to name the physical features of the places where they live, and name the landforms, bodies of water, soil, plants, weather and climate in their immediate surroundings from their own point of view (Brillante & Minkiw, 2015; Fromboluti & Seefeldt, 1999)."Movement" is another basic science area in preschool geography education. The science of geography also examines how information, people, objects, etc. move from one place to another. In daily life, people travel, go to work, go to school and move in this way (Hannibal et al., 2002). In encouraging preschool children to acquire the concept of "movement" in geography education, it is important to associate it with daily life, to present examples from real life, and to support it with pictures, drawings or games. On the other hand, it should be emphasized that movement is necessary not only for humans but also for nature. In a nature trip with children, it can be observed that the wind blowing a leaf or a stream carrying water and the objects in it involve natural movements. By encouraging children's active participation, they can be given the opportunity to better understand the concept of "movement".

"Region" is another basic component of preschool geography education. A region consists of a certain number of areas with similar characteristics (Öztürk et al., 2015). As a matter of fact, places in a region generally have similar characteristics such as climate and vegetation. In this respect, each region has different characteristics and qualities: forest region, mountainous region, etc. Maps showing different regions of the world can be utilized when carrying out activities related to regions with children. At the same time, it can be stated

that children's homes, schools and neighborhoods belong to a region and that each region has its own characteristics and lifestyles. Therefore, children can be enabled to perceive the concepts that enable them to adapt to the environment they live in and meet their needs according to environmental conditions for "human-environment interaction", which is another component of preschool geography education (Öztürk et al., 2015). In addition, in geography education in preschool period, it is important to address topics such as directions and map reading skills, topography and environmental awareness, countries and cultures, weather and climate, space and universe through geographical inquiry processes in accordance with children's age and developmental levels (Figure 2). The geographical inquiry process in preschool children involves a curiosity and discovery-oriented approach. This process allows children to explore their natural environment, ask questions and seek answers.

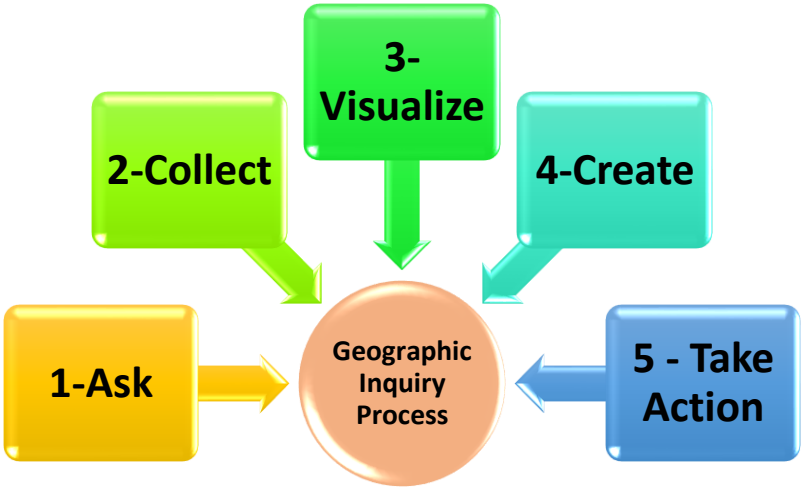


Figure 2. Geographic inquiry process

The National Geographic Society's Geographic Inquiry Process is a five-step method that begins with children formulating a question (Ask); continues with data collection (Collect); moves to data visualization (Visualize); progresses to organization, analysis, and effective communication (Create); and ends with the all-important conscious action (Act). Geographic Inquiry is based on a more general inquiry process that shares some of the key elements of the scientific method (National Geographic Society, 2017; Oberle, 2020).

Supporting Geography Education in Preschool

For children to enjoy learning, they need to be excited and inspired by what they are doing, which requires a creative and flexible approach to teaching. Quality pre-school geography education is exciting and fun, using a variety of approaches to teaching, engaging children with current issues and interesting topics that are often relevant to their own experiences,

challenging their thinking and introducing them to new themes and ideas. In this period, children's first-hand experiences are important, in this context, out-of-school learning environments can be utilized and children can collect first-hand materials through learning on field trips (Catling & Willy, 2010). For example, Mavilidi et al. (2016) investigated the effects of physical activities integrated into a geography task on preschool children's learning performance and enjoyment. As a result of the study, children in the physical activity group outperformed children in the non-physical activity group on an immediate retention test and on a delayed retention test administered five weeks later. In addition, children in the physical activity conditions enjoyed the learning methods the most. Incorporating task-related physical activities into the classroom and learning task has been expressed as a promising way to improve children's learning, enjoyment and health (Mavilidi et al., 2016). In this context, it can be said that in preschool geography education, fun activities in which children will be active, out-of-school learning environments will be utilized, and fun activities are important in supporting children.

Catling and Willy (2010) show six characteristics of high-quality geography education in preschool period as follows:

1. Purpose Driven Teaching: Geography teaching enables children to understand the purpose and see the value of the subject they are studying. This attracts their interest and arouses their curiosity.

2. Problem-Oriented Approach: Geography learning is not limited to gathering information; it also requires children to analyze problems, propose solutions and evaluate the results.

3. Inquiry-Based Approach: The study of geography encourages children to question and leads them to figure out how to investigate, draw conclusions based on evidence and think rigorously.

4. Collaborative Learning: Geography learning is often done through group projects, which allows children to interact with each other and with experts.

5. Interacting with the World: Geography learning allows children to interact with the real world, which is based on local fieldwork, contacts with experts and research linked to current issues.

6. Interaction with a Variety of Sources: Geography teaching enables children to interact with a variety of sources, which includes the use of a variety of resources such as photographs, maps, newspapers, websites. These quality resources encourage children's satisfactory learning and increase their achievement (Catling & Willy, 2010).It can be said that it is important to support preschool geography education with interactive methods such

as games, activities and augmented/virtual reality to increase children's participation. In addition, nature walks and field trips in places such as parks, gardens, streets and wooded areas contribute to children's experience of natural and man-made environments. It is thought that it is important to increase the awareness of teachers, families and children about geography education in preschool period.

Limitations Regarding Geography Education in Preschool

One of the limitations of preschool geography education is that children are not allowed to spend much time in the environment today. When children do not have geographical knowledge and a sense of self-awareness in the preschool period, when they lack stimulation and interaction with the environment, it is inevitable that they will have problems in primary school and later educational levels (Hewes, 1982). Unfortunately, many children today do not have the experience of freely walking and playing in the streets, parks and neighborhoods as in past generations. Children's interactions with the environment are limited to shopping at chain stores in shopping malls or interacting with technology instead of their environment. This prevents children from fully developing their skills as curious and engaged individuals who are connected to the world around them. Equipped with curiosity and the five senses, young children explore and manipulate the materials around them to understand the world around them. In preschool, geography is often treated traditionally, focusing on activities that develop geographical skills, such as map making. However, the discipline of geography consists of two main subfields: physical geography and human geography. While physical geography is the study of the natural environment, human geography is the study of the relationship between people and their natural environment (Brillante & Minkiw, 2015). In this respect, it is important to address geography education in preschool period in a more inclusive way rather than limiting it to maps or globes.

Another important limitation is that teachers prefer to use ready-made resources such as worksheets too much in preschool geography education (Catling & Willy, 2010). This situation causes children not to benefit sufficiently from activities that are creative, inquisitive, support imagination, and include learning environments enriched with out-of-school learning environments.

An important element in geography education in preschool period is teachers. The fact that teachers have sufficient knowledge and equipment in this subject is directly related to the development of children's geography skills. However, in many higher education institutions in our country, geography is not defined as a course within the scope of preschool teacher training undergraduate programs. This situation leads to the fact that teachers cannot develop

much awareness about geography education in preschool within the undergraduate program. In this context, it is important to include preschool geography education in teacher training programs.

CONCLUSION

In conclusion, geography education in preschool period can cover topics such as directions and map reading skills, topography and environmental awareness, countries and cultures, weather and climate, space and universe. It can be said that it is important to support preschool geography education with interactive methods such as games, activities and augmented/virtual reality to increase children's participation. In addition, nature walks and field trips in places such as parks, gardens, streets and wooded areas contribute to children's experience of natural and man-made environments. It is thought that it is important to increase the awareness of teachers, families and children about geography education in preschool period.

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İHYÂ' VE BA'S ŞİİR EKOLÜ VE ŞİİR ANLAYIŞI

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ÖZET
İhyâ' ve Ba's şiir ekolü 19. Yüzyılın ikinci yarısında o döneme kadar yaşanan şiir üretkenliğindeki durgunluk ve edebi yönden gerilemeye karşı bir başkaldırı hareketi olarak ortaya çıkmıştır. Bu ekol Arap edebiyatında Modern Dönem'deki ilk şiir ekolü olma özelliğini taşımaktadır. İhyâ' ve Ba's şiir ekolünün kurucusu, modern Arap şiirinin önde gelen isimlerinden Mahmûd Sâmî el-Bârûdî'dir. Bârûdî'nin yanı sıra Ahmed Şevkî, Hâfız İbrâhîm, Rusâfî, Ahmed Muharrem ve Bişâre el-Hûrî de ekolün öne çıkan diğer simalarıdır. Bu şairler Arap şiirini eski parlak günlerine kavuşturmaya çabalamış ve üslup ve tema yönünden geleneksel şiirlere benzer şiirler kaleme almışlardır. Fakat her şairin kendine has bir yazım üslubu olduğunu ve diğerlerinden farklı şiir temaları seçebildiğini gözden kaçırmamak gerekir. Ekol köklü Arap şiir tarzını kendine yöntem edinerek yeniden canlandırmayı amaç edinmiştir. Bu nedenle Arapça olarak "*diriltme ve canlandırma*" manasına gelen *"ihyâ' ve ba's*" ismiyle tesmiye edilmiştir. Bu ekole mensup şairlerin ise "*ihyâiyyûn, muhâfizûn, beyâniyyûn*" olarak isimlendirildikleri mülahaza edilmektedir. Ekole "*ihyâ'*" ismi ekolün eski Arap şiirini canlandırma ve şiir sigalarında yenilikler yaparak sanatsal yönünü öne çıkarma faaliyetlerinden dolayı; "*ba's*" ismi ise klasik Arap şiirinin kafiye, vezin, yapı ve belağat özelliklerini muhafaza ettiği için verildiği görülmektedir. İhyâ' ve Ba's ekolünü diğer şiir ekollerinden ayıran bazı temel hususiyetleri vardır. Kaside nazmederken eski Arap şiir tarzını benimsemeleri ve her kafiyede bir kafiyeye bağlı kalmaları; medih, mersiye, gazel ve vasf gibi eski şiir temaları odaklı şiir yazmaları; kelime seçiminde eski şairleri örnek almaları; eski şairler gibi bir kasidede birden fazla tema işlemeleri; Osmanlı döneminde yaygın olan tasavvuf şiiri gibi şiirlerden kaçınmaları; milli şiir, toplumsal şiir gibi eskiden mevcut olmayan şiir temaları oluşturmaları; kimi şiirlerinde hitap üslubunu kullanmaları; şiirlerinin bir amaç gütmesi ve hikmet ve öğüt gibi olgular içermesi İhyâ' ve Ba's ekolünün göze çarpan özellikleri arasında gösterilebilir.
Anahtar Kelimeler: Arap Edebiyatı, Modern Şiir Ekolleri, İhyâ' ve Ba's Şiir Ekolü

IHYÂ' AND BA'AS POETRY SCHOOL AND UNDERSTANDİNG OF POETRY

Abstract
The Ihyâ' and Ba's poetry school emerged in the second half of the 19th century as a movement of rebellion against the stagnation in poetry productivity and literary decline experienced until that period. This school has the distinction of being the first poetry school in the Modern Period in Arabic literature. The founder of the Ihyâ' and Ba's poetry schools is Mahmûd Sâmî el-Bârûdî, one of the leading names of modern Arabic poetry. In addition to Bârûdî, Ahmed Muharrem, Ahmed Şevkî, Hâfız İbrâhîm, Rusâfî and Bişâre el-Hûrî are other prominent figures of the school. These poets tried to restore Arabic poetry to its former glory and wrote poems similar to traditional poems in terms of style and theme. However, it should not be overlooked that each poet has his or her own writing style and can choose different poetry themes from others. Ekol aims to revive the deep-rooted Arabic poetry style by adopting it as its own method. For this reason, it is called "ihyâ' and ba's", which means "resurrection and revitalization" in Arabic. It is considered that the poets belonging to this school were named "ihyâiyyûn, muhâfizûn, beyâniyyûn". The name of the school "ihyâ'" is due to the school's activities of revitalizing the old Arabic poetry and highlighting its artistic side by making innovations in poetry forms; It seems that the name "ba's" was given because it preserved the rhyme, meter, structure and rhetoric features of classical Arabic poetry.There are some basic characteristics that distinguish the Ihyâ' and Ba's schools from other schools of poetry. When composing the ode, they adopt the old Arabic poetry style and stick to one rhyme in each rhyme; writing poems focusing on old poetic themes such as eulogy, elegy, ghazal and vasf; taking old poets as an example in word selection; They use more than one theme in one ode, like the old poets; They avoid poems such as Sufi poetry, which was common during the Ottoman period; creating poetic themes that did not exist before, such as national poetry and social poetry; their use of address style in some of their poems; The fact that their poems have a purpose and contain facts such as wisdom and advice can be shown among the salient features of the Ihyâ' and Ba's schools.
Keywords: Arabic Literature, Modern Poetry Schools, İhyâ' and Ba's Poetry School.

Giriş

Batı kültürünün 19. Yüzyılda Arap dünyası üzerindeki nüfuzunun artmasıyla Arap edebiyatı hem şiir hem de nesir alanında köklü değişimlere şahitlik etmiştir. Nesir alanında Arap edebiyatı roman, hikâye ve gazete neşriyatı gibi yeniliklerle tanışmıştır. Fakat bu tür edebi ürünlerin Arap edebiyatında hiç var olmadığını söylemek mümkün değildir. Zira Arap edebiyatında bu formların öncüsü sayılabilecek "*makamât*" mevcut olup daha sonraları bu sanatın roman, hikâye gibi sanatlara dönüştüğü görülmektedir. Düzyazı ise seci gibi belağat sanatlarından ayrışarak daha sade, anlaşılır hale gelmiştir. Matbaanın da etkisiyle bu edebi formlar hızlı bir şekilde Arap dünyasına yayılmış ve rağbet görmüştür. Şiir alanına bakıldığında ise Arap şiiri de Batılı akımlardan etkilenmiş ve bir takım yeniliklerle yeniden tezahür etmiştir. Nesir kadar olmasa da Batı kültüründen nasibini alan Arap şiirinde zamanla ekolleşmeler görülmüştür. Bu ekollerden biri de İhyâ' ve Ba'ʿs ekolüdür. Eski Arap şiirini parlak günlerine döndürmeyen amaçlayan ekol eski Arap şiiri temalarıyla o dönemki meseleleri ayrıca ekole mensup şairlerine özgü temaları da mezcederek yeni bir şiir hareketi olarak Arap edebi tarihindeki yerini almıştır. İhyâ' ve Ba'ʿs Ekolü bu özelliğiyle diğer ekoller arasında kendine münhasırdır.

1. İHYÂ' ve BA'ʿS ŞİİR EKOLÜNÜN ORTAYA ÇIKIŞ SÜRECİ ve ŞİİRSEL ÖZELLİKLERİ

İhyâ' ve Ba'ʿs şiir ekolü 19. Yüzyılın ikinci yarısında o döneme kadar edebiyat alanında yaşanan durgunluğa bir başkaldırı hareketi olarak ortaya çıkmıştır. Ekol şiirleriyle köklü Arap şiiri tarzını yeniden canlandırmayı hedeflemiştir. Bu nedenle ekole mensup şairler "*ihyâiyyûn, muhâfizûn, beyâniyyûn*" olarak isimlendirilmişlerdir (Âl-Uceym, 2022, s. 1211). Buna paralel olarak İhyâ' ve Ba'ʿs Ekolü'nün de "*İhyâ' ve't-Turâs*", "*el-Medresetu'l-İttibâiyye ve'l-İhyâiyye*", "*el-Medresetu'l-İttibâiyye fî'ş-Şi'ri'l-Arabî*" ve "*Medresetu'n-Nahda*" olarak tesmiye edildiği görülmektedir (Mûsâ vd., 2015, s. 16). İhyâ' ve Ba'ʿs ekolü batıdaki Neoklasisizm'in Arap dünyasındaki karşılığı sayılabilir. İhyâ' ve Ba'ʿs ekolünün öncüsü Mahmûd Sâmî el-Bârûdî'dir. Bârûdî'nin şairlik yeteneği hakkında Taha Huseyn: "*Arap şiirine; uzun zamandır yoksun olduğu güç, etkili söz, vakur bir üslup ve ince manalar katmasıyla eşsizdir*" cümlelerini sarfetmiştir (Mûsâ vd., 2015, s. 15). Bârûdî şiirleriyle bu yeni akımın öncül ürünlerini vermiştir. Bizzat kendisi kendisinden önceki şairler gibi konuştuğunu dile getirmiş ve Arap şiirini yeniden canlandırmaya çalıştığı için kendisini bilgisiz kimselerin eleştirmemesini istemiştir. Bârûdî şiirdeki tarzını Arap şiirinin ilk asırlarına göre uyarlamıştır. Bu açıdan bakıldığında onun şiir tanımının Âmîdî, Merzûkî gibi şairlerin şiir anlayışıyla örtüştüğü görülmektedir. Bârûdî bu anlayışla klasik Arap şiirine

öykünerek şiirlerini kaleme almıştır. Bârûdî'nin bu çabası edebiyat çevrelerinde karşılık bulmuş ve etrafında bir grup şair topluluğu oluşmuştur (Neşâvî, 1984, s. 42-43). Bârûdî ve o asırdaki diğer İhyâ' ve Ba'ş Ekolü şairleri ve daha sonra gelen ekol şairleri o dönem insanının ahvalini konu edinip eski Arap şiirinin sanatsal yapısını da baz alarak Arap şiirine yeniden can vermeye çabalamışlar ve otorite kabul edilen eski Arap şairlerin tarzını örnek alarak şiir üslubunda reform girişiminde bulunmuşlardır (Teys & Mehdîd, 2021, 329).Bârûdî'den sonra ekolün liderliği "*Emîru'ş-şuarâ*" olarak lakaplandırılan Ahmed Şevkî'ye geçmiştir. Şevkî'nin edebi çalışmaları edebiyat eleştirmenleri arasında canlı bir faaliyet meydana getirmiştir. Şevkî de Bârûdî gibi eski Arap şiiri kaynağından beslenmiş ve eski şairlerden ilham almıştır. Şevkî'nin o dönem tezahür eden şairleri de etkilediği görülmektedir (Neşâvî, 1984, s. 42-43). İhyâ' ve Ba'ş Ekolü Arap edebiyatındaki "*Yeni Dönem*"in ürünüdür. Bu ekolün ürünlerine bakarak o dönemki sosyal, psikolojik ve kültürel durumun okunabilmesi de mümkündür. Bununla beraber İhyâ' ve Ba'ş Ekolü şiir faaliyetine özgü bir hareket olup yankılarını bugünkü Arap şiirinde bile görmek mümkündür. Ekolün temel özelliği eski Arap edebi anlayışına öykünme olarak tanımlanabilir. Ekol şairleri vezin, kafiye, aruz sistemi ve temalarını muhafaza ederek eski Arap şiirlerine benzer şiirler nazmetmeyi amaçlamıştır (Mûsâ vd., 2015, s. 15-17). Ekolün birçok şairi ahlaki konular, sosyal ilerleme, Arap âleminin sorunları, toplumda görülen olumsuz davranışlar gibi konulardan ilham almakla beraber fikri çatışma ve fusha ve ammice arasındaki mücadele ekol şairlerinin şiirlerinde görülen bir başka olgudur (el-Atavî, 2009, s. 73).

Yukarı aktarılan verilerden anlaşıldığı üzere İhyâ' ve Ba'ş ekolü şairleri kendilerini eski Arap şairlerin şiir temalarıyla sınırlandırmamışlardır. Ekolün temel özelliği eski Arap şiirlerine benzer şiirler serdetmek olsa da o dönemki sorunlara bigâne kalmamıştır.

İhyâ' ve Ba'ş ekolünün temel aldığı esaslar vardır. Bu esaslar şu şekilde tasnif edilebilir.

a) Akılcılık-Öykünme: İhyâ' ve Ba'ş ekolü eski eski ulemâyı örnek alınacak en mükemmel numuneler olarak görmüşler ve akıl ve mantık olgusuna büyük önem vermiştir. Öyle ki akıl ve mantığı mükemmeliyetin, ölçülü ve uyumlu olmanın esası kabul etmişlerdir.

b) Yetenek ve Üretkenlik: Ekol edebi ve sanatsal yeteneği desteklemek için pratik, bilgi, kararlılık ve üretkenliğin önemine dikkat çekmiştir.

c) Hedef: İhyâ' ve Ba'ş ekolü ahlak gibi yüce hedefler belirleme ve bunları öncelikleri arasına koyma eğiliminde olmuşlardır. Mükemmeliyetin ancak ahlaki gayelerle mümkün olacağına inanmışlardır.

d) Eski Edebi Numuneleri Ölçüt Kabul Etme: Bu ekol mensupları eski Arap edebi ürünlerini ölçüt kabul etmişler ve eserlerini bu ölçütlere göre dizayn etmişlerdir.

e) Nesîb: Ekol mensupları şiirlerine, eski şiirlerde olduğu gibi gazel veya harabeler başında durmak gibi olgularla başlamaya çabalamışlar daha sonra fahr, medih, mersiye, vasf gibi temalara geçiş yapmışlardır. (Sa'd, 2018, s. 683-687).

İhyâ' ve Ba's ekolünün zemin aldığı olgularla beraber bir takım şiirsel özellikleri bulunmaktadır. Bu özellikler şöyle sıralanabilir:

a) Kasidenin birbirinden bağımsız beyitlerden oluşması, vezin ve kafiyeyi muhafaza etmesi.

b) Eski şairlerinin şiirlerini medih, mersiye, gazel, fahr gibi temalar yönünden taklit etmesi.

c) Eski şairler gibi imgeler, tasvirler ve ahenke özen göstermesi.

d) Siyaset, toplum gibi birbirinden farklı pek çok konu işlemesi.

e) Ekolün tam manasıyla kendi içerisinde organik bir bütünlük oluşturamaması.

f) Kasidelere başlarken belirsiz üçüncü şahıslara hitap edebilmesi.

g) Net ibarelere sahip olması, ifadelerdeki kalite ve dili doğru kullanması (Teys & Mehdîd, 2021, 331).

İhyâ' ve Ba's ekolü şiirlerinin tarihsel sürecine bakıldığında birkaç aşama geçirdiği göze çarpmaktadır. Bu aşamalar şunlardır:

a) Fikri uyanışın baş göstermesi

b) Eski edebi mirasa dönüş

c) Batı kültürüne açılma

d) Batıdaki edebi ekollerle iletişim

e) Sömürgecilikle mücadele

f) Fikri mücadele (Teys & Mehdîd, 2021, 332-333).

2. İHYÂ' ve BA'S ŞİİR EKOLÜNÜN EN ÖNEMLİ TEMSİLCİLERİ

2.1. Mahmûd es-Sâmî el-Bârûdî (1839-1904)

6 Ekim 1839 yılında Kahire'de doğdu. Ailesi soyu Memlüklülere dayanan Çerkez kökenli bir aileydi (el-Hadîdî, 1967, s. 27-28). Babası Hasan Hüsnî Bey bir topçu albayı olup Mehmet Ali Paşa döneminde Dongola ve Berber bölgelerinin yöneticisiydi. Bârûdî yedi yaşında iken babasını kaybetti (Fenânî, 2018, s. 31). 1851 yılında Harp okulundaki eğitimine başladı ve 1854 yılının sonlarında mezun oldu. Bu sıralarda Arap edebiyatına özellikle de şiire büyük ilgi duymuş ve şiirle yoğun iştigali neticesinde bu alanda derin bilgi sahibi olmuştu (Âl Cundî, 1958, s. 434). Bârûdî daha sonra İstanbul'a gitmiş ve burada Türkçe ve Farsça'yı öğrenmiştir. Mısır'a ordu ve idarede dönünce çeşitli görevlerde bulunmuştur. Girit'te patlak veren isyanın bastırılmasında görevli Mısırlı birliklerin komutanı olarak görev almış ve 1877 Osmanlı-Rus savaşında Osmanlı'ya yardım amacıyla gönderilen birliklerden birinin de komutanı olarak atanmıştır. Bârûdî İngilizler Mısır'ı işgal edince yargılanmış ve

Seylân adasına sürgün edilmiştir. Hayatının on yedi senesini sürgünde geçirmiş ve burada İngilizce öğrenmiştir. 1900 yılında affedilince Kahire'ye dönmüştür. (Neşâvî, 1984, s. 48). Bârûdî İhyâ' ve Ba's ekolünün öncü ismi kabul edilir. Şiirleriyle Arap şiirine eski canlılığını kazandırmayı amaç edinmiştir. Şiirleri eski Arap şiirini taklit etse de çağın ruhunu da yansıtmaktadır. Şiirlerinde kullandığı lafızlar net, etkileyici ve fasih özellikte olmakla beraber duyguları ustaca kullanır. Bârûdî'nin başka bir özelliği de Modern Dönem'de siyasi şiir temalı örnek sunan öncü bir isim olmasıdır (Fenânî, 2018, s. 31).

2.2. Ahmed Şevkî (1868-1932)

Mısırlı bir şair olan Ahmed Şevkî 1868 yılında doğmuştur. Doğum yılı için 1870 yılı da zikredilmektedir. Modern Dönem'in en meşhur şairlerinden olup "*Emîru'ş-Şuarâ*" olarak lakaplandırılmaktadır. Şevkî'nin ilk dönem hayatı Hidiv İsmail'in sarayında geçmiştir. Bu durumun edebi yönü üzerinde etkileri olduğu görülür. İlk eğitimini Şeyh Sâlih adlı bir hocanın dersliğinde almış daha sonra ilkokul ve lise tahsilini tamamlamıştır (Utût, 2010, s. 7). 1885 yılında "Medresetu'l-Hidiv" okulunda iki sene hukuk eğitimi alan Şevkî 1887 yılında Hidiv Tevfik tarafından Paris'e eğitimine devam etmesi için gönderilmiştir. Burada Tercüme Bölümü'nde Fransızca eğitimi almıştır. Bu durum Fransız kültürü yakından tanımasına imkân vermiş ve tiyatro gibi batıya ait sanatlarla tanışmasını sağlamıştır. 1891 yılında Mısır'a dönen Şevkî saray şairi, hidiv sözcüsü olarak çalışmalara başlamıştır. Birinci dünya savaşının patlak vermesiyle İspanya'ya sürülmüş ve beş sene sürgün hayatı yaşamıştır. Bu sırada pek çok Arap ve yabancı edebi eseri tetkik etmiştir. Sürgün hayatının kendisi ve edebi ürünleri üzerinde ciddi etkileri olmuştur. Bu durum şiirlerinde görülebilmektedir. Ahmed Şevkî 1919 yılında vatanı Mısır'a dönmüştür ve 14 Ekim 1938 tarihinde vefat etmiştir (Sâdık, 2012, s. 11-12).Ahmed Şevkî medih, vasf, mersiye, gazel gibi eski Arap şiiri temalarının pek çoğuyla ilgili şiir kaleme almıştır. Dört yaşında şiir yazmaya başlayan Şevkî tüm hayatı boyunca şiirle ilgili olmuştur. Ebû Nuvâs, Ebû Temâm, Buhturî ve Mütenebbî gibi şairlerin şiirlerden ilham almış ve eski Arap şiir tarzını yaşadığı asırdaki olgularla harmanlayarak çağına uyarlamaya çalışmıştır. Şiirlerinde kullandığı lafızların kulağa hoş gelmesi ve sade üslubuyla Modern Dönem'deki şairler arasında ön plana çıkmaktadır. Şevkî'nin şiirleri, Arapça'nın klasik üslupla modern asırdaki olguları özümseyebilmesine delil olarak gösterilmektedir (Teys & Mehdîd, 2021, 331).

2.3. Hâfız İbrâhîm (1872 – 1932)

Hâfız b. İbrâhîm Fehmî Mısır'ın Deyrut kentinde mühendis bir babanın ve Türk bir annenin oğlu olarak dünyaya geldi. Küçük yaşta babasını kaybettikten sonra Kahire'de dayılarının himayesinde büyüdü. Tanta şehrindeyken şiir ve edebi kitaplarla ilgilenmeye başladı. Daha

sonra harp okuluna girdi ve subay ünvanı aldı. Mısır'ın Sudan'a yaptığı askeri çıkarmayla beraber Sudan'â gönderildi. Burada işler istediği gibi gitmeyince bir grup subayla beraber isyan çıkardı ve akabinde yargılanıp emekli edildi. Mısır'a dönünce şiir yazmaya ve edebiyatçıların sohbet meclislerine katılmaya başladı. Bu süreçte Muhammed Abduh ile tanıştı ve onun bilgisinden fazlasıyla istifade etti. 1911 yılında Dâru'l-Kutubi'l-Mısriyye'nin edebiyat bölümü müdürlüğü görevine getirildi (Fâhûrî, 1953, s. 976). Yaklaşık yirmi sene bu görevde kaldıktan sonra 1932 yılının şubat ayında emekliye ayıldı ve aynı yılın temmuz ayında vefat etti (Emîn, 1987, s. 65-66).Hâfız İbrâhîm bir şair olarak klasik şiirin bütün temalarını işlemekle beraber şiire sosyal ve siyasi bir hava katmakla hem Bârûdî hem de Ahmed Şevkî'yi geçmiştir. Klasik temalarda genellikle başarılı olmakla beraber methiye gibi bazı türlerde zayıf olduğu söylenebilir. Bunun da sebebi bu tür şiirlerinde iş bulma ümidiyle gerçek duygularını yansıtmadığından kaynaklı olabilir. Zira içinden geldiği yazdığı methiye şiirlerinde kaliteli ürünler vermiş, mersiyede ise "mersiye şairi" olarak anılacak kadar başarı göstermiştir (Yazıcı, 1997, s. 91).İhyâ' ve Ba's Ekolü'nün yukarıda zikredilen şairlerden başka Ma'rûf Rusâfî, Cemîl Sıdkî ez-Zehâvî, Abdulmuhsin el-Kâzimî, İbrâhîm el-Yâzicî, Emîn Nahle, Ahmed es-Sâfî en-Necefî ve Muhammed Mehdî el-Cevâhirî gibi pek çok önemli temsilcisi bulunmaktadır.

Sonuç

Arap dünyasının Napolyon'un Mısır seferi sonucu Batı ile teması sonucu yaşanan kültürel değişim edebiyat alanında da kendini göstermiştir. Bu alanlardan biri olan Arap şiiri birbirinden farklı ekollerle temayüz etmiş ve farklı özellikleriyle seçkinleşmiştir. Modern Dönem'de görülen bu şiir ekollerinden biri de İhyâ' ve Ba's Ekolü'dür. Bu ekole mensup şairlerin şiirlerinin en temel özelliği geleneksel Arap şiir tarzını temel alması, muhteva ve biçim açısından eski Arap şiirine öykünerek Arap şiirini ilk dönemlerinde olduğu gibi canlı tutmaya çabalamalarıdır. İhyâ' ve Ba's şiir ekolü bu hedef ve niteliğiyle diğer modern Arap şiir ekollerinden ayrışmaktadır. İhyâ' ve Ba's şiir ekolünün pek çok temsilcisi olmakla beraber ekolün öncüsü Mahmûd Sâmî el-Bârûdî'dir. Bârûdî'nin eski Arap şiirlerine öykünerek kaleme aldığı şiirler o dönem Arap edebiyat dünyasında ses getirmiş ve İhyâ' ve Ba's ekolünün ekolleşme sürecini başlatmıştır. Bârûdî'nin şiirleri Modern Dönem'de Arap şiirine yeni bir soluk getirmekle beraber edebi zevkini, yönelimlerini ve gerçekleştirmek istediklerini de yansıtmaktadır. Bârûdî ile başlayan İhyâ' ve Ba's şiir ekolü serüveni Ahmed Şevkî ve Hâfız İbrâhîm gibi şairlerle devam ettirilmiştir. Süreç içerisinde pek çok şairin bu ekol etrafından kümelendiği görülmektedir. İhyâ' ve Ba's Ekolü'ne mensup şairlerin şiirleri eski Arap şiirlerinin işlediği hemen hemen bütün şiir temalarıyla ilgili örnek vererek yeni

dönem ile klasik dönem arasında köprü kurmanın yanında kendi döneminin meselelerini de konu edinmiştir. Öte yandan şairlerin kendilerine özgü şiir temaları seçebildiği de görülmektedir. Bu şekilde eski Arap şiirinin işlediği temalar yeni dönemin getirdiği meselelerle harmanlanmış şekilde İhyâ' ve Ba'ʿs Ekolü şairlerinin şiirlerinde vücut bulmuştur.

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MEDYADA OLUŞAN NEGATİF HABER KÜLTÜRÜNÜN EKONOMİK KARAR ALMA SÜREÇLERİNDE YAŞANAN SOSYOLOJİK VE PSİKOLOJİK PROBLEMLERE ETKİSİ

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ÖZET
Bu makalede, medyadaki negatif haber kültürünün, bireylerin ekonomik karar alma süreçlerine olan etkileri incelenmiştir. Medya aracılığıyla yayılan haberler, filmler ve diğer içerikler vasıtasıyla geniş kitlelere ulaşırken, bu kültürün ekonomik kararlar üzerindeki sosyolojik ve psikolojik etkileri giderek artmaktadır. Bu makale, medyadaki negatif unsurların finansal piyasalar üzerindeki volatiliteye, tasarruf ve yatırım davranışlarına, tüketim alışkanlıklarına ve bireylerin risk algısına olan etkilerini ele almaktadır. Ayrıca, bireylerin negatif haber kültüründen etkilenme derecesini belirleyen faktörler ve bu etkilerin nasıl azaltılabileceği üzerinde de durulmuştur. Medyadaki negatif haber kültürünün ekonomik karar alma süreçlerine olan derinlemesine etkilerini anlamak ve bu etkilerle başa çıkmak için önemli bir çerçeve sunmaktadır. Ekonomik karar alma süreçlerinde bir dizi sosyolojik ve psikolojik probleme yol açmaktadır. Bu etkiler arasında, kitlelerin duygusal tepkilerinin finansal piyasaları etkileyerek aşırı volatiliteye yol açması, tüketicilerin tasarruf ve harcama alışkanlıklarının değişmesi, yatırımcıların risk algısının bozulması ve güvensizlik duygusunun artması gibi konular bulunmaktadır. Medyadaki negatif unsurların ekonomik karar alma süreçlerine olan etkilerini anlamak, bu kültürün olumsuz etkilerini azaltmak ve bireylerin daha bilinçli ve sağlıklı finansal kararlar almasını teşvik etmek önemlidir. Bunu yaparken hali hazırda devam eden başka bir çalışmada görüşülen yüksek sayıdaki örneklemin bir kısmı olan 200 kişi ile yapılan bir anketin değerlendirilmesi de sunulacaktır. Bu bağlamda, medyanın sorumlulukları ve etik kurallarının gözden geçirilmesi, medya içeriğinin daha dengeli bir şekilde sunulması ve bireylerin medya okuryazarlığının artırılması gibi önlemler alınabilir. Medyanın finansal karar alma süreçlerine olan etkilerini anlamak, daha sağlıklı ve sürdürülebilir ekonomik davranışlar sergilemek için önemli bir adımdır.
Anahtar Kelimeler : Davranışsal Finans, Medya, Finans Sosyolojisi, Finans Psikolojisi

NEGATIVE NEWS CULTURE IN THE MEDIA AND ITS IMPACT ON SOCIOLOGICAL AND PSYCHOLOGICAL PROBLEMS IN ECONOMIC DECISION-MAKING PROCESSES

ABSTRACT
This article examines the effects of the negative news culture in the media on individuals' economic decision-making processes. As news, films, and other content disseminate through the media to wide audiences, the sociological and psychological effects of this culture on economic decisions are increasingly significant. The article addresses the impact of negative elements in the media on financial markets' volatility, saving and investment behaviors, consumption patterns, and individuals' risk perception. Additionally, it discusses factors determining the extent to which individuals are influenced by the negative news culture and how these effects can be mitigated. Understanding the profound effects of the negative news culture in the media on economic decision-making processes provides an important framework for coping with these effects. It leads to a range of sociological and psychological problems in economic decision-making processes. Among these effects are emotional responses of masses influencing financial markets leading to excessive volatility, changes in consumers' saving and spending habits, deterioration of investors' risk perception, and increased feelings of insecurity. Understanding the effects of negative elements in the media on economic decision-making processes, reducing the adverse effects of this culture, and promoting individuals to make more informed and healthy financial decisions are important. Furthermore, an evaluation of a survey conducted with two hundred participants, who are a subset of a larger sample currently being studied, will also be presented.. In this context, measures such as reviewing the responsibilities and ethical standards of the media, presenting media content in a more balanced manner, and increasing media literacy among individuals can be taken. Understanding the media's impact on financial decision-making processes is a crucial step towards exhibiting healthier and sustainable economic behaviors.
Keywords: Behavioral Finance, Media, Financial Sociology, Financial Psychology

Giriş

Dünyanın olumsuz gidişatı ile medyanın yaklaşımı oldukça önem taşımaktadır. Basında her gün savaş, terör, kirlilik, eşitsizlik ve adaletsizlik ile ilgili iddialar, olan olaylar, olmayan olaylar, hikayeler yer almaktadır. Aynı zamanda uzun köşe yazıları ve kimi manşetlerin krizleri daha da tırmandırmak ve deyim yerindeyse okuyucu (izleyici) ile etkileşime girerek toplulukları etkilemek medyanın uzun süredir neredeyse görevi haline gelmiş bulunmaktadır. Görsel-işitsel haberlerde dahil olmak üzere her akşam haberinde dünyanın bir yerlerinde savaş ve terörün olması artık olağan karşılanmaktadır. Haber denilen olan şeylerle ilgilenmeli olmayan şeylerle ilgilenmemelidir. Fakat sosyal medyada oluşan gruplar, sosyal medya hesapları, milyon takipçili hesaplar eşliğinde küresel birer haber kanalı gibi çalışmaktadırlar. Buradaki temel problemin şu olduğunun kesin olarak bilinmesi lazım: Haberin doğası gereği insanların hayatlarının her alanlarında dünyaya olan bakış açılarının değiştirilmesi medya ile mümkün olmaktadır. Ayrıca arşivlerin internet ortamında tutulduğu günümüzde haberden etkilenen bireylerin haberlerin akış hızına bağlı olarak arşivleri dahi karıştırarak geçmişe ait doğrulama yapamamaları sorunu daha büyük sorunları da beraberinde getiriyor görünmektedir. Doğru haber kanalları bir tarafa sosyal medyadan başını kaldıramayan insanoğlu haberin kaynağına inemediği için hangi konuların doğru, hangi konuların yanlış olduğunu belirleme yetisinden gün geçtikçe uzaklaşmaktadır. Yoğun haber akışları ile gündeme yetişmek zorunda kalındığında sürekli doğru/yanlış sorgulamasının günlük yaşama olan etkisi oldukça negatif yönde ve güçlü olmaktadır. Dünyanın gündemi ekonomi olduğundan özellikle COVID sonrası artan enerji ve gıda fiyatları insanların temel ihtiyaçlarını daha maliyetli olarak edinmeleri sorunu doğurmuştur. COVID sırasında alınan tedavi süreçlerinde tedavinin olup olmadığı ile pandeminin varlığının olup olmadığı dahi sorgulanmışken medyanın bireylerin ekonomik karar alma mekanizmanlarına olan istemsiz etkileri daha da sorgulanır hale gelmiştir. Bu çalışma, hali hazırda devam eden medyadaki korku kültürünün ekonomik karar alma süreçlerine olan etkilerini derinlemesine incelemekte olan kapsamlı bir çalışmanın amaçlarından bahsedecektir. Bu etkilerin nasıl ele alınabileceği konusunda öneriler sunacak olan çalışmada, devam eden araştırmanın şu ana kadar hazır olan 200 kişi ile yapılan bir anketin değerlendirilmesi de sunulacaktır. Çalışma bu haliyle dünyada kendisine oldukça fazla çalışma alanı bulan bir perpektifi Türkiye kapsamında ele almış olacaktır.

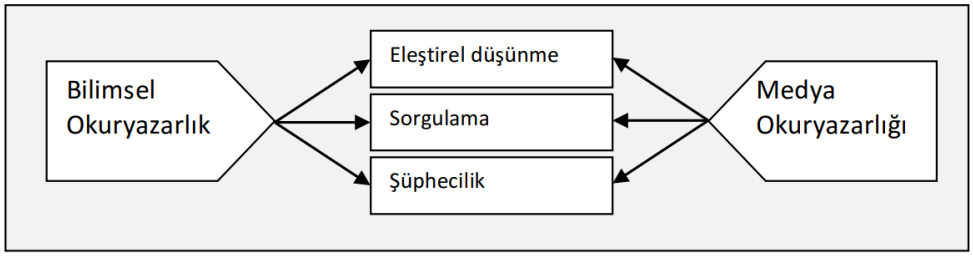
Medya ve Ekonomik Karar Alma Süreçleri Arasındaki Etkileşim

Medya ve İlişkili Olduğu Okuryazarlık Türleri

Sosyal medyanın daha fazla yer aldığı medya kavramı toplumda tüm insanların günlük yaşamı için vazgeçilmez bir araç haline gelmiştir. Bilgi alma hakkına sahip olan insanoğlu aynı zamanda medyada görüşlerini ifade eden bireyler haline geldi. Buradaki temel konu "medya" nın ne olduğu ile ekonomik karar süreçleri ile medyanın arasında nasıl bir etkileşim olduğudur. Öyle ki burada sadece haber almanın çok ötesinde etkileşmeler mevcuttur.

Medium kelimesinin çoğulu olan medya, iletişim kanallarını ifade eden bir terim olup haberler, müzik, filmler, eğitim ve tanıtım mesajları gibi içeriklerin yayıldığı araçları kapsar. Yazılı ve yayın medyası olmak üzere iki ana kategoriye ayrılır ve internetin yükselişiyle dijital medya da önem kazanmıştır. Toplumda iletişimde kullanılan çeşitli yolları açıklar ve sosyal medya da online iletişim kanallarının bir kolektifini ifade eder. Hatta medyayı geleneksel medya ve yeni medya olarak ayırmak mümkündür. Bulunmaz (2014:25) şu şekilde ifade etmektedir: *Geleneksel medyada her şey monolog üzerine kuruludur. Biri kalkar bir şey söyler, mümkün olan herkes dinlerdi. Fakat dinleyenler kimdi, yaşları, cinsiyetleri neydi, anlatılan hakkında ne düşünüyorlardı? Bunları öğrenmenin gerçek bir yolu yoktu. İşte yeni medya tam bu noktada ayrılıyor geleneksel medyadan, bu nedenle yeni medya sizinle diyalog halinde olan medyadır. Biri kalkar bir şey anlatır, herkes dinler ve sonra herkes bunun hakkında yorum yapar, beğenir, eleştirir, paylaşır, önerir. Üstelik bunları yapanlar hakkında çok fazlaca bilgi de edinilir ve kim bunlar dendiğinde cevap verebilir (http://yenimedya.co/ornek-sayfa/, 02.11.2011).* Yeni medya kavramını sosyal medya ile bütünleştirmekte mümkündür. Semiz ve Bora (2014:1) ile Veysel ve Aydın (2014:198) *"Sosyal medya, adında medya olmasına rağmen geleneksel medyadan farklılık göstermektedir. Özgünlüğünü yaratan en önemli farklılığı, herhangi bir bireyin sosyal medyanın içeriğini yaratabilmesi, yorumda bulunabilmesi ve katkı sağlayabilmesidir"* şeklinde ifade etmektedirler. Medya sosyal medya platformları haline geldikçe elektronik bağlantılar kendi arasında iletilebilir sosyal elektronik ağlara dönüşmüştür. Ağların sunduğu sınırsız özgürlük alanları kişinin belki de gerçekte yapamayacağı eylemleri gerçekleştirebilmesi için bir imkân gibi sunulmuştur (Acar,2024). Gerçekte konuşmayanların konuştuğu, konuşanların sustuğu, Doğrunun ve yanlışın tekrar sorulamadan cevapların okunamadan geçiştirildiği platformları halini almıştır. Öyle ki zorbalık kavramı siber zorbalık olarak yerini almıştır. Zorbalık hak etmeyen kitlelere de bunu izletmiş, okutmak zorunda bırakmış ve haberlerin medyada verilen biçimi halkın yararının olmasına özen gösterilmesini sağlayamamıştır. Buradaki temel problemin şu olduğu gerçeği yatmaktadır: Dünyanın her tarafında her döneminde şiddettin bir izleyici kitlesi hep olmuştur. Şiddet ve bunu yayınlamak dikkat çekmenin en kolay yoludur

(Görmez,2024:279)Bir değer tarafta da bilimsel okuryazarlık ile medya okuryazarlığı ilişkisinin tam ve doğru olarak kurulması lazımdır. Bilimsel okuryazar; medya araçlarındaki bilimsel konuları kavrayabilme, kavradığının kalitesini değerlendirebilen, kanıtlara dayalı iddialara yönelme yeteneğine sahip olan (Benzer,2020:11) birey olarak tanımlanmaktadır. Medya okuryazarlığı ise medyadaki tüm mesajlara ulaştığında bunları çözümleme değerlendirme, analiz etme (Benzer,2020:12), yanlışla doğruyu kanıtlarıyla ayırabilme, iletileri çözerken negatif yönde etkilenmeme kabiliyetlerine sahip olan bireyler manasına gelmektedir.



Şekil 1: Bilimsel Okuryazarlık ve Medya Okuryazarlığının içerdiği benzer amaçlar

Kaynak: (Benzer,2020:12)Bilimsel okuryazarlığın; eleştirel düşünme, sorgulama, şüphecilik kavramları medya okuryazarlığının kavramsal çerçevesi ile örtüşmektedir. Bunun aynı zamanda ekonomik haberlerde dahil tüm bilgi kaynaklarına uygulanabilir olması esastır.

Medya ve Ekonomik Karar Alma Süreçleri

Medyanın kitlesel kamuoyu algısını değiştirmesi çok uzun çağlardan beri süregelen aktif araçlardan bir tanesidir. Bu konu iletişim biliminin alanına girmekle birlikte medyada yer alan bilgiyi iletişim kanallarına sokan bireyler iletişimde olunan kitlenin seçimlerini etkileme görevini de yapmaktadırlar. Dijital ürünlerin hayata daha çok girmesi ile birlikte haberlerin yayılımı ve kitlelerin düşüncelerini ve bakış açılarını etkileme becerileri olağanüstü bir hızda yayılım göstermektedir. Profesyonel finansçıların dahi hızla okumakta güçlük çektiği çeşitli ekonomik bilgiler bu alanla ilgilenen iktisatçılar dahil herkesi oldukça etkiler hale gelmişlerdir.

Medya içeriğinin ekonomik beklentileri nasıl etkilediğine dair yapılan çalışmada (Boumans vd., 2023:1296) Medya içeriğinin "*gerçekten önemli bir bilgi kaynağı olduğu ve ekonomistlerin beklentileri üzerinde etkisi olduğu gerçeğini güçlendirdiği"* sonucuna ulaşılmıştır. Ayrıca çalışmada, "*uzun süredir devam eden demokratik sistemlere sahip ülkelerdeki ve demokratik kurumları biraz kusurlu olan gelişmekte olan ülkelerdeki ekonomi uzmanları, medyayı yeni demokrasilerdeki ve otoriter rejimlere sahip ülkelerdeki ekonomi uzmanlarından önemli ölçüde daha güvenilir"* buldukları sonucuna da ulaşmışlardır. Son

olarak "*uzmanların medyanın başkaları üzerindeki etkisinin kendilerinden çok daha yüksek olduğu"* sonucunu çıkarmışlardır.

Peress (2022) ise finansal karar almada medyanın rolünü bilgiye erişimi kolaylaştırmak, bilgiyi filtrelemek, ve yeni bilgi yaratmak olarak tanımlanmıştır. Valerio (2019:5) reklam, promosyon, markadan daha çok ekonomik aktivitelerin kullanıcı yorumları ile oldukça etkilendiğini göstermiştir. Çalışma daha çok pazarlama ve e-ticaret alanında yapılmış olsa da bunun finansal enstrüman alım satımı ile de bütünleştirilmesi de aynı sonucu verecektir. Finansal araçlar kullanılarak yapılan alım satımlarda sosyal medyada yapılan yorumların etkisinin azımsanmayacak kadar fazla olduğu düşünülmektedir. Azalan sosyal sermaye ile birlikte insanların ekran başında yalnız daha çok vakit geçirmesi, beraberinde 1950 sonrasında dünyada oluşan siyasi, ekonomik gerginlikler, savaş ve terör saldırıları ile birlikte medyada yer alan negatif haberlerin psiko-sosyal etkileri artmış sosyal yapıların dijitale entegre olması ile birlikte Putnam (2000) belirtilen yüzyüze etkileşimi teşvik eden mekanizmaların ortadan kalktığı söylenebilir. DellaVigna ve La Ferrara (2015) tüketim ve tasarruf kavramlarının medya tarafından doğrudan etkilediği gerçeğini vurgulamışlardır. Li (2021) ise çalışmasında medyanın düzenleyicilerin karar alma süreçlerinin verimliliğini artırmaya yardımcı olduğunu ileri sürmektedir.

Öztopçu (2019:365)'e göre davranış gibi karmaşık yapıyı etkileyen ve ölçümü zor ya da belirsiz hale getiren diğer faktörlerden biri insani duygulardır. Duyguların kontrol edilmesindeki zayıflık ya da ani olaylar karşısındaki istemsiz tepkiler, birey davranışıyla ilgili belirsizliği de artırmaktadır. Sosyal medyada ise tam olarak bu noktada devreye girmekte ve istemsiz duyguların ortaya çıkmasında başrolü oynamaktadır (Kıran vd.,2020:435). Ekonomik karar verme aşamasında olan insanların rasyonel beklentiler ile hareket etmeleri gerektiği hususunda 1950'lerden itibaren genel kabul görmüş görüşler, 80'lerin ortasından itibaren davranışsal finans adıyla yeni bir alanın doğuşu ile değişiklik göstermiştir. Bu görüşe göre kişiler rasyonel hareket etmezler ve Markowitz'in etkin piyasa hipotezi kavramı bir yönüyle artık geçerli değildir. Bu noktada finansal kararları almak durumunda kalan bireyler yatırıma yönlenme, tasarruf etme, tüketim kararlarını gözden geçirme, finansal enstrümanlara yatırım yapma, borçlanma araçlarını kullanma konusunda toplumun genelinden etkilenme konusunda çok açıktırlar. Medyanın da toplumu şekillendirme rolü ile birleştiğinde insanların sosyal medya üzerinden birbirleri ile etkileşime girerek ekonomik kararlarını medyada çıkan haberlere göre şekillendirmeleri davranışsal finans kapsamında değerlendirilebilir. Kısaca sosyal medyanın kamuoyunu şekillendirmede ve aynı zamanda ekonomik karar almayı etkilemede önemli bir role sahip

olduğu sonucuna varılabilir (Ausat,2023:35; Gorodnichenko vd., 2021; Robinson,2008:137; Gündüç,2020:376)

Negatif Haber Kültürü: Psikolojik ve Sosyolojik Perspektif

Negatif ya da depresif haber okuma takıntısı anlamına gelen kötü haber bağımlılığı ya da felaket kaydırması (doomscrolling), son yılların en ciddi problemlerinden biri olarak ön plana çıkmaktadır (Sabater, 2022: Erişim: 19.03.2024). (Zıttı ise Gleefreshing olarak adlandırımaktadır) İnsanlar hiç farkında olmadan psikolojik uyarıcılara maruz kalmaktadır. Bu kötü haber bağımlılığının tüm bir sosyal ağ içinde kabul görmesi ise bu çalışmada "negatif haber kültürü" olarak adlandırılmıştır. "Doomscrolling-culture" ifadesi, toplumda yaygınlaşan ve insanların sürekli felaket senaryolarına veya endişe verici içeriklere odaklanma eğilimini ifade etmektedir. Bu terim, sosyal medyada veya diğer çevrimiçi platformlarda insanların negatif içeriklere aşırı ilgi gösterme ve bu tür içeriklere sürekli maruz kalma kültürünü tanımlar.

Bu noktada ciddi şekilde yayılmaya başlayan haberlere verilen tepkiler endişe verici ve üzücü boyutlara uşatığında önce psikolojik sonra ise sosyolojik yıpranmalara sebep olurlar. Negatif haberlere olan bağımlılık bir süre sonra sansasyonel hatta sahte haberlere olan ilgiyi de arttırır. (Aklınızı keşfedin. Erişim Tarihi :15.03.2024)

Medya okuryazarlığının az olması ise negatif haberlere olan bağımlılığın ayıklanmasını güçleştirmektedir. Kurt ve Dürüm (2010) aktardığına göre "bireylerde yaşamboyu öğrenme bilincini oluşturma, bu bilinci geliştirme, daha etkin öğrenme için bireylerin yeni beceriler kazanmalarını sağlama olarak tanımlanan okuryazarlıktır" (Organisation for Economic Cooperation and Development [OECD], 1995: 22). Medya okuryazarlığı, "yazılı ve yazılı olmayan, büyük çeşitlilik gösteren yapılardaki (internet, televizyon vb.) mesajlara ulaşma, bunları çözümleme, değerlendirme ve iletme yeteneği" olarak tanımlanmaktadır (İnceoğlu, 2005:27 aktaran Kurt ve Dürüm (2010:21)).

Ekonomik Karar Alma Süreçlerinde Medyanın Rolü: Negatif Haber Kültürünün Analizi

Verileri toplama ile olguları ve olayları açıklama yöntemlerinden Nitel Analiz kullanılmıştır. Çalışmada araştırma desenlerinden nitel analiz kullanılmasının nedeni verinin nasıl sorusu sorularak edinilmiş olmasından kaynaklanmaktadır. Soruların cevapları nedenleri ve nasılları incelediğinden açık uçlu sorular üzerinden esnek bir çalışma olanağına ihtiyaç olduğu açıktır. Burada temel problem belirli kalıplara ait cevaplar beklenmediğinden doğrudan sorulan soruya ve verilen cevaba odaklanarak herhangi bir görüşten etkilenmeden ve verilmiş bir hipotez kısıtlanması olmadan direk araştırmacının da araştırmanın tarafı

olmasının istenmesidir. Bu anlamda Nitel araştırma desenlerinden Gömülü Teori deseni kullanılmış olup, teori, Glaser ve Strauss (2006:3-4) tarafından sistematik olarak toplanan verilerden teoriye erişme çabaları; olay ve olguların içinde yerleşik ya da temellenmiş bilgileri açığa çıkarmaya yönelik bir nitel yöntem yoluyla kuramı ortaya çıkarma metodolojisi olarak tanımlanmıştır (Bulduklu,2019:3)

Katılımcıların verdiği cevaplarda kodlara en yakın kelimeler analiz edilmiş ve katılımcıların konuşmalarında birden fazla kod çıkarılmıştır.Negatif haberlerin yayılmasıyla birlikte insanların risk algısı artmakta ve risk yönetimi stratejilerinde bozulmalar yaşanmaktadır. Bu durum, insanların ekonomik kararlarında daha temkinli ve çekingen olmalarına neden olabilir. Negatif haberler tüketiciler arasında güvenin azalmasına yol açmaktadır. Tüketiciler, ekonomik belirsizlikler karşısında harcamalarını kısıtlayabilir veya tasarruf eğilimine girebilirler. Negatif haberlerin rekabet ortamında doğrudan etkisi olduğu gözlemlenmektedir. Rekabetin azalması veya zorlaşması, ekonomik belirsizliklerin etkisiyle rekabetçi piyasalarda iş yapmayı zorlaştırabilir. Negatif haberler, işletmelerin yatırım ve büyüme stratejilerini etkileyebilir. Belirsizlikler nedeniyle işletmeler daha az yatırım yapabilir veya büyüme stratejilerini revize etmek zorunda kalabilirler. Negatif haberlerin etkisiyle bireylerin borçlanmaya bağlı itibarlarında bozulmalar yaşanabilir. Bu durum, kişilerin finansal güvenliklerini ve itibarlarını olumsuz etkileyebilir, borçlanma alışkanlıklarını değiştirebilirler.Negatif haberlerin yayılmasıyla birlikte tüketiciler arasında harcamaya olan ihtiyacın azaldığı gözlemlenmektedir. Bu durum, tüketicilerin gereksiz harcamalardan kaçınma eğilimine girebileceğini ve tasarruf etme yoluna gidebileceklerini göstermektedir. Negatif haberler tüketiciler arasında güven kaybına neden olmaktadır. Ekonomik belirsizliklerin artmasıyla birlikte tüketiciler, geleceğe dair güvenlerini kaybedebilirler ve bu da harcama eğilimlerini olumsuz etkileyebilir. Negatif haberlerin etkisiyle tüketicilerin tüketim alışkanlıklarında değişiklikler yaşandığı gözlemlenmektedir. Örneğin, tüketiciler daha az lüks tüketim yapabilir veya daha temel ihtiyaçlarını karşılamaya odaklanabilirler. Negatif haberlerin tüketicilerin ekonomik beklentilerini önemli ölçüde etkilediği görülmektedir. Tüketiciler, ekonomik belirsizlikler karşısında geleceğe dair beklentilerini revize edebilirler ve bu da harcama eğilimlerini etkileyebilir. Negatif haberler nedeniyle tüketiciler arasında varlık değerlerinde azalma korkusu yaşandığı gözlemlenmektedir. Bu durum, tüketicilerin finansal varlıklarının değer kaybetmesinden endişe duymalarına ve harcama alışkanlıklarını değiştirmelerine neden olabilir.Negatif ekonomik haberlerin yayılmasıyla birlikte insanlar arasında geleceğe dair belirsizlik hissi artmaktadır. Bu durum, insanların gelecekle ilgili planlarını yaparken daha temkinli

olmalarına neden olabilir. Negatif haberlerin etkisiyle işsizlik endişesi artmaktadır. İş kaybı korkusu, insanların maddi güvenliklerini sorgulamalarına ve ekonomik belirsizlikler karşısında endişelenmelerine neden olabilir. Negatif ekonomik haberlerin yayılmasıyla birlikte finansal durumlarda sarsıntı endişesi artmaktadır. İnsanlar, gelirlerinin azalabileceği, tasarruflarının eriyebileceği veya varlıklarının değer kaybedebileceği endişesiyle karşı karşıya kalabilirler. Negatif haberler nedeniyle iş güvencesi ve kariyer endişesi artmaktadır. İnsanlar, işlerini kaybetme veya kariyerlerinde gerileme yaşama endişesi taşıyabilirler, bu da psikolojik ve finansal stresi artırabilir. Negatif ekonomik haberlerin etkisiyle psikolojik etkilerin arttığı gözlemlenmektedir. Kaygı, stres, depresyon gibi psikolojik sorunlar, ekonomik belirsizliklerin ve endişelerin artmasıyla birlikte yaygınlaşabilir.

Veriler, negatif haberlerin ekonomik davranışlar, tüketici güveni, stratejik planlama ve toplumsal güven üzerinde derin ve çeşitli etkiler yarattığını ortaya koymaktadır. Bu etkiler daha ayrıntılı olarak ele alınacak olursa:Negatif haber kültürünün "Ekonomik Davranışlar Üzerine Etkilerine" bakıldığında; *Risk Algısı ve Yönetiminde Bozulmalar %75 çıkmıştır.* Oran, negatif haberlerin kişilerin risk algısını önemli ölçüde bozduğunu göstermektedir. Riskten kaçınma eğilimini artıran bir unsur olarak görülmektedir. *Yatırım ve Büyüme Stratejilerinde Bozulmalar (%12,5) ikinci sıradadır.* Negatif haberler, şirketlerin ve bireylerin yatırım yapma şeklini ve büyüme stratejilerini tedirgin etmektedir.Negatif haber kültürünün "Tüketim Alışkanlıkları ve Harcama Eğilimleri" etkisine bakıldığında; "*Ekonomik Beklentilerin Değişmesi" %81,5* çıkmıştır. Bu oran, tüketicilerin gelecekteki ekonomik durum hakkında daha kötümser olmalarına neden olduklarını göstermektedir. Harcama ve yatırım kararlarını sınırlama şeklinde eğilim içerisine girilebileceğini göstermektedir." *Güven Kaybı"* %55,5 çıkmıştır. Güvenin azalması doğrudan tüketim eğilimlerini etkileyebileceği, insanların bunun sonucu olarak daha az harcama yapmayı tercih edebilecekleri sonucuna ulaşılmıştır.Endişe ve Belirsizlik Duygularının etkilenmesi de önemli bir diğer husustur. *"Finansal Durumlarda Sarsıntı Endişesi"* %83,5 ve "*Psikolojik Etkiler"* %78,5 oranları ile cevaplanmıştır. Finansal belirsizliklerin, kişisel ve profesyonel hayatlar üzerinde stres ve anksiyeteye yol açabildiği rahatlıkla söylenebilir, Genel sağlık ve refah durumunun olumsuz etkilenmesine neden olmaktadır.Stratejik Planlama Üzerine Etkilerine bakıldığında şu sonuçlara ulaşılmıştır: İnovasyon ve Yenilikte Revizyon diyenlerin oranı %64,5 çıkmıştır. Kurumlar, piyasa koşullarına adaptasyon sağlamak ve rekabetçi kalabilmek adına inovasyon ve stratejilerinde önemli değişiklikler yapabileceklerinin sinyalini vermektedirler.

Negatif haber kültürünün *"Sosyal Medyanın Tüketici Davranışları Üzerindeki Etkisi"'nin tetikleyicilerine bakıldığında ise mülakat sonucunda bireyler "*Marka ve Ürün Seçiminde Belirsizlik" için %83,5 ve "Satın Alma Kararlarının Ertelenmesi" %95 oranında cevap vermişlerdir. Tüketiciler, belirsiz koşullar altında yeni ürünler denemekten kaçınabildiklerini belirtmişlerdir. Büyük alımların ertelenmesi olasıdır. Toplumsal Güven ve Sosyal Dayanışma Üzerine Etkilerine bakıldığında ise negatif haber kültürü "Dayanışmanın Azalmasını (%70,5) ve Toplumsal Huzursuzluk ve Protestoların Artmasını tetikleyebilir (%30,5) denmektedir. Negatif haberler toplum içinde bölünmeye ve dayanışmanın zayıflamasına neden olur, ki sosyal çatışmaları tetikleme ihtimalini arttırabilir denmektedir. Negatif haber kültüründe "Haberlerin Verilme Tarzı" çok önemli bulunmuştur. Öyle ki haberlerin verilme tarzına göre "Toplumsal Duyarlılıkta Bozulma" olabileceği (%97) yüksek bir cevaplama oranıyla söylenmektedir. Haberlerin sunum şekli, toplumun duyarlılığını ve tepkilerini derinden etkileme potansiyeline sahiptir, Genel toplumsal ve ekonomik istikrarsızlığın artmasına yol açan en önemli etkenlerin başında gelmektedir. Bu sonuçlardan anlaşıldığı üzere, negatif haberlerin yalnızca bireylerin ekonomik kararlarını değil, aynı zamanda genel toplumsal yapı ve duyarlılığı da şekillendirdiği görülmektedir.

Sonuç

Negatif ekonomik haberlerin insanların ekonomik davranışları üzerinde çeşitli etkileri bulunmaktadır. Bu etkiler farklı kategorilere ayrılarak incelendiğinde, öncelikle risk algısı ve yönetiminde belirgin bozulmalar yaşandığı görülmektedir. İnsanlar, ekonomik belirsizlikler karşısında risk alma konusunda çekingen davranmakta ve risklerini yönetme stratejilerinde değişikliklere gitmektedirler. Bununla birlikte, tüketicilerin güveninde de önemli düşüşler yaşandığı gözlemlenmektedir. Güvenin azalması, tüketicilerin harcama eğilimlerini olumsuz etkileyerek tüketim alışkanlıklarında ve harcama eğilimlerinde değişikliklere yol açmaktadır. Özellikle ekonomik beklentilerdeki değişmeler, tüketicilerin harcama alışkanlıklarını etkileyen temel faktörler arasındadır.Ayrıca, negatif ekonomik haberlerin endişe ve belirsizlik duygularını artırdığı da belirlenmiştir. Bu duyguların artmasıyla birlikte, insanlar geleceğe dair belirsizlik hissi yaşamakta ve iş güvencesi, finansal durumlarında sarsıntı gibi konular üzerinde endişelenmektedirler. Bu da psikolojik etkilerin ortaya çıkmasına neden olmakta ve toplum genelinde stres ve kaygı düzeylerinin artmasına yol açmaktadır.Negatif haberlerin ayrıca stratejik planlamaları da etkilediği gözlemlenmektedir. Özellikle risk algısının artması, acil durum planlarının güçlendirilmesi ve piyasa değişimlerine adaptasyon gibi konular, işletmelerin stratejik planlama süreçlerinde dikkate alınması gereken önemli unsurlardır. Aynı zamanda, müşteri ve pazar analizi ile

yenilik ve inovasyon süreçlerinde revizyonlar yapılması gerekebilir.Sosyal medyadaki negatif haberlerin tüketici davranışlarını da önemli ölçüde etkilediği tespit edilmiştir. Bu haberlerin yayılmasıyla birlikte, tüketiciler arasında marka ve ürün seçiminde belirsizlikler yaşanmakta, satın alma kararları ertelenmekte ve tasarruf eğilimi artmaktadır. Bu durum, tüketici davranışlarının değişmesine ve pazar dinamiklerinde önemli değişikliklere yol açabilmektedir.

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EK-1

Mülakat Soruları ve Kategorileri

1. Medyada oluşan negatif haber kültürünün ekonomik karar alma süreçlerine olan etkisini anlamak için, negatif haberlerin insanların ekonomik davranışlarını nasıl etkilediğine dair gözlemleriniz nelerdir?

[Kategori 1: Negatif haberlerin insanların ekonomik davranışlarını nasıl etkilediği]

2. Medyanın ekonomik haberleri sunma tarzının, bireylerin ve toplumun genel ekonomik algısını nasıl etkilediğini düşünüyorsunuz?

[Kategori 2: Haberlerin verilme tarzının ekonomik davranışları nasıl etkilediği]

3. Negatif ekonomik haberlerin yoğun olduğu bir dönemde, insanların tüketim alışkanlıkları ve harcama eğilimleri üzerindeki etkilerini nasıl değerlendirirsiniz?

[Kategori3: Negatif Haberlerin tüketim alışkanlıkları ve harcama eğilimlerini nasıl etkilediği]

4. Medyada oluşan negatif haber kültürünün, yatırımcıların risk algısını ve yatırım kararlarını nasıl etkilediğini düşünüyorsunuz?

[Kategori 4: Negatif haberlerin risk algısını ve yatırım kararlarını nasıl etkilediği]

5. Negatif ekonomik haberlerin toplumda endişe ve belirsizlik duygularını artırdığına dair gözlemleriniz nelerdir?

[Kategori 5: Negatif ekonomik haberlerin endişe ve belirsizlik duygularını nasıl arttırdığı]

6. Medyada oluşan negatif haber kültürünün iş dünyasındaki profesyonellerin karar alma süreçlerine nasıl yansıdığını düşünüyorsunuz? Bu durum şirketlerin stratejik planlamalarını nasıl etkiliyor?

[Kategori 6: Negatif haber kültünün iş dünyasının karar alma süreçlerini nasıl etkilediği]

[Kategori 7: Negatif haber kültürünün stratejik planlamaları nasıl etkilediği]

7. Negatif ekonomik haberlerin sosyal medya platformlarında hızla yayılmasının, toplumun ekonomiye olan güvenini ve tüketici davranışlarını nasıl etkilediğini düşünüyorsunuz?

[Kategori 8: Sosyal medyadaki negatif haberlerin ekonomiye olan güveni nasıl etkilediği]

[Kategori 9: Sosyal medyadaki negatif haberlerin tüketici davranışlarını nasıl etkilediği]

8. Sosyal medyada yer alan olumsuz ekonomik haberlerin, bireylerin ve toplumun genel ruh halini ve mental sağlığını nasıl etkilemektedir?

[Kategori 10: Sosyal medyadaki olumsuz ekonomik haberlerin bireylerin ve toplumun genel ruh halini ve mental sağlığını nasıl etkilediği]

9. Negatif ekonomik haberlerin toplumsal güven ve sosyal dayanışma üzerindeki etkilerini değerlendirebilir misiniz?

[Kategori 11: Negatif ekonomik haberlerin toplumsal güven ve sosyal dayanışmayı nasıl etkilediği]

10. Medyanın ekonomik haber sunumunda daha dengeli ve objektif bir yaklaşım benimsemesinin, toplumun ekonomik karar alma süreçlerine nasıl bir katkı sağlayabileceğini düşünüyorsunuz?

[Kategori 10: Medyanın ekonomik haber sunumunda daha dengeli ve objektif bir yaklaşım benimsemesinin, toplumun ekonomik karar alma süreçlerine nasıl bir katkısı olur]

EK-2 Derinlemesine Mülakat Tekniği İle Elde Edilen Cevaplara Ait Kodlar

Kategori 1: Negatif haberlerin insanların ekonomik davranışlarını nasıl etkilediği		
Kodlar	#	%
Risk algısı ve yönetiminde bozulmalar	150	75
Tüketicilerin güveninde bozulmalar	100	50
Rekabet ortamında bozulmalar	14	7
Yatırım ve büyüme stratejilerinde bozulmalar	25	12,5
Borçlanmaya Bağlı Bireysel itibarda bozulmalar	16	8

Kategori 3: Negatif Haberlerin tüketim alışkanlıkları ve harcama eğilimlerini nasıl etkilediği		
Kodlar	#	%
Harcana ihtiyacının azalması	35	17,5
Güven kaybı	111	55,5
Tüketim alışkanlıklarında değişiklik	27	13,5
Ekonomik beklentilerin değişmesi	163	81,5
Varlık değerlerinde azalma korkusu	19	9,5

Kategori 5: Negatif ekonomik haberlerin endişe ve belirsizlik duygularını nasıl arttırdığı		
Kodlar	#	%
Gelecek beklentilerinde belirsizlik	28	14
İşsizlik Endişesi	94	47
Finansal durumlarda sarsıntı endişesi	167	83,5
İş güvencesi ve kariyer endişesi	96	48
Psikolojik etkiler	157	78,5

Kategori 7: Negatif haber kültürünün stratejik planlamaları nasıl etkilediği		
Kodlar	#	%
Risk algısının artması	67	33,5
Acil durum planlarının güçlendirilmesi	54	27
Piyasa değişimlerinde adaptasyon	39	19,5
Müşteri ve Pazar Analizi	19	9,5
İnovasyon ve yenilikte revizyon	129	64,5

Kategori 9: Sosyal medyadaki negatif haberlerin tüketici davranışlarını nasıl etkilediği		
Kodlar	#	%
Tüketim isteksizlği	18	9
Tasarruf eğilimi	112	56

Marka ve ürün seçiminde belirsizlik	167	83,5
Riskten kaçınmada süreklilik	59	29,5
Satın alma kararlarının ertelenmesi	190	95

Kategori 11: Negatif ekonomik haberlerin toplumsal güven ve sosyal dayanışmayı nasıl etkilediği

Kodlar	#	%
Güvenin azalması	149	74,5
Bölünme ve ayrışmaya olan inanç	27	13,5
Dayanışmanın azalması	141	70,5
Toplumsal destek mekanizmalarının zayıflaması	37	18,5
Toplumsal huzursuzluk ve protestoların artması	61	30,5

Kategori 2: Haberlerin verilme tarzının ekonomik davranışları nasıl etkilediği

Kodlar	#	%
Algı ve inançta bozulmalar	174	87
Yatırımcıların risk alma isteklerinin düşmesi	167	83,5
Ekonomik politikaların yetersizlğine dair inanç	25	12,5
Piyasalarda belirsiz dalgalanmalar	75	37,5
Toplumsal duyarlılıkta bozulma	194	97

Kategori 4: Negatif haberlerin risk algısını ve yatırım kararlarını nasıl etkilediği

Kodlar	#	%
Endişede artış	165	82,5
Varlık değerinde düşüş endişesi	197	98,5
Kriz yönetim stratejilerinin yetersizliğine dair oluşan kanı	19	9,5
Yatırım iştahının azalması	182	91

Kategori 6: Negatif haber kültünün iş dünyasının karar alma süreçlerini nasıl etkilediği

Kodlar	#	%
Hızlı karar alma güveninde azalma	24	12
Yatırım ve genişleme planlarında değişiklik	164	82
Kriz yönetim stratejilerinin güçlendirilmesi	180	90
Marka yönetiminde temkinli olma	11	5,5
Rekabet ortamında değişiklik	37	18,5

Kategori 8: Sosyal medyadaki negatif haberlerin ekonomiye olan güveni nasıl etkilediği

Kodlar	#	%
Geleceğe dair olumlu beklentilerde azalma	168	84
Tüketim davranışlarında değişiklik	19	9,5
Piyasalara olan yatırımcı güveninin sarsılması	64	32
İş dünyasındaki belirsizlikler	39	19,5
Kuruluşların itibarlarının zarar görmesi endişesi	47	23,5

Kategori 10: Sosyal medyadaki olumsuz ekonomik haberlerin bireylerin ve toplumun genel ruh halini ve mental sağlığını nasıl etkilediği

Kodlar	#	%
Endişe ve kaygı oluşumu	111	55,5
Stres ve anksiyete	157	78,5
Duygusal iyi olamama hali	138	69
Umutsuzluk çaresizlik	149	74,5
Toplumsal baskı ve gerginlik	155	77,5

Kategori 12: Medyanın ekonomik haber sunumunda daha dengeli ve objektif bir yaklaşım benimsemesinin, toplumun ekonomik karar alma süreçlerine nasıl bir katkısı olur

Kodlar	#	%
Bilgiye eşit ve zamanında erişim sağlama	124	62
Toplumsal farkındalık oluşturma	166	83
Güven ve itibarın artması	119	59,5
Yanlış bilgilendirmenin önlenmesi	93	46,5
Karar alma süreçlerinde daha sağlıklı tartışmaların yaşanması	175	87,5

HALKA ARZLARA OLAN TALEBİN DAVRANIŞSAL FİNANS KAPSAMINDA İNCELENMESİ

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ÖZET
Çalışma, halka arzlara olan talebin arkasındaki faktörleri anlamak ve finansal karar alma süreçlerindeki davranışsal etkilerini değerlendirmek amacıyla yapılmıştır. Teorik kısımda, halka arzlara olan talebi etkileyen psikolojik ve sosyolojik faktörler detaylı bir şekilde ele alınacaktır. Bu faktörler arasında yatırımcıların duygusal durumları, risk algıları, sosyal etkileşimler ve medyanın rolü gibi unsurlar bulunmaktadır. Ayrıca, davranışsal finansın temel prensipleri ve insan davranışlarının finansal piyasalar üzerindeki etkisi üzerine bir çerçeve sunulacaktır. Çalışmanın analiz bölümünde, 2023 sonrasında gerçekleşen halka arzlar üzerinden yapılan bir anket çalışması detaylı bir şekilde açıklanacaktır. Bu anket çalışması, 100 katılımcıyla gerçekleştirilmiş olup, katılımcıların halka arzlara olan ilgi düzeyleri, yatırım motivasyonları, risk algıları ve medyanın etkisi gibi konuları içermektedir. Ayrıca bu ankette grup düşünce ve sürü davranışı, izlemeye duyulan eğilim, anlık memnuniyet, durumu, bilişsel önyargılar ve algıda yanılsamalar, finansal okuryazarlık eksikliği, otomatize olmuş düşünce ve ani karar almada eksiklikler ile kamuoyu ve medyanın etkisi sınıflarında ölçümler detaylı bir şekilde yapılacaktır. Anket verileri, halka arzlara olan talebin arkasındaki davranışsal faktörlerin analiz edilmesi için kullanılacaktır. Çalışmanın sonuçları ve tartışma bölümünde, elde edilen veriler ışığında halka arzlara olan talebin davranışsal finans açısından değerlendirilmesi yapılacaktır. Bulgular, halka arzların arkasındaki dinamikleri ve yatırımcı davranışlarının finansal piyasalar üzerindeki etkilerini daha iyi anlamamıza katkı sağlayacaktır. Ayrıca, bu çalışma, gelecekteki halka arz süreçlerinde daha etkili stratejiler geliştirmek için önemli ipuçları sunabilir. Çalışma, halka arzlara olan talebin psikolojik ve sosyolojik yönlerini inceleyerek, finansal karar alma süreçlerine daha derin bir anlayış sunmaktadır. Davranışsal finansın, geleneksel finans teorilerine kıyasla daha kapsamlı bir bakış açısı sunarak yatırımcı davranışlarını daha iyi anlamamıza yardımcı olduğu görülmektedir.
Anahtar Kelimeler : Davranışsal Finans, Halka Arz, Psikolojik faktörler

EXAMINATION OF THE DEMAND FOR INITIAL PUBLIC OFFERINGS IN THE CONTEXT OF BEHAVIORAL FINANCE

Abstract
The study aims to understand the factors behind the demand for initial public offerings (IPOs) and evaluate their behavioral effects on financial decision-making processes. In the theoretical section, psychological and sociological factors influencing the demand for IPOs will be extensively discussed. These factors include investors' emotional states, risk perceptions, social interactions, and the role of media. Additionally, a framework will be provided on the fundamental principles of behavioral finance and the impact of human behavior on financial markets. The analysis section of the study will detail a survey conducted on IPOs occurring after 2023. This survey involved 100 participants and covered various aspects such as participants' levels of interest in IPOs, investment motivations, risk perceptions, and the influence of media. Furthermore, measurements on groupthink and herd behavior, tendency towards herding, instant gratification, cognitive biases and perception distortions, lack of financial literacy, automated thinking, deficiencies in making sudden decisions, and the influence of public opinion and media will also be conducted. The survey data will be used to analyze the behavioral factors behind the demand for IPOs. In the results and discussion section, the demand for IPOs will be evaluated from the perspective of behavioral finance based on the obtained data. The findings will contribute to a better understanding of the dynamics behind IPOs and investor behaviors' effects on financial markets. Additionally, the study may offer valuable insights for developing more effective strategies in future IPO processes. By examining the psychological and sociological aspects of the demand for IPOs, this study provides a deeper understanding of financial decision-making processes. It is evident that behavioral finance, with its comprehensive perspective compared to traditional finance theories, assists in better understanding investor behaviors.
Keywords : Behavioral Finance, Initial Public Offering, Psychological Factors

Giriş

Bir şirket hisse senetlerini ilk kez halka sattığında bu süreç ilk halka arz (Initial Public Offering) olarak adlandırılmaktadır. Halka, arzlar şirketlerin hisse senetlerinin lansmanı şeklinde ifade edilebilir. Bir şirketin hisselerinin sermaye piyasası kurulu tarafından onaylanmış bir sermayesi üzerinden belirlenmiş bir konsorsiyum yardımıyla fiyat belirlenerek talep toplanması ve toplanan talep neticesinde halka arz fiyatı belirlenerek bireysel ve kurumsal yatırımcılara satılması olarak tanımlanabilir. Halka arz sirkülerinde yatırımcıların bilgilendirmesi yapılarak satış sağlanmaktadır. Gürsoy ve Can (2019) çalışmalarında belirttiğine göre ilk halka arzlarda ve sonrasında sürü davranışının var olup olmadığını tespit etmeye çalışmış ve başkalarının düşüncelerinin belirsizliği gidermede etkili olup olmadığını tartışmıştır. Çalışmasında bununla ilgili herhangi bir bulguya rastlamamış olsa da a) düşük fiyatlama olgusunun varlığı, halka arz sonrasında potansiyel yatırımcılar üzerinde domino etkisi (sürü) oluşmasına neden olduğu (Arisanti ve Asri,2018), b) ilk halka arzlarda fiyatlamalarda şirket CEO'larının yatırımcıların sürü davranışında bulundukları için fiyat tahminlemede zorlandıklarından hareketle isteksiz olmaya meyilli olduğu (Simo vd., 2021:121), c) halka arz edilen şirketler üzerinden yatırım kararları alınırken yatırımcıların özellikle piyasayı kontrol etme gücüne sahip yatırımcıları taklit ettikleri Ariyento ve Hayretti (2020:273), d) halka arz öncesi medyadaki hisse haber hareketlerinin halka arz fiyatı üzerine önemli etkisi olduğu belirtilmiş olup bu çalışmalar çoğaltılabilmektedir. Bu çalışmada ise davranışsal teorilerin halka arzlar üzerinde tam etkili olduğu belirlenmiştir. Bu yapılırken Türkiye genelinde halka arzlarda 2023 yılında işlem yapan 100 katılımcıyla gerçekleştirilmiş olan açık uçlu görüşme soruları ile katılımcıların halka arzlara olan ilgi düzeyleri, yatırım motivasyonları, risk algıları ve medyanın etkisi gibi konularda ki cevapları incelenmiş ve Türkiye'deki ilk halka arz yatırımcı profili davranışlarının sonuçta hangi teorileri desteklediği ortaya çıkarılmaktadır.

Halka Arzların Talep Oluşturmadaki Davranışsal Finansal Boyutu

Davranışsal finans, aynı şekilde düşük fiyatlandırılmış IPO hisselerinin piyasanın altında performans göstereceğini ve takip eden bir ila üç yıl içinde vasat performans sergileyeceğini öne sürmektedir (Adams vd.,2008). Singh ve Kumar (2022) insanın karar verme sürecindeki temel psikolojik önyargıların daha iyi anlaşılmasının, bir ülkede gerçekleşen halka arz piyasasının daha önemli bir piyasa verimliliği seviyesine ulaşmasına yardımcı olacağını öne sürmektedirler. Baker ve Nofsinger (2002) spesifik olarak, bir yatırımcının bilişsel ve duygusal zayıflıklarından kaynaklanan finansal hatalara maruz kalabileceğini göstermektedir. Hataları iki kategoride gruplandıran araştırmacılar: yatırımcıların nasıl

düşündüğü ve yatırımcıların nasıl hissettiğinin finansal karar alma mekanizmalarında kendilerini hataya sürüklediğini göstermişlerdir.

Halka arzları sürükleyen düşünce diğer ikinci el piyasalarında olduğu gibi ileride yükseleceği beklentisindendir. Tamamen yatırımcının ufukta ne gördüğüne bağlı olarak değişmektedir. Halka arzlar ülkemizde 2022 yılından itibaren BIST endeksine canlılık getirmiş ve halka arzlar ile çok yatırımcıyı borsaya çekmeyi başarmıştır. Öyle ki hemen hemen halka arzların yüzde %90'ı çıktığı andan itibaren ilk hafta her işlem günün de tavan değeri ile işlem görmüştür. Global halka arz piyasası raporlarında şu şekilde özet bilgiler geçilmesi piyasasının büyüklüğünün anlaşılması açısından önemlidir: Dünyada 2019 ve 2020 yılında halka arz hacmi toplamı 518 milyar dolar iken yalnızca 2021 yılı halka arz miktarı 607 milyar dolar olmuştur. 2022 ve 2023 yıllarında ise dünyada halka arz miktarları sırasıyla 171 ve 119 milyar dolar seviyesindedir. Halka arz büyüklerinin bu derece gelişmiş olmasının sebebi pandemi sürecindeki karışıklıklar olarak bulunmuştur. 31.12.2023 tarihi itibariyle Merkezi Kayıt Kuruluşu verileri ve KPMG analiz raporlarından edinilen bilgiye göre 2023 yılında 54 halka arz gerçekleşmiş ve 79.3 milyar TL 'lik bir halka arz hacmine ulaşılmıştır. Borsa açıldığı günden itibaren 2023 yılı karşılaştırıldığında 2023 yıl sonu verilerine göre 7.6 milyon hisse senedi yatırımcısı dolar bazında halka arz büyüklüğünü %187 arttırmış gözükmektedir. Bu payın %80.5 yurt içi bireysel müşteri tarafından alım-satım yapılarak elde edilmiştir. Borsa İstanbul platformunda halka arzın faydaları ile halka arza karar verme başlıklı bilgi setinde şu bilgi yer almaktadır: Halka arz şirketlere finansman, likidite, tanıtım, kurumsallaşma, ikinci halka arz imkanı, kredibilite, globalleşme konularında fırsatlar sunmaktadır. Özellikle yurt içi ve yurt dışında yaygın tanıtım kısmında ise *Borsa'da işlem gören şirketlere ait çeşitli bilgiler, Borsa'nın şeffaflık ve kamuyu aydınlatma görevi kapsamında, veri yayın kuruluşları, basın ve diğer görsel medya aracılığıyla sürekli olarak yurt içi ve yurt dışı yatırımcılara iletilmektedir* denilmektedir. [Erişim Tarihi: 20.03.2024]. Bu bilgi halka arzların devlet desteği ile piyasaları canlandırmak amacıyla yapıldığı ve bunun bir sermaye piyasası politikası olduğu gerçeği görülmektedir. Bu noktada davranışsal finans gereği halka arzlar ile fiyatlarının piyasadaki mevcut yüksek getirili hisse seviyesine yükseleceğini düşünen yatırımcılar kısa ve orta vadede halka arzlara yönelme ihtiyacı hissetmektedirler (Adams vd., 2008). İlk halka arz piyasasında yatırımcıların aşırı iyimserliği, halka arz fiyatlarının ilk işlem gününde beklenen değerin de üzerine çıkmasına ve uzun süre bu şekilde kalmasına neden olmaktadır. Bu iyimserlik, sezgisel güdümlü önyargının bir tezahürüdür (Shefrin,2023:239). Ndrangu (2014) ilk halka arzlarda en önemli unsurun farkındalık olduğunu ortaya koymuştur.

Kadınların risk almada çekimser olduğu ile gençlerin yaşlılara, servet sahibi olanların düzenli geliri olanlara göre ilk halka arzlarda daha fazla risk aldıkları ortaya konmuştur. (Macy,2011:69) küçük şirketlerin yeni fikirler, yeni teknolojiler ve agresif büyüme ile ilişkilendirildiğinden halka arzlara talebin her zaman olduğu araştırma sonucunda yer almıştır. Yatırımcı ilk halka arz fiyatını en düşük fiyat seviyesi olarak gördüğü ve şirket yöneticilerinin ilk halka arzdan verim almak için hisse fiyatının daha da yukarı gitmesini duydukları istekten yatırımcı da ilk halka arz sonrası hisse fiyatlarının yukarı gideceği beklentisi ile hareket etmektedir. Diğer taraftan Shiller (1988) hipotezinde, ihraç edenlerin bilerek fiyatları düşük tutarak tanınırlık elde etmek ve heyecanı teşvik etmek istediği varsayımına ulaşmıştır. Sonuçlar tarafından önerilen diğer hipotezlerde, ilk halka arzlarda yatırımcı risk algısı, adil oyun (Fama,1970:383) hipotezidir."

Ljungqvist vd., (2006) ilk halka arz yatırımcılarını iki tip yatırımcı olarak belirtmektedir. İlk tip, özellikle IPO'lar hakkında iyimser veya kötümser "duygu" durumlarına eğilimli olan küçük, deneyimsiz yatırımcılardır; herhangi duygusal bir süreçte bile yanlış karar alma eğilimine rahatlıkla girebilirler. İkinci yatırımcı tipi, ihraç eden firmanın gelecekteki beklentilerine adil bir tahminle uyumlu inançlara sahip olan rasyonel düşünebilen kurumsal yatırımcı tipidir. Akgün (2016) yatırımcı ilgisini hem aktif hem de pasif ilgi olarak ayırmıştır. Medyadan elde edilen bilgi pasif ilgi, Google arama motorundan elde edilen ilgi ise aktif ilgi kapsamında değerlendirilmiştir. Yatırımcı ilgisinin kısa vadeli getirilere etkisi olmadığı ve halka arz öncesindeki yatırımcı ilgisinin bir heyecan yaratıyor olmasının uzun vadede etkisinin olmayacağını göstermiştir. Ibrahim ve Benli (2022) yatırımcı duyarlılığı ve portföyün uzun vadeli performansı arasında bir ilişkinin varlığından bahsetmektedirler.Davranışsal Finans, (Tversky ve Kahneman,1974; Kahneman ve Tversky,1979;Taheler,2015; Barberis ve Thaler,2003) piyasadaki farklılaşmaları bireylerin akıldışı yani irrasyonel davranışlarıyla ilişkilendiren, ekonomik karar alma mekanizmalarının sosyal ve duygusal dürtülerden ne şekilde etkilendiği üzerine çalışmalar gerçekleştiren ve genel olarak, fiyat farklılaşmalarının rasyonel unsurlardan daha çok irrasyonel unsurların/olguların tesiri altında olduğunu ve bunları da kapsayan bazı modelleri açıklayan bir yaklaşımdır (Sansar, 2016 aktaran Ormancı vd., 2022: 908) Yatırım kararlarında etkili olan davranışsal finans eğilimlerini ise aşağıdaki şekilde özetlemek mümkündür (Aktan, 2018)

- *Kendini Kandırma Eğilimi:* Bu grupta bilişsel hata ve yanılgılardan; Aşırı Güven, Aşırı İyimserlik, Hataları Yanlış Değerlendirme Eğilimi, Sonradan Anlama Önyargısı Eğilimi başlıkları yer almaktadır.
- *Bilişsel Eğilimler:* Bu grupta bilişsel hata ve yanılgılardan; Temsil Etme Eğilimi, Çerçeveleme Eğilimi, Mevcudiyet Yanılgısı, Çapalama, Kumarbaz Yanılgısı, Kayıptan Kaçınma, Mizaç Etkisi, Zihinsel Muhasebe, Tutuculuk, Doğrulama Yanlılığı, Bilişsel Uyumsuzluk Eğilimi başlıkları yer almaktadır.
- *Duygusal Eğilimler:* Bu grupta bilişsel hata ve yanılgılardan; Belirsizlikten Kaçınma, Pişmanlıktan Kaçınma başlıkları yer almaktadır.

Psikolojik Faktörlerin Halka Arz Talebine Etkisi: Davranışsal Finans Yaklaşımı

Bir önceki bölümde gruplanan eğilimlere bakıldığında bunların psiko-sosyal davranışlar kapsamında değerlendirilmesi gerektiği görülmektedir. Bireyler her alanda olduğu gibi ekonomik kararlar verirken de kendilerini kandırma eğiliminde olmaktadırlar. Burada aşırı güven fenomeni ile çevrelerinde yatırım yapanların davranışlarına bakarak ve ilk halka arz hissesinin medyada çıkan haberlerine itibar ederek yatırım yapma eğilimine girdiği bilinen bir gerçektir. Sonradan anlama önyargısı ile de hataya düşebilmektedir. Genelde ilk halka arz sonrası kişisel olarak belirlediği fiyatın altında kalan yatırımcının olayın sonucunu bilerek, olayın gerçekleşme nedenini geriye dönük olarak değerlendirme eğiliminde olmasını ifade eder. Ya da aslında kötü bilanço döneminin gizlendiğini bilerek ya da istediği fiyata gelmeyeceği endişesi taşımadan aldığı miktarın azlığına bakarak, gerçekçi olmayan beklentiler ile aşırı iyimserlik beklentisine girebilir.Bilişsel eğilimlere bakıldığında ise karmaşık duygu durumlarda bulunabildiği görülebilir. Karmaşık düşünceleri basite indirgeme yoluyla sektördeki benzer şirketlerin bu halkı temsil ettiği gibi bir yanlışa da düşebilir. Bu onu doğruya da götürebilir. Nihayetinde yapılan analiz yalnızca öznel olduğu için bunun bilinmesi oldukça zordur. Belki bu noktada bir şirketin ilk halka arz sonrası oluşacak fiyatlarında gerçek durumu yansıtmasa da geçmişte yaşanan benzeri durumlardan hareket ederek yatırıcının bir sonuca varması yatırımcının karar alma sürecini olumsuz olabileceği gibi olumlu da etkileyebilir.Diğer bir konu da yatırımcıların risk ve getiri arasındaki algılarını belirlemede sıkça kullandıkları "çerçeveleme etkisi" dir. Burada şirketin halka arzda kullandığı bilgiler çerçevesinde hareket edilmesi ile şirketin bilgi ve iletişim sunma becerilerinin değerlendirilmesi söz konusu olmaktadır. Yatırımcı yatırımında mevcudiyet yanılgısı şeklinde bir düşünce durumunda da olabilir. Yatırımcı bu noktada, şirketin değerinin yanlış değerlemesi, portföylerinde yanlış değerlendirmeden kaynaklanan odaklanma sorunu yaşamaları, medyada yer alan haberlerin niteliğinin popülerlik ve algıda

yanlış anlaşılması gibi durumları da yaşayabilir. Yatırımcı hissenin uzun süre düşük performans göstermeyeceği ilk halka arzdan sonra yükseleceği sonra düşüşe geçeceği esnada piyasada toplaması gerektiği ve daha sonra topladığı hisse senetleriyle daha yüksek miktarda getiri elde edeceği beklentisine girebilir. Geçmiş performanslara bakarak gelecek performansı hakkında bu tip bilgiyi üretmek ve buna inanmak diğer olası tüm sonuçlar değerlendirildiğinde yatırımcıya kazanç sağlayabilir. Tek başına düşünüldüğünde kazanç kayıp ekseninde yatırımcının yatırımında zarara düşme olasılığı yükselir. Kısa vadeli olarak tutmak istediğinde ise piyasanın o sektöre doğru kayacağını ve yatırımcıların yükseleceği için kısa vadede bu hisseyi toplayacağı beklentisine girebilir. Burada da kumar oynamış olur.Kanıtlar, bu en yüksek öncelikli fiyatın yatırımcılar tarafından işlem kararları alınırken kullanılan bir referans noktası olarak tutarlı olduğunu göstermektedir. İlk halka arzlar Barber ve Odean (2008) Dikkat Hipotezini doğrulamaktadır (Huddart vd., 2009:16) Barber ve Odean (2008) Dikkat Hipotezi Fiyat baskısı hipotezi olarak da bilinen dikkat hipotezi, bireysel yatırımcıların aşina oldukları ve kolayca hatırladıkları hisse senetlerine yatırım yapma eğiliminde olduklarını öne sürer (Topaloğlu ve Ege,2020). Heath vd., (1999) ekonomik faktörleri kontrol edildiğinde, hatta etkin piyasa hipotezi koşulları gerçekleşse dahi psikolojik faktörlerin bireylerin yatırım kararlarını etkilediği sonucuna varmaktadırlar.

Tablo 1. Yatırımcı Psikolojisi

DUYGUSAL FAKTÖRLER	**BİLİŞSEL FAKTÖRLER**	
Kayıptan Kaçınma	Temsil Edilebilirlik	Bilişsel Çelişki
Statüko Eğilimi	Çıpalama	Belirsizlikten
Pişmanlıktan Kaçınma	Zihinsel Muhasebe	Kaçınma
Aşırı İyimserlik	Geri Görüş Önyargısı	Tutuculuk
Kendine Atfetme	Çerçeveleme Yanlılığı	Bulunabilirlik
	Kısa Yolu Doğrulama Yanlılığı	Kontrol Yanılsaması
	Aşırı Güven	

Kaynak: Pompian(2006); aktaran Tosun (2021: 25)

Davranışsal Finansın Halka Arz Talebine Etkileri: Bir Analiz

Yapılan çalışmada yatırım kararlarında davranışlarının etkisinin daha rahat gözlemlenebileceği ve Türkiye'de ki yatırım profilinin büyük çoğunluğunu oluşturan uzun süredir yatırım yapan fakat mesleği finans veya borsa olmayan, dönemsel eğilimleri rahatlıkla cevaplayabilen, inani durumlarda daha kolay tepki verebilen sıradan, amatör halktan, 2023 ve sonrası en az 5 halka arza girmiş 100 kişi üzerinden değerlendirme yapılmıştır. Çoğunlukla telefonda ya da yüz yüze yapılan değerlendirmede online ankete sınırlı sayıda katılım olduğu için tercih edilmiştir. Katılımcıların ortak özellikleri arasında finansal okuryazar olmaları, psikolojik etkilere açık ve duygularını gösterebilmeleri önem arz etmiş ve çalışmanın daha başarılı olarak ortaya çıkmasına sebep olmuştur. Araştırmada 25 adet soru sorulmuş ve 13. Soruda dikkat ölçmek açısından bu kısımda katılıyorum seçeneğini işaretleyiniz şeklinde bir ara soru sorulmuştur (Ek-1). İlk halka arzlar bu çalışmanın daha başında belirtildiği gibi 2022 de başlayan süreçte çok önem kazanmıştır. 2023 yılında ise uzman ve araştırmacıların sürekli dile getirildiği ve sosyal medyada neredeyse her gün yüksek oranda *"hashtag"* olan popülerliği de buradan çıkarılabilen bir olay haline gelmiştir. (Sosyal medya platformlarında içerikleri düzenlemek ve ilgili konularla ilişkilendirmek için kullanılan bir işarettir.) (Bernard,2019)Anket sorularının 3'lü hazırlanmasının (Katılıyorum-Kararsızım-Katılmıyorum) açıkça katılma ya da katılmama düzeyini belirlemek içindir. Verilen cevaplarda mutabakat olabilmesi için Kısmen Katılıyorum ya da Kısmen Katılmıyorum seçenekleri kaldırılmıştır. Bundaki bir diğer etken de anketi cevaplayan da isteksizlik uyandıracak uzunluk olmaması ile soru sorarken sorana da rahatlık olması içindir. Aman yatırımcı için önemli bir kavramdır. Katılımcıların 100'ü de çalışmaktadır. Ankete kişisel özellikle konulmamakla birlikte katılımcılardaki özel sektörde çalışma-devlet memuriyeti nedeyse eşit oranlıdır. %53 'ü özel sektör çalışanıdır. Tüm örneklemin %10'u kendi işini yapmaktadır.

Case Processing Summary

		N	%
Cases	Valid	100	100,0
	Excluded[a]	0	,0
	Total	100	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
,558	26

Analizde halka arz sürecinde psikolojik faktörlerin etkili olup olmadığı, endişelerin, umut, korku gibi olumsuz duyguların alım satım kararlarını verirken nasıl etkili olduğuna dair sorular sorulmuştur. Ayrıca Şirkete duyulan güven, çevrede oluşan baskı ve stres durumları, sektörün durumu, düşüncelerdeki belirsizlik ve karmaşıklık durumunun nasıl etkilediğine dair cevaplar alınmıştır. Şans, hava durumu, tahmin, pişmanlık, kayıpta sebebini dışarıda arama durumu, çevreye kabahat bulma durumu, kazançta sadece kendine yorma durumu ile ilgili de sorular sorulmuş ve cevaplar oldukça tatmin edici bir şekilde alınmıştır.

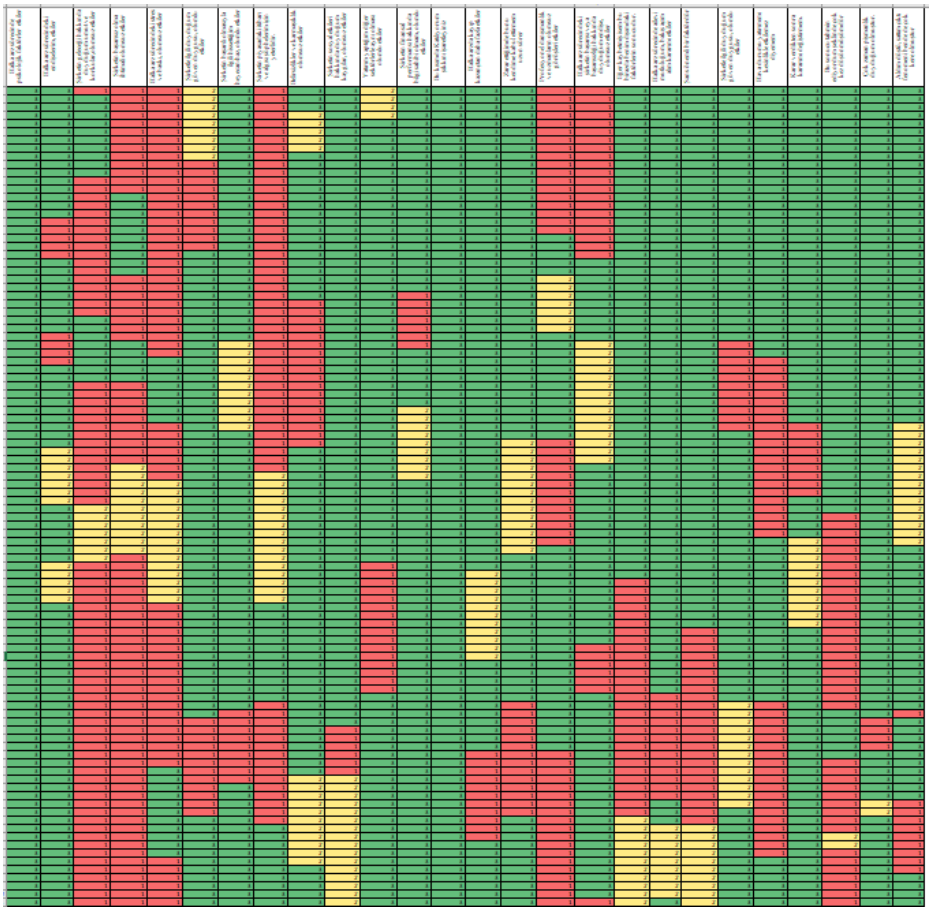
Tablo 2: Cevap Dağılımı (yüzde)

Halka arz sürecinde psikolojik faktörler etkiler	%100 Katılıyorum
Halka arz sürecindeki endişelerim, etkiler	%79 Katılıyorum
Şirketin geleceği hakkında duyduğum umut ve korkular,olumsuz etkiler	%75 Katılmıyorum
Şirketin başarısız olma ihtimali olumsuz etkiler	%74 Katılmıyorum
Halka arz sürecindeki stres ve baskı, olumsuz etkiler	%66 Katuılmıyorum
Şirketle ilgili duyduğum güven duygusu, olumlu etkiler	%68 Katılıyorum
Şirketin başarılı olmasıyla ilgili hissettiğim heyecan/haz, olumlu etkiler	%80 Katılıyorum
Şirketin piyasadaki itibarı ve algısı şüphelerim için yeterlidir.	%62 Katılmıyorum
Belirsizlikler ve karmaşıklık olumsuz etkiler	%66 Katılıyorum
Şirketin sosyal etkileri hakkında duyduğum kaygılar, olumsuz etkiler	%78 Katılıyorum
Yatırım yaptığım diğer sektörlerle aynı olması olumlu etkiler	%80 Katılıyorum
Şirketin finansal performansı hakkında bilgi sahibi olmam, olumlu etkiler	%84 Katılıyorum
Halka arzda kayıp kazançtan daha fazla etkiler	%78 Katılıyjorum
Zarar ettiğimde bunu kendime kabul ettirmem uzun sürer	%72 Katılıyorum
Profesyonel danışmanlık ve uzmanların olumsuz görüşleri etkiler	%43 Katılıyorum ve %50 Katılmıyorum
Halka arz sürecindeki şirketin başarısı veya başarısızlığı hakkında duyduğum endişe, olumsuz etkiler	%57 Katılıyorum
Eğer kaybetmiş isem bu birazda benim dışımdaki faktörlerin sonucudur.	%60 Katılıyorum
Halka arz sürecinde ailevi mutluluğum, bakış açım alım kararımı etkiler	%78 Katılıyorum
Şans önemli bir faktördür	%66 Katılıyorum ve %24 Katılmıyorum
Şirketle ilgili duyduğum güven duygusu, olumlu etkiler	%76 Katılıyorum
Hava durumu yatırımımı kesinlikle etkilemez diyemem	%41 Katılmıyorum ve %59 Katılıyorum
Karar verdikten sonra kararımı değiştirmem.	%80 Katılıyorum
Bu sonucu tahmin ediyordum şeklinde çok kez düşünmüşümdür	%40 Katılmıyorum ve %58 Katılıyorum
Çok zaman pişmanlık duyduğum olmuştur.	%94 Katılıyorum
Aldım düştü, sattım çıktı fenomeni bende de çok kere olmuştur	%75 Katılıyorum

Tablo 2, bireylerin halka arz süreci sırasında yaşadıkları psikolojik faktörler ve bu süreçteki davranışlarını etkileyen düşünceleri yansıtan bir dizi ifadeyi ve bu ifadelere katılım oranlarını göstermektedir. %100 ile "Halka arz sürecinde psikolojik faktörler etkiler" ifadesine tam katılım psikolojik faktörlerin yatırım kararları üzerinde mutlak bir etkiye sahip olduğunu göstermesi açısından dikkat çekici bulunmuştur. Diğer ifadeler ve yüzdelik katılım oranları incelendiğinde, halka arz sürecinde endişe (%79 katılıyorum) ve şirketin sosyal etkileri hakkında kaygılar (%78 katılıyorum) gibi negatif duyguların baskın olduğunu görülmektedir. Şirketin başarılı olmasıyla ilgili heyecan ve şirketin finansal performansı

hakkında bilgi sahibi olmanın olumlu etkileri (%80 ve %84 katılıyorum) gibi pozitif faktörler de önemli yer tutmaktadır. Bunun yanı sıra, yatırımcıların aldıkları kararlar sonucu oluşan pişmanlıkların yaygın olduğunu gösteren yüksek yüzde (%94 katılıyorum), halka arz sürecindeki kararlılık (%80 katılıyorum) ve "şans"ın bir faktör olarak kabul edilmesi (%66 katılıyorum) gibi psikolojik ve sübjektif unsurların da belirgin bir şekilde göze çarpması benzeri yayınlarda çıkan sonuçlar ile paralellik göstermektedir.

Şekil 1: Cevapların renk dağılımı



Cevapların renk dağılıma bakıldığında ise çoğunlukla dengeli bir dağılım sergilediği görülmektedir. Renk yoğunluğu olarak yeşil rengin hakimiyeti sorulara çoğunlukla katılıyorum cevabının verildiğini göstermektedir. Ayrıca sarı renk olarak tanımlanan Kararsızım seçeneğinin az olması, sorulan sorulara mülakatı yapılan kişinin hakim olduğunu göstermesi açısından önemlidir.

Sonuç

Analizin sonucunda, halka arz süreçlerinde psikolojik faktörlerin, yatırımcıların davranış ve kararlarını derinden etkileyen önemli unsurlar olduğunun anlaşılması açısından önemi büyüktür. Yatırım kararları yalnızca finansal verilere dayalı rasyonel hesaplamalar değil, aynı zamanda yatırımcıların kişisel duygusal deneyimleriyle de fiyatlanmaktadır. Yatırım

kararlarındaki psikolojik faktörlerin tamamının kabul edilmesi (%100 katılıyorum), bu etkileşimin derecesini ve psikolojik dinamiklerin yatırım dünyasındaki geniş kapsamlı etkisini vurgulaması açısından önemlidir. Halka arz sürecindeki belirsizlikler, stres ve sosyal etkiler gibi faktörlerin yanı sıra, karar verme süreçlerindeki pişmanlıklar ve "aldım düştü, sattım çıktı" kararları gibi piyasa psikolojisi unsurlarının yüksek katılım oranlarıyla belirginleşmesi, bireysel yatırımcıların kararlarının önemli ölçüde psikolojik etkilere açık olduğunu göstermesi açısından önemlidir. Halka arz süreçlerindeki yatırımcı davranışlarını anlamak ve tahmin etmek için, finansal analizlerin yanı sıra psikolojik faktörleri de dikkate almak zorunludur. Bu, aynı zamanda yatırımcı eğitimi ve finansal danışmanlık hizmetlerinde psikolojik öğelerin entegre edilmesinin önemini de ortaya koymaktadır.

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Ek-1

	Katılmıyorum (1)-Kırmızı	**Kararsızım (2)-Sarı**	**Katılıyorum (3)-Yeşil**
1. Halka arz sürecinde psikolojik faktörler etkiler			
2. Halka arz sürecindeki endişelerim, etkiler			
3. Şirketin geleceği hakkında duyduğum umut ve korkular, olumsuz etkiler			
4. Şirketin başarısız olma ihtimali olumsuz etkiler			
5. Halka arz sürecindeki stres ve baskı, olumsuz etkiler			
6. Şirketle ilgili duyduğum güven duygusu, olumlu etkiler			
7. Şirketin başarılı olmasıyla ilgili hissettiğim heyecan/haz, olumlu etkiler			
8. Şirketin piyasadaki itibarı ve algısı şüphelerim için yeterlidir.			
9. Belirsizlikler ve karmaşıklık olumsuz etkiler			
10. Şirketin sosyal etkileri hakkında duyduğum kaygılar, olumsuz etkiler			
11. Yatırım yaptığım diğer sektörlerle aynı olması olumlu etkiler			
12. Şirketin finansal performansı hakkında bilgi sahibi olmam, olumlu etkiler			
13. Bu kısımda Katılıyorum şıkkını işaretleyiniz			
14. Halka arzda kayıp kazançtan daha fazla etkiler			
15. Zarar ettiğimde bunu kendime kabul ettirmem uzun sürer			
16. Profesyonel danışmanlık ve uzmanların olumsuz görüşleri etkiler			
17. Şirketin başarısı veya başarısızlığı hakkında duyduğum endişe, olumsuz etkiler			
18. Eğer kaybetmiş isem bu birazda benim dışımdaki faktörlerin sonucudur.			
19. Halka arz sürecinde ailevi mutluluğum, bakış açım alım kararımı etkiler			
20. Şans önemli bir faktördür			
21. Şirketle ilgili duyduğum güven duygusu, olumlu etkiler			
22. Hava durumu yatırımımı kesinlikle etkilemez diyemem			
23. Karar verdikten sonra kararımı değiştirmem.			
24. Bu sonucu tahmin ediyordum şeklinde çok kez düşünmüşümdür			
25. Aldım düştü, sattım çıktı fenomeni bende de çok kere olmuştur.			

KIZ ÜNİVERSİTE ÖĞRENCİLERİ TARAFINDAN ALGILANAN ANNE TUTUMU İLE YEME DAVRANIŞLARI ARASINDAKİ İLİŞKİNİN İNCELENMESİ

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ÖZET
Bu çalışma kız öğrencilerin yeme davranışı ile anne tutumları arasındaki ilişkiyi incelemek amacıyla tanımlayıcı araştırma çalışması olarak planlanıp yürütülmüştür. Yeme bozuklukları son yıllarda genç ve genç yetişkinler arasında artış göstermektedir. Yeme bozukluklarını etkileyen psikolojik faktörler arasında aile yapısı ve aile içi ilişkilerin etkili olduğu belirtilmektedir. Yeme bozukluğuna sahip bireylerin ailelerinin çocuklarını desteklemediği ve yeterli empati kuramadıkları belirtilmiştir. Ebeveyn tutmlarının ve bunun çocukların gelişimi üzerindeki etkisi uzun yıllardır araştırmacıların ilgisini çeken bir konu olmuştur. Ancak, genç yetişkinler arasında anne tutumu ve yeme davranışları arasındaki ilişkiye odaklanmak nispeten yenidir. Bu çalışma, üniversite öğrencisi kızların algıladıkları anne tutumunu ve bunun yeme davranışları üzerindeki etkisini incelemeyi amaçlamıştır. Bu çalışma Muğla Sıtkı Koçman Üniversitesi Fethiye Sağlık Bilimleri Fakültesinde okuyan 230 kız üniversite öğrencisinden oluşan bir örneklem üzerinde yürütülmüştür. Katılımcılardan, demografik verileri, antropometrik ölçümleri, üç faktörlü yeme davranışları ölçeğini (TFEQ-R21), algıladıkları anne tutumunu (ABTÖ) ve yeme tutum testini (YTT-26) ölçeklerini içeren bir anket doldurmaları istenmiştir. Verilerin analizi SPSS 22 programı kullanılmıştır. Bireylerin %15.2'sinin zayıf, %79.6'sının normal kilolu, %9.6'sı hafif kiloludur. Elde edilerin verilerin sonucunda 22-25 yaşındaki katılımcıların bilişsel kısıtlama ve duygusal yeme düzeylerinin 18-21 yaşındaki katılımcılardan farklı ($p<0.05$) bulunmuştur. BKİ ile yeme tutum bozukluğu arasında ilişki bulunamamıştır ($p>0.05$). Otoriter tutum algı düzeyi ile kontrolsüz yeme ve yeme tutum bozukluğu arasında pozitif yönde istatistiksel olarak anlamlı ilişki olduğu analiz edilmiştir. Sonuç olarak anne tutumu kız öğrencinin yeme tutumunda etkili olabilmektedir. Annelere ve kızlara beslenme eğitimi verilerek yeme bozukluklarının önüne geçilebilir.

Anahtar Kelimeler: anne tutumu, yeme tutumu, kız üniversite öğrencileri, yeme davranışları

INVESTIGATION OF THE RELATIONSHIP BETWEEN MATERNAL ATTITUDE AND EATING BEHAVIOR PERCEIVED BY FEMALE UNIVERSITY STUDENTS

Abstract
This study was planned and carried out as a descriptive research study to examine the relationship between female students' eating behavior and maternal attitudes.Eating disorders have been on the rise among teenagers and young adults in recent years. Among the psychological factors affecting eating disorders, family structure and intra-family relationships are reported to be effective. It has been reported that the families of individuals with eating disorders do not support their children and do not have sufficient empathy. Parental attitudes and their impact on children's development has been a topic of interest to researchers for many years. However, the focus on the relationship between maternal attitude and eating behaviors among young adults is relatively new. This study aimed to examine the perceived maternal attitude of female university students and its effect on their eating behaviors. Within the scope of the study, this study was conducted on a sample of 230 female university students studying at Muğla Sıtkı Koçman University Fethiye Faculty of Health Sciences. Participants were asked to fill out a questionnaire including demographic data, anthropometric measurements, three-factor eating behavior scale (TFEQ-R21), perceived maternal attitude and eating attitude test (EAT-26) scales. SPSS 22 program was used for data analysis. 15.2% of the individuals were underweight, 79.6% were normal weight and 9.6% were slightly overweight. As a result of the data obtained, the levels of cognitive restraint and emotional eating of 22-25 year old participants were found to be ($p<0.05$) higher than 18-21 year old participants. There was no relationship between BMI and eating attitude disorder ($p>0.05$). It was analyzed that there was a low statistically significant positive relationship between the level of perception of authoritarian attitude and uncontrolled eating and eating attitude disorder. As a result, mother's attitude can be effective on the eating attitude of female students. Eating disorders can be prevented by providing nutrition education to mothers and girls.
Keywords: maternal attitude, eating attitude, female university students, eating behaviors

GİRİŞ

Besinlerin tüketim biçimi yeme davranışı olarak adlandırılmaktadır (Grimm, 2011). Yeme davranışının ve tutumunun bozulması durumunda yeme bozuklukları ortaya çıkmaktadır (Akdevelioğlu ve Yörüsün, 2019; Hay vd., 2014). Yeme davranışını etkileyen çeşitli faktörler bulunmaktadır. Bu faktörler arasında bireylerin yaşı, cinsiyeti, yaşam tarzı alışkanlıkları, kültürel ve sosyal normlar, kişisel tercihler ve psikolojik veya duygusal durumlar yer almaktadır (Warren, 2020). Ergenlik ve genç yetişkinlik, bireylerin yeme ve kilo ile ilgili tutumlarını keşfetmek ve oluşturmak gelişim dönemleridir (Ebrahim Essa, 2020). Üniversite yıllarına denk gelen bu dönemlerde yaşam biçiminin değişmesi sonucunda yetersiz ve dengesiz beslenme davranışları gelişebilir (Demir, 2019). Üniversite dönemine görülen yeme bozuklarının kişinin yetişkinlik dönemini de etkilediği bilinmektedir (O. Brown vd., 2017). Özellikle kız öğrencilerdeki prevalansının daha yüksek olduğu bildirilmiştir (Hudson, 2007). Kız öğrencilerde yeme bozukluğunun neden olan faktörlere aile ilişkileri dahildir (Toker ve Hocaoğlu, 2009). Özellikle kız çocukları, annelerinin yeme tutumlarından ve beden algılarından etkilenerek benzer düşünce ve davranışları benimseyebilirler (Sleddens vd., 2015). Yeme bozukluğunun erken tanı ve tedavisinde öncelikli olarak bozulmuş yeme davranışına sebep olan faktörlerin tanımlanmasıdır (Karaağaç ve Bellikci-Koyu, 2021). Bu nedenle bu araştırmada sağlık bilimleri fakültesi öğrencilerinin yeme tutum ve davranışlarını belirlemek, kız üniversite öğrencileri arasında algılanan anne tutumu ile yeme davranışları arasındaki ilişkiyi incelemek amaçlanmıştır.

MATERYAL METOD

Araştırma Modeli

Bu çalışma kesitsel bir çalışmadır. Çalşma, üniversite öğrencileri üzerinde yapılmıştır. Muğla Sıtkı Koçman Üniversitesinde okuyan kız öğrenciler araştırmanın örneklemini oluşturmuştur.

Araştırma Evren ve Örneklemi/Araştırma Materyali

Çalışmada 18-34 yaş arası üniversite öğrencileri yer almıştır. Çalışmaya katılacak öğrenci sayısı, 0.05 hata payı ve 0.95 güç ile 0.67 etki büyüklüğünde en düşük örneklem sayısı 170 kişi olarak hesaplanmıştır (G*Power 3.1).

Veri Toplama Araçları

Çalışma sırasında veri toplamak için uygulanan anket toplam 6 bölümden ve 105 sorudan oluşmaktadır. Beden kütle indeksi ağırlık (kg)/ boy karesi (m2) formülü ile hesaplanmıştır (Nishida vd., 2010). BKİ, WHO kriterlerine göre sınıflandırılmıştır (Tablo 3.1.) (WHO, 2000). Yeme Tutum Testi (EAT-40), düzensiz yemek yemeyi ölçmek için yaygın olarak

kullanılan bir öz bildirim anketidir(American Psychiatric Association, 2013). EAT-40 formunun Türkçe'ye uyarlanma çalışması 1989 yılında yapılmıştır (Savaşır ve Erol). Yeme Tutum Testi Kısa Formu (YTT-26) Türkçeye uyarlanması ve üniversite örnekleminde değerlendirilmesi yapılmıştır (Ergüney-Okumuş ve Sertek-Berk, 2019). YTT-26 için kesme değeri 20 puandır. 20 ve üzerinde puan alındığında yeme tutumunun bozulduğunu belirlenmektedir (Ergüney Okumuş ve Sertek Berk, 2019). 1985 yılında 51soruluk şeklinde Stunkard ve Messic tarafından oluşturulmuştur. Ölçek daha sonra madde sayısı 21 olacak şekilde revize edilmiştir (Stunkard ve Messic, 1985). Üç Faktörlü Yeme Davranışları Ölçeği (TFEQ R-21), maddelik bu versiyonun Türkçe'ye uyarlaması geçerlilik ve güvenilirlik çalışması Karakuş vd. tarafından yapılmıştır (Karakuş vd., 2016). Çalışmanın sonunda orijinali ile uyumlu olarak bilişsel kısıtlama, duygusal yeme ve kontrolsüz yeme şeklinde 3 faktör tespit edilmiştir (Karakuş vd., 2016). Ana- baba tutum ölçeği Polat tarafından 1986 yılında geçerlilik ve güvenilirliği yapılmıştır. Ölçeğin amacı, ana-baba davranışlarının çocuklar tarafından nasıl algılandıklarını belirlemektir. 26 maddeden oluşan bu ölçekte alınan puan ne kadar yüksek ise ana-baba tutumlarının çocuk tarafından otoriter olarak algılandığını saptamaktadır. Ölçekte 13 maddelik demokratik 13 maddelik otoriter ifadelerden oluşan sorular bulunmaktadır (Çetin ve Aytar, 2012). Araştırma kapsamında katılımcılar sadece anneler için bu ölçeği doldurmuşlarıdır.

BULGULAR

Araştırmaya Muğla Sıtkı Koçman Sağlık Bilimleri Fakültesinde öğrenim görmekte olan 230 kız öğrenci ile yürütülmüştür. Sosyo-demografik özelliklere ilişkin veriler Tablo 1 de sunulmuştur.

Tablo 1. Araştırmaya Katılanların Demografik Bilgilerine İlişkin Veriler

Değişken	Kategori	n	%
Yaş	18-21 yaş	179	77.8
	22-25 yaş	51	22.2
Bölüm	Hemşirelik	106	46.1
	Beslenme ve diyetetik	124	53.9
Sınıf	1	31	13.5
	2	96	41.7
	3	80	34.8
	4	23	10.0
Medeni durum	Bekâr	230	100.0
Tanısı konulmuş bir hastalığın olması durumu	Yok	178	77.4
	Kas iskelet hastalıkları	2	0.9
	Hormonal hastalıklar	13	5.7
	Solunum sistemi hastalıkları	4	1.7
	Sindirim sistemi hastalıkları	5	2.2
	Vitamin ve mineral yetersizlikleri	29	12.6
	Ruhsal sorunlar	11	4.8
Alkol kullanım durumu	Evet	98	42.6
	Hayır	132	57.4
Alkol türü, sıklığı ve miktarı	Yılda 5-6 kez	5	5.1
	Ayda 4-5 kez	5	5.1
	Ayda 1-3 kez	39	39.8
	Haftada 4-5 kez	5	5.1
	Haftada 1-3 kez	44	44.9
Kalınan yer	Yurtta	108	47.0
	Aile / akraba ile evde	33	14.3
	Arkadaş ile evde	89	38.7
BKI	Zayıf	25	10.9
	Normal kilolu	183	79.6
	Hafif şişman	22	9.6
	Toplam	**230**	**100**

Tablo incelendiğinde, katılımcıların %77.8'inin 18-21, %22.2'sinin 22-25 yaşlarında olduğu, %46.1'inin hemşirelik, %53.9'unun beslenme ve diyetetik bölümünde öğrenci olduğu, %13.5'inin 1, %41.7'sinin 2, %34.8'inin 3, %10'unun 4. sınıfta öğrenci olduğu görülmektedir. Katılımcıların tamamının bekar olduğu, %77.4'ünün tanısı konulmuş bir rahatsızlığının olmadığı, %0.9'unun kas ve iskelet hastalıkları, %5.7'sinin hormonal hastalıklar, %1.7'sinin solunum sistemi hastalıkları, %2.2'sinin sindirim sistemi hastalıkları, %12.6'sının vitamin-mineral yetersizliği, %4.8'inin ise ruhsal sorunlarının olduğu görülmektedir. Katılımcıların %42.6'sının alkol kullandığı, %57.4'ünün kullanmadığı, alkol

kullananların %5.1'inin yılda 5-6 kez, %5.1'inin ayda 4-5 kez, %39.8'inin ayda 1-3 kez, %5.1'inin haftada 4-5 kez, %44.9'unun haftada 1-3 kez kullandığı, %47'sinin yurtta, %14.3'ünün aile / akraba ile evde, %38.7'sinin arkadaş ile evde yaşadığı görülmektedir. Katılımcıların %15.2'sinin zayıf, %79.6'sının normal kilolu, %9.6'sının hafif şişman olduğu görülmektedir.

Tablo 2. Araştırmaya Katılanların TFEQ-Tr21 Yeme Ölçeği Puanlarının Yaş Değişkenine Göre Karşılaştırılması

Alt boyut	Yaş	N	X	SS	T	P
Bilişsel kısıtlama	18-21 yaş	179	14.65	4.42	-2.964	.003*
	22-25 yaş	51	16.69	3.95		
Duygusal yeme	18-21 yaş	179	12.24	4.46	-3.135	.002*
	22-25 yaş	51	14.43	4.19		
Kontrolsüz yeme	18-21 yaş	179	19.85	4.75	-.373	.709
	22-25 yaş	51	20.12	3.61		

Tablo incelendiğinde, katılımcıların yaşlarına göre kontrolsüz yeme düzeylerinde istatistiksel olarak farklılık olmadığı ($p>0.05$) görülmektedir. Ancak 22-25 yaşındaki katılımcıların bilişsel kısıtlama ve duygusal yeme düzeylerinin 18-21 yaşındaki katılımcılardan anlamlı düzeyde daha yüksek olduğu ($p<0.05$) görülmektedir.

Tablo 3. Araştırmaya Katılanların Ana-Baba Tutumu ile Yeme Ölçeği TFEQ-R21 ve Yeme Tutumu (EAT-26) Arasındaki İlişkinin İncelenmesine Yönelik Korelasyon Analizi

		1	2	3	4	5	6	7
1. Demokratik tutum	R	-						
	P							
2. Otoriter tutum	R	-.619	-					
	P	.000						
3. BKI	R	-.024	.056	-				
	P	.713	.396					
4. Bilişsel kısıtlama	R	-.048	-.133*	.033	-			
	P	.465	.043	.615				
5. Duygusal yeme	R	.022	-.064	.105	.253	-		
	P	.734	.337	.113	.000			
6. Kontrolsüz yeme	R	-.045	.179*	.129	-.331	.439	-	
	P	.500	.006	.051	.000	.000		
7. Yeme tutum bozukluğu	R	-.109	.157*	.022	-.041	-.037	.025	-
	P	.098	.017	.742	.535	.581	.710	

Tablo incelendiğinde, demokratik tutum algı düzeyi ile bilişsel kısıtlama, duygusal yeme, kontrolsüz yeme ve yeme tutum bozukluğu düzeyleri arasında istatistiksel olarak anlamlı

düzeyde ilişki olmadığı görülmektedir (p>0.05). Otoriter tutum algı düzeyi ile kontrolsüz yeme (r=.179; p<0.05) ve yeme tutum bozukluğu (r=.157; p<0.05) arasında pozitif yönde düşük düzeyde, bilişsel kısıtlama (r=-.33; p<0.05) arasında negatif yönde düşük düzeyde istatistiksel olarak anlamlı düzeyde ilişki olduğu, otoriter tutum ile duygusal yeme arasında ise istatistiksel olarak anlamlı düzeyde ilişki olmadığı (p>0.05) görülmektedir. BKI ile bilişsel kısıtlama, duygusal yeme, kontrolsüz yeme, yeme tutum bozukluğu arasında istatistiksel olarak anlamlı düzeyde ilişki olmadığı (p>0.05) görülmektedir.

Tablo 4. Ana-Baba Tutumunun Bilişsel Kısıtlama Üzerine Etkisine İlişkin Çoklu Doğrusal Regresyon Analizi Sonuçları

Değişken	B	Std. Hata	B	T	x^2	P
Sabit	19.614	1.557		12.595		.000
Demokratik tutum	-4.690	1.822	-.213	-2.574	.046*	.011
Otoriter tutum	-5.374	1.675	-.265	-3.209		.002

Tablo incelendiğinde, ana-baba tutumunun bilişsel kısıtlama üzerinde %4.6 oranında anlamlı düzeyde etkisinin olduğu görülmektedir (r^2=.046; p<0.05). Alt boyutlar bazında incelendiğinde, en büyük etkisinin sırasıyla demokratik tutum (β=-.213; p<0.5) ve otoriter tutum (β=-.265; p<0.05) şeklinde olduğu görülmektedir.

Tablo 5. Ana-Baba Tutumunun Kontrolsüz Yeme Üzerine Etkisine İlişkin Çoklu Doğrusal Regresyon Analizi Sonuçları

Değişken	B	Std. Hata	B	T	x^2	P
Sabit	16.997	1.608		10.572		.000
Demokratik tutum	2.442	1.881	.108	1.298	.039*	.196
Otoriter tutum	5.127	1.729	.246	2.965		.003

Tablo incelendiğinde ana-baba tutumunun kontrolsüz yeme üzerinde %3.9 oranında anlamlı düzeyde etkisinin olduğu görülmektedir (r^2=.039; p<0.05). Alt boyutlar bazında incelendiğinde, en büyük etkinin sırasıyla otoriter tutum (β=.246; p<0.05) ve demokratik tutum (β=.108; p>0.05) şeklinde olduğu görülmektedir.

TARTIŞMA

Bu araştırmada yaş grubu değişkenine göre öğrencilerin yeme ölçeği puanları arasında anlamlı farklılıkların olduğu bulunmuştur (Tablo 2). Gruplar arasındaki farklılıkların sadece bilişsel kısıtlama ve duygusal yeme düzeyinde görüldüğü tespit edilmiştir. Ortaya çıkan sonuçlara göre, 22-25 yaşındaki katılımcıların bilişsel kısıtlama ve duygusal yeme

düzeylerinin 18-21 yaşındaki katılımcılardan anlamlı düzeyde daha yüksek olduğu bulunmuştur. Literatürde bu konuda yapılan ve araştırma sonuçları ile paralellik gösteren benzer çalışmalarda da yaş unsurunun yeme tutum ve davranışları üzerinde belirleyici olduğu bulunmuştur (Akkol, 2018; Kadıoğlu ve Ergün, 2015).

Bu çalışmada yeme ölçeği ile BKİ ilişkisi incelendiği zaman, bilişsel kısıtlama, duygusal yeme ve kontrolsüz yeme tutumunun BKİ ile ilişkili olmadığı bulunmuştur. Bu sonucun ortaya çıkmasının temelinde öğrencilerin büyük bir bölümünün BKİ'lerinin sağlıklı sınırlar içinde yer almasının yattığı düşünülebilir. Literatüre bu alanda yapılan bir çalışmada BKİ, yeme tutum ve davranışları üzerinde belirleyici olduğu (Akkol, 2018), başka bir araştırmada ise BKİ göre katılımcıların yeme tutum ve davranışlarının farklılaşmadığı rapor edilmiştir (Ayaz, 2021). Yapılan bu BKİ'nin yeme bozukluğu üzerinde belirleyici olmadığı bulunmuştur. Araştırma sonuçları ile paralellik gösteren benzer bir çalışmada olumlu ve olumsuz yeme davranışlarının katılımcıların vücut kompozisyonlarına göre farklılaşmadığı rapor edilmiştir (Dağcılar, 2016). Araştırmaya katılan öğrencilerin öğrenim görülen bölüm değişkenine göre ebeveyn tutumu algılarına ilişkin bulgular incelendiği zaman, öğrencilerin algıladıkları ebeveyn tutumlarının öğrenim gördükleri bölüm değişkenine göre farklılaştığı bulunmuştur. Gruplar arasındaki farklılığın sadece demokratik ebeveyn tutumunda olduğu görülmüştür. Ortaya çıkan sonuçlara göre, beslenme ve diyetetik bölümündeki katılımcıların demokratik tutum algı düzeylerinin hemşirelik bölümündeki katılımcılardan anlamlı düzeyde daha yüksek olduğu tespit edilmiştir. Araştırma sonuçları ile paralellik gösteren benzer bir çalışmada da üniversite öğrencilerinin öğrenim gördükleri bölümlere göre algıladıkları ebeveyn tutumlarının anlamlı farklılık gösterdiği bulunmuştur. Birinci sınıfta öğrenim gören öğrencilerin üçüncü sınıfta öğrenim gören öğrencilere göre anne baba tutumunu koruyucu algıladıkları bulunmuştur (Taki-Yılmaz, 2009).Araştırmanın sonucunda algılanan ebeveyn tutumları ile yeme tutum ölçeği puanları arasında anlamlı ilişkinin olduğu görülmüştür (Tablo3). Ortaya çıkan sonuçlara göre, otoriter tutum algı düzeyi ile kontrolsüz yeme ve yeme tutum bozukluğu arasında pozitif yönde düşük düzeyde, bilişsel kısıtlama arasında negatif yönde düşük düzeyde istatistiksel olarak anlamlı düzeyde ilişki olduğu belirlenmiştir. Annenin davranışının otoriter olarak algılalanmasının kız öğrencide kontolsüz yemeye ve yeme tutumunun bozulmasına sebep olabilir. Kız öğrenci yemeyi otoriteden kaçış veya otoriteye karşı bir davranış olarak görüyor olabilir. Literatürde üniversite öğrencilerinde yeme tutumlarının algılanan ebeveyn tutumu değişkenine göre ele alındığı çalışmalar bulunmaktadır. Yapılan bir çalışmada algılana ebeveyn tutumlarında olusuzluk arttıkça duygusal yeme düzeyinde de artış olduğu tespit edilmiştir (Soyumtürk,

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SONUÇ

Katılımcıların okudukları bölümlerine göre otoriter tutum algı düzeylerinde istatistiksel olarak anlamlı düzeyde farklılık olmadığı ($p>0.05$), ancak beslenme ve diyetetik bölümündeki katılımcıların demokratik tutum algı düzeylerinin hemşirelik bölümündeki katılımcılardan anlamlı düzeyde daha yüksek olduğu ($p<0.05$) belirlenmiştir. Otoriter tutum algı düzeyi ile kontrolsüz yeme ve yeme tutum bozukluğu arasında pozitif yönde düşük düzeyde istatistiksel olarak anlamlı düzeyde ilişki olduğu, otoriter tutum ile duygusal yeme arasında ise istatistiksel olarak anlamlı düzeyde ilişki olmadığı ($p>0.05$) bulunmuştur.

TEŞEKKÜR

Çalışmaya katılan tüm gönüllülere teşekkür ederiz.

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HASTANE ÖNCESİ ACİL SAĞLIK HİZMETLERİ SİSTEMLERİNİN KARŞILAŞTIRMASI: TÜRKİYE 112-KANADA 911

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ÖZET

Araştırma Problemi (Background): Türkiye Sağlık alanında ilerlemeye ve büyümeye hızla devam etmektedir. Kanada hastane öncesi acil sağlık hizmetlerinde kurucu ülkelerden bir olması nedeniyle örnek ülke durumundadır. Söz konusu hizmetlerin Türkiye'de kaliteli ve sürdürülebilir kılınabilmesi için bu konudaki ambulans teknolojileri (kara, hava, deniz) ve hizmet sunum teknikleri incelenerek gerekli düzenlemelerin yapılması gerekmektedir. Amaç: Bu çalışmada, Türkiye'deki hastane öncesi acil sağlık hizmetlerinin parçaları olan Kara, Hava, Deniz Ambulans servisi hizmetlerinin Kanada gibi ülkelerdeki sistemlerle karşılaştırarak mevcut olan gelişmişlik düzeyimizi daha ileriye seviyeye taşımak suretiyle sunulan hizmetlerin mevcut durumlarının güncellenmesini amaçlıyoruz. Metot-Yöntem: Çalışmada, Türkiye'nin ve Kanada'nın Acil Sağlık Hizmetleri kapsamındaki (Kara, Hava, Deniz) Ambulans hizmetleri ve bu hizmetlerin dayandığı kanun, tüzük veya yönetmeliklerin yerli yabancı literatür taraması ile araştırılması planlanmıştır. Çalışmada WOS tarama yöntemi kullanılmıştır. Bulgular: Türkiye ve Kanada ambulans hizmeti sistemleri Anglo-Amerikan modelini benimsemektedir. Aynı model olması nedeniyle birçok konuda benzerliklerle birlikte belirli ölçüde de farklılıklar olduğu ortaya çıkartılmıştır. Kanada'da Personel çalışma saatleri, eğitim, rütbe ve derece sistemi, teknik alt yapılar ve araç biçimlerinde farklılıklar bulunduğu görülmektedir. Kanada'da Komuta Kontrol Merkezinin uygulamış oldukları yönetim tarzı yapay zekâ ile sürekli güncellenerek desteklenirken, Türkiye'de daha çok personelin kendisi tarafından idare edildiği sonucu ortay çıkmaktadır. Sonuç ve öneriler: Türkiye'de gerek nüfus artışı gerekse sağlık hizmeti alıcılarının beklentilerindeki artış Acil Sağlık Hizmetleri'nde yapay zekâ uygulamalarının güncellenmesini zorunlu kılmaktadır. Sağlık politikası yapıcıları ve bu hizmeti uygulama durumunda olanların personel çalışma saatleri, eğitim, rütbe ve derece sistemi, teknik alt yapılar ve araç alanındaki uygulamalarını güncellemeleri önerilmektedir.

Anahtar Kelimeler: Acil Sağlık Hizmetleri, Ambulans, Acil Tıp Teknisyeni, Acil Tıp Teknikeri, Paramedik, Komuta Kontrol Merkezi

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ABSTRACT

Research Problem (Background): Türkiye continues to progress and grow rapidly in the field of health. Canada is a model country as it is one of the founding countries in pre-hospital emergency health services. In order to ensure the quality and sustainability of these services in Turkey, ambulance technologies (land, air, sea) and service delivery techniques should be examined and necessary arrangements should be made. Objective: In this study, we aim to update the current status of the services provided by comparing the Land, Air and Sea Ambulance services, which are the parts of pre-hospital emergency health services in Turkey, with the systems in countries such as Canada and to move our current level of development to a higher level. Method: In the study, it was planned to investigate the Ambulance services within the scope of Emergency Health Services (Land, Air, Sea) in Turkey and Canada and the laws, by-laws or regulations on which these services are based through a domestic and foreign literature review. WOS search method was used in the study. Findings: Turkish and Canadian ambulance service systems adopt the Anglo-American model. Since it is the same model, it has been revealed that there are similarities in many aspects and differences to a certain extent. In Canada, there are differences in personnel working hours, training, rank and grade system, technical infrastructure and vehicle types. While the management style applied by the Command and Control Center in Canada is constantly updated and supported by artificial intelligence, in Turkey, it is more likely to be managed by the personnel themselves. Conclusion and recommendations: In Turkey, both population growth and the increase in the expectations of healthcare service recipients necessitate the updating of artificial intelligence applications in Emergency Health Services. Health policy makers and those in the position of implementing this service are recommended to update their practices in the areas of staff working hours, training, rank and grade system, technical infrastructures and vehicles.

Keywords: Emergency Health Services, Ambulance, Emergency Medical Technician, Emergency Medical Technician, Paramedic, Command Control Center

ÖZET

Hastane öncesi acil sağlık hizmetleri tüm Dünya'da olduğu gibi Türkiye'de de profesyonel şekilde hizmet vermeye devam etmektedir. Bu çalışmada, Türkiye'deki hastane öncesi acil sağlık hizmetlerinin parçaları olan Kara, Hava, Deniz Ambulans servisi hizmetlerinin Kanada gibi ülkelerdeki sistemlerle karşılaştırarak mevcut olan gelişmişlik düzeyimizi daha ileriye seviyeye taşımak suretiyle sunulan hizmetlerin mevcut durumlarının güncellenmesini amaçlıyoruz. Türkiye'nin ve Kanada'nın Acil Sağlık Hizmetleri kapsamındaki Ambulans hizmetleri ve bu hizmetlerin dayandığı kanun, tüzük veya yönetmeliklerin yerli yabancı literatür taraması yapılmıştır. Çalışmamız da WOS tarama yöntemi kullanılmıştır.

GİRİŞ

Türkiye'deki hastane öncesi acil sağlık hizmetleri Amerika Birleşik Devletleri, Kanada gibi öncü ülkelerde uygulanmakta olan İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modeli ile benzerlikler taşımaktadır. Bu model ile olay yerinde mümkün olduğunca az zaman geçirilmesi hedeflenerek hasta ya da yaralının ihtiyaç duyduğu donanımlı bir acil servise götürülmesi amaçlanmaktadır. Türkiye'de hastane öncesi acil sağlık hizmetlerine ulaşım için "112" tek numara üzerinden sağlanmaktadır. Acil Çağrı Merkezi'ne ulaşan çağrılar Komuta Kontrol Merkezlerinden yönlendirilen ambulanslar ile sağlanmaktadır. Acil vakalara ulaşım için kara, hava ve deniz ambulansları kullanılmaktadır. Ambulanslarda, çalışma durumlarına bağlı olarak acil tıp teknisyenleri, paramedikler ve hekimler görev yapmaktadır. Acil hasta ve yaralıya uygulanacak acil tıbbi bakım için gerekli tüm ekipmanlar ambulans içinde bulunan tıbbi araç gereçler ile yapılmaktadır. Ambulanslarla iletişim telsiz ve mobil telefonlar aracılığı ile yapılırken 2019 yılı başlarında Elektronik Vaka Sistemi (EVS) tablet sistemine geçilmeye başlanmıştır. Acil hastalar tablet sistemi üzerinden ambulans ekiplerine verilmektedir. Hasta ya da yaralıya yapılan tüm tıbbi işlemler tablet sistemine işlenmektedir. Kanada gibi ülkelerle aramızda personel çalışma saatleri, eğitim, rütbe ve derece sistemi, teknik alt yapılar ve araç alanındaki uygulamaları gibi farklılıklar yer almaktadır.

HASTANE ÖNCESİ ACİL SAĞLIK HİZMETLERİ TARİHÇESİ

Hastane öncesi acil sağlık hizmetlerinin tarihsel geçmişi 11. Yüzyıla kadar uzanmaktadır. Ancak günümüzdeki ambulans benzeri motorlu araçların, atlı arabalarla hasta yada yaralı taşıma tekniklerine benzeri ilk olarak 1487 yılında Malaga savaşı kuşatması sırasında İspanyollar tarafından kullanılmıştır. Birinci ve İkinci Dünya Savaşları'nda çok sayıda hasta ve yaralı kara ambulansları yanında trenler, gemiler, uçak ve helikopterler ile hastanelere götürülmüşlerdir. Acil tıp anabilim dalı ilk kez 1970 yılında ABD'de Cincinnati Üniversitesi'nde açılmıştır (Sofuoğlu, 2020).Osmanlı döneminde 1871 yılında taşralarda

hasta ve yaralılara ulaşmak için doktorlar görevlendirilmiştir. Bu doktorlara başvuran halkın acil sağlık sorunları herhangi bir maddi karşılık olmadan gerektiğinde evlerine kadar gidilerek tedavi edilmiştir. Osmanlı döneminde ayrıca yaralı askerlere acil müdahalenin yapılması ve askerlerin sağlık kuruluşlarına taşınması için Hilal-i Ahmer (Kızılay) bünyesinde görevli atlı ambulans birlikleri kurulmuştur. 1917 yılında ise Kızılay tarafından ilk motorlu ambulanslar kullanılmaya başlanmıştır (Aydın, 2004).1985 yılında Ankara Numune Hastanesi'nde 077 Hızır Acil Servis uygulaması ile günümüzde sunulan ambulans hizmeti anlamında ücretsiz şekilde vatandaşlara hizmet vermeye başlanmıştır. 1991 yılına gelindiğinde gelişen teknoloji ve alt yapı sistemi ile 077 yerine 112 numarasına geçiş yapılmıştır. 1993 yılında Dokuz Eylül Üniversitesi Sağlık Hizmetleri Yüksek Okulunda Kanada tarafından verilen destek ile iki yıllık ön lisans programı Paramedik (İlk ve Acil Yardım Teknikeri) bölümü açılmış ve ilk mezunlarını 1994 yılında vermiştir. 1996 yılında da liselerde Acil Tıp Teknisyeni (ATT) bölümleri açılmıştır. Böylelikle ambulanslarda çalışacak sağlık personellerinin nasıl bir eğitim alacağına kararlaştırılmıştır ve eğitimlerine başlanmıştır. Acil Sağlık Hizmetleri Yönetmeliği için 1996 yılında çalışmalar başlamış ve 2000 yılında "Acil Sağlık Hizmetleri Yönetmeliği" çıkarılmıştır. 2007 yılında yapılan yönetmelik değişiklikleri ile ATT ve Paramediklerin görev, yetki ve sorumlulukları tanımlanmıştır. 2003 yılında başlatılan Sağlıkta Dönüşüm Programı (SDP) ile Acil Sağlık Hizmetleri gelişimi hızlanmıştır. 2008 yılı başında 81 ilde dijital olarak Komuta Kontrol Merkezi sisteminin alt yapısı tamamlanarak ambulansların uydu üzerinden takibi, telsiz ve telefon ses kayıtlarının tutulması, arayan kişinin telefon numarasının gözükmesi gibi sistemler aktif edilmiştir. Türkiye'de Tek Acil Çağrı Numarası (112) Projesi 2003 yılında imzalanmış, 2010 yılında Antalya ve Isparta'da pilot olarak uygulanmaya başlanmıştır. 2019 yılı itibariyle 81 ilde tüm alt yapı çalışmaları tamamlanarak hizmete geçiştir (Sofuoğlu, 2020).

HASTANE ÖNCESİ ACİL SAĞLIK HİZMET MODELLERİ

Genel olarak tüm dünya ülkelerinde hastane öncesi acil sağlık hizmetleri ambulanslar ile yapılır. Fransız-Alman (Franko-German) "kal ve tedavi et" ya da İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modellerine göre vatandaşlarına hizmet vermektedir. Fransız-Alman (Franko-German) "kal ve tedavi et" modeli daha çok acil doktorları ve anestezi uzmanları tarafından sahada tüm teknolojik imkanlar kullanılarak hasta ya da yaralıya yapılan müdahale ile doğrudan hastane yataklı servislerine nakledilmesiyle sonlanır. Bu model Avusturya, Fransa, Almanya, Litvanya, Portekiz, Norveç, İsveç ve İsviçre'de uygulanmaktadır. İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modeli ise hekim dışı

sağlık personelleri, örneğin Paramedikler tarafından olay yerinde acil tedavi ve bakım protokolleri uygulanmaya başladıktan sonra mümkün olduğu kadar az zaman kaybetmesi hedeflenerek ileri tıbbi tedavi ve bakım hizmetleri için hastane acil servislerine sevk edilirler. Burada hasta ya da yaralıya en iyi sağlık hizmeti verilerek mortalite ve morbidite oranlarının düşürülmesi amaçlanmaktadır. İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modeli başta Amerika Birleşik Devletleri (ABD), Avustralya, Kanada, Türkiye gibi ülkeler olmak üzere pek çok Avrupa, Asya ve Afrika ülkesinde kullanılmaktadır (Şimşek ve ark, 2019).

TÜRKİYE'DE HASTANE ÖNCESİ ACİL SAĞLIK HİZMETLERİ

Hastane öncesi acil sağlık hizmetleri Türkiye'de İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modelini birebir aynısı olmamakla beraber genel olarak benimsenmektedir. Türkiye'de acil sağlık hizmetleri sisteminde ambulansların çalışma tiplerine göre pratisyen hekimler, ATT ve Paramedikler tarafından hizmet verilmektedir. Türkiye'de 2023 Aralık ayı itibariyle toplam istasyon sayısı 3.402'e, acil sağlık hizmetlerinde kullanılan kara ambulans sayısı ise 5.738'e, deniz ambulansı sayısı 6'ya ve helikopter ambulans sayısı ise 13'e ulaşmış durumdadır. Tüm ambulanslar Avrupa Birliği ülkeleri standardına uygun donanımlara sahiptirler (Sağlık Bakanlığı, 2023).

Ambulanslar Sağlık Bakanlığı, Acil Sağlık Hizmetleri Genel Müdürlüğü'ne bağlı olarak İl Sağlık Müdürlüğünün Sağlık Hizmetleri Başkanlığı altında bulunan İl Ambulans Servisi Başhekimliği koordinesinde Komuta Kontrol Merkezi tarafından idare edilmektedir. Türkiye'deki ambulanslarda en az üç personel görev yapmaktadır. Bunlar en az iki sağlık personeli olmak üzere bir adet sürücüden oluşmaktadır. Yıllara göre yapılan istihdam artışı sonrasında ambulanslarda sürücülük görevini ATT ve Paramedikler de yapmaktadır. Ambulanslar; hasta ya da yaralıya acil sağlık hizmeti sunmak ve tıbbi müdahalede bulunmak amacıyla nüfus oranı, coğrafi durumu, ulaşım imkanları, trafik ve iş kazası durumlarına göre, yapılan incelemeler sonucunda İl Sağlık Müdürlüğü'nün teklifi ve Valiliğin onayı ile kurulan binalara istasyon adı verilmektedir (Resmi Gazete, 2006).

5.1 Ambulans Çalışma Yönetmeliği ve İstasyonlar

Acil Sağlık Hizmetleri Yönetmeliği 11.05.2000 tarihli Resmî Gazetenin 24046 numaralı sayısıyla, Ambulanslar ve Acil Sağlık Araçları ile Ambulans Hizmetleri Yönetmeliği ise 07.12.2006 tarihli Resmî Gazetenin 26369 sayısı ile yürürlüğe girmiştir. Bu yönetmeliklerle İl Ambulans Servisi Başhekimliğinin, Komuta Kontrol Merkezinin, istasyonların ve ambulansta çalışan personellerin aşamalı olarak sevk ve idaresine dair usul ve esasları belirlenmektir. İl Ambulans Servisi Başhekimliği tarafından Komuta Kontrol Merkezi başta olmak üzere istasyonlar, ambulanslar ve buralarda görev yapan tüm personellerin sevk ve

idaresi yapılır. Başhekimlik, hizmetin sürekliliği ve geliştirilmesi için ATT ve Paramediklerin göreve başladıktan sonra belirli aralıklarla tıbbi eğitim almasını sağlar, gerekli planlama ve organizasyonu yapar. Komuta Kontrol Merkezi, Başhekimliğe bağlı olarak görev yapar. Komuta Merkezine gelen çağrıları sağlık personeli kendisi değerlendirerek sabit olarak konumlanan en yakın en uygun ambulans ekibinin olay yerine görevlendirilmesini sağlar. Hastaneler arası koordinasyonu sağlayarak hasta ya da yaralının başta yoğun bakım olmak üzere diğer ihtiyaç duyulan sağlık hizmetlerine ulaşmasını yardımcı olur. Olağan dışı, afet, toplumsal olaylar gibi durumlarda diğer kurum ve kuruluşlar ile koordinasyonu sağlar (Resmi Gazete, 2009).Komuta Kontrol Merkezi tarafından verilen acil vakaları, il içi, il dışı hasta nakillerini ve diğer acil durum görevlerini yerine getirirler. İstasyonlarda bulunan ambulans ile en hızlı şekilde hasta ya da yaralıya ulaşım sağlanması hedeflenir. Bazı durumlarda bir istasyon içerisinde ihtiyaç halinde iki adet ambulans bulundurabilir. Ambulanslar belirlenen istasyon birimleri dışında başka yerde bekleyemezler. Görevleri tamamlandıktan sonra istasyona dönmek zorundadırlar. İstasyonlar verdikleri hizmet sunumu açısından A, B, C olarak üç ana gruba ayrılmaktadır (Resmi Gazete, 2009).

1- A tipi istasyonlar: A tipi istasyonlar 7 gün 24 saat hizmet vermek üzere Bakanlığının onayı ile açılırlar. A tipi istasyonlar iki gruba ayrılır. A1 tipi istasyonlarda pratisyen hekimler bulunurken A2 tipi istasyonlarda sadece ATT ve Paramedikler görev yapmaktadır. A tipi istasyonlar idari ve özlük hakları bakımından başhekimliğe bağlıdır ve kadrolu personelleri vardır.

2- B tipi istasyonlar: Birinci, ikinci ve üçüncü basamak sağlık kuruluşları ve bu kuruluşların acil servisi ile çalışan istasyonlardır. B tipi istasyonlar iki gruba ayrılır. B1 tipi istasyonlar acil servis ile entegre olarak çalışırlar. B2 tipi istasyonlar ise birinci basamak sağlık kuruluşu ile entegre olarak çalışırlar. Bu istasyonlar idari ve özlük hakları bakımından çalıştıkları kuruma bağlıdır. Ancak ambulans hizmeti açısından Komuta Kontrol Merkezine bağlı olarak görev yaparlar.

3- C tipi istasyonlar: Bu istasyonlar idari ve özlük hakları bakımından başhekimliğe bağlıdır. Ancak sürekli aktif olarak görev yapmazlar. İhtiyaç halinde günün belirli zamanlarında görev alırlar.

5.2 Ambulans Personeli Çalışma Sistemi

Acil Sağlık Hizmetlerinde görevli pratisyen hekimler, ATT, Paramedik ve sürücüler bulunmaktadır. İl Ambulans Servisi Başhekimliği, Komuta Kontrol Merkezi ve istasyonlarda çalışacak personelin büyük çoğunluğunu ATT ve Paramedikler oluştururken

Komuta Kontrol Merkezi ve istasyon tipine göre pratisyen hekimler de bulunmaktadır. Sağlık personellerinin yanı sıra sadece sürücülük görevini yerine getiren ilkyardım eğitimi almış personeller de çalışmaktadır (Resmi Gazete, 2006). Sağlık personeli istihdamları hekimler hariç olmak üzere Kamu Personeli Seçme Sınavı (KPSS) puanına göre yapılmaktadır. Acil Sağlık Hizmetlerinde görevli Komuta Kontrol Merkezi ve istasyonlardaki personeller 24 saat esasına göre hizmet verilmektedir. Personeller haftada en az 40 ya da 45 saat olacak şekilde nöbet tutmaktadır. Nöbetler 24 saat ve 12 saat olmak üzere vardiyalı şekilde belirlenmektedir. İstasyonlarda görevli personelin istihdam durumlarına göre nöbet vardiyalarında farklılıklar bulunmaktadır. İstasyonlarda mutfak, tuvalet, banyo, dinlenme odaları ve bilgisayar bulunmaktadır. Ambulansta görev yapan personeller istasyonlarından ayrılamazlar, göreve hazır olacak şekilde beklemek zorundadırlar. Daha önceden belirlenmiş bir dinleme ya da yemek süreleri yoktur. Bu ihtiyaçlar görev harici en müsait zamanlarda yapılmaktadır. Personeller görev harici istasyondaki diğer evrak işleri, tıbbi malzemelerin kontrolü ve takibi ile sorumludurlar. Ambulanslarda hasta taşıma sedyeleri insan gücüyle sağlanmaktadır. Kullanılan araç modelleri standart gövde olarak tercih edilmektedir. Her istasyonun kadrolu personel arasından Başhekimlik tarafından belirlenen bir adet sorumlu sağlık personeli ve sorumlu sürücü bulunmaktadır.

5.3 Acil Çağrı Merkezi ve Elektronik Vaka Sistemi

2003 yılında "Sağlıkta Dönüşüm Programı" kapsamında tek acil çağrı numarası oluşturma kapsamında "112 Acil Çağrı Merkezi Projesi" kararı alınmış ve 06 Nisan 2005 tarihinde Antalya pilot il olarak belirlenmiş ve hızla çalışmalara başlanmıştır. Proje kapsamında 2021 yılı sonu itibariyle 81 ilde "112 Acil Çağrı Merkezleri" kurulmuştur. Acil çağrı merkezinde; sağlık, itfaiye, jandarma, polis, orman, afad, sahil güvenlik gibi diğer birimlerin aynı mekânda olduğu ve koordinasyon imkânı sağlayan co-location modeli tercih edilmiştir. 16.05.2014 tarihli Resmî Gazetenin 29002 sayısı ile 112 Acil Çağrı Merkezleri Kuruluş, Görev ve Çalışma Yönetmeliği yayınlanmıştır. Yönetmelikte belirtildiği üzere Acil Çağrı Merkezleri T.C. İçişleri Bakanlığı'na bağlı olarak görev yapmaktadır. (Acil Çağrı Merkezi, 2021).Acil Çağrı Merkezleri'nin kurulmasıyla birçok sorun ortadan kalkmıştır. 112 Acil Çağrı Merkezleri'nin 81 ilde aktif olmasıyla birlikte birden fazla acil numara ezberleme zorunluluğu ortadan kalkmıştır, her bir birim için çağrı merkezi oluşturma, bina yapımı gibi durumlara ihtiyaç kalmayarak maliyet tasarrufu sağlanmıştır. Sunulan hizmette standart ve kaliteli hizmet ile verimlilik arttırılmıştır. Tüm acil durumlarda kurumlar arası daha hızlı olacak şekilde koordinasyon ve iş birliği sağlanmıştır. Tüm illerde iletişim daha hızlı ve güvenli hale gelmiştir. Teknolojik alt yapı ile tüm çağrılar, telsiz konuşmaları, GPRS

hareketleri kayıt altına alınmış ve takip sistemi daha iyi hale gelmiştir. Uluslararası standartlara erişerek ülkemizde bulunan yabancı hasta ya da yaralılara yardımcı olmak amacıyla dil bilen, özellikle Almanca, İngilizce, Arapça ve Rusça dillerinde çağrı karşılayan personel istihdam edilmektedir (İller İdaresi Genel Müdürlüğü, 2020).112 Acil Çağrı Merkezi numarası arandığı zaman ön çağrı personeli tarafından ilk çağrı karşılaması yapılmaktadır. Ön çağrı personeli arayan kişinin arama sebebini ve kişisel bilgilerini aldıktan sonra arama sebebine göre gerekli birime yönlendirmesi yapılır. Çağrı yönlendirilen personel tarafından tekrar kısa bir görüşme sonrası ihtiyacına göre destek sağlanmak üzere ekipler görevlendirilir. Sağlık ekibi tarafından karşılanan bir çağrı var ise istasyonda göreve hazır halende bekleyen ekibe tablet cihazı üzerinden acil vaka ataması yapılır. Aynı zamanda telsiz üzerinden teyit alınır. Sağlık çağrı ekibi, Acil Sağlık Otomasyon Sistemi'ne (ASOS) ambulans ekibinin istasyondan çıkış, olay yerine ulaşma, olay yerinden ayrılma, hastaneye ulaşma, hastaneden ayrılma ve istasyona dönme sürelerini bildirilen parametreleri gözlemleyerek doğru ve eksiksiz kaydedilmesini sağlar. Eğer hata ya da eksiklik varsa ambulans ekibi ile irtibata geçerek düzeltilmesini sağlar (Resmî Gazete – 2014).Elektronik Vaka Sistemi (EVS) tablet uygulaması 2019 yılında Bolu başta olmak üzere Sakarya, Kırıkkale, Çanakkale gibi birçok ilde pilot olarak uygulanmaya başlanmıştır. Sağlık Bakanlığı ve İçişleri Bakanlığı tarafından ortak geliştirilen Elektronik Vaka Sistemi (EVS) tablet projesi ile ambulanslarda dijital dönüşümün ilk adımları atılmıştır. Acil sağlık hizmetine ihtiyacı olan hasta ya da yaralı acil çağrı merkezini aradıktan sonra Komuta Kontrol Merkezi tarafından yapılan yönlendirmeyle arayan kişinin bilgileri, konumu tablet üzerinden ambulans ekibine dijital ortamda aktarılmaktadır. Ayrıca bir navigasyon cihazına ihtiyaç duyulmadan arayan kişinin konumu tablet uygulamasına tanımlandığı için olay yerine ulaşım süresi oldukça kısalmaktadır. Tablet uygulamasına aktarılan vaka, ekip tarafından fark edilmesi için sesli ve görsel olarak 5 saniye boyunca uyarı vermektedir. Vakayı kabul eden ekip gideceği hastanın ön tanısını, kişisel bilgilerini ve bulunduğu konumu otomatik olarak görmektedir. Konum yönlendirmesi en hızlı ve en iyi rota tercihi sunularak trafik durumu anlık olarak ekranda yer almaktadır. Hastaya ait tüm bilgiler, tıbbi işlemler ve vaka çıkış, varış, ayrılış, hastane varış ve ayrılış süreleri tablet sistemine işlenmektedir. Hastanın hastaneye teslim sürecinde hastane tarafından verilen kodlar ile hastaya uygulanan tüm bilgiler doktor ekranına yansımaktadır. Böylelikle veri güvenliği sağlanmakta ve hastanın tıbbi geçmişi elektronik ortama hızlıca aktarılmaktadır. Tüm bu bilgiler ASOS'ne anlık olarak kaydedilmektedir (Sağlık Bakanlığı, 2022).

6. KANADA'DA HASTANE ÖNCESİ ACİL SAĞLIK HİZMETLERİ

Kanada eyaletlerle yönetilen bir ülkedir. Her eyaletin ayrı bir yönetmeliği ve idare biçimi vardır. Ancak temelde hepsi genel olarak aynı yöntemleri kullanmaktadır. Örneklememiz Ontario eyaletini kapsamaktadır. Kanada Ontario eyaletinde hastane öncesi acil sağlık hizmetleri İngiliz-Amerikan (Anglo-Amerikan) "kap ve götür" modeline göre hizmet vermektedir. Kanada'da ambulanslarda paramedikler bulunmaktadır. Bunun dışında ambulanslarda hekim ya da acil uzman hekimi bulunmamaktadır. Uzman hekimler sadece Komuta Kontrol Merkezlerinde danışman hekim olarak görev yapmaktadır. Ambulanslar Sağlık Bakanlığı kontrolünde olup belediye, hastane ve özel kuruluşlara bağlı olarak hizmet vermektedir. Komuta Kontrol Merkezleri tarafından idare edilmektedirler. Ambulanslarda rütbelerine göre iki adet paramedik görev yapmaktadır. Sürücülük görevini paramedikler dönüşümlü olarak yerine getirmektedirler. Paramedik mesleğinde 3 aşamalı rütbe sistemi mevcuttur. Kanada'da paramedik rütbeleri almış oldukları mezuniyet durumlarına göre, aşamalı olarak, belirlenmektedir (Ministry of Health, 2024);

1- Temel Bakım Paramediği (Primary Care Paramedic (PCP)
2- İleri Bakım Paramediği (Advanced Care Paramedic (ACP)
3- Yoğun Bakım Paramediği (Critical Care Paramedic (CCP)

6.1 Ambulans Çalışma Yönetmeliği ve İstasyonlar

Kanada'da ambulans yasası 1990 yılında yürürlüğe girmiştir. Yasayla birlikte Ontario eyaletinin ambulans yönetmeliği 257/00 numarası kapsamında 19 Nisan 2000 tarihinde onaylanmıştır. 2001 yılında ise ambulans hizmetleri toplu iş sözleşmesi yasası yürürlüğe girmiştir. Yönetmelikle beraber paramediklerin görev ve sorumlulukları, yeterlilik sınavları, ambulansların çalışma usul ve esasları belirlenmiştir (Ontario regulation, 2000). Ontario eyaletinde Komuta Kontrol Merkezi ve idarelerinde hekimler yerine paramedikler görev yapmaktadır. Şef, şef yardımcısı, süpervizör ve süpervizör yardımcısı rütbelerinde paramedikler bulunmaktadır. Şef rütbesindeki paramedik bulunduğu eyaletin en üst yöneticisi konumundadır. Paramedikler sahada nöbet süreleri boyunca süpervizör ve süpervizör yardımcıları ile sahada görev yapabilirler. Şef ve şef yardımcıları ise idareci olarak hizmetin sürekliliği ve geliştirilmesi için gerekli planlama ve organizasyonu yaparlar. Komuta Kontrol Merkezi 911 Acil çağrı sistemi üzerinden gelen aramaları değerlendirilerek eyaletin çeşitli bölgelerinde bulunan ambulans ekiplerinin yönlendirmesini yapar. Komuta Kontrol Merkezi personelleri yapay zeka destekli sistem tarafından nöbet esnasında belirli aralıklarla ambulansları farklı noktalara görevlendirerek dinamik olarak çalışmalarını sağlar. Böylelikle acil durumlarda en hızlı şekilde hasta ya da yaralıya ulaşım sağlanması hedeflenir.

Eyaletlerin belirli bölgelerinde ambulansların ihtiyaçlarını karşıladıkları, personelin nöbet değişimi sağladıkları merkez istasyonlar vardır. Bu noktalarda birden fazla ambulans ekibi bulunur. Tıbbi malzemelerini, yemek ve dinlenme molaları, ihtiyaç duyulan tüm araç ve gereçleri buradan temin edebilirler. Merkez istasyonlarında mutfak, tuvalet, banyo, dinlenme ve idareci odaları bulunmaktadır (Modern Paramedik, 2020).

6.2 Ambulans Personeli Çalışma Sistemi

Kanada Ontario eyaletinde paramedikler üniversitelerden mezun olduktan sonra meslek odaları tarafından yeterlilik sınavına tabi tutulurlar. Yeterlilik sınavı sonrası başarılı olanlar göreve başlatılmaktadır. Yeterlilik testleri görevde olan personeller için yıllık yada iki yıl arayla tekrar yapılır ve başarılı olanlar görevine devam etmektedir. Paramedik görev süresi boyunca belirli aralıklarla tekrarlayan hizmet içi eğitimler almaktadır. İlk göreve başlayan paramedik Primary Care Paramedic (PCP)- (Temel Bakım Paramediği) rütbesindedir. Ambulanslarda iki adet paramedik görev yapmaktadır. Nöbet sırasında paramedikler aynı rütbede veya bir tanesi üst seviye paramedik olabilir. Sürücülük görevi iki paramedik arasında hasta ya da yaralının duruma göre dönüşümlü olarak yapılmaktadırlar (Ontarıo regulatıon, 2000). Nöbet değişimleri merkez istasyonlarda belirlenen saat aralıklarında dönüşümlü olarak yapılmaktadır. Nöbet değişimi sonrası 911 Komuta Kontrol Merkezi tarafından yapay zeka ile belirlenen konumlara yönlendirilerek göreve hazır halde beklenir. Belirli aralıklara nöbet yerleri değiştirilir. Yemek molası, ihtiyaçların giderilmesi için diğer ambulanslar ile dönüşümlü olarak önceden belirlenen zamanlarda merkez istasyona dönüş yapılır. Ontario eyaletinde acil sağlık hizmetlerindeki personeller 24 saat esasına göre 12 saatlik gündüz ve gece olmak üzere iki vardiya halinde görev yapmaktadırlar. Personeller haftalık en az 36,5 saat olacak şekilde bir nöbetinde 12 saat kesintisiz olarak görev yapmaktadırlar. Personeller arası istihdam farklılıkları bulunmamaktadır. Ambulanslarda hasta taşıma sedyeleri otomatik elektrik sistemlidir. Kullanılan araç modelleri geniş kasa olarak tercih edilmektedir (Modern Paramedik, 2020).

6.3 Acil Çağrı Merkezi ve Vaka Sistemi

Kanada Ontario eyaletinde 911 tek numaradan ulaşılan Acil Çağrı Merkezi sistemi kullanılmaktadır. Polis, sağlık ve itfaiye ekipleri aynı yerde görev yapmaktadır. Bazı eyaletlerde farklı binalarda da konumlanabilirler ancak kullanılan ortak sistem aynıdır. 911 Acil Çağrı Merkezi sisteminde paramedikler veya çağrı merkezi eğitimi almış personeller görev yapmaktadır. 911 arandığında personel tarafından yapay zeka destekli sistem tarafından arayan kişiye önünde bulunan çeşitli soruları sorarak aciliyet durumu saptanır. Çıkan sonuçlara göre bazı kodlar belirlenir. Kodlar ambulans ekibinde bulunan tablet

sistemine aktarılır ve telsiz üzerinden teyit yapılır. Bu kodlara göre ek ekip ihtiyacı, kliğinin aciliyeti, siren ve tepe lambalarının kullanımı gibi durumlar belirlenmektedir (Modern Paramedik, 2020). Ambulans ekibi tablet üzerinden hastanın ön tanısını, kişisel bilgilerini ve bulunduğu konumu otomatik olarak görmektedir. Ayrıca bir navigasyon cihazına ihtiyaç duymadan hızlı şekilde olay yerine varılması sağlanır. Tablet sistemi üzerinden vaka çıkış, varış, ayrılış, hastane varış ve ayrılış süreleri yapay zeka destekli algoritmalarla otomatik olarak işlenmektedir. Eyaletlerde ambulans ihtiyacı bulunan yerler geçmiş yıllardaki veriler işlenerek planlamaktadır. Yapay zeka destekli sistem ile geçmiş yıllara ait girilen veriler sürekli güncellenerek yoğunluk durumları göz önünde bulundurularak ambulans ekipleri eyaletin çeşitli bölgelerinde bulunan alışveriş merkezleri, hastaneler, toplu kalabalık alanlar gibi yerlerde aktif olarak konuşlandırılırlar. (Ministry of Health, 2024).

Sonuç

Türkiye'de gerek nüfus, gerekse sağlık hizmeti alıcılarının beklentilerindeki artış Acil Sağlık Hizmetleri'nde yapay zekâ uygulamalarının güncellenmesini zorunlu kılmaktadır. Acil Sağlık Hizmetlerinde öncü ülkelerde görülen teknolojik alt yapıdaki gelişmeler yakından takip edilmelidir. Paramediklerin sistem içerisindeki yetki, rütbe ve etkinlikleri tekrar yenilenmelidir. Özellikle haftalık çalışma süreleri, personeller arası farklı istihdam koşulları ve işe alım süreci kriterleri gibi farklılıklar incelenerek öncü ülkelerdeki gibi güncellenmesi önerilmektedir.

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YÖRESEL TARIM ÜRÜNLERİNİN E-TİCARET ÜZERİNDEN SATIN ALINMASINA YÖNELİK TÜKETİCİ ALGISININ DEĞERLENDİRİLMESİ: ANKARA İLİ ÖRNEĞİ

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Özet
Son yıllarda tüketicilerin doğal ve yöresel gıda ürünlerine yönelik ilgi artış eğilimi göstermesiyle birlikte bu ürünlere ulaşım noktasında e-ticaret etkili ve hızlı bir pazarlama kanalı olarak karşımıza çıkmaktadır. E-ticaretin gıda alım-satımında yaygınlaşmasında tüketici algısı önem taşımaktadır. Bu noktadan hareketle çalışmada yöresel tarım ürünlerinin e-ticaret üzerinden satın alınmasına yönelik tüketici algısının ortaya konulması amaçlanmıştır. Çalışmanın ana materyalini basit tesadüfi örnekleme yöntemiyle belirlenen 384 tüketiciden 2023 yılında anket yoluyla elde edilen birincil veriler oluşturmaktadır. Elde edilen bulgulara ışığında, tüketicilerin aylık ortalama gelirinin 15 853.57 tl olduğu, eğitim düzeyinin ağırlıkta lisans ve üstü (%54.7) olduğu belirlenmiştir. Tüketicilerin %89.6'sının yöresel ürün satın alırken e-ticaret yoluyla satın alanların oranı düşük (29.4) düzeydedir. Ayrıca önceden satın almış fakat satın alma davranışına devam etmeyenlerin oranı (%32.8) dikkat çekmektedir. Yöresel gıda ürünlerinin e-ticaret yoluyla satın alımında fiyat, ulaşılabilirlik, zaman kısıtı gibi faktörler etkili iken, memnun kalmama, güven duymama, kalite gibi unsurların tüketicilerin e-ticareti tercih etmemelerinde etkili olduğu gözlenmiştir. E-ticaret yoluyla pek çok gıda ürününe erişim söz konusu olmakla beraber araştırma kapsamında tüketicilerin satın almada zeytin, zeytin yağı, bal, tarhana, salça vs. raf ömrü uzun olan ürünleri tercih ettikleri belirlenmiştir. Tüketiciler daha çok tanıdık tavsiyesini ve güvenilirliği (bilinen ya da markalaşmış siteleri) dikkate alarak e-ticaret yoluyla alışveriş yapmaktadırlar. Diğer yandan site tasarımı, ürün bilgisi, müşteri hizmetleri gibi unsurların satın alma davranışının sürdürülebilirliğinde etkili olduğu tespit edilmiştir. E-ticaret yoluyla yöresel ürünlerin satın alımının yaygınlaşmasında güven unsurunun etkili olduğu sonucuna varılmıştır. Buna göre ticaret odaları, tarım ve orman bakanlığı gibi ilgili kurum ve kuruluşların denetleme mekanizmasını iyileştirmekle beraber gıda ürünlerinde kalite ve hizmet odaklı standardizasyon çalışmalarına ağırlık verilmesinin e-ticaretin yaygınlaşmasında etkili olacağı düşünülmektedir.
Anahtar Kelimeler: Yöresel tarım ürünü, e-ticaret, pazarlama

EVALUATION OF CONSUMER PERCEPTION TOWARDS THE PURCHASE OF LOCAL AGRICULTURAL PRODUCTS VIA E-COMMERCE: THE CASE OF ANKARA PROVINCE

Abstract
While consumer interest in natural and local food products has increased in recent years, e-commerce has emerged as an effective and fast marketing channel at the point of departure for these products. Consumer perception plays an important role in the spread of e-commerce in the procurement and sale of food. From this point on, the study is aimed at developing consumer perception of purchasing local agricultural products via e-commerce. The study's main material is primary data obtained by survey in 2023 from 384 consumers identified by simple random sampling. In the light of the findings obtained, it was determined that the average monthly income of consumers was 15 853.57 tl, and the level of education was by weight undergraduate and higher (54.7%). 89.6% of consumers buy local products, while the percentage of e-commerce buyers is low (29.4). The percentage of people who had previously purchased but did not continue their purchasing behaviour (32.8) is also remarkable. It has been observed that factors such as price, availability and time constraints have an influence on the purchase of local food products via e-commerce, while elements such as dissatisfaction, uncertainty, and quality have an effect on consumers' refusal to prefer electronic commerce. While access to many food products through e-commerce is concerned, the research has determined that consumers prefer to buy olives, olive oil, honey, tarhana, sauce, etc. products that have a long shelf life. Consumers shop via e-commerce, taking more familiar advice and reliability into account (known or branded sites). On the other hand, elements such as site design, product information, customer service have been found to be influential in the sustainability of purchasing behaviour. It has been concluded that the confidence element is effective in the spread of the purchase of local products through e-commerce. In addition to improving the supervisory mechanism of relevant institutions and organizations such as chambers of commerce, the Ministry of Agriculture and Forestry, emphasis on quality and service-oriented standardization work in food products is believed to have an impact on the spread of e-commerce.
Keywords: Local agricultural product, e-commerce, marketing

Giriş

Dünyada ve Türkiye'de hızla gelişen pazarlama ağlarının başında elektronik ticaret gelmektedir. Gelişen teknoloji ile yeni bir pazarlama modeli olarak ortaya çıkan e-ticaret, son yıllarda yüksek bir ivme yakalamıştır. Gün geçtikçe büyüyen bu pazar tüketiciye çok çeşitli ürün yelpazesi sunmaktadır. Son zamanlarda gıda ürünleri başta olmak üzere tekstil, kozmetik, sağlık ve teknoloji ürünlerinin e-ticaret kanalıyla satışında yükselme görülmektedir. Türkiye'de internet üzerinden 2023 yılının ilk 3 ayında verilen siparişlerin %37.1'ini gıda ürünleri oluşturmaktadır (TÜİK, 2023b). Gıda ürünlerinin tüketicilere ulaştırılmasında en etkili ve hızlı pazarlama kanalı haline gelen e-ticaret, üreticilere de doğrudan pazarlama imkânı sağlayarak fazla kar avantajı sağlamaktadır.

Özellikle pandemi ile tüketicilerde bilinçli tüketim arayışı başlamıştır. İnternet kullanımı ve sosyal medya paylaşımlarının etkisi doğal, sağlıklı, taze gıda, kültürel değerlere artan yönelim ile yöresel ürünlere tüketici eğilimini arttırmıştır (Kocaman ve diğ., 2022; Gürün ve İkikat Tümer, 2023). Yöresel ürünlere yönelik ilgi ile günümüzde tüketiciler yöresel ürün-doğal gıda ilişkisinin yanında kalite göstergesi olarak tanımlamaktadır (Eriksen, 2013; Türkpatent, 2024). Son yıllarda yöresel ürünlerin korunmasında coğrafi işaret kullanımının artışı görülmektedir. Bu algıda belli bir bölge ile ürün özdeşleştirilerek kalite özelliklerinin ön plana çıkartıldığı coğrafi işaretin (yöresel ürün) etkisi fazladır. Yerel gıdaların çoğunlukla küçük işletmeler tarafından üretilmesi geniş kitlelere ulaşma noktasında yetersiz kalmaktadır (Köksal, 2014). Yöresel ürünlere olan talep artışı ile ürüne ulaşma imkanını sağlamada üreticilerinde pazarlama kanallarında değişikliğe giderek e-ticarete yönelmeleri olumlu yönde etkilenmiştir (Gürün, 2020; Aslan ve Bozok, 2022). Coğrafi sınırlılıkların kalkmasıyla geniş kitlelere ürünlerin ulaştırılmasını sağlayan e-ticaret pazarlama ve tutundurma faaliyetleri açısından fırsat sunmaktadır (Sayılı ve Büyükköroğlu, 2012; Demirdöğmez ve ark., 2018). İşletmeler sadece fiziki mağazalarla değil e-ticaret kanalıyla da ürünlerini pazarlamaktadır. Kendisine ait internet sitesi veya sosyal medya aracılığıyla satış yapabilmelerinin yanında bir platforma üye olarak da yöresel ürünlerin satışı yapılabilmektedir (İşçioğlu ve Ağyol, 2019, Aslan ve Bozok, 2023). Ayrıca yaygın olarak kullanılan online marketlerle de üreticiye ulaşma imkanı doğmuştur. Satılan yöresel gıdaların e-ticaret satışları fiziki mağaza satışlarına kıyasla düşük olsa da, iyi bir satış oranına sahiptir (Kocaman ve diğ., 2022). Değişen tüketici algısı ve satış kanalıyla ülkenin her yerine ulaşım imkanı sunulması ile ileride bu durumun değişmesi mümkündür. Çalışma ile ilgili yapılmış önceki çalışmalar; yöresel ürünlerin satın alım davranışı (Köksal, 2014; Kadanalı ve Dağdemir, 2016; Dokuzlu ve ark., 2019; Yüzbaşıoğlu, 2020; Ünal ve Taş, 2022; Gürün

ve İkikat Tümer, 2023), e-ticaret yoluyla gıda ve yöresel ürünlerin pazarlanma yapısı (Sayılı ve Büyükköroğlu, 2012; Köksal, 2014; Sünbül, 2016; Aloğlu, 2019; Özdemir ve Paksoy, 2021; Aslan ve Bozok, 2022; Kocaman ve diğ, 2022; Aslan ve Bozok, 2023) ile ilgilidir.

Yöresel ürünlere artan ilgi ve ürüne ulaşım imkanının tüketicinin bulunduğu yerde sağlaması satın alım davranışı üzerinde etkili görülmektedir. Üreticilerin fiziki mağaza yanında e-ticaret kanalı kullanımı ve satışların devamlılığı ürün özellikleri başta olmak üzere site tasarımı, kullanıcı yorumları, ödeme kolaylığı gibi faktörlerden etkilenmektedir. Çalışmanın amacı; Ankara ilinde yöresel tarım ürünlerinin e-ticareti ile satın alınmasında tüketici algısının değerlendirilmesidir. Türkiye'de yöresel tarım ürünlerinin e-ticareti ile ilgili ekonomik değere yönelik çalışmalara katkı sağlaması ve bu alandaki bilimsel eksikliğin giderilmesine ve sonrasında yapılacak çalışmalara kaynak oluşturması hedeflenmektedir.

Materyal ve Yöntem

Yöresel tarım ürünlerin e-ticaret ile satın alınmasında tüketici algısının değerlendirilmesini ana amaç olarak belirleyen çalışmada Ankara ili örneklem olarak belirlenmiştir. Çalışmada tüketicilerin yöresel ürün satın alımında dikkate alınan faktörler, ürün satın alım sıklığı ve hangi ürünlerin daha fazla alındığı, e-ticaret sitesi tercihinde etkili olan faktörler ve satın alımın arttırılması için neler yapılması gerektiği belirlenmeye çalışılmıştır.Araştırmanın anket çalışmasında hedef olarak kabul edilen Ankara ili Merkez ilçelerinde (Çankaya, Keçiören, Yenimahalle, Mamak ve Altındağ) TÜİK verilerine göre toplam nüfus 3.688.013 kişidir. Yöresel ürün satın alımını eğitim düzeyi yüksek tüketici kitlesinin oluşturduğu belirlenmiştir (Kayacan ve Demirbaş, 2022). 2021 yılında Ankara nüfusunun %28.6'sı lisans ve üstü eğitim seviyesine sahiptir (TÜİK, 2023a). Bu sayının %70.3'ü ise çalışma kapsamındaki ilçelerde yaşayan nüfusa aittir.

Tüketici boyutunda ana kitlenin en iyi düzeyde temsil edilecek örnek sayısının belirlenmesinde Eşitlik 1 kullanılarak örnek hacmi 384 olarak hesaplanmıştır (Çiçek ve Erkan, 1996).

$$n = \frac{N.p.q}{[(N-1).(D)^2] + p.q} \qquad \text{(Eş. 1)}$$

n= örnek büyüklüğü, N= populasyon büyüklüğü, $D^2 = (d / t)$, q= 0,5 – p= 0,5, d : Araştırıcı tarafından kabul edilebilecek maksimum hata miktarı (0.05), t: güven aralığı (1.96) temsil edilmektedir.

Örneğe alınan tüketiciler yaş, gelir, cinsiyet ve medeni durumlar gibi özellikler dikkate alınarak tesadüfi olarak belirlenmiştir. Mart-Nisan 2023 tarihlerinde toplanan veriler web anket olarak oluşturulup, elde edilmiştir.

Belirlenen örnek hacminin dağıtılmasında, katılımcıların gelirleri dikkate alınarak düşük (14.999 TL ve altı/145 kişi), orta (15.000 ve 20.000 arası/104 kişi) ve yüksek (20.000 ve üstü/135kişi) gelir düzeyi şeklinde 3 gruba ayrılmış ve elde edilen bilgiler çapraz tablolar oluşturularak yorumlanmıştır.

3. Bulgular ve Tartışma

Türkiye'de yöresel ürün tüketimine eğiliminin özellikle pandemi sonrası tüketicilerin doğal ve sağlıklı ürünler tüketme arayışıyla artış kazandığı söylenebilir. Bu eğilimde demografik faktörlerin etkili olabileceği düşünülmektedir. Ankara ili merkez ilçedeki tüketicilere ilişkin demografik bilgiler Çizelge 1'de sunulmuştur. Katılımcıların cinsiyet dağılımına bakıldığında genelde oransal olarak önemli bir farklılığa rastlanmaz iken gelir grupları itibariyle incelendiğinde gelir düzeyi arttıkça kadın katılımcı oranının azaldığı görülmektedir. Genel ortalamada katılımcıların yaş ortalaması 41.75 yıl olup gelir düzeyi arttıkça yaş ortalamasının arttığı belirlenmiştir.

Tüketicilerin %54.7'sinin lisans ve üstü eğitim düzeyine sahip olduğu ve gelir düzeyi ile yakından ilişkili olduğu Çizelge 1'de görülmektedir. Tüketicilerin aylık gelir ortalamasının 15 853.57 ₺ olduğu gelir gruplarına göre detaylı incelendiğinde düşük, orta ve yüksek gelir gruplarında sırasıyla 10 058.90 ₺, 16 771.43 ₺ ve 21 370.37 ₺'dır. 2023 yılı ocak ayı itibariyle en düşük memur maaşı 11 848 ₺ ay^{-1} olduğu dikkate alındığında araştırma bölgesindeki katılımcıların aylık gelirinin ortalamanın üzerinde olup en düşük gelir grubu en düşük memur maaşını içermektedir.

Çizelge 1. Tüketicilere ilişkin genel bilgiler

	Gelir Düzeyi			
	Düşük	**Orta**	**Yüksek**	**Genel**
Cinsiyet (%)				
Kadın	57.9	47.1	37.0	47.7
Erkek	42.1	52.9	63.0	52.3
Yaş (yıl)	36.9	42.7	46.3	41.8
Eğitim (%)				
İlk ve ortaokul	24.2	2.9	1.5	10.4
Lise	31.7	15.4	5.9	18.2
Ön lisans	21.4	20.2	8.9	16.7
Lisans ve üstü	22.8	61.5	83.7	54.7
Aylık ortalama gelir (₺)	10 058.90	16 771.43	21 370.37	15 853.57

Çalışmada ankete katılan katılımcıların yüksek oranda (%89.6) yöresel ürün satın alımında bulunduğu ve gelir grupları arasında önemli bir farklılığın olmadığı tespit edilmiştir (Çizelge 2) . Dokuzlu ve ark. (2019) tarafından Doğu Anadolu Bölgesi'nde yapılan bir çalışmada bu oranın %69 düzeyinde olduğu belirlenmiştir. Söz konusu çalışmanın pandemi dönemi

öncesinde yapıldığı düşünüldüğünde pandemi sürecinin yöresel ürün tüketim eğilimi üzerinde etkili olabileceği düşünülmektedir. Yöresel tarım ürünleri geniş bir yelpazeye sahiptir. Bu nedenle tüketicilerin bu ürünleri satın alma sıklıkları tüketicilerin ürün özelliğine göre önemli ölçüde değişebilmektedir. Nitekim raf ömrü uzun, kurutulmuş ve dondurulmuş ürünlerin satın alınma sıklığının düşük olması beklenirken; nispeten daha az dayanıklı ürünlerin satın alınma sıklığının artacağı düşünülmektedir. Çizelge 2'deki bilgilere göre tüketicilerin %49.7'sinin yılda birkaç kez, %36.3'ününayda bir, geriye kalanının ise haftada birkaç kez yöresel ürün satın aldığı gözlenmektedir ve gelir düzeyine göre sıralamada değişiklik bulunmamaktadır.

Çizelge 2. Yöresel ürün satın alma durumuna ilişkin bilgiler (%)

	Gelir Düzeyi			
	Düşük	**Orta**	**Yüksek**	**Genel**
Yöresel ürün satın alımı				
Evet	86.2	91.3	91.9	89.6
Hayır	13.8	8.7	8.1	10.4
Yöresel ürün satın alma sıklığı				
Haftada birkaç kez	12.0	17.9	12.9	14.0
Ayda birkaç kez	41.6	30.5	35.5	36.3
Yılda birkaç kez	46.4	51.6	51.6	49.7

Tüketicilerin yöresel ürünleri pek çok yerden temin ettikleri fakat bununla beraber tercihlerinde ilk sırayı memleketleri alırken bunu sırasıyla yöresel marketler, süpermarket ve diğer marketler, tanıdıktan temin takip etmektedir. Üreticiden fiziki temin ve semt pazarlardan alımların ise düşük seviyede kaldığı görülmektedir. Araştırmanın sonuçları Dokuzlu ve ark. (2019) tarafından yapılan çalışmanın sonuçları ile benzerlik göstermektedir. Tüketicilerin satın alım yeri tercihinde güvenilirlik, yakınlık, alışkanlık, ürün kalitesi ve çeşitliliği, ürün fiyatı, deneyim ve tavsiye ile hijyen koşulları etkili olmaktadır. Elde edilen veriye göre tüketiciler satın alma yeri tercihinde ilk sırayı güvenilirlik (%71.8) alırken ikici sırada ürün kalite ve çeşitliliği (%53.49) yer almaktadır. Satın alma yeri tercihinde etkili olabilecek unsurların gelir grupları arasında belirgin bir farklılık göstermediği belirlenmiştir (Çizelge 3).

Çizelge 3. Yöresel ürün satın alma yeri ve tercih nedenleri (%)

	Gelir Düzeyi			
	Düşük	**Orta**	**Yüksek**	**Genel**
Yöresel ürün satın alım yeri				
Market	45.6	49.5	55.7	50.3
Memleketten temin	71.2	73.7	80.6	75.3
Semt pazarı	8.8	22.1	10.5	13.1
Tanıdık vasıtası ile	15.2	31.6	30.6	25.3
Üreticiden	11.2	23.2	22.6	18.6
Yöresel Market	61.6	54.7	65.3	61.0
Yöresel ürün satın alım yeri seçiminde etkili olan faktörler				
Eve ve iş yerine yakınlık	20.0	18.9	16.1	18.3
Güvenilir olması	69.6	68.4	76.6	71.8
Alışkanlık	20.0	12.6	25.0	19.8
Ürün kalite ve çeşitliliği	40.8	53.7	66.1	53.5
Ürün fiyatının uygun olması	28.8	33.7	34.7	32.3
Önceden satın aldığım veya tavsiye edilen yer olması	30.4	35.8	42.7	36.3
Hijyen koşulları	23.2	18.9	17.7	20.1

* Katılımcılar birden fazla tercihte bulunduğu için toplamları %100'ü geçmektedir

Çizelge 4'te katılımcıları yöresel ürün satın alımında e-ticaret kanalını kullanım durumuna ilişkin bilgiler yer almaktadır. Tüketicilerin büyük bir çoğunluğu yöresel tarım ürünleri satın alırken e-ticaret yoluyla bu ürünleri satın alanların oranı oldukça düşük düzeydedir (%29.4). E-ticaret yoluyla bu ürünleri satın almayan ve almaktan vazgeçenlerin oranı ise sırasıyla % 37.8 ve %32.9 düzeyindedir. Tüketicilerin e-ticareti tercih etme nedenleri zaman tasarrufu sağlaması, daha uygun fiyatlı ürün temin etme, doğrudan üreticiye ulaşma imkanı şeklindedir. Buna karşın e-ticaretin tercih edilmeme nedenleri; doğrudan üreticiye ulaşma imkanı, güvenilir bulmama, ürünü görerek ve tadarak alma ve daha önceki internetten alışverişinden memnun kalmama olarak belirlenmiştir. Burada dikkat çeken husus tüketicilerin satın alma davranışı gösterip sonrasında vazgeçme durumudur. Kahramanmaraş ilinde yapılan bir çalışma da ise katılımcıların %4.9'unun e-ticaretten yöresel ürün satın aldığı ve %25.0'inin ise almaya istekli olduğu tespit edilmiştir (Gürün ve İkikat Tümer, 2023). Sonuçlardaki değişikliğin çalışmaların yapıldığı illerin demografik özelliklerindeki farklılıklardan kaynaklandığı düşünülmektedir.

Tüketicilerin e-ticaret algısını belirlemeye yönelik Gaziantep ve Adıyaman da gerçekleştirilen bir çalışmada katılımcıların %65'inin güvenilir olmadığı için alışveriş yapmadığını belirtmiştir (Akçi ve Annaç Göv, 2015). Benzer bir sonuç, Gürün ve İkikat Tümer (2023) çalışmasında belirtmiş ve katılımcıların e-ticaret kanalında satılan yöresel ürünleri güvenilir bulmadıkları (%58.4) için satın almadıklarını tespit etmiştir.

Çizelge 3. Yöresel ürün alımında e-ticaret tercihine ilişkin bilgiler (%)

	Gelir Düzeyi			
	Düşük	**Orta**	**Yüksek**	**Genel**
E-ticaretten yöresel ürün satın alıma durumu				
Alıyorum	21.6	28.4	37.9	29.4
Daha önce alıyordum şimdi almıyorum	37.6	27.4	32.3	32.9
Hiç almadım	40.8	44.2	29.8	37.8
E-ticaret yoluyla satın alma nedenleri				
Zaman tasarrufu sağlaması	40.7	18.5	21.3	25.7
Uygun fiyatlı ürün temin etme	29.6	51.9	34.1	37.6
Doğrudan üreticiye ulaşma imkanı	11.1	18.5	23.4	18.8
E-ticaret yoluyla satın almama nedenleri				
Doğrudan üreticiye ulaşma imkanı	55.6	59.3	68.1	62.4
Güvenilir bulmama	45.9	60.3	61.1	54.7
Ürünü görerek ve tadarak alma	38.8	30.9	44.2	38.3
Daha önceki internetten alışverişinden memnun kalmama	37.6	27.4	32.3	32.9

* Katılımcılar birden fazla tercihte bulunduğu için toplamları %100'ü geçmektedir.

Katılımcıların e-ticaret yoluyla almış oldukları yöresel ürünler incelendiğinde ilk 5 ürünün genel ve gelir grupları arasında farklılık bulunmadığı sadece sıralama tercihlerin de değişikliğin olduğu tespit edilmiştir. Genel tercih değerlendirildiğinde balın en fazla satın alınan ürün olduğu zeytinyağı, peynir, zeytin ve nar ekşisinin onu takip ettiği belirlenmiştir. Bu ürünlerin daha çok yöresel ürün olarak özdeştirildiği söylenebilir. Gelir grupları incelendiğinde ise en çok satın alımda düşük grupta zeytinyağı, orta grupta bal, yüksek grupta ise peynir yer almaktadır (Çizelge 5). En az tercih edilen ürünler ise ayçiçek yağı, beyaz et, enginar, salep ve şerbetler olarak belirlenmiş aynı durumun gruplar arasında da en düşük tercihte bulunulan ürünler olduğu görülmüştür. Dokuzlu ve ark. (2019)'nın çalışmalarında tüketicilerin tercih ettikleri yöresel ürünlerde benzerlik görülmektedir. En çok tercih edilen yöresel ürünler peynir başta olmak üzere, bal, tereyağı, zeytin ve kahvaltılık ürünler olarak ifade etmiştir. E-ticaretten sipariş verilme sıklığında ise gelir grupları arasında değişim görülmemekte genel olarak incelendiğinde katılımcıların %14.1'i ayda birkaç defa, %14.1'i ayda bir, %56.3'ü yılda birkaç defa, geriye kalan %15.6'sı yılda bir sipariş vermektedir.

Çizelge 5. İnternetten siparişi verilen ilk 10 ürün ve tercih sıralaması*

Sıra	Gelir Düzeyi							
	Düşük		Orta		Yüksek		Genel	
	Ürün	%	Ürün	%	Ürün	%	Ürün	%
1	Zeytinyağı	46.2	Bal	56.3	Peynir	47.4	Bal	45.3
2	Bal	43.6	Zeytinyağı	43.8	Zeytinyağı	42.1	Zeytinyağı	43.8
3	Zeytin	33.3	Nar Ekşisi	37.5	Zeytin	42.1	Peynir	39.1
4	Peynir	30.8	Zeytin	34.4	Bal	40.4	Zeytin	37.5
5	Nar Ekşisi	25.6	Peynir	34.4	Nar Ekşisi	36.8	Nar Ekşisi	33.6
6	Salça	25.6	Salça	31.3	Salça	36.8	Salça	32.0
7	Tereyağı	25.6	Kuru Meyve-Sebze	31.3	Tereyağı	36.8	Tereyağı	28.9
8	Tarhana	23.1	Kuruyemiş	31.3	Kuruyemiş	26.3	Kuru Meyve-Sebze	24.2
9	Asma Yaprağı	23.1	Baharat	25.0	Kuru Meyve-Sebze	24.6	Kuruyemiş	24.2
10	Baharat	20.5	Pekmez-Tahin	25.0	Tarhana	21.1	Tarhana	21.1

* Katılımcılar birden fazla tercihte bulunduğu için toplamları %100'ü geçmektedir.

Yöresel ürünlerin satın alımında kullanılan e-ticaret sitelerine ilişkin bilgiler Çizelge 6'da sunulmaktadır. Katılımcıların e-ticaret yoluyla yöresel ürün satın alımında en fazla online alışveriş sitelerini (%46.5) tercih ettikleri belirlenmiştir. Online alışveriş siteleri ile üreticiler yöresel ürünlerini satabildiği gibi bu siteler üreticinin desteklenmesi adına çeşitli projelere (Hepsi Türkiye'den programı) yer vermektedir (Hepsiburada, 2023). Bu tarz pozitif ayrımcılığın yapıldığı projeler ile tüketicilerin yöresel ürünlere ulaşma olanağı artmaktadır. Katılımcıların %41.6'sı ise üreticilerin doğrudan sitelerinden alışverişlerini gerçekleştirdiği görülmektedir. Yöresel ürün üreticilerinin özellikle pandemiyle birlikte satış kanallarını genişletme girişiminde bulundukları ve bu konuda da başarıya ulaştıkları görülmektedir. Bu satış kanalı ile üreticiler kendilerine ait e-ticaret sitelerinden satış yapabildiği gibi sosyal medya aracılığıyla satış yapar durumdadır. Ayrıca üreticiler bir platform üzerinden de üye olarak satış imkanı bulabilmektedir. Online marketler aracılığıyla yöresel ürün tercihlerinin ise daha az tercih edildiği belirlenmiştir. Gelir düzeylerine göre tercih edilen e-ticaret sitelerinde değişiklik görülmekte, orta ve yüksek gelir grubunda üretici siteleri tercih edilirken, düşük gelir grubunda online alışveriş siteleri öncelikli olarak tercih edilmektedir. Aloğlu (2019) çalışmasında yöresel ürün tüketicilerinin %44.7'sinin hepsiburada.com, %35.20'sinin n11.com, %6.90'ının gittigidiyor.com, geriye kalanlarının ise üretici sitelerinden satın aldığı belirtilmiştir.E-ticaret sitesinde satın alım yapan katılımcılar farklı

yöresel ürünler için farklı e-ticaret sitelerini (%73.4) kullandığını ifade etmiştir. Bu durum düşük, orta ve yüksek gelir düzeylerine göre farklılık göstermekte ve sırasıyla katılımcıların %59.0'u, %81.3'ü, %78.9'unda farklı ürün-site kullanımı söz konusudur. E-ticaret sitesine ulaşım yolu gelir düzeylerine göre farklılık göstermektedir. Düşük gelire sahip katılımcılar arama sonuçlarından, orta gruptakiler arkadaş tavsiyesi, yüksek gelire sahip katılımcıların ise bildiği internet siteleri üzerinden ulaştığı belirlemiştir. Katılımcıların genel siteye ulaşım yolu incelendiğinde en öncelikli e-ticaret sitesine ulaşımda arkadaş tavsiyesinin etkili olduğu görülmektedir.

Çizelge 6. Yöresel ürün alımında e-ticaret sitelerine ilişkin bilgiler

	Gelir Düzeyi			
	Düşük	**Orta**	**Yüksek**	**Genel**
E-ticaret siteleri (%)*				
Online alışveriş sitesi	59.3	55.6	34.1	46.5
Online market	14.8	11.1	10.6	11.9
Üretici sitesi	25.9	33.3	55.3	41.6
E-ticaret sitesine ulaşım yolu (%)				
Arama sonuçları	55.6	29.6	31.9	37.6
İnternet reklamları aracılığıyla	18.5	25.9	19.2	20.8
Arkadaş tavsiyesiyle	44.4	66.7	48.9	52.5
Güvenilir internet siteleri.	25.9	51.9	55.3	46.5
Fiziki alım sonrası internet sitesi satın alma	11.1	14.8	17.0	14.9
E-ticaret sitesi tercihinde etkili olan faktörlerin öncelik sıralaması**				
E-ticaret sitesinin güven vermesi	2	2	1	1
Ürünün fiyatı	1	1	2	2
Ürünün teslim süresi	3	4	4	3
E-ticaret sitesinin bıraktığı ilk görsel izlenim	4	3	3	4
Ödeme seçenekleri ve taksit imkânı	5	5	5	5
Müşteri yorumları ve tavsiyeler	6	6	6	6
Ürün lezzeti ve kalitesi	7	7	7	7

* Katılımcılar birden fazla tercihte bulunduğu için toplamları %100'ü geçmektedir.

** Katılımcı tercihlerinde ağırlıklı puan hesaplaması yapılarak sıralama oluşturulmuştur.

Çalışmaya dahil edilen katılımcıların e-ticareti tercih etmelerinde etkili olan en önemli faktörler sırasıyla; sitenin güven vermesi, ürün fiyatları, teslim süresi, sitenin görsel izlenimi, ödeme ve taksit imkanı, müşteri yorumları ve tavsiyeler, ürünün lezzeti ve kaliteli olmasıdır (Çizelge 6). Gelir gruplarına göre etkili faktörlerin ilk sıralamalarında değişiklik görülmekte düşük ve orta gelir grubundaki katılımcılar için ilk sırada ürün fiyatı gelirken, yüksek gelir grubundakiler için sitenin güven vermesi etkilidir. Bu sonuçlar genel olarak yöresel ürün satın alan katılımcıların satış yeri seçiminde etkili faktörler ile kıyaslandığında güvenilirlik hem fiziki satın alımda hem de e-ticaret sitesi tercihinde etkili en önemli faktör olarak

görülmektedir. Fiziki satın alımda ürün özelliklerinin istenildiği gibi olması öncelikli tercihler arasındayken, benzer cevap olarak değerlendirilebilecek ürün lezzeti ve kalitesi daha az öneme sahiptir. Aynı durum "önceden satın aldığım veya tavsiye edilen yer olması" (fiziki alımlarda) ile "müşteri yorumları ve tavsiye" (e-ticaret alımlarında) için de geçerlidir. Sonuç olarak iki satın alım durumunda da dikkate alınan faktörler benzer olmakta ancak önceliklerin farklılık gösterdiği söylenebilmektedir. Sayılı ve Büyükköroğlu (2013), çalışmalarında e-ticaret kanalıyla gıda maddesi satın alımında siteye güven, yerinden satın alım maliyetine göre düşük olması, kredi kartı bilgilerinin doğrudan paylaşılmaması öncelikli bulunmuştur. Alışverişlerde ödeme kanalları incelendiğinde katılımcılara birden fazla ödeme yöntemi tercihi sunulmuş, kredi kartı (%60.2), sanal kart (%34.4), EFT/Havale (%12.5) ve kapıda ödeme (%18.8) yöntemleri belirtilmiştir. Gelir gruplarında ise kredi kartı kullanımının tüm gruplarda yüksek olduğu (düşük: %61,5, orta: %46.9, yüksek: %66.7), düşük gelir grubundaki katılımcıların %38.5'inin kapıda ödeme seçeneğini tercih ettiği belirlenmiştir. Bu durum ürünün görülmeden veya kart bilgilerini internet sitesiyle paylaşılmadan ödeme yaparak öncelikle siteye ve ürüne güven oluşturulması için düşük gelir grubunda daha fazla tercih edildiği düşünülmektedir. Benzer bir çalışmada ise e-ticaretle yöresel ürün satın alan tüketicilerin %75.50'sinin kredi kartı, %20'sinin sanal kart ile ödeme yaptığı belirtilmiştir (Aloğlu, 2019).

Sonuç

Tüketicilerin büyük bir çoğunluğu yöresel ürün satın almasına karşın e-ticaret yoluyla satın almayı tercih etmemektedirler. Bu durumun temel nedeni söz konusu pazar kanalının güvenilir bulunmamasıyla açıklanabilir. Dolayısıyla E-ticaret yoluyla yöresel ürünlerin satın alımının yaygınlaşmasında güven unsurunun etkili olduğu sonucuna varılmıştır. Buna göre ticaret odaları, tarım ve orman bakanlığı gibi ilgili kurum ve kuruluşların denetleme mekanizmasını iyileştirmekle beraber gıda ürünlerinde kalite ve hizmet odaklı standardizasyon çalışmalarına ağırlık verilmesinin e-ticaretin yaygınlaşmasında etkili olacağı düşünülmektedir.

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TÜKETİCİLERİN YEREL BAL ALGISI: BİNGÖL BALI ÖRNEĞİ

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Özet
Yerel bir ürüne yönelik algı, tüketicilerin belli bir bölge ile ilişkilendirdiği ürüne verdiği değer ile oluşmaktadır. Bölge ile ilişkilendirilen ve belli bir üne sahip ürün için öncelikle yerel halk tarafından benimsenmesi ve talep oluşturulması gerekmektedir. Yerel ürünlerin tüketiminin arttırılması, üreticilerin ve bölgenin desteklenmesine, geleneksel yöntemler ile devamlılığının sağlanmasına önemli faydalar sağlayarak kırsal kalkınmaya katkı sağlamaktadır. Bu çalışmada bal üretiminde Türkiye de ilk sıralarda yer alan Bingöl ilinde coğrafi işaret tescili öncesi Bingöl Balına yönelik tüketici algılarının belirlenmesi hedeflenmiştir. Bu amaçla 2022 yılında Bingöl ili merkez ilçesinde basit tesadüfi olarak seçilen 96 kişi ile anket çalışması gerçekleştirilmiştir. Çalışma sonuçlarına göre tüketicilerin bal tercihlerinde kalite, güvenirlilik, besin değerleri, tadı ve tavsiye öncelikli faktörler olarak belirlenmiştir. Tüketicilerin %74.3'ünün yöresindeki Bingöl Balı'nı tükettiği, kavanoz veya çita olarak doğrudan tanıdık arıcılardan (%82.3) tedarik ettiği saptanmıştır. Ayrıca Bingöl Balı'nın coğrafi işaret ile tescillenmesinin markalaşma sürecine katkı sağlayacağı düşüncesine sahip oldukları tespit edilmiştir. Coğrafi işaret almasıyla üreticiye, bölge halkına sağlayacağı destek ve geleneksel üretim metotlarına teşvik edeceğinin bilinmesi nedeniyle daha fazla ödemede bulunabileceklerini ifade etmişlerdir. Sonuç olarak yerel halkın Bingöl Balını kalite, güvenirlilik, kültür, gelenek ve ekonomik destek ile özdeşleştirdiği, başka bir ifade ile yerel bal algısının oluştuğu ve coğrafi işaret alması sonrasında da tanınırlığının yerel halk tarafından önemli katkılar sağlayacağı söylenebilir.
Anahtar Kelimeler: Yerel ürün, tescil, tüketim

CONSUMERS' PERCEPTION OF LOCAL HONEY: THE EXAMPLE OF BİNGÖL HONEY

Abstract
The perception of a local product is formed by the value that consumers give to the product that they associate with a certain region. For the product, which is associated with the region and has a certain reputation, it must first be adopted by the local people and demand must be created. Increasing the consumption of local products contributes to rural development by providing significant benefits to supporting producers and the region, and ensuring their continuity with traditional methods. In this study, it is aimed to determine consumer perceptions of Bingöl Honey before geographical indication registration in Bingöl province, which is in the first place in Turkey in honey production. For this purpose, a survey was carried out with 96 randomly selected people in the central district of Bingöl province in 2022. According to the results of the study, quality, reliability, nutritional values, taste and recommendation were determined as the primary factors in consumers' honey preferences. It was determined that 83.3% of the consumers consumed Bingöl Honey in their region and procured it directly from familiar beekeepers (82.3%) as jars or cheetahs. In addition, it has been determined that they have the idea that the registration of Bingöl Honey with a geographical indication will contribute to the branding process. They stated that they could pay more to the producer because it was known that it would provide support to the people of the region and encourage traditional production methods by obtaining a geographical indication. As a result, it can be said that the local people identify Bingöl Honey with quality, reliability, culture, tradition and economic support, in other words, the perception of local honey is formed and its recognition will make significant contributions by the local people after receiving a geographical indication.
Keywords: Local product, registration, consumption

Giriş

Yerel ürünler, belli yöre, bölge veya şehir sınırları içerisinde üretimi sınırlandırılan tarımsal veya hayvansal kökenli gıdalardır (Kang ve Rajagopal, 2014). Yerel bir ürüne yönelik algı ise tüketicilerin belli bir bölge ile ilişkilendirdiği ürüne verdiği değer ile oluşmaktadır. Sağlıklı, güvenilir ve kaliteli ürünlere artan rağbet yöresel ürünlere yönelik ilgiyi arttırmış, bu durum tüketicilerde günümüzde yöresel ürün-doğal gıda ilişkisi ile satın alım kararlarını etkilemektedir (Eriksen, 2013; Lalelidağ, 2020; Türkpatent, 2024). Son yıllarda yöresel ürünlerin korunmasında coğrafi işaret kullanımının artışı görülmektedir. Bu algıda belli bir bölge ile ürün özdeşleştirilerek kalite özelliklerinin ön plana çıkartıldığı coğrafi işaretin (yöresel ürün) etkisi fazladır. Coğrafi işaretler bir ürünün benzerlerinden farklı olarak sahip olduğu kalite, tanınırlık ve diğer karakteristik özelliklerinin ön plana çıkartılarak coğrafi bölge ile ilişkili standartlaştırılmış üretim yöntemini ortaya koymayı amaçlayan işaretlerdir (Usta ve Şengül, 2022). Yerel ürünlerin taklitlerine karşı markalaşma yoluyla korunması sağlanarak ticari değerinin arttırılması sağlanmaktadır (Özbey ve Köşker, 2021). Bu süreçte bölge ile ilişkilendirilen ve belli bir üne sahip ürün için öncelikle yerel halk tarafından benimsenmesi ve talep oluşturulması gerekmektedir. Yerel ürünlerin tüketiminin arttırılması, üreticilerin ve bölgenin desteklenmesine, geleneksel yöntemler kullanılarak yerel ürünlerin sürdürülebilirliğine ve yerel kültürlerin korunmasını sağlayarak kırsal kalkınmaya katkı sağlamaktadır. Bu nedenle yerel ürün algısıyla tüketicilerin satın alma tercihleri etkilenebilir ve yerel ürün pazarının büyümesine de katkıda bulunabilmektedir. Bu çalışmada bal üretiminde Türkiye de ilk sıralarda yer alan Bingöl ilinde coğrafi işaret tescili öncesi Bingöl Balına yönelik tüketici algılarının belirlenmesi hedeflenmiştir.

Materyal ve Yöntem

Tüketicilerin yerel bal algısını ortaya koymayı amaçlayan bu çalışmada Bingöl Balına yönelik bölge halkının algılarının belirlenmesi hedeflenmiştir. Çalışma verileri 2022 yılında web anket yoluyla sağlanan birincil verilerden oluşmaktadır.

Bu çalışmada hedef olarak kabul edilen Bingöl ili Merkez ilçesinin nüfusu 168 953 kişidir (TÜİK, 2022). Örnek hacminin belirlenmesinde aşağıdaki formülden yararlanılmıştır (Çiçek ve Erkan, 1996).

$$n=(N(p.q))/((N-1)\ D^2+(p.q))$$

$$n=168953(0.5)(0.5)/([(168952)\ (0.10/1.96)^2\ ]+(0.5)(0.5)\ )$$

$$n=95.88\sim96$$

Örnek hacmi %95 güven aralığı ve %10 hata payı ile belirlenmiştir. Anket verilerinin toplanmasında 96 kişi basit tesadüfi olarak seçilmiştir. Elde edilen veriler frekans ve yüzde hesaplamalar kullanılarak yorumlanmıştır.

Bulgular

Çalışmada öncelikle tüketicilerin demografik özelliklerine yer verilmiştir. Tüketicilerin yaş ortalaması 33.2, eğitim düzeyi lisans ve üstü ve memur ağırlıklı olduğu belirlenmiştir. Bu durumun merkez ilçede başta üniversitenin bulunması ve kamu dairelerinin yer alması ile ilgili olduğu düşünülmektedir. Tüketicilerin aylık ortalama gelirleri ise 17 500.0 ₺ olarak belirlenmiştir. Çalışmada ayrıca Bingöl balına yönelik algının oluşma durumu incelendiği için yerel halkın ilde yaşama süresi de ele alınmış ve %80'inin 5 yıldan fazla süredir ilde bulunduğu tespit edilmiştir (Çizelge 1).

***Çizelge 1**. Demografik özelliklere ilişkin bulgular*

	Genel		**Genel**
Cinsiyet (%)		Meslek (%)	
Kadın	32.3	Memur	53.1
Erkek	67.7	Özel Sektör	29.2
Yaş (yıl)	33.2	Diğer	17.7
Eğitim (%)		Bingöl de oturum (%)	
Lise	11.4	1-5 yıl	20.8
Önlisans	11.5	6-10 yıl	26.0
Lisans	50.0	11-20 yıl	10.4
Lisansüstü	27.1	21 yıl ve üzeri	42.7
Aylık ortalama gelir (₺)	17 500.0		

Katılımcıların tamamı bal tüketiminde bulunmaktadır. İlçede genel olarak bal tüketiminin en az haftada bir ve üstü olduğu (%79.2) söylenebilir. Bu durum bal tüketiminin yaygınlaştığını göstermektedir. Tüketicilerin kahvaltı ve sağlık amacıyla bal tüketiminde bulunduğu ve satın alımlarını kavanoz ve süzme bal olarak tercih ettikleri belirlenmiştir. Tüketicilerin %82.3'ünün tanıdık arıcılardan ballarını tedarik ettiği ve çoğunlukla Bingöl Balı'nı (%74.3) tükettikleri görülmektedir (Çizelge 2).

Çizelge 2. *Tüketicilerin bal tüketim ve satın alımına ilişkin genel bilgileri (%)*

	Genel		Genel
Bal tüketim sıklığı		**Ne amaçla kullanıldığı**	
Hergün tüketiyorum	29.2	Kahvaltı yapmak amacıyla	59.4
Haftada üç gün tüketiyorum	34.4	Sağlık amacıyla	26.0
Haftada bir gün tüketiyorum	15.6	Bedensel ve zihinsel gelişim amacıyla	14.6
Çok nadir tüketiyorum	20.8		
Bal türü		**Satın alım yeri**	
Süzme	58.3	Tanıdık arıcılar	82.3
Petek	41.7	Süper Market/Market	17.7
Ambalaj türü		**Marka tercihi**	
Teneke	8.3	Bingöl Balı	74.3
Kavanoz	60.4	Balparmak	14.2
Plastik	5.2	Diğer	11.5
Çita	26.0		

Tüketiciler balı sunulan tüm faktörlerde önemli gördükleri, bazı konulara ise daha fazla önemsedikleri belirlenmiştir. Tüketiciler özellikle; kalitesine (4.7), güvenirliliğine (4.7), tadına (4.6), içeriğindeki besin değerlerine (4.6), tavsiye üzerine (4.2) ve kalite belgesine sahip olmasını (4.1) göz önünde bulundurarak satın almaktadır (Çizelge 3).

Çizelge 3. *Bal satın alımında önemli görülen faktörler (%)*[*]

		Genel			Genel
Fiyat	1	6.2	**Satış Şekli**	1	22.9
	2	8.3		2	2.1
	3	85.5		3	75.0
	x̄±			x̄	3.8±1
	ss	3.9±0.8		± ss	.2
Kalite	1	-	**Gıda güvenliği sistemleri ve yönetim belgesine sahip olması**	1	13.5
	2	-		2	5.2
	3	100.0		3	81.2
	x̄±			x̄	4.1±1
	ss	4.7±0.4		± ss	.1
Ambalaj	1	8.3	**Reklam ve tanıtımın olması**	1	26.0
	2	11.5		2	9.4
	3	80.2		3	64.6
	x̄±			x̄	3.6±1
	ss	3.9±0.9		± ss	.3
Etiket	1	18.8	**Sahip olduğu besin değeri**	1	1.0
	2	13.5		2	-
	3	67.7		3	99.0
	x̄±			x̄	4.6±0
	ss	3.6±1.1		± ss	.5
Cinsi veya Türü (Çiçek veya Çam)	1	11.5	**Uzman tarafından tüketiminin önerilmiş olması**	1	17.7
	2	7.3		2	12.5
	3	81.2		3	69.8
	x̄±			x̄	3.8±1
	ss	4.0±0.9		± ss	.2
Koyuluğu	1	15.6	**Güvenirlilik**	1	1.0
	2	17.7		2	-
	3	66.7		3	99.0
	x̄±			x̄	4.7±0
	ss	3.6±0.9		± ss	.5
Damak tadı	1	2.1	**Ürüne ilişkin çevre/aile tavsiyelerine**	1	6.3
	2	1.0		2	4.2
	3	96.9		3	89.6

		Genel			Genel
	x̄± ss	4.6±0.6		x̄ ± ss	4.2±0.8
Alışkanlık	1 2 3 x̄± ss	6.3 8.3 85.4 4.0±0.8	**Yaşadığı veya çalıştığı yere yakın marketlerde kolay bulunabilir olması**	1 2 3 x̄ ± ss	15.6 9.4 75.0 3.8±1.1
Markası	1 2 3 x̄± ss	25.0 9.4 65.6 3.6±1.3			

* "1"-Hiç önemli değil ve önemli değil, "2"-ne önemli ne değil, "3"-önemli ve çok önemli, "x̄"-ortalama, "ss"-standart sapmayı ifade etmektedir.

Tüketicilerin tamamının Bingöl Balını bildiği, %94.8'inin ise tükettiği belirlenmiştir. Tüketicilerin yerel bal algısına ilişkin değerlendirmeleri coğrafi işaret tescili kapsamında değerlendirilmiştir. Tüketicilerde Bingöl balının markalaşmasıyla bölgeye katkı sağlayacağı görüşü hakimdir. Ayrıca yerel üreticiye ve yerel ekonomiye katkı sağlayacağı ve bölgenin kültürel değerlerinin bir parçası olduğu görüşündedir (Çizelge 4). Bu durum coğrafi işaretin ekonomik destek özelliklerinin tüketiciler tarafından daha fazla önemsendiği ve tescil sonucu bu değerlerin karşılanabileceğini göstermektedir.

Ürünlerin kalite ve güvenilirliğinin sağlanması yeniden satın alım kararı üzerinde oldukça etkilidir. Tüketicilerin Bingöl balına yönelik değerlendirmelerinde bölgede üretilmesi, kalitesi, lezzeti ve diğer ballara göre daha sağlıklı bulmaları bu kararlarında etkili olduğunu göstermektedir. Bu yargılara katılımları ekonomik destek özelliklerine oranla kısmen düşük olsa da etkisinin yüksek olduğu görülmektedir.

Çizelge 4. *Tüketicilerin yerel bal algısına ilişkin değerlendirmeleri (%)*[*]

		Genel
Bingöl balı yerel ekonomiye destek sağlar.	1	5.2
	2	5.2
	3	89.6
	x̄±ss	4.3±0.8
Bingöl balı yerel üreticiye katkı sağlar.	1	3.1
	2	3.1
	3	93.7
	x̄±ss	4.4±0.8
Bingöl balının markalaşması bölgenin tanıtımına katkı sağlar.	1	4.2
	2	3.1
	3	92.7
	x̄±ss	4.6±0.8
Bingöl balının markalaşması fiyatının artmasını sağlar.	1	5.2
	2	13.5
	3	81.2
	x̄±ss	4.1±0.9
Bingöl balı bölgenin kültürünün bir parçasıdır.	1	4.2
	2	4.2
	3	91.6
	x̄±ss	4.4±0.7
Bingöl balı geleneksel üretim metotlarının korunmasına katkı sağlar.	1	6.3
	2	16.7
	3	77.1
	x̄±ss	4.1±0.9
Bingöl balı üretim metodları ile geçmişten günümüze aktarılarak bölgenin kültürel varlığını korumaya yardımcı olur.	1	3.1
	2	15.6
	3	81.2
	x̄±ss	4.1±0.7
Bingöl balı diğer ballardan daha kalitelidir.	1	10.4
	2	27.1
	3	62.5
	x̄±ss	3.8±1.0
Bingöl balı diğer ballardan daha sağlıklı ve güvenilirdir.	1	9.4
	2	31.3
	3	59.4
	x̄±ss	3.8±0.9
Bingöl balı diğer ballardan daha lezzetlidir.	1	9.4
	2	32.3
	3	58.3
	x̄±ss	3.7±0.9
Bingöl balı kesinlikle ilgili bölgede üretilir.	1	10.4

		Genel
	2	21.9
	3	67.7
	x̄±ss	3.8±0.8
Bingöl balının geleneksel metotlarla ilgili bölgede üretildiğine inanıyorum.	1	7.3
	2	25.0
	3	67.7
	x̄±ss	3.6±0.8

* "1"-kesinlikle katılmıyorum ve katılmıyorum, "2"-nee katılıyorum ne katılmıyorum, "3"-katılıyorum ve kesinlikle katılıyorum, "x̄"-ortalama, "ss"-standart sapmayı ifade etmektedir.

Genel ortalamada değerlendirildiğinde ortalama 4.0 ile tüketicilerin yerel bal algısının oluştuğu ve coğrafi işaret kapsamında değerlendirilen yargılara katıldıkları belirlenmiştir. Tüketicilerin coğrafi işaret alması ile ilgili katılım sağladıkları yargılara ek olarak bu yargıların daha fazla ödeme istekliliği üzerinde etkisinin ne yönde olacağı Çizelge 5'de sunulmuştur. Tüketicilerin yaklaşık yarısının Bingöl balı satın almaları durumunda üreticisine ekonomik katkı sağlayacağı, bölge tanıtımına katkı sağlayacağı ve geleneksel üretim metotların kullanımını teşvik edeceğini bilmeleri daha fazla ödeme isteklilikleri üzerinde etkili olduğu bulunmuştur.

Çizelge 5. *Tüketicilerin Bingöl balına yönelik ödeme istekliliği (%)*[*]

Bingöl balını satın almam durumunda,… bingöl balına daha fazla ödeme isteğimi;		**Genel**
….., üreticisine ekonomik katkı sağlayacağını bilmem….	1	25.0
	2	25.0
	3	50.0
….., bölge tanıtımına katkı sağlayacağını bilmem….	1	24.0
	2	19.8
	3	56.3
….., geleneksel üretim metotlarının kullanımını teşvik edeceğini bilmem….	1	25.0
	2	28.1
	3	46.9

* "1"-etkilemez, "2"-ne etkiler ne etkilemez, "3"-etkileri ifade etmektedir.

Çizelge 6. *Tüketicilerin Bingöl balına yönelik ödeme tercihinde değişiklik (%)*

		Genel
Diğer balların fiyatlarının Bingöl balının fiyatından yüksek olması durumunda tercih	Diğer bal	5.2
	Kararsız	10.4
	Bingöl Balı	84.4
Bingöl balı ile diğer balların fiyatlarının eşit olması durumunda tercih	Diğer bal	3.1
	Kararsız	11.5
	Bingöl Balı	85.4
Bingöl balının fiyatının diğer balların fiyatlarından yüksek olması durumunda tercih	Diğer bal	15.6
	Kararsız	27.1
	Bingöl Balı	57.3

Tüketicilerde coğrafi işaret bağlamında yerel ürün algısının oluşması bu ürüne yönelik ödeme istekliliğini değiştirebilmektedir. Ürünün güvenilirliği, kalite ve sağlık algısı satın alım kararı üzerinde etkili olduğu kadar, ödeme üzerinde de etkilidir. Tüketicilerin %94.8'inin Bingöl balını tükettiği göz önünde bulundurulduğunda tüm değişkenler değerlendirerek diğer ballar ile kıyaslama yapabilmelerine olanak sunmaktadır. Çizelge 6'da farklı fiyat senaryolarında tüketicilerin bal tercihinin ne yönde değişeceği ele alınmıştır. Diğer balların fiyatının Bingöl ballarından yüksek olması durumunda tercihin daha uygun fiyatlı olan Bingöl balına (%84.4) yöneldiği belirlenmiştir. Tüketiciler iki balın fiyatlarının eşit olması durumunda ise memnuniyetin hali hazırda yüksek olduğu Bingöl balını (%85.4) satın alma eğilimindedir. Ancak tescil alması ile fiyatların yükselmesi üretici açısından beklenen bir durumdur. Böyle bir durumun gerçekleşmesiyle, farklı bir ifade ile Bingöl balının fiyatının diğer ballardan yüksek olması durumunda tüketicilerde diğer ballara yönelmenin olduğu görülmektedir.

Sonuç

Coğrafi işaretler yerel ürünlerle ilişkili, yöre ve bölgeye ekonomik katkısı, kalkınma ve tanınırlığa etkisi gibi çeşitli alanlarda önemli rol oynamaktadır. Bingöl balının tescili ile üreticiler daha fazla kaliteli bal üretiminde bulunacağı, kendine has özelliklerin ön plana çıkartılarak diğer ballardan ayırt edilebileceği, talep artışı sonucu satışlarda artış sağlanacaktır.

Yöreye özgü tescilli ürünler yöreyi cazip hale getirerek bölgenin de tanınırlılığını desteklemektedir. Bununla beraber denetime sahip ve tescilli ürünlere olan güvenin artışı, Bingöl balına olan güveni de sağlayacaktır.

Bingöl ili merkez ilçesinde gerçekleştirilen bu çalışmada tüketicilerin tamamının bal tüketiminde bulunduğu ve yüksek oranda Bingöl Balını tükettiği belirlenmiştir. Tescil almasının üretici ve bölgeye ayrıca tüketiciye etkilerinin bilinmesi büyük önem taşımaktadır. Bu farkındalık tescilin başlıca olumlu etkilerinin tüketici gözünde daha fazla ödeme istekliliği ile desteklenmektedir.

Yerel halkın Bingöl Balını kalite, güvenirlilik, kültür, gelenek ve ekonomik destek ile özdeşleştirdiği, başka bir ifade ile yerel bal algısının oluştuğu ve coğrafi işaret alması sonrasında da tanınırlığına yerel halk tarafından önemli katkılar sağlanacaktır. Bu nedenle öncelikli olarak yerel halkın yöresel ürünlere yönelik koruma, tanıtım konularında yaygınlaştırma çalışmalarının yapılması gerekmektedir.

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GUY STANDING'İN PREKARYA OLGUSU İLE GÖÇMEN KARŞITLIĞI ÜZERİNE BİR DURUM DEĞERLENDİRMESİ

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Özet
Guy Standing'in "*Prekarya"* olgusu, geleneksel işçi sınıfının örgütlü yapısının ortadan kalkması ile enformel iş ilişkisinde iş, istihdam ve gelir güvencesizliği olarak bir dönüşümü ifade etmektedir. "Precarious" (güvencesiz) ve Proletariat (proleterya) isimlerinin bir araya gelmesiyle ortaya çıkan prekarya kavramı ile ucuz işgücü olarak görülen göçmenler ilişkilendirilmektedir. Standing'e göre prekaryayı oluşturan bir grup olarak göçmenler, gittikleri ülkede işgücü piyasasında arz fazlası olarak değerlendirilmektedir. Bu sebeple prekaryanın yaşadığı güvencesiz ortamın sebebi olarak ülkenin istidam politikalarının yanı sıra, göçmenlerin işgücü piyasasından yerli halkın yerini alması görülmektedir. Ülkede yaşanan yoksulluk, işsizlik gibi birçok sosyo-ekonomik sorun göçmenlerin suçlanmasına ve toplumun göçmen karşıtlığına yol açmaktadır. Bu doğrultuda ülkenin yerli halkının istihdam imkânı bulamayıp, göçmenlerin bu imkâna sahip olduğu algısı göçmenlere yönelik negatif düşünceleri arttırmakta ve göçmen karşıtlığı hissettirmektedir. Bu durum, çalışma hayatında dezavantajlı gruplardan biri olan göçmenlere yönelik sosyal dışlanma davranışı geliştirilmesine, ötekileştirilmeye hatta düşmanca davranışlar geliştirilmesine yönelik sorunlara zemin hazırlamaktadır.Çalışmanın temel amacı, günümüz koşullarında işçi sınıfının işgücü piyasasında dönüşümü olarak nitelendirilen prekaryanın yapısı ile göçmenlik olgusu arasındaki ilişkiye yönelik güncel bir durum tespiti yapmaktır. Bu çerçevede bu çalışma ile öncelikle Guy Standing'in "Prekarya" olgusunun genel bir çerçevesi açıklanmaya çalışılacaktır. Standing'in göçmen ve sığınmacılar ile eşleştirdiği prekaryanın esnek ve güvencesiz istihdam koşulları incelenecek olup, daha sonra göçmen karşıtlığı ile prekarya arasındaki ilişki teorik olarak incelenmeye çalışılacaktır.
Anahtar Sözcükler: Guy Standing, Prekarya, Göçmen Karşıtlığı, Güvencesizlik.

A SITUATION EVALUATION ON GUY STANDING'S CONCEPT OF PRECARIAT AND OPPOSITION TO IMMIGRATION

Abstract
Guy Standing's "Precariat" phenomenon expresses a transformation in the informal working relationship as job, employment and income insecurity with the disappearance of the organized structure of the traditional working class. The concept of precariat, which emerged from the combination of the names "Precarious" (precarious) and Proletariat (proletariat), is associated with immigrants who are seen as cheap labor. According to Standing, immigrants, as a group that constitutes the precariat, are considered to be oversupply in the labor market in the country they go to. For this reason, the reason for the insecure environment in which the precariat lives is the country's employment policies, as well as the fact that immigrants are replacing local people in the labor market. Many socio-economic problems in the country, such as poverty and unemployment, lead to the blaming of immigrants and the society's anti-immigrant sentiment. In this regard, the perception that the native people of the country cannot find employment opportunities and that immigrants have this opportunity increases negative thoughts towards immigrants and makes people feel anti-immigrant. This situation paves the way for problems such as social exclusion, marginalization, and even hostile behavior towards immigrants, who are one of the disadvantaged groups in working life.The main purpose of the study is to determine the current situation regarding the relationship between the structure of the precariat, which is described as the transformation of the working class in the labor market in today's conditions, and the phenomenon of immigration. In this context, this study will first try to explain the general framework of Guy Standing's "Precariat" phenomenon. The flexible and precarious employment conditions of the precariat, which Standing equates with immigrants and refugees, will be examined, and then the relationship between anti-immigrant sentiment and the precariat will be tried to be examined theoretically.
Keywords: Guy Standing, Precariat, Anti-Immigration, Insecurity.

Giriş

İnsanlık tarihinde ilk önemli değişim avcılık ve toplayıcılık döneminden tarımsal yerleşik düzene geçmek olurken, 18. yüzyılın ikinci yarısından sonra yaşanan sanayi devrimi yaşamın her alanında değişimlerin öncüsü olmuştur. Buhar makinesinin icadından sonra, 19. Yüzyılın sonlarına doğru elektrik ve montaj hattının çalışma hayatına entegrasyonuyla hızlanan süreç, dijital devrim olarak kabul edilen kişisel bilgisayarlar ve internet yaygınlaşmasıyla dördüncü sanayi devriminin zeminini hazırlamıştır. Mobil veri, yapay zekâ, nano-teknoloji, yenilenebilir enerji, akıllı fabrika sistemleri gibi birçok alanın dijitalleşmesini sağlayan dördüncü sanayi devriminin en önemli avantajları arasında üretimde esnekliğin arttırılması ve işgücü maliyetini azaltılması yer almaktadır. Sanayi devrimleri ile yaşanan değişim süreçleri içerisinde, çalışan profilleri de bu süreçten etkilenmiş olup, özellikle günümüzde çalışma hayatının merkezinde yer alan dijitalleşme ve robot teknolojisi ile çalışanlar güvencesiz, esnek ve belirsiz süreli istihdam edilmeye başlanmıştır. İşgücü istihdamının güvencesiz ve esnek haline Guy Standing, "Yeni Tehlikeli Sınıf" çalışmasında *"Prekarya"* olarak tanımlamıştır. Bu yeni sınıflandırmanın proletaryadan farklı olarak temel belirleyici özellikleri arasında emeğin esnekleştirilmesi, belirsiz süreli yarı zamanlı ya da geçici çalışma ve güvencesiz iş ortamı yer almaktadır. Bu çalışma Standing tarafından geliştirilen prekarya kavramını tanımlamakla beraber, prekaryanın yapısı içerisinde göçmenleri ve göçmenlik olgusunu değerlendirmektedir. Günümüz bu çalışma düzeninin yarattığı fırsat ve tehditler ortaya konularak, çalışanların üzerindeki etkilerine değinilecek ve toplumsal anlamda göçmen karşıtlığı ile prekarya arası ilişki teorik olarak incelenmeye çalışılacaktır.

Guy Standing ve Prekarya Olgusu

Fransızca precarite, ingilizce precarity/ precariousness olarak ifade edilen prekarya olgusu, güvencesiz anlamına gelen prekarya ve işçi sınıfı anlamına gelen proletarya isimlerinin bir araya gelmesiyle oluşan yeni bir kavramdır (Uludağ Güler ve Parlak, 2022:110; Standing, 2017). Prekarya kavramı ilk kez 1980'li yıllarda Fransız sosyologlar tarafından geçici ve mevsimlik işçileri tanımlamak için kullanılmış olup, popüler olarak kullanılmaya başladıktan sonra kavramın anlamında değişiklikler olmuştur. İtalya'da precarito kavramı, insanların geçici işlerde düşük ücretle çalışmasının ötesinde güvencesiz bir hayat tarzını anlamında kullanılmaktadır. Almanya'da sadece geçici işlerde çalışanları değil, aynı zamanda umutsuzluk içerisindeki işsizleri de kapsamaktadır. Japonya'da ise prekarya kavramı bir dönem çalışan yoksullar ile eşanlamlı olarak kullanılmıştır (Standing, 2022:44-45).Guy Standing, prekaryayı kavramını tanımlarken şu ifadelere yer vermektedir (Standing,

2022; 41-42):*Genel olarak bakıldığında, eski sınıflar dünyanın çeşitli bölgelerinde var olsa da bugün 7 çeşit sınıf tanımlanabilir. Tepede az sayıda ancak inanılmaz derecede zengin küresel vatandaşların meydana getirdiği elit sınıf var ve bu sınıf sahip olduğu milyarlarca dolarla bütün evrene hükmediyor. ...Bu elit sınıfın altında maaşlılar var. Hala tam istihdam çerçevesinde çalışan, bazıları elit sınıfa geçmeyi ümit eden bu sınıfın çoğunluğu genelde devlet tarafından karşılanan ücretli izinlerin ve şirketin sağladığı sosyal hakların tadını çıkarıyor ve içinde olduğu sosyal konumdan memnundur. Söz konusu maaşlı sınıf, büyük şirketlerde, devlet ve kamu kuruluşlarında yoğun olarak istihdam edilmektedir. Maaşlıların yanında bir de profisyenler var. Profesyonel ve teknisyen sözcüklerinin birleşimi olarak düşülebilecek bu kesim, şu anda çok daha küçük bir grup. Pazarlayabilecekleri vasıflara, sözleşmeye dayalı olarak yüksek gelirlere sahip kişileri kapsıyor; Danışman ya da kendi için çalışan işçiler bu gruba girebilir. Bugünün profisyenleri, Ortaçağ'daki şövalyeler, küçük toprak sahipleri ve beyler olarak düşünülebilir. Tek bir işletmede uzun dönemli tam istihdam dürtüsü olmaksızın, farklı yerlerde çalışma beklentisi ve arzusuyla yaşayan kişiler bunlar. Standart istihdam ilişkisi bu kesime göre bir şey değildir. Gelir açısından Profisyenlerin altında el emeğiyle çalışanların giderek daralan eski işçi sınıfı var. Bu dört sınıfın altında ise, bir tarafta işsizler ordusu diğer yanda da toplumun uç kısımlarında yaşayan ve onun genel yapısıyla uyuşmayan ayrıksı bir kesimle kuşatılmış 'prekarya adlı giderek büyüyen bir sınıf bulunmaktadır.*

Tablo 1. Yeni Küresel Sınıfın Tabakaları



Kaynak: Standing, 2014:21-22; Uludağ Güler ve Parlak, 2022:111.

Prekarya ve Göçmenlik

Göçmen kavramının tarihsel bir yükü olmakla birlikte Standing'e göre, dünyadaki prekaryaların büyük bir bölümünü göçmenler oluşturmaktadır. Göçmenler bir taraftan prekaryanın genişlemesine sebep olurken, diğer taraftan bu sürecin asıl sorumlusu olarak görülmektedir (Standing, 2022:175).

Standing'e göre, gelir vergisi sistemine dayalı bir toplum düzeni içerisinde, toplumun yabancısı olan göçmenlere yönelik gerilim artmaktadır. Vergiye tabi olanların, vergiden muaf olan göçmenlere yönelik hislerinin altında ırksal bir önyargıdan ziyade düşmanca hissiyat yer almaktadır. Göçün küreselleşmesiyle birlikte, göçmenler işgücü piyasasında "arz fazlalığı" olarak düşünülmektedir. İşgücü piyasasında göçmenler, genellikle yerli halk tarafından tercih edilmeyen işlerde düşük ücretle, yarı zamanlı, kısa süreli ve güvencesiz işlerde çalıştırılmaktadır (Koçak, 2022:136). Prekarya, belirsizlikler ile karşı karşıya olan bir sınıftır (Ayparçası,2022:268). Ülkede yaşanan işsizlik gibi birçok sosyo-ekonomik problem, göçmenlerin suçlanmasına ve ülke içi belirsizliklerin artmasında temel sebep olarak görülmelerine neden olmaktadır. Bu açıdan yabancı düşmanlığı olarak da ifade edilebilen göçmen karşıtlığı kavramı, toplumların algısında bazı korkuların ortaya çıkmasıyla birçok kaygıyı da içinde barındırmaktadır (Odabaş,2020:550). Günlük yaşantı halinde kitlesel olarak göç etmiş yabancılar ile etkileşim halinde olanlar, yabancıların varlığıyla kaygı yaşamakta ve bilinmezlikten ötürü yabancıya verilecek tepkilerinde korku ve endişeye kapılabilmektedir (Bauman,2016:14).Türkiye'de de göçmen düşmanlığı özellikle ekonomik temelli endişeler sebebiyle artmaktadır. Özellikle sığınmacı statüsünde olan Suriyelilerin artan nüfusları ve göçmenlere yönelik kalıcı ve çözümleyici iç sosyal politikamızın yetersiz kalması yerel toplumu kaygılandırmakta ve göçmen karşıtlığı derecesini arttırmaktadır. Bu çerçevede işgücü piyasasında yerli çalışanlar kazandıkları ücretin yetersizliği ve kötüye giden çalışma koşulları sebebiyle yabancı çalışanlara karşı öfke duymaktadır (Koçak, 2022:137-138). İşverenler açısından düşük maliyet olarak görülen göçmen emeği, yerli çalışanlar açısından önemli bir çalışma hayatı sorunu olarak algılanmaktadır. İçinde toplumsal güvencesizlik barındıran bu durum, göçmen karşıtlığı algısını pekiştirmektedir.Prekarya genellikle mevsimlik işçiler ve geçici işlerde çalışanlardan oluşsa da göçmenler, genç işçiler, yeni mezunlar, engelliler, eski hükümlüler ve kadınlar da prekarya olarak kabul edilmektedir. Prekaryanın bir basamağını oluşturan göçmenler içerisinde kadınlar en dezavantajlı grup olarak kabul edilmektedir. Özellikle Avrupa'da kadın göçmenlerin ve yabancı uyruklu kadınların kayıt dışı işgücü piyasasındaki payı gitgide artmaktadır. Kadın göçmenlerin %25'i ev işlerinde yardımcı, çocuk bakıcısı ya da yaşlı

bakım hizmeti gibi ev içi işlerde çalışırken, %11'i kuaför, güzellik uzmanı gibi kişisel bakım hizmetlerinde çalışmaktadır (Uludağ Güler ve Parlak, 2022:113).

Sonuç ve Değerlendirme

Kayıt dışı ekonominin bireylerin refah algısı üzerinde ciddi olumsuz etkileri bulunmaktadır. Ancak kayıt dışı ekonominin özellikle kentsel yoksullar, göçmenler ve işsizler gibi toplumun dezavantajlı grubu içerisinde yer alan bireyler açısından bir kurtarıcı da olduğu bilinmektedir. Gerek sosyal dışlanma gerekse diğer sebeplerden ötürü formel bir istihdam imkanı bulamayan ve işgücü piyasasında yer almak zorunda olan bireyler, kendilerini kayıt dışı sektörlerde bulmaktadır (Öçal ve Şenel,2021:1208).Türkiye'de her üç kişiden birinin kayıt dışı istihdam edildiği görülmektedir. Ayrıca aktif işgücü statünde olan her dört gençten biri işsizdir (TUİK,2021). Küreselleşme sürecinde artan prekaryal çalışma şekli, Türkiye'de toplumsal hareketlerle göçmen karşıtlığını arttırmıştır. Çünkü toplumda dezavantajlı konumda olan ve işgücü piyasasında yedek ve ucuz işgücü olarak algılanan göçmenler, yerli işgücünün işverenle ücret pazarlığını olumsuz etkilemektedir. Standing'e göre, göçmenler girdikleri işlerde düşük ücret ve çok az sosyal yardımlarla çalışmak zorunda olan, küresel kapitalizmin hafif piyadeleridir. Bu durum toplumda sosyal dayanışmanın yok olmasına, vergilerini ödeyen ülke vatandaşlarının evrensellikten uzaklaşarak toplumsal gerilim yaşamasına sebep olmaktadır. Bu sebeple gelecekte göçmenlere yönelik bu tutumun ve göçmen karşıtlığın artmaması için gerekli önlemlerin gündeme alınması ve denetimlerin yapılması gerekmektedir. Şüphesiz tüm çalışanların insan hayatına yakışan yaşam standartlarının oluşturulması ve güvenceli iş imkânının sağlanması, toplumsal huzurun evrensel bir çözümü olacaktır.

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21. YÜZYIL DİL TEST VE DEĞERLENDİRMELERİNİN TEMEL İLKELERİ

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ÖZET
21. Yüzyıl, yabancı dil öğretimi ve öğrenimi alanında bir dizi yeni düzenleme ve yeniliğin ortaya çıkmasına neden olmuştur. Teknoloji entegrasyonunun alana çok fazla dahil olması ve yeni neslin bireysel farklılıkları, ve ilgili bir dizi faktörün müdahalesi göz önüne alındığında, dil testi kavramının gözden geçirilmesi ve yeniden şekillendirilmesi gerekmektedir. Bu nedenle bu çalışma, 21. Yüzyılda dil sınavlarının özelliklerini ölçme ve değerlendirme kapsamında ortaya koymayı ve geleceğin öğretmen adayları için süreci sınav oluşturulması ve değerlendirilmesii açısından aydınlatmayı amaçlamaktadır. Öğretmen adayları için sürecin çerçevesinin çizilmesi ve net bir şekilde ifade edilmesi amaçlanmaktadır.
Anahtar Kelimeler: Yabancı dil öğretimi, ölçme ve değerlendirme, bireysel farklılıklar

THE KEY PRINCIPLES OF 21st CENTURY LANGUAGE TESTING AND ASEESSMENTS

ABSTRACT
The 21 century has given rise to a number of new regulations and ınnovations in the field of foreign language teaching and learning. As the technology integration is too much involved in the area, as well as the individual differences of the new generation, the concept of language testing needs revision and reshaping given that the interference of a number of factors should be taken into consideration. Therefore, this study aims to reveal the characteristics of language testing for the 21 st century and enlighten the process for the future prospective teachers. The process is aimed to be framed and clearly stated for the inservice language teachers.
Keywords: Foreign language teaching, assesments and testing, individual differences

INTRODUCTION

Assessment is essential to ELT since it helps determine learners' requirements, assess language proficiency, and guide teaching strategies. Multiple language skills, such as speaking, listening, reading, writing, and language use in everyday situations, are assessed in ELT. They may consist of summative evaluations, which take place at the conclusion of a unit, course, or academic term to measure student success, as well as formative assessments, which happen during the learning process to inform instruction, as Bachman (1990) emphasized.From the early 1900s, when the reforms in language education gained traction, there has been a gradual shift toward approaches that emphasize meaningful contact and increased communication. When it came to teaching English as a foreign language, the direct method approach and grammar translation were the main focus. As a result, the assessments were overly mechanical and focused on the language's structure (Clark, 1983). The field of language testing is expected to undergo an unavoidable transition with the development of the communicative approach in foreign language reaching. This flow has raised various issues, and care must be made to maintain the integrity of justice and fairness in the testing environment.Numerous concerns are deemed crucial since teaching foreign languages is always a challenging endeavor requiring global efforts (Oktay, 2015). The language instructers are expected to take five basic principles of language assessment into consideration while assessing and teaching language as a continuum. When it comes to the terrain where language is taught, particularly in Türkiye, prep class education is the main source of funding for language instruction at the tertiary level. This is the year that the university students start their education to fix their language deficiency before they go to their own faculty. This system, therefore, requires a scientific plan and curriculum development given that students from diverse linguistic and cultural backgrounds are part of this language ecosystem, and their departments mandate the use of a foreign language as the primary medium of instruction either 100% or 30% of the time. In addition to coming from various cultural backgrounds inside the nation, some students are international as well. This harmony of diverge students from different cultures and nations gives rise to a solid and comprehensive planning before hand and administering the assessment tools so that the objectivity and fairness can well be sustained. As a result, during the testing and assessment process, a variety of evaluation concerns and potential issues could surface. Depending on all these factors cited above, there are three main question raised through the assesments of a foreign language teaching;

• What are the principles that we must consider while assessing a language?

• Are there any other concerns?

• What are the possible recommendation for the teachers?

METHODOLOGY

This research was constructed as a descriptive study, describing events, objects, circumstances, institutions, groups and various areas as what they are (Kaptan, 1998) • The study took place at a prep school in state university in Turkey • 10 instructors from different levels are taken into through random sampling. • One of the qualitative research methods, case study, was preferred to reveal perceptions and cases in their natural environment as exact and integrated (Yıldırım and Simsek, 2008). A semi-constructed interview form was used to collect data • The form included questions regarding personal information and two openended questions about problems they have experienced or observed during their language assesment process and their suggestions for each problem they stated. In terms of data analysis, the data from document analysis and interviews were transferred to computer. Texts were examined in detail and categories and terms were then determined. Then, data was separated to meaningful parts and we tried to determine the conceptual meanings of each part. Parts with a meaningful whole were coded. After finding common codes, categories were determined. In terms of reliability, the research process was explained in detail, starting from the preparation of data collection tool to the application and analysis steps Secondly, research results were shared with individuals participating to the research, and they were asked to comment on these results. Thirdly, raw data was presented to another researcher specializing in this field, and the researcher was asked to establish themes and coded opinions.

a) The concern of administering the assessment principles

b) The concern of individual differences

c) The concern of administering the alternative assessments

a) *The concern of administering the assessment principles*

Mc Namara (2000) defines the principles of language testing and assessment as; Practicality, Validity, Reliability, Authenticity and Washback Practicality is an emerging concern given that the number of the students make the differences. The cost and the assessments of the papers after the exam is time consuming. Validity refers to the use of right tool to asses the perfoemnce of a skill or language improvement. Reliability is another issue to be dealt with mostly the individual differencers of the students matter a lot. The originality and the real life resemblence of the exam questions is a significant concern in language assessment. Necessary studies and investigations should be made in order to sustain the washback effect.

Additionally, the number of the students whose either proficiency or language accumulation are tested is too many, therefore, to test them fairly and in an appropriate way is unrealistic. Thus, the principles of language assessments and their applicability are far-fetched.

b) *The concern of individual differences*

Individual differences play a significant role in English Language Teaching (ELT) Cronbach (1956) cited that they influence how students learn, process information, and interact with the language. These differences encompass a wide range of factors including cognitive styles, learning preferences, motivation, personality traits, prior knowledge, cultural background, and linguistic aptitude. Understanding and addressing these differences can greatly enhance the effectiveness of assesment process in the ELT context. For example, language aptitude is regarded as a prominent skill in language learning and acquisition and constitutes the foundation of language proficiency (Dörnyei, 2005; Ehrman, 1996) it is also referred to "an individual's initial state of readiness and capacity for learning a foreign language" (Carrol, 1981, p. 86). In terms of language assessments, this difference play a significant role either in administrating the test or evaluating it. Additionally, the learning styles and strategies of the students generate the dilemma of creating a common, reconciled type of test and exam. One teacher says" it is truly intriguing to find a perfect match exam which accentuates the learning habits of all the learners". It is apparent that these distinctive features create contradictory situations for the assessor when administering a foreign language measures.

The concern of using alternative assessments

Alternative assessments offer diverse ways to evaluate students' understanding, skills, and knowledge beyond traditional tests and exams. They aim to provide a more holistic view of students' learning and abilities while promoting creativity, critical thinking, and practical application of knowledge. In English Language Teaching (ELT), alternative assessments can be particularly valuable for assessing language proficiency in authentic contexts. These are protfolios, observations, interviews, presentations, online homeworks, perfomance based assesments. High-stakes testing may lead some concerns as asingle testing item, alternate assessment and classroom-based measurements of student progress give teachers an array of different ways to promoto testing and assessment. As a result, it is crucial to assist college students enrolled in teacher preparation programs and in-service educators in comprehending substitute classroom-based assessments as well as the fundamental principles and practices of standardized testing. However, as there are some drawbacks of this type of assesment, implementing and administering it is rather time-consuming. To

observe a class individually, with 22 students in total may be costly as alternative types of asessment is long-term based unlike high stake exams. The usefullness of these methods is also criticized given that for teachers to be fair and impartial is difficult to manage. Therefore, the administeration of alternative assesments required a well-structured pattern beforehand, when the previous educational season is over.

CONCLUSION, DISCUSSIONS AND RECOMMENDATIONS

In terms of assesments and testing in a foreign language domain, there are a number of issues and ipmlications can be drawn. These are;

- Individual differences in foreign language teaching environment must be taken into account in assessing a foreign language.
- The exam practicality is of crucial importance in terms of administering it before and assessing it after the process.
- Pure alertness of teacher is required in language assessment process.
- The way how the performances are assessed should be kept free from the unethical implications.
- The alternative assesments types should be prdetermined and administred.
- The individuals' ideas and reflections have to be taken into account in all layers of language assessments.
- In order to sustain a solid and precise assessment, the reflections of the learners should be taken into consideration.
- Alternative types of assesments and measurements need well-constructed planning and administration.
- An eclective approach shoul be adopted while assessing the learners' language level and proficiencies.

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MYCELIUM-BASED COMPOSITES IN ARCHITECTURE: EXPLORING LIVING MATERIALS THROUGH A BIBLIOMETRIC ANALYSIS

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ABSTRACT
The combination of micelle-based composite materials with contemporary architectural practices marks a significant development in sustainable design and construction methodologies. This research examines the complex interaction between mycelia—a versatile fungal network—and architectural materials. At the center of the study is the concept of living materials, in which we emphasize the qualities of micelle that make it a practical choice for sustainable building projects and a comprehensive bibliometric study that illuminates the current situation. In other words, the study represents the final point in micelle, architecture, and material science research. For this purpose, comprehensive research was conducted between 1997 and 2024, focusing on studies published in English in the Scopus database. The research was carried out in two stages: bibliometric and content analysis. The results show that although significant strides have been made in research methodologies and academic interest has increased significantly, there are severe deficiencies in the production optimization of micelle-based composite materials, long-term durability evaluation, and scalability required for commercial application. Future research efforts must address these gaps and utilize micelle as a sustainable building material. The detailed bibliometric study presented here provides essential insights into the course and status of development in the field and provides a solid basis for further research and creative projects. The growing interest in sustainable and bio-based materials is paving the way for further advances to accelerate the widespread integration of micellar-based composite materials into traditional architectural practices, which may contribute to creating a more ecological built environment.
Keywords: Mycelium-based composites, living materials, bibliometric analysis, fungi, biomaterials, architectural applications

MİMARİDE MİSELYUM ESASLI KOMPOZİTLER: BİBLİYOMETRİK ANALİZ YOLUYLA CANLI MALZEMELERİN KEŞFİ

ÖZET
Misel kökenli kompozit malzemelerin çağdaş mimari uygulamalar ile bir araya gelmesi, sürdürülebilir tasarım ve inşaat metodolojilerinde önemli bir gelişmeye işaret eder. Bu araştırma, misel -çok yönlü bir mantar ağı- ve mimari malzemeler arasındaki karmaşık etkileşimi incelemektedir. Araştırmanın merkezinde, miselin sürdürülebilir yapı projeleri için etkin bir seçim yapılmasını sağlayan niteliklerini vurguladığımız canlı malzemeler kavramı ve mevcut durumu aydınlatan kapsamlı bir bibliyometrik çalışma bulunmaktadır. Bir başka ifade ile çalışma, misel, mimarlık ve malzeme bilimi araştırmalarında gelinen son noktayı koymaktadır. Bu amaçla 1997 ile 2024 yılları arasında, Scopus veritabanında İngilizce olarak yayınlanan çalışmalara odaklanılarak kapsamlı bir araştırma yapılmıştır. Araştırma, bibliometrik ve içerik analizi olmak üzere iki aşamalı gerçekleştirilmiştir. Elde edilen sonuçlar, araştırma metodolojilerinde önemli adımlar atılmasına ve akademik ilginin belirgin bir şekilde artmasına rağmen, misel kökenli kompozit malzemelerin üretim optimizasyonu, uzun vadeli dayanıklılık değerlendirmesi ve ticari uygulama için gerekli ölçeklenebilirlik konularında ciddi eksiklikler bulunduğunu göstermektedir. Gelecek araştırma çalışmalarının, miseli sürdürülebilir bir yapı malzemesi olarak kullanabilmesi için bu boşlukları ele alması gerekmektedir. Burada sunulan detaylı bibliyometrik çalışma, alandaki gelişim seyrine ve durumuna dair önemli görüşler sunmakta olup, ileri araştırma ve yaratıcı projeler için sağlam bir temel oluşturmaktadır. Sürdürülebilir ve biyo-tabanlı malzemelere artan ilgiyle birlikte, misel kökenli kompozit malzemelerin yaygın bir şekilde geleneksel mimari uygulamalara entegrasyonunu hızlandıracak daha fazla ilerlemenin önünün açılması, daha ekolojik bir yapılı çevrenin oluşturulmasına katkı sağlayabilir.
Anahtar Kelimeler: Miselyum bazlı kompozitler, canlı malzemeler, bibliyometrik analiz, mantarlar, biyomalzemeler, mimari uygulamalar

INTRODUCTION

Production of construction materials has been under much pressure due to high demand in the last decade (Madurwar et al., 2013; Pheng & Hou, 2019). At the same time, the annual consumption of agricultural products increases with the rapid increase in population, which produces more agrarian waste (such as rice husks, cotton stalks, and straw), which are burned or thrown away to eliminate them and produce carbon dioxide, atmospheric particles, and other greenhouse gases (Bhuvaneshwari et al., 2019; Defonseka, 2019; Maraveas, 2020). Sometimes, these identical residues have been used to some extent as an additive for fertilizers, animal bedding, and low-quality construction materials for infrastructures and road fillers (Defonseka, 2019). Mycelium has received attention due to its low energy consumption in growth, the use of agricultural waste in growth, and its recyclability in different basins (Holt et al., 2012; Pelletier et al., 2013; Jones et al., 2017; Nawawi et al., 2020).One of the reasons for the increasing attention to mycelium-based composites is that they are produced with the help of the mycelium network in reproduction, the vegetative part of filamentous fungi, on abundant organic substrates such as agricultural waste and natural fibers (Elsacker et al., 2020; Jones et al., 2020). Potential applications of these materials in the architectural field are reported in the literature as insulation materials (Holt et al., 2012; Yang et al., 2017) and insulation bricks (Xing et al., 2018).Although these materials are weak in structural strength (such as moisture, tensile strength, and biological corrosion), they are strong with their acoustic properties, fire resistance, and lack of chemical content (Meyer et al., 2020; Rafiee et al., 2020). Many scientific studies are being carried out to improve the weaknesses of these composites (Girometta et al., 2019; Rafiee et al., 2021).This paper aims to identify research trends, reveal research gaps, and reveal potential study topics for future studies by systematically reviewing studies on mycelium-based architectural composites.Elsacker, E., Vandelook, S., Van Wylick, A., Ruytinx, J., De Laet, L., Peeters, E., 2020. A A comprehensive framework for the production of mycelium-based lignocellulosic composites. Sci Total Environ 725, 138431. https://doi.org/10.1016/j.scitotenv.2020.138431

LITERATURE REVIEW

The share of petroleum-derived and chemically added materials in the building sector has increased significantly due to scientific and technological breakthroughs. The need for sustainable materials has grown due to these materials, the majority of which cannot be recycled and are starting to cause serious environmental issues. Studies on biomaterials and

the mycelium-based composites that are the focus of this investigation have become more significant at this point.

Mycelium-Based Composites in Architecture and Environmental Considerations in Contemporary Architectural Practices

Because of its sustainable qualities and ease of manufacturing, mycelium—a fibrous network found in mushrooms—has gained attention in the literature as an environmentally friendly alternative (Jones and Huynh, 2018). According to Cheng and Shiu (2018), this material is helpful for ecologically friendly and sustainable building design. It has started to be viewed as a means of lowering the carbon footprint in the building sector and supports the ideas of the circular economy (El Enshasi et al., 2020; Jones and Huynh, 2018).Many studies show that composites injected with mycelium and organic fibers rich in cellulose, hemicellulose, and lignin are sustainable (Jones et al. 2017). Mycelium can grow when provided with sufficient nutrients and in different environments. (Jones et al. 2017) While one group researching this subject obtained pure mycelium materials by disintegrating the hyphae, the other group created soft, paper-like products that can be obtained from the contents of the fungal layer (Appels et al., 2019). Synthetic leather and renewable papers can be produced with mycelium (Jones et al., 2020a; Vandelook et al., 2021). Mycelium-based composites emerge as a sustainable research topic in emerging industries. For example, low-density, degradable, water-resistant, fireproof sheets are obtained (Vidholdová et al., 2019). (Figure 1)

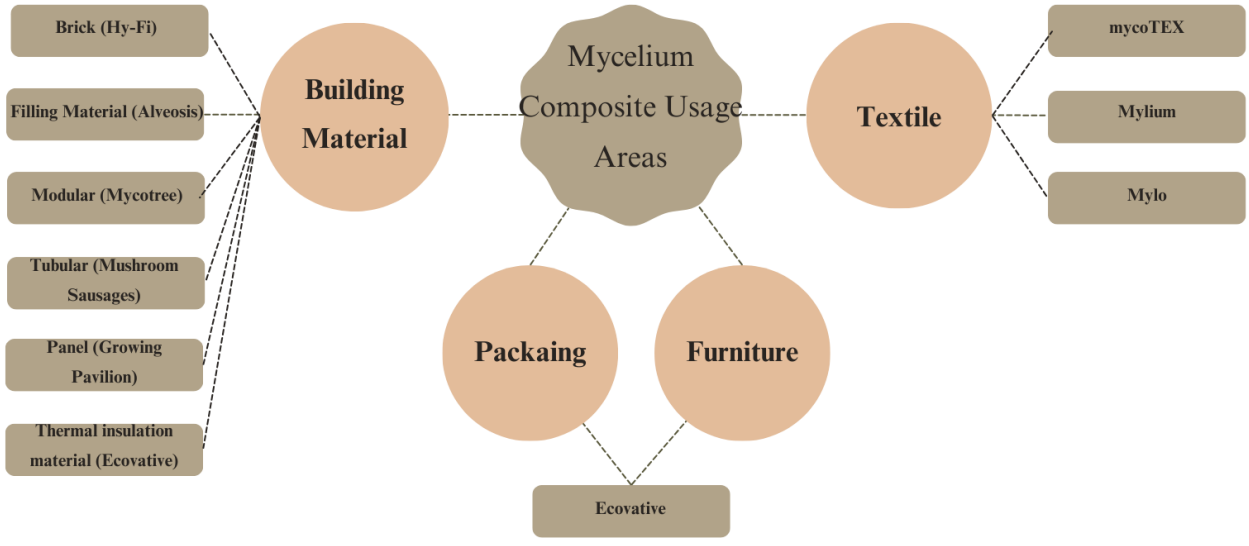


Figure 1. Where to use mycelium composites (adapted from Sertkaya, 2022)

Early European experiments demonstrated the versatility of mycelium in terms of creative designs and inspiring applications in furniture, interior products, and household items. Maurizio Montalti from Officina Corpuscoli, in partnership with Utrecht University, curated

exhibitions showcasing the versatility of mycelium in different forms and textures. Designers like Aniela Hoitink, Jonas Edvard Neilson, Kristel Peters, and Phil Ross explored mycelium's adaptability. Edvard Neilson's MYX Lamps (Chin, 2014) and Danielle Trofe's Mushlume (Danielle et al., 2020) represent innovative lighting design with mycelium supplied by Ecovative.Montalti's company, Mogu, in collaboration with Arup, has introduced "Foresta," an acoustic panel that meets technical standards and environmental sustainability. Unlike traditional composite panels, Foresta is biodegradable and serves as a panel for office features, emphasizing ecological performance. Mogu and Arup are broadening their selection of mycelium-based products for high-end interior projects, as the interior fit-out market currently presents the most significant potential for bio-based materials in construction (Arup, 2021). Mycelium experimentation covers a range of applications, including hardboard, flexible leather alternatives, disposable packaging, and architectural elements. Architects, engineers, and contractors increasingly prioritize sustainability, recognizing the impact of design on the built environment's carbon footprint. Mycelium's biodegradability, sourced from waste materials with renewable energy, offers superior environmental performance. Despite success in disposable products, mycelium faces challenges in construction due to market dynamics shaped by aesthetics, cost, and ethics (Gagnier, 2000; Kompatsiaris & Chrysagis, 2020). Adamatzky et al. (2020) assert that although mycelium-based composites have great promise, their current architecture applications still need improvement. Research is ongoing on topics like standardization, enhancing the durability of materials, expanding the production scale, and optimizing their use in the building sector (Jones and Huynh, 2018).

Delineates the Evolutionary Trajectory of Architectural Mycelium-Based Composites and Experimental Approaches

The research of mycelium-based composites reached high levels in the 1990s and early 2000s in different parts of the world, especially in the Netherlands and the United States. This multidisciplinary topic has led to collaborations between artists, architects, scientists, and industrial partners, highlighting mycelium's creative and scientific potential (Cerimi et al., 2019; Hüttner et al., 2020).Two groups looked into mycelium as a biodegradable substitute for synthetic building components between 2006 and 2009. Eben Bayer and Gavin McIntyre, two students at Rensselaer Polytechnic, created Ecovative in New York and invented mycelium-based insulation, which led to the introduction of Greensulate insulation boards in 2007. Phil Ross, an artist, conducted mycelium experiments in California during the 1990s, which led to the building of the Alpha Mycotectural tea house in 2009 using

Ganoderma lucidum mycelium blocks. In 2011, he received a patent for mushroom structures used in manufacturing and construction (U.S. Patent no. 9410116).The patent describes techniques that MycoWorks founders Phil Ross and Sophie Wang used to produce industry prototypes, including compressing material during mycelium growth and adding structural supports. Panels, flat molded forms for furniture and interiors, and structural systems are all part of its material portfolio. MycoWorks has been shown at the 2016 Venice Biennale and the Design and Violence exhibit at MoMA. David Benjamin's Hy-Fi installation at MoMA featured self-supporting mycelium bricks and low-carbon, energy-consuming reflecting bricks. Because these bricks biodegrade in 60 days, they offer a controlled growth environment. Scientists are now investigating the aesthetic and practical applications of mycelium, with a focus on scalability, mechanical performance, and material possibilities. Famous businesses like Ecovative and MycoWorks have applied for about 50 patents since 2006 (Cerimi et al. 2019).While investigating the trend of mycelium-based composites, new manufacturing methods (MBC) were used, including minimal surface shapes, modular myceliums, and chain plates for architectural applications. The “Waste to Biomaterials” initiative in Denmark used cellulose pulp, 3D printing, pulverized straw, crushed coffee cups, and adaptive manufacturing to produce MBC surfaces efficiently. Graz University of Technology researchers developed Mycera, a mixture of clay and mycelium for printable MBCs of varying degrees. In contrast, Lund University researchers used 3D printing to replicate the development of termite mounds. Modanloo et al. (2021) used shredded cardboard inoculated with mycelium to print catenary arches, forming load-bearing vaults, while Elsacker et al. (2020) cultivated large MBC blocks shaped with abrasive wire-cutters, minimizing formwork waste.One of the rooms built in the last few years that fits into this expanding trend is MY-CO SPACE, a minimalist retreat that encourages sustainable living. 330 mushroom-shaped roof panels are part of its structure made of composite corks. The wooden frame represents the fungal growth environment and the evolutionary connection between fungi and humans. Using fungi and agricultural byproducts as nutrients is a discovery for sustainable living (Almpani-Lekka, D., 2021).Bamboo end plates and metal dowels are added to aid efficient load transfer between MBC components during growth. An example of a massive continuous MBC structure is the Circular Garden by Carlo Ratti Associati (Ratti & Frenchman, 2020), which uses the hanging chain technique for catenary designs. The self-supporting Module+ structure in rural Vietnam was created by Nguyen Khac Phuoc Architects and Dang + Partners and consists of interlocking wooden modules. Finite element analysis was used in Markus Hudert's 2017 Aalto Festival exhibition

Interlocking Particles to explore the architectural potential of interlocking modular components and structural performance (Hudert et al., 2018).In recent years, various projects have highlighted the potential of mycelium-based architectural composites. For example, these materials are used in architectural projects, including a pavilion made of wood and growing cork in the Netherlands. Pulp Faction of Byssomerulius corium and Gloeophyllum used 3D printing technology to make mycelium-based composites. Solid buildings and vault-like buildings using shredded cardboard infected with P. ostreatus strains have been used (Modanloo, B. et al., 2021). MBC panels developed with Fomes fomentarius are used in semi-integrated MycoSpace by MY-CO-X Collective in Germany. The panels are covered with hexagonal panels that are placed on plywood frames. Superpraxis' Refugio Fungico in Argentina employs component-based surfaces and mycelium bricks cultivated with Ganoderma lucidum for load-bearing structures at the Buenos Aires Biennale. PLP Architecture has created an installation at Clerkenwell Design Week that combines modular mycelium blocks with 3D-printed wooden shells, creating a fusion of natural and engineered materials. These projects demonstrate mycelium-based materials' adaptability and structural strength in architectural contexts.According to previous studies, the following section examines the development process of using mycelium-based composites in architecture.

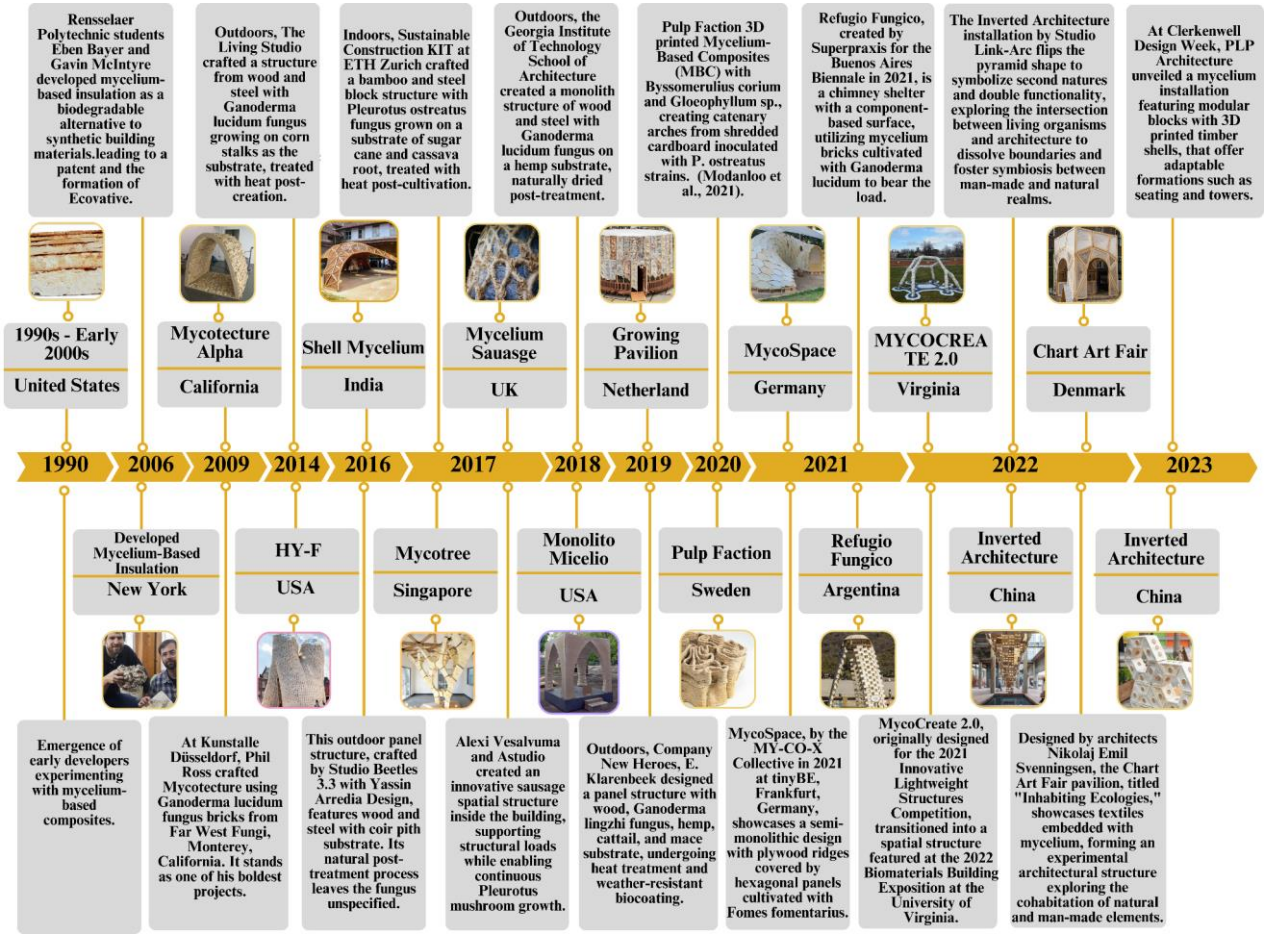


Figure 2. Mycelium Composite timeline (Prepared by authors)

According to the information provided in the timeline above, MBC's exploration of architectural applications has seen significant global growth over the past decade. In the 1990s and early 2000s, prototypes appeared in the United States and Europe, particularly in the Netherlands, collaborating with artists, architects, scientists, and industrial partners. Innovative research in the mid-2000s by groups in New York and California led to the development of mycelium-based insulation and structural components, leading to patents and the founding of companies such as Ecovative and MycoWorks. These innovations paved the way for diverse approaches to mycelium fabrication, including spherical modular designs, minimal surface forms, and 3D printing techniques using various materials such as straw powder and shredded cardboard. Projects such as Hy-Fi and The Circular Garden demonstrated the structural and sustainable potential of MBC in architectural designs. At the same time, recent projects such as the Growing Pavilion and Refugio Fungico have significantly improved material and structural integrity. Also, interdisciplinary collaborations continue to explore mycelium's aesthetic and functional possibilities. Researchers on material performance, mechanical properties, and scalability are the focus.

Despite the challenges, the development of applications of mycelium as a sustainable and versatile material for future architectural projects is emphasized.

METHODOLOGY

Bibliometric analysis helps to increase literature knowledge about a field, identify research identifiers, identify models related to the subject, and reveal research trends. Standard tools for these analyzes include software such as CitNetExplorer, VOSviewer, CiteSpace, Web of Science Tool, and SciMAT (Leydesdorff & Rafols, 2009; Van Eck & Waltman, 2014; Aria & Cuccurullo, 2017; Varshabi et al., 2022). This paper discussed insights on keywords, author and institution collaborations through network maps produced with VOSviewer and Biblioshiny, using articles retrieved from the Scopus database.This search begins by finding English-language papers published from 1997 to 2024. For this purpose, we used the keywords as follows: "mycelium", "fungal materials", "mycelium-based composites", "biomimicry", "bio-based", "living architecture", "fungal architectures", "architectural material", "building", "architectural pavilion", "biomaterials". Through this search, 138 papers were identified (Figure 3).

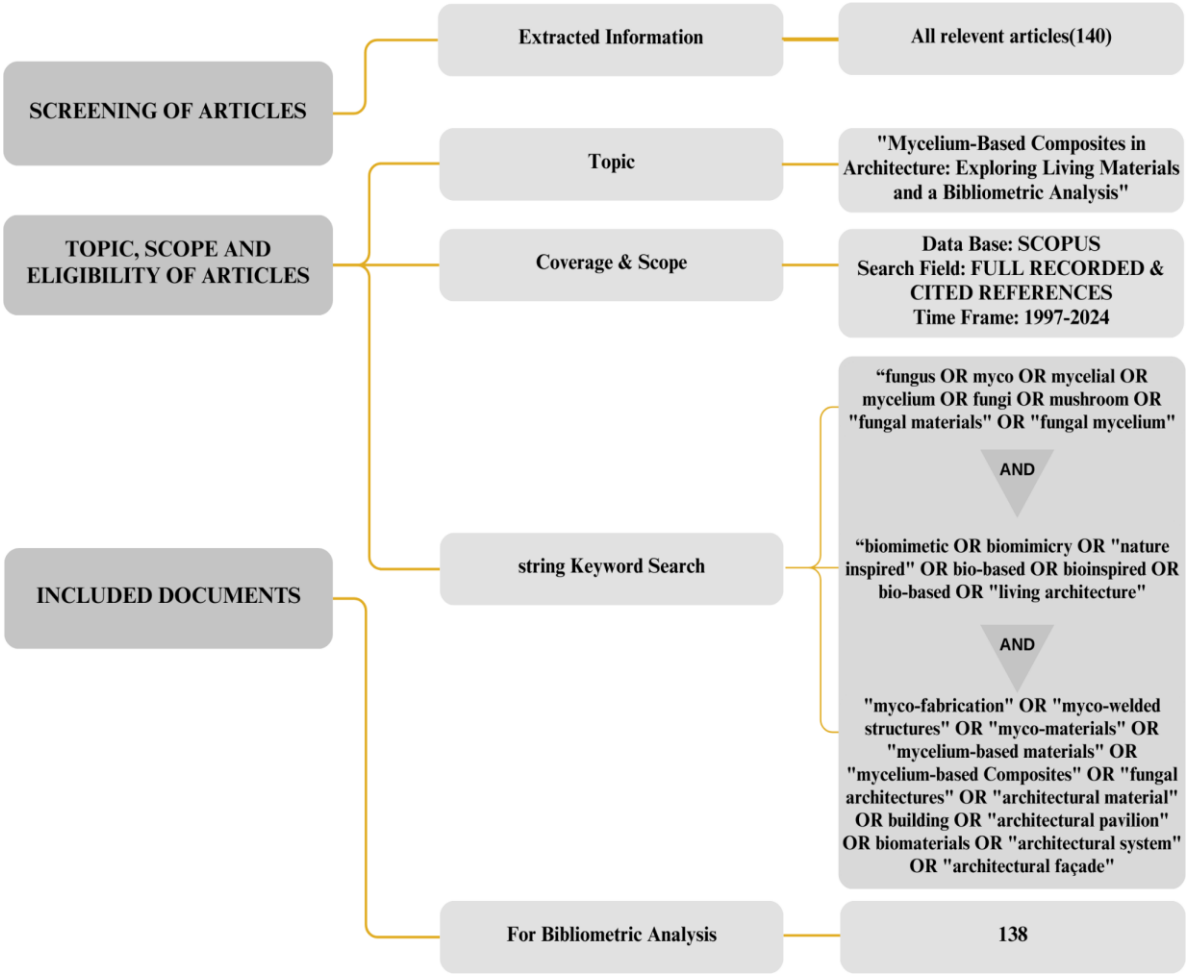


Figure 3. Flowchart of the study

FINDINGS

This part of the research includes bibliometric analysis findings of studies conducted on "Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis" are included. In this context, in this research, which was limited to articles written only in English, 138 articles from 140 sources were examined with bibliometric analysis.One of the earliest and seminal references to this topic can be found in "Analytical Biochemistry, 1976," signifying its foundational importance within the academic discourse. 683 authors wrote 138 articles about "Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis." The number of keywords belonging to the authors was determined to be 564 (Figure 8).



Figure7. General information about bibliometric analysis

Scientific Production by Years

The first publication was "Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis" in 1997 (N=1). In 2022, this number was determined to be 31. There is a general increase in the number of studies conducted on this subject between 1997 and 2024.

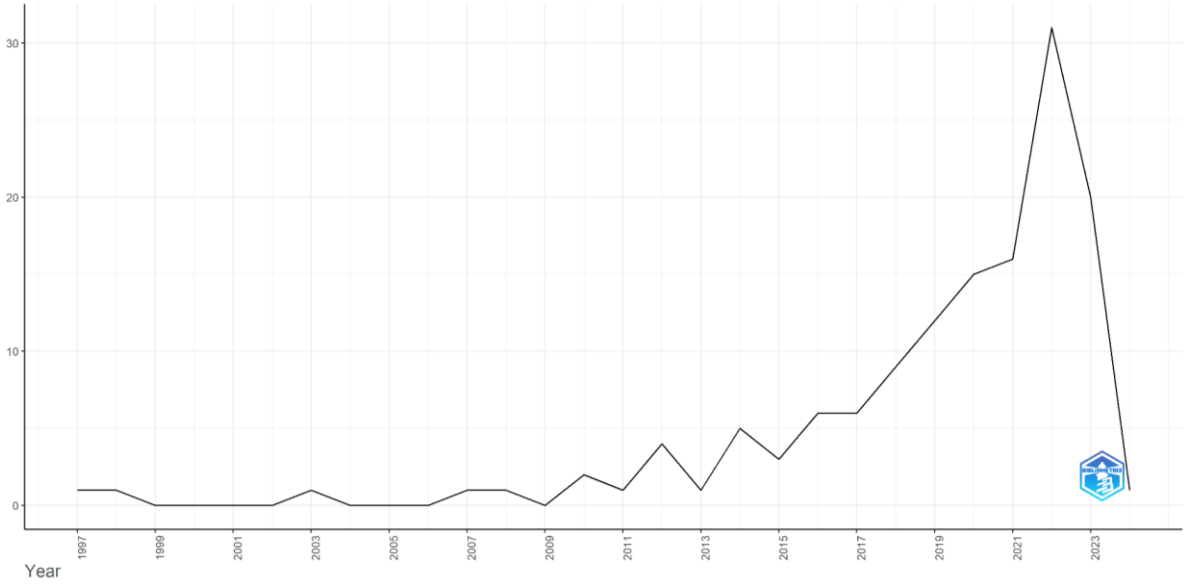


Figure8. Scientific production by years

Three-Fields Plot

A three-field chart based on the Sankey diagram with countries, authors, and keywords is shown in Figure 11. The height of the rectangular nodes in the graph reflects the collaboration network of a particular country, author, and keyword. The lines' thickness between nodes reflects the number of connections, revealing Germany as the most connected country with 17 links, followed by Australia with 13 connections.

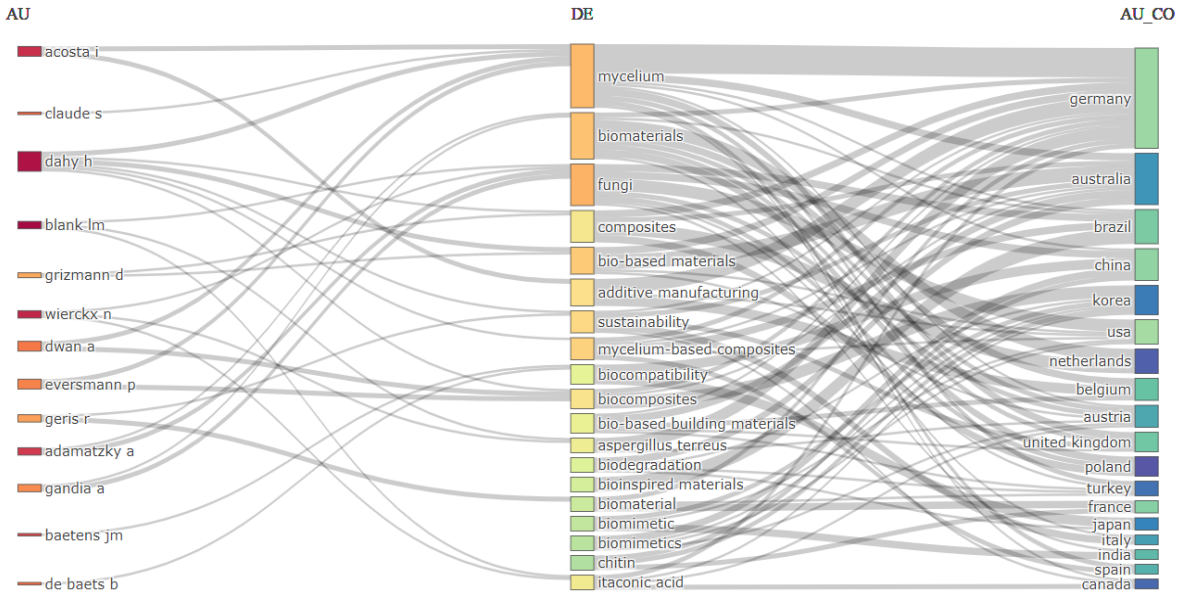


Figure 9. Three-Fields Plot

Most Relevant Sources

Figure 9 illustrates the prominent journals that have published articles on 'Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis.'

Among these, Biomimetics stands out with 5 publications, accumulating 43 citations, followed by Applied Microbiology and Biotechnology, which has published 4 articles with 149 citations. Additionally, the International Journal of Biological Macromolecules has contributed 3 articles garnering 119 citations, while Iop Conference Series Earth and Environmental Science and Biomacromolecules have each published 3 and 2 articles, respectively. These journals emerge as the primary outlets for research in this field.

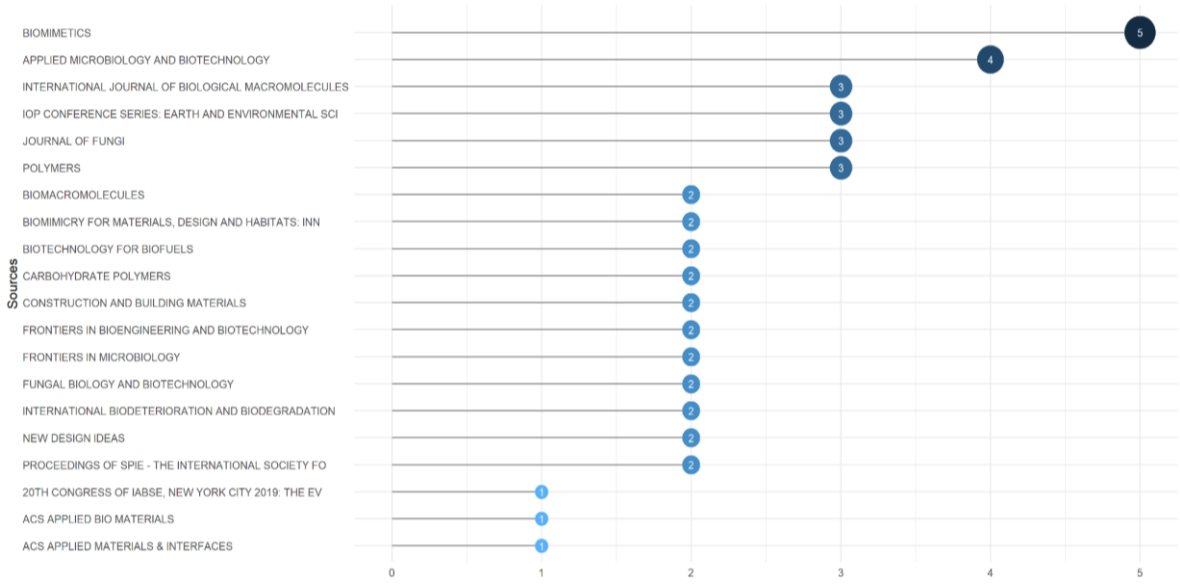


Figure 9. Three-Fields Plot

Source Growth

The trend graph showcasing the top 8 journals with the most articles in the area of "Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis" is shown in Figure 14. According to this graph, the number of articles in each journal has increased.

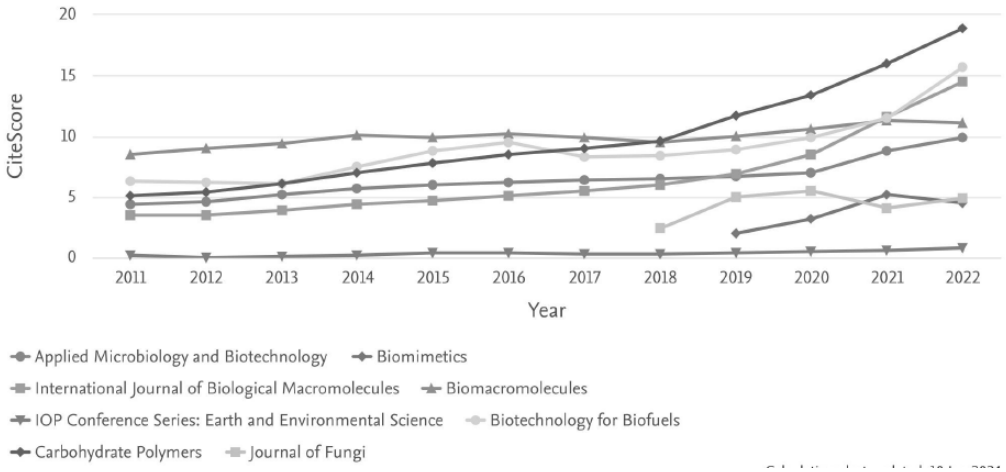


Figure 10. Most Local Cited Sources

Most Local Cited Sources

The chart displaying the growth of the top five journals with the most articles published in the area of "Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis" by year is shown in Figure 11. According to this graph, the number of articles increases for each journal.

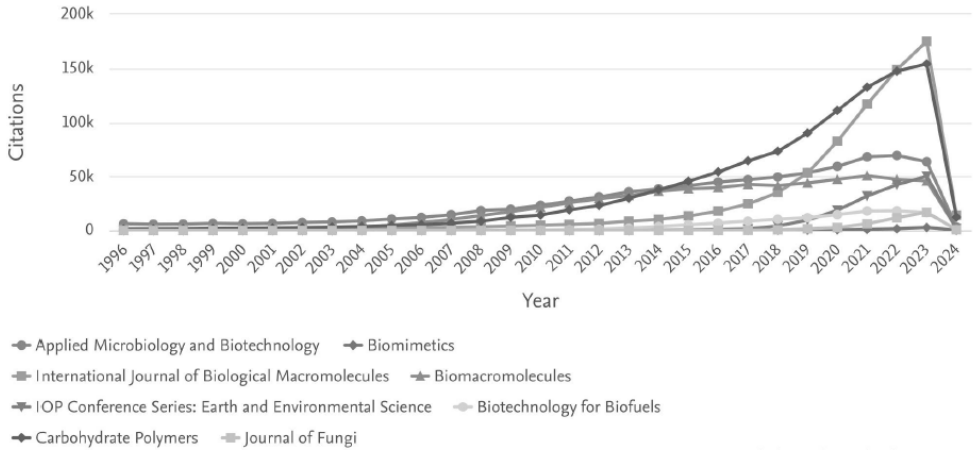


Figure 11. Most Local Cited Sources

Most Relevant Authors

The distribution of publications among the top twenty authors in the field of 'Mycelium-Based Composites in Architecture: Exploring Living Materials and a Bibliometric Analysis' is depicted in Figure 12. Notably, Bertron A. and Dahay H Martinez D. stand out as significant contributors with 3 publications each, indicating their active engagement in this area of research. Furthermore, Blank Lm, with 113 citations, and Wierckx N, with 145 citations, also possess 3 publications each, underscoring their impactful contributions to the field.

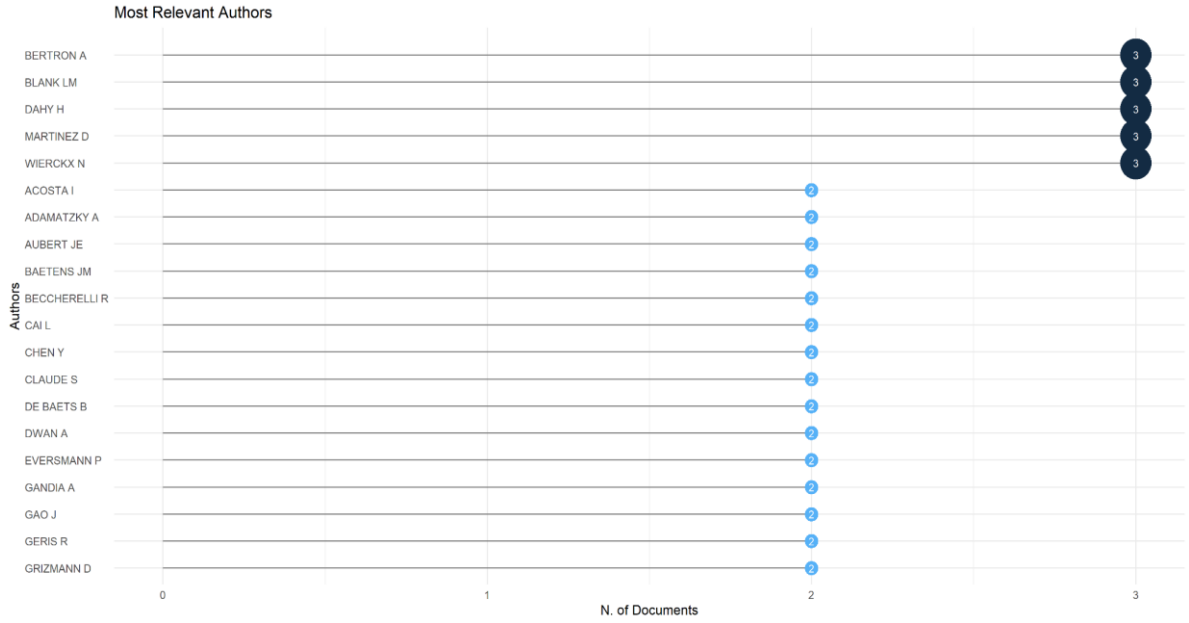


Figure 12. Most Relevant Authors

Most Relevant Affiliations

Upon examining the organizations with the most significant number of publications within the scope of bibliometric analysis, the University De Toulouse, the Federal University of Bahia, and Ghent University emerge as leading contributors with 6, 5, and 5 publications, respectively. The distribution of documents among other organizations is visualized in Figure 13 below.

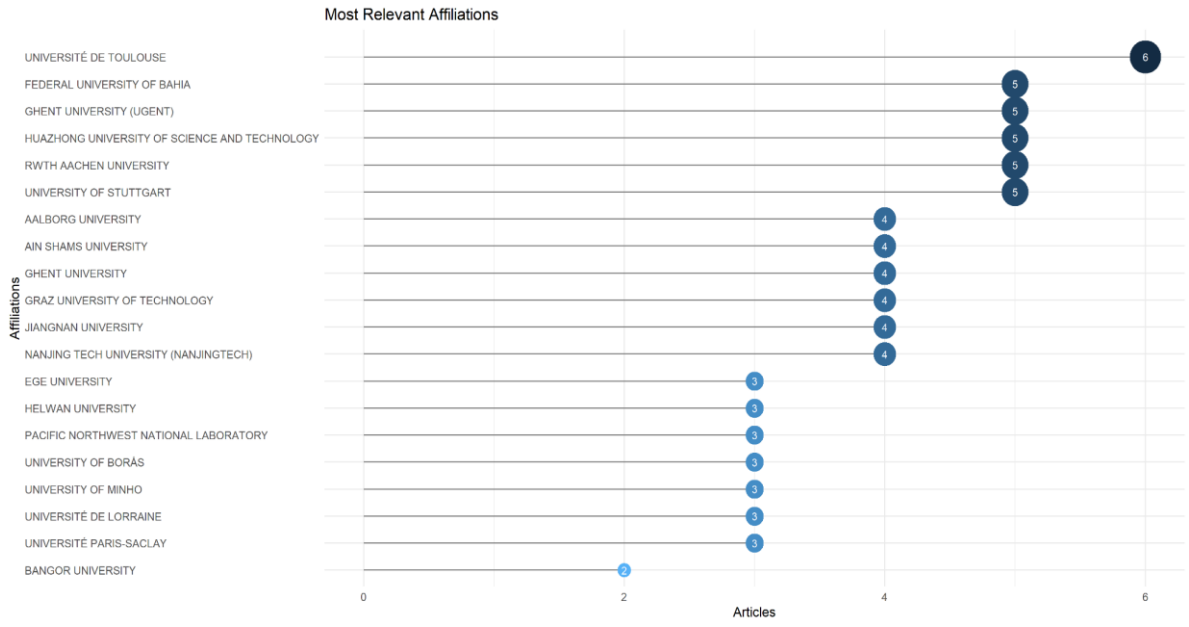


Figure 13. Most Relevant Affiliations

Corresponding Authors' Country

As depicted in Figure 14, the United States takes the lead in scholarly publications with 21, establishing itself as the primary contributor. Germany closely follows with 17 publications, securing its position as the country with the second-largest number of authors contributing to the scholarly output. France follows suit with 13 publications, trailed by the United Kingdom with 11, China with 11, India with 9, and Australia with 6. This distribution highlights the diverse global participation in scholarly publishing within the examined scope.

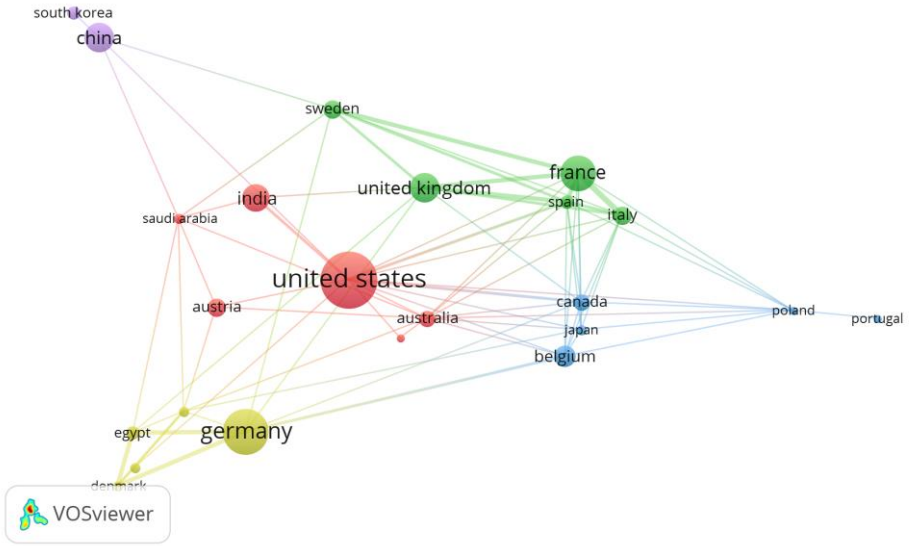


Figure 14. Corresponding Authors' Country

Most Frequent Words

When analyzing the most frequently used keywords within the research scope, the following terms emerge prominently with the most frequent: fungi, mycelium, biomaterials, mycelium-based composites, stability, additive manufacturing, biocomposites, composites, itaconic acid, and Aspergillus genus. Building materials based on biocompatibility are among the top twenty keywords identified biologically (Figure 15).The green keywords focus on biotechnological methods, including microorganism engineering and natural sources like fungi and biomass for sustainable production. This aligns with biotechnology and materials science goals, enhancing understanding and applications in various fields. Red keywords explore fungi, metabolism, biomaterials, and chemistry, driving sustainable material and biochemical development. This interdisciplinary pursuit advances biotechnology and materials science. Blue keywords cover research methodology, publication standards, and pharmacological investigations, supporting scientific integrity and ethics across disciplines.

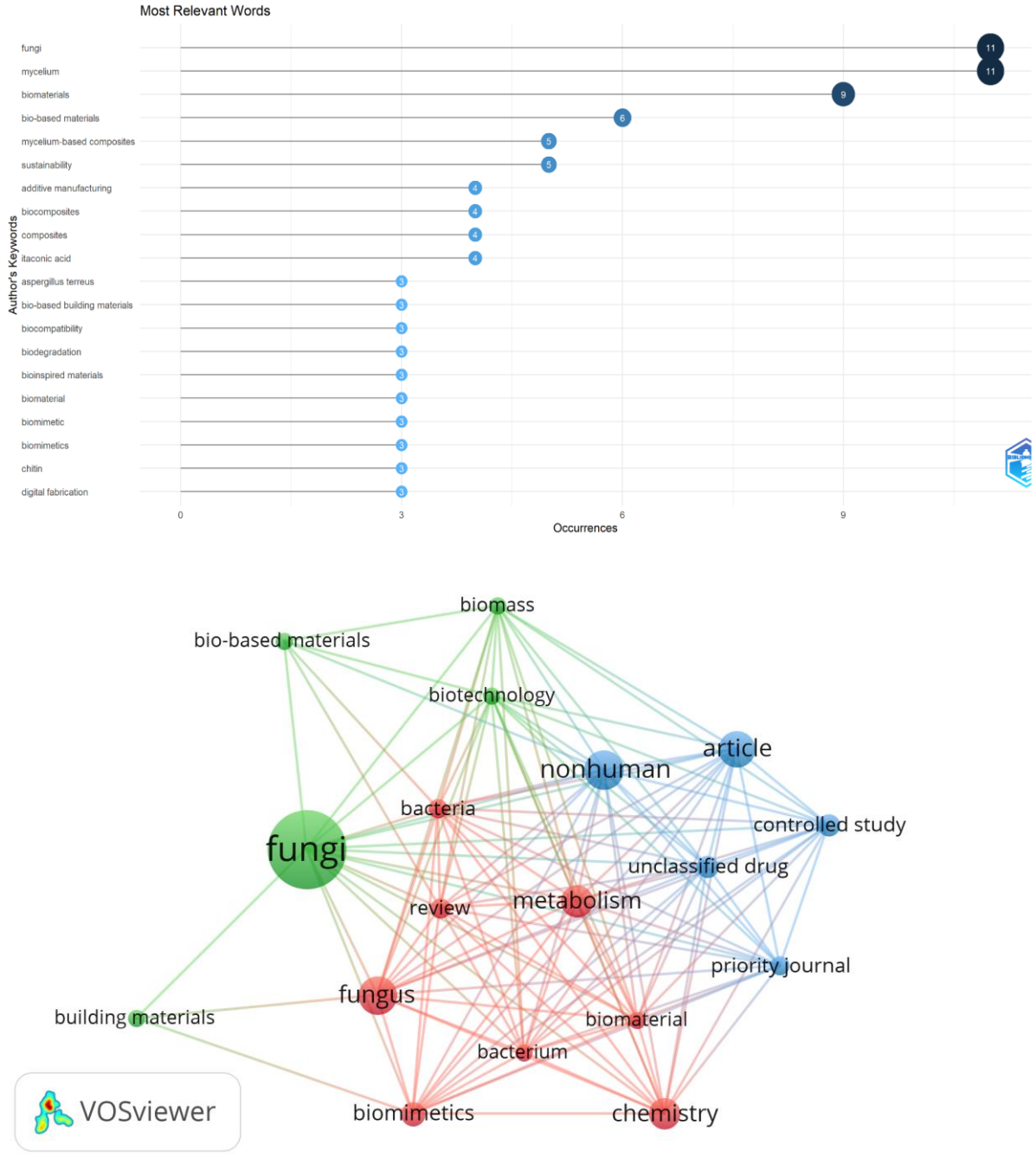


Figure15. Most Frequent Words

Trend Topics Based on Author's Keywords

In Figure 16, the term 'lignocellulose' prominently emerges as the most frequently used author keyword, with a frequency of 10. Following closely are 'cellulose' with N=20 in 2022 and 'mycelium' with N=17 in 2022. Key terms within the research scope also encompass bio-based materials, lignin, biomimetics, wood, biodegradation, lungi, chemistry, controlled study, nonhuman, and fungus. These terms encompass a broad range of subjects, such as using bio-based materials in construction and thoroughly investigating biodegradation processes.

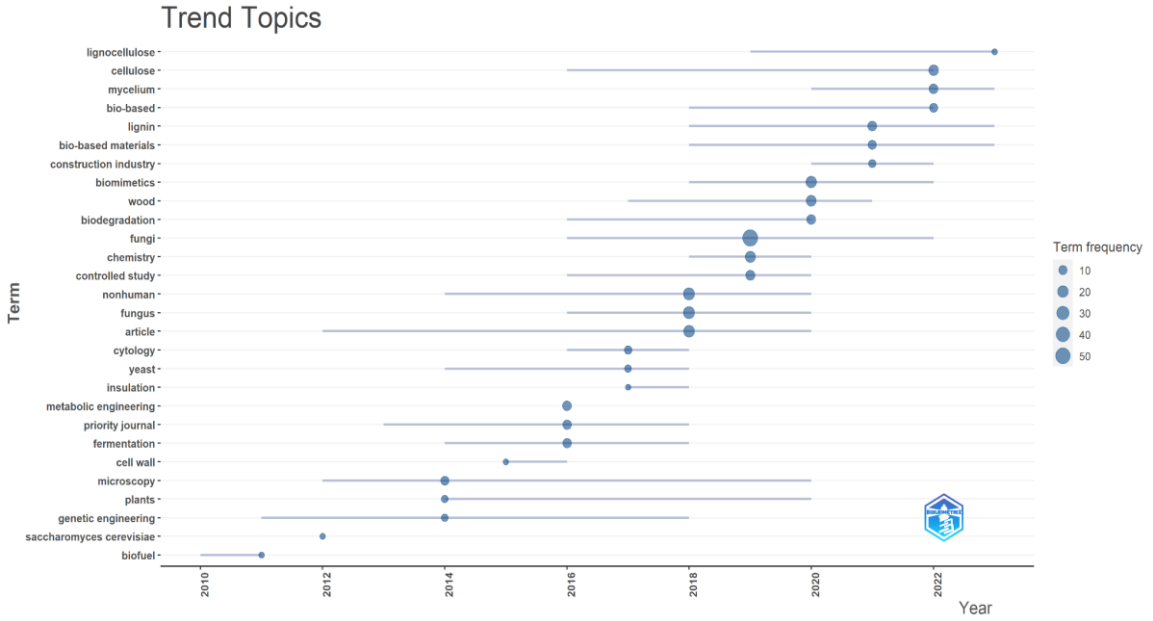


Figure16. Trend Topics Based on Keywords Plus

Thematic Map

The thematic map resulting from the bibliometric analysis within the study reveals five distinct clusters. Notably, themes such as fungi, nonhuman, and fungus are discernible. However, at the heart of the map, bio-based materials, building materials, and biodegradation emerge as the central and prominent concepts, as depicted in Figure 17.

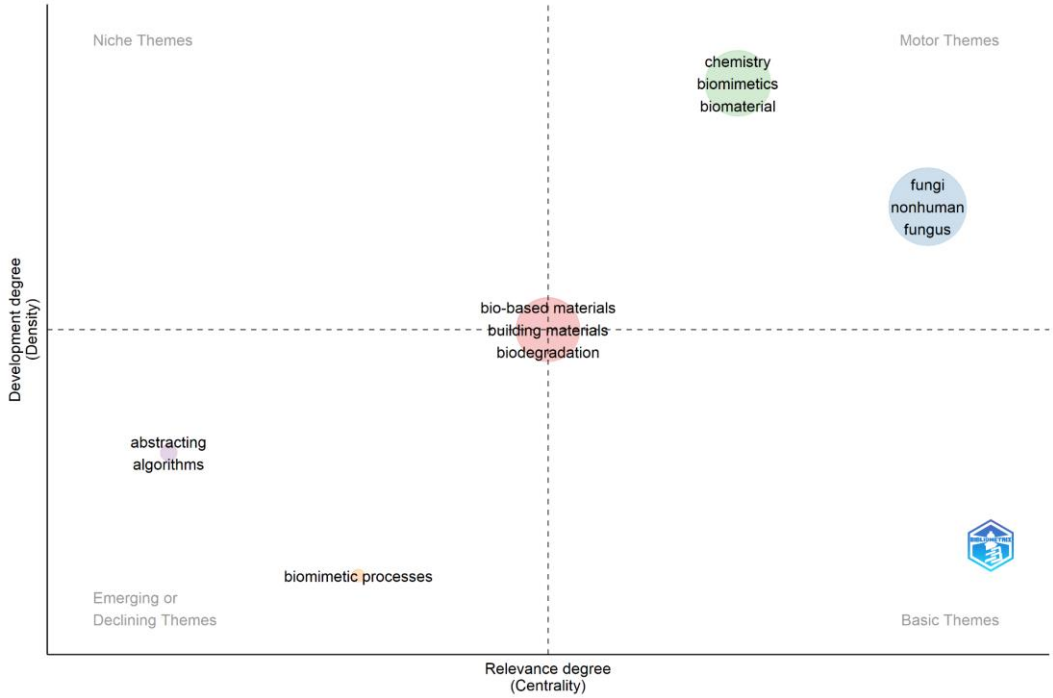


Figure17. Thematic Map

Table 1. Content analysis of the top 10 cited in the 138 documents.

1	**Title**	Melanin and melanogenesis: From pigment cells to human health and technological applications (d'Ischia et al., 2015).
	Purpose Status of the Problem and Importance	Explores the role of melanin and melanogenesis in various fields, including health and technology.
	Contribution	Provides insights into the multifunctional properties of melanin and their applications.
	Method(s) Used	Literature review, biochemical and biophysical analysis.
	Findings	Melanin has diverse applications in medicine, materials science, and biotechnology, but further research is needed to understand its properties and potential fully.
	Conclusion/ Discussion	Future studies should explore novel applications of melanin, elucidate their biosynthesis mechanisms, and develop strategies for controlling melanin production for therapeutic and industrial purposes.
2	**Title**	Production of succinic acid by metabolically engineered microorganisms (Ahn et al., 2016).
	Purpose Status of the Problem and Importance	Investigates the production of succinic acid using metabolically engineered microorganisms.
	Contribution	It offers a biotechnological approach to producing a valuable chemical compound.
	Method(s) Used	Metabolic engineering, microbial fermentation.
	Findings	Metabolically engineered microorganisms demonstrate potential for succinic acid production, offering a renewable petrochemical alternative.
	Conclusion/ Discussion	Future research should focus on optimizing strain performance, improving fermentation processes, and exploring downstream processing techniques for succinic acid extraction and purification.
3	**Title**	One-step electrospinning of cross-linked Chitosan fibres (Schiffman et al., 2007).
	Purpose Status of the Problem and Importance	Develop a method for one-step electrospinning of cross-linked chitosan fibres.
	Contribution	Introduces a novel electrospinning technique for producing cross-linked chitosan fibres.
	Method(s) Used	Electrospinning technique combined with chemical cross-linking.
	Findings	One-step electrospinning of cross-linked chitosan fibres is achieved, demonstrating the potential for applications in tissue engineering and wound healing.
	Conclusion/ Discussion	Further studies should explore the mechanical properties, biocompatibility, specific applications of these fibres, and scalability for industrial production.
4	**Title**	Fungi as a source for new bio-based materials: A patent review (Cerimi et al., 2019).
	Purpose Status of the Problem and Importance	Reviews patents related to fungi as sources for new bio-based materials.
	Contribution	Summarizes existing patents and identifies trends in fungal bio-based materials.

Table 1 (continued). Content analysis of the top 10 cited in the 138 documents.

	Method(s) Used	Patent analysis and review of fungal biotechnology literature.
	Findings	Various patents exist for using fungi in bio-based material production, indicating a growing interest in this field.
	Conclusion/ Discussion	Future efforts should focus on developing innovative fungal-based materials, improving production processes, and addressing potential challenges in commercialization.
5	**Title**	Biological, physical, and mechanical properties of particleboard manufactured from waste tea leaves (Yalinkilic et al., 1998).
	Purpose Status of the Problem and Importance	Explores the use of waste tea leaves for manufacturing particleboard and evaluates its properties.
	Contribution	Addresses the issue of waste management while investigating a potential material source.
	Method(s) Used	Material characterization, mechanical testing, particleboard manufacturing techniques.
	Findings	Particleboard manufactured from waste tea leaves exhibits promising properties for construction and furniture applications.
	Conclusion/ Discussion	Further research should focus on optimizing manufacturing processes, assessing long-term durability, and exploring potential applications in the construction industry.
6	**Title**	Production of bio commodities and bioelectricity by cell-free synthetic enzymatic pathway biotransformations (Percival Zhang, 2010).
	Purpose Status of the Problem and Importance	Explores the use of waste tea leaves for manufacturing particleboard and evaluates its properties.
	Contribution	Addresses the issue of waste management while investigating a potential material source.
	Method(s) Used	Material characterization, mechanical testing, particleboard manufacturing techniques.
	Findings	Particleboard manufactured from waste tea leaves exhibits promising properties for construction and furniture applications.
	Conclusion/ Discussion	Future research should improve enzyme stability, optimize pathway efficiency, and integrate cell-free systems into larger-scale bioproduction processes.
7	**Title**	An Environmentally Benign Antimicrobial Coating Based on a Protein Supramolecular Assembly (Gu, J., et al. 2017).
	Purpose Status of the Problem and Importance	Develops an environmentally benign antimicrobial coating based on a protein supramolecular assembly.
	Contribution	Introduces a sustainable alternative to traditional antimicrobial coatings.
	Method(s) Used	Protein-based supramolecular assembly, antimicrobial testing.
	Findings	Protein-based antimicrobial coating shows effectiveness against pathogens while being environmentally benign.
	Conclusion/ Discussion	Future research should focus on optimizing coating properties, scalability for commercial applications, and potential integration into various materials and surfaces.

Table 1 (continued). Content analysis of the top 10 cited in the 138 documents.

8	**Title**	Biomass-derived production of itaconic acid as a building block in specialty polymers (Eleky et al., D.C. 2019).
	Purpose Status of the Problem and Importance	Investigates the use of biomass-derived itaconic acid for producing specialty polymers.
	Contribution	Offers a renewable alternative to petroleum-based polymers.
	Method(s) Used	Biomass conversion techniques, polymer synthesis methods.
	Findings	Itaconic acid derived from biomass can be used as a building block for specialty polymers, reducing reliance on fossil fuels.
	Conclusion/ Discussion	Future research could explore the optimization of production processes, characterization of polymer properties, and assessment of environmental impacts.
9	**Title**	Understanding interactions between cementitious materials and microorganisms: a key to sustainable and safe concrete structures in various contexts (Bertron, A. 2014).
	Purpose Status of the Problem and Importance	Investigate interactions between microorganisms and cementitious materials to increase the durability of concrete.
	Contribution	It emphasizes the importance of understanding microorganism-cementitious material interactions.
	Method(s) Used	Microbiological analysis, material characterization techniques.
	Findings	Understanding microbial interactions with cementitious materials can lead to strategies for enhancing concrete durability and sustainability.
	Conclusion/ Discussion	Future efforts should focus on developing microbial-based solutions for preserving concrete, optimizing concrete mix designs, and implementing monitoring strategies for microbial activities in concrete structures.
10	**Title**	Growing and testing mycelium bricks as insulation materials (Xing et al., P. 2018).
	Purpose Status of the Problem and Importance	Investigate interactions between microorganisms and cementitious materials to increase the durability of concrete.
	Contribution	Highlights the importance of understanding microorganism-cementitious material interactions.
	Method(s) Used	Microbiological analysis, material characterization techniques.
	Findings	Understanding microbial interactions with cementitious materials can lead to strategies for enhancing concrete durability and sustainability.
	Conclusion/ Discussion	Using mycelium bricks as an alternative to traditional insulation materials is promising, but more research is required to optimize its properties and scalability. Future research should focus on improving the manufacturing process, evaluating long-term durability, and increasing production for commercial use.

CONCLUSIONS AND SUGGESTIONS

The evolution of current research in this field was examined with a comprehensive analysis of the existing literature in the field of mycelium-based composites in architecture. Our

review of 138 articles from 140 sources since their first publication in 1997 shows that academic interest in mycelium-based composites has increased in this area for environmental and performance reasons in architectural fields. The significant increase in the number of publications over the years shows the expansion of the scope of research and the increasing importance of this innovative material in architectural practice and research.However, sufficient experimentation and research in the practical areas discussed below has not yet been enough. Our analysis identifies key players in the academic discourse, including influential journals such as Biomimetics, Applied Microbiology and Biotechnology, and the International Journal of Biological Macromolecules. These journals are critical to publishing research findings and facilitate scientific exchange. This research demonstrates the diverse and collaborative nature of mycelium-based composites, including Bertron A, Dahay H, and Martinez D, and institutions such as the University of Toulouse, the Federal University of Bahia, and the University of Ghent have played a fundamental role in advancing knowledge and creating innovation in this field.Furthermore, our review shows that global scientific participation in this field is extensive and inclusive, with countries such as the United States, Germany, France, the United Kingdom, China, India, and Australia contributing significantly to the existing literature. This analysis highlights the frequency of keywords and the broad scope of mycelium-based composites research, covering biomaterial properties to applications in the building industry and biodegradation processes. Biomaterials and building materials play a central role in contemporary research discourse, as evidenced by the thematic map we produced, which graphically illustrates the related concepts.Conclusively, the bibliometric analysis conducted in this investigation provides significant perspectives on the current status of research concerning mycelium-based composites in architecture, laying the groundwork for forthcoming investigations and advancements in this emerging domain. As interest and investment in sustainable and bio-based materials grow, we anticipate further advancements and discoveries that will shape the future of architecture and construction practices.The ten highly cited articles encompass diverse research methodologies to address critical challenges and explore innovative solutions. Methods employed include literature review, biochemical and biophysical analysis, metabolic engineering, microbial fermentation, electrospinning combined with chemical cross-linking, patent analysis, material characterization, mechanical testing, particleboard manufacturing techniques, and microbiological analysis. While these methods have led to significant advancements, there remains an information gap in mycelium-based composites concerning optimizing production processes, assessing long-term durability, and

scalability for commercial use. Despite showing promise as alternatives to traditional insulation materials, mycelium bricks require further research to understand and fully optimize their properties and scalability. Hence, future investigations should focus on optimizing production processes, assessing long-term durability, and scaling up production for commercial use to bridge this gap in knowledge and advance the field of mycelium-based composites.

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KIYI PEYZAJLARINDA ÇEVREYE UYUMLU YAKLAŞIMLARLA KULLANIM ZARARLARININ AZALTILMASI

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ÖZET
Kıyılar, yeryüzünün eşsiz bir parçası olarak hem karasal hem de sucul ekosistemlerin birleşim noktasında yer almaktadır. Bu nedenle kıyılar, sadece canlılar için bir yaşam alanı olmaktan öte; fiziksel, sosyal, ekonomik vb. tüm faaliyetlerini gerçekleştirilebilmelerine olanak sağlamaktadır. Bu sebeple, insan etkisi altında yoğun bir değişime uğrayarak kültürel olarak çeşitlenen kıyı peyzajlarında farklı amaçlarla birçok kullanım söz konusudur. Bu durumda kıyılar, sahip oldukları çeşitlilik ve dinamizm ile dikkate değer, çok fonksiyonlu peyzajlar olarak karşımıza çıkmaktadır. Doğal ve kültürel çeşitli unsurları barındıran kıyı peyzajları fiziksel, psikolojik, sosyal, ekonomik ve ekolojik açıdan çeşitli fonksiyonlara sahiptir ve bu fonksiyonlar çoğu zaman birbiriyle etkileşim içerisindedir. Ancak belirli bir çerçevede kıyıların kesin sınır çizgilerinin var olması ve sınırlı genişletilebilecek ya da hiç genişletilemeyecek alanlar olması sebebiyle kapsamlı ve karmaşık dinamiklere sahip kıyı peyzajlarının kullanımı ve yönetimi, dikkatli bir şekilde planlanmalı ve sürdürülebilirlik temeline dayanmalıdır. Faklı kullanımlar sonucu sahip olduğu ekosistemin ve kullanım olanaklarının gelecek nesillere de aynı şekilde bırakılabilmesi için uygun tedbirlerin alınması gerekmektedir. Bu kapsamda, kullanım sınırlılıklarının bilincinde olunması, kullanım biçimlerinin içinde bulunulan ekosisteme uygun olarak belirlenmesi ve peyzaj karakterlerinin bozulmaması önem arz etmektedir.Dünya üzerindeki kıyı peyzajları, sanayiden ticarete, enerjiden savunmaya, ulaşımdan rekreasyon faaliyetlerine kadar geniş bir kullanım yelpazesi sunmaktadır. Bu nedenle, kıyı peyzajları, çeşitli disiplinlerdeki araştırmalar için önemli bir odak noktası oluşturmaktadır. Bu çalışmada, kıyı peyzajı kavramının tanımı, kapsamı ve önemi incelenmiş; kıyı peyzajlarının farklı kullanım biçimleri ve bu kullanımların olası çevresel etkileri ele alınmıştır. Kıyı peyzajlarının kullanımına bağlı olarak ortaya çıkabilecek zararların önlenmesinde en önemli çözümlerden birinin doğaya uyum yaklaşımı olduğu göz önünde bulundurularak, olası zararları azaltma stratejileri üzerinde durulmuştur. Bu çalışma, kıyı peyzajlarının çeşitli işlevlerini anlamak ve sürdürülebilir yönetim için önemli ipuçları sunmayı amaçlamaktadır.
Anahtar Kelimeler: Kıyı, kıyı peyzajı, kullanım biçimleri, doğaya uyumlu yaklaşımlar

MITIGATING USAGE DAMAGES IN COASTAL LANDSCAPES WITH ENVIRONMENTALLY FRIENDLY APPROACHES

ABSTRACT

Coasts are situated at the intersection of both terrestrial and aquatic ecosystems, making them a unique part of the Earth. Therefore, coasts not only serve as habitats for organisms but also provide opportunities for various activities, including physical, social, economic, and others. As a result of human influence, coastal landscapes have undergone intensive changes, leading to cultural diversity and serving multiple purposes. In this context, coasts emerge as remarkable, multifunctional landscapes characterized by their diversity and dynamism.Coastal landscapes, which harbor both natural and cultural diversity, possess various functions from physical, psychological, social, economic, to ecological perspectives, and these functions often interact with each other. However, due to the existence of definite boundaries and areas that can be limitedly or not extended at all, coastal landscapes with comprehensive and complex dynamics require careful planning and should be based on sustainability principles. Taking appropriate measures is necessary to ensure that the ecosystem and utilization opportunities it possesses can be passed on to future generations in the same manner. In this context, it is crucial to be aware of usage limitations, determine usage patterns according to the current ecosystem, and preserve landscape characteristics.Coastal landscapes around the world offer a wide range of uses, from industry to commerce, energy to defense, transportation to recreational activities. Therefore, coastal landscapes constitute an important focal point for research in various disciplines. This study examines the definition, scope, and significance of coastal landscapes, as well as the different usage patterns of coastal landscapes and their potential environmental impacts. Emphasizing the importance of an approach that harmonizes with nature as one of the most important solutions to prevent damage that may arise from the use of coastal landscapes, the study also focuses on strategies to reduce potential harm. The aim of this study is to understand the various functions of coastal landscapes and provide important insights for sustainable management.

Keywords: Coast, coastal landscape, usage patterns, nature-friendly approaches

GİRİŞ

Fiziki olarak kıyılar "kara ile suyun birleştiği yer, kenar, periferi[13]" olarak tanımlanmaktadır (Türk Dil Kurumu, 2024). Alphan'a (1998) göre deniz, akarsu, doğal ve yapay göller ile bu ögelerin çevresini kuşatan; dalga akıntı ve rüzgâr etkisi ile oluşan kumluk, çakıllık, taşlık, bataklık ve kayalık alanları ile sazlık vb. su bitkilerinin yetişmesine elverişli olan sığ alanları ifade etmektedir. Deniz ve kara ekosistemleri arasında bir geçiş özelliği gösteren ve kendi içinde dinamik döngülere sahip kıyılar, birçok çevresel bileşeni bir arada bulundurmasından dolayı oldukça önemli, öncelikli ve aynı zamanda hassas olarak nitelendirilmektedir (Alkan, 2006). Bu durumda, kıyıların deniz ve kara ekosistemlerini kapsayan bir kompozisyon olduğunu söylemek mümkündür.Kıyılar, doğal kaynak potansiyeli ve sahip olduğu biyoçeşitlilik ile dikkat çeken, toplumlar için önemli ekonomik fırsatlar sunan, ancak gelişme baskısı altında olan ve baskılara oldukça duyarlı olan alanlardır (Mekânsal Planlama Genel Müdürlüğü, 2024a). Bu yönleriyle değerlendiğinde kıyılar, su ile kara parçasının birbirinden ayrılmasına olanak sağlayan basit bir çizgi değil; kara ve su kaynaklarının ayrı ayrı taşıdıkları değerlerin çok üzerinde bir değer oluşturmaktadır. Bu doğrultuda birçok alt bölgeden oluştuğunu söylemek mümkündür. Diğer bir ifadeyle kıyılar, gerisinde tepeleri, sırtları, yamaçları, vadileri, düzlükleri ile doğal bir oluşumu, bulunduğu coğrafyada yer alan yerleşik bir mekânın parçasını; ilerisinde ise suyun ufuk çizgisi ile arasında kalan ve altındaki çukurlukları, düzlükleri de kapsayan bir bütündür (Abay ve Erdönmez, 2021). Bu bütün yapının getirisi olarak bir çizgi ya da yüzey değil; doğal ve yapay oluşumların bütünleştiği sosyal, kültürel ve ekonomik derinliğe sahip üç boyutlu geometrik bir mekânı temsil etmektedir (Ay, 1996).Kıyılar sahip oldukları dinamikleriyle çeşitli perspektiflerden ön plana çıkan eşsiz alanlardır ve bu özellikleri nedeniyle kullanımları oldukça çeşitlidir. Ancak süreç içerisinde kullanımların, dolayısıyla kıyılar üzerinde artan baskının olumsuz etkileri kıyıları, su ve kara ekosistemleri büyük ölçüde tehdit etmektedir. Bu durum yasal, yönetimsel ve ekonomik faktörlerin etkisiyle giderek büyümekte ve çeşitli sorunlara yol açmaktadır. Bu durumun önüne geçilebilmesinde temel yaklaşım, sürdürülebilir uygulamalar benimsenmeli ve bu uygulamaların etkinliğini arttırıcı yöntemlere başvurulması gerekmektedir.

KIYI PEYZAJLARININ KULLANIM VE ÇEVRESEL ETKİLERİ

Önemli'ye (2007) göre yaşam alanlarının kuruluşlarında ve gelişmesinde, su ögesinin etkinliği kabul edilmiş bir gerçekliktir. Yaşam alanları ve kültürel gelişmelerde su, önemli

[13] Kenar veya dış yüzey.

bir etken olarak çeşitli görevler üstlenmiş; yerleşimden sanayiye, savunmadan ticarete birçok alanda ön plana çıkmıştır. Antik çağlardan günümüze yerleşimin çevresinde geliştiği, doğal ve yapılı çevre arasındaki karşılıklı etkileşim sonucu kıyılar, üretim ve tüketim ilişkilerinin de belirlendiği öncelikli eylem alanlarından biri konumundadır (Ercanlı ve Savaşır, 2022). Tarihsel süreç içerisinde toplumların yaşam tarzlarındaki değişimlerle birlikte, öncelikle su ürünlerinden faydalanma ve ulaşım, daha sonra nüfus artışı ve teknolojik ilerlemelerle birlikte kıyı manzaralarına yönelik yeni kullanım biçimleri gündeme gelmeye başlamıştır (Ay, 1996). Genellikle, kıyılar başlangıçta su ürünlerinden faydalanma ve ulaşım için kullanılmıştır. Ancak zaman içerisinde teknolojik ilerlemeler ve ulaşım ile depolama gereksinimleri gibi nedenlerle, sanayi tesislerinin kıyı bölgelerine yerleşmeye başladığı bilinmektedir (Sağlık ve diğ., 2012a). Antik çağlardan itibaren, kıyıların kaynak olarak kullanılması ve liman faaliyetlerinin artmasıyla birlikte, bu kullanımların çeşitlenerek arttığı gözlemlenmiştir. Sanayileşme, ulaşım bağlantıları, turizm etkinlikleri ve liman, baraj, marina gibi tesislerin inşasıyla birlikte, kıyı bölgelerinin işlevleri çeşitlenmiştir. Ayrıca, bu tesisler, toplumların ekonomik ve sosyal gelişimine katkıda bulunarak, kıyı bölgelerinin ve hatta ülkelerin genel kalkınmasında, diğer alanlardan daha büyük bir rol oynamaktadır (Karaşah ve diğ., 2010). Bu kapsamda kıyı peyzajlarının çeşitli kullanım biçimleri; tarımdan madencilik faaliyetlerine kadar kaynak olarak, ulaşım sistemlerinden sanayi bölgelerine kadar alt ve üst yapı tesisleri olarak, turizm ve rekreasyon imkanlarına ev sahipliği yapan veya biyolojik çeşitlilik ile doğal alanların korunması yönünde çeşitli amaçlara hizmet edebilmektedir (Avcı, 2017). Türkiye Cumhuriyeti Çevre, Şehircilik ve İklim Değişikliği Bakanlığı tarafından kıyılarda gerçekleştirilen kullanımlar; yerleşim alanları, kentsel bölgeler, ikinci konut bölgeleri, turizm (yat, kurvaziyer turizmi, plajların kullanımı) ve rekreasyon, ulaşım, iskele ve liman faaliyetleri, kara ve demiryolu bağlantıları, lojistik merkezler, gemi inşa ve bakım sanayi alanları, tersaneler, balıkçılık faaliyetleri ve su ürünleri yetiştiriciliği, enerji ihtisas bölgeleri, sanayi bölgeleri, serbest bölgeler, petrol rafineri ve petrokimya sanayi, askeri birimler, güvenlik bölgeleri ve sahil güvenliği ile doğa koruma ve sit alanları olarak tanımlanmıştır. Bu tanımların temelinde, kıyı peyzajlarının kullanımlarıyla ilgili verilen ayrımlar ve detaylar göz önüne alındığında, genel olarak yerleşim, kaynak kullanımı, turizm ve rekreasyon, altyapı ve üstyapı tesisleri, ve ekolojik kullanım gibi başlıklar altında sınıflandırılabilmektedir (Tablo 1.).

Tablo 1. Kıyı peyzajlarında yer alan faaliyetler, (Abay ve Erdönmez, 2021) ve Mekânsal Planlama Genel Müdürlüğü'den (2024c) geliştirilmiştir.

Kullanım Faaliyetleri	Alt Birimler
Yerleşim Amaçlı Kullanım	Konut Gelişmeleri
	İkincil Konut Gelişmeleri
	Kentsel Alanlarda Kıyı Kullanımları
Kaynak Olarak Kullanım	Su Ürünleri Yetiştiriciliği
	Balıkçılık Faaliyetleri
	Tarımsal Faaliyetler ve Ormancılık
	Madencilik
	Kum ve Çakıl Temini
Turizm ve Rekreasyon Amaçlı Kullanım	Denizcilik faaliyetleri
	Yat ve Kurvaziyer Turizmi
	Marinalar
	Plajlar
Alt ve Üst Yapı Tesisi Olarak Kullanım	Ulaşım ve Bağlantılar (Deniz, Kara ve Demiryolu)
	Lojistik Merkezler
	Limanlar, İskeleler ve Boru Hatları
	Gemi İnşa ve Bakım Sanayileri, Tersaneler
	Enerji İhtisas Bölgeleri
	Sanayi Endüstri Bölgeleri
	Serbest Bölgeler
	Enerji Üretimi
	Petrol Rafinerileri
	Petrokimya Sanayileri
	Askeri Alanlar, Güvenlik Bölgeleri ve Sahil Güvenliği
Ekolojik Kullanım	Doğa Koruma ve Sit Alanları
	Deniz Koruma Alanları
	Yaban Hayatı Geliştirme Sahaları
	Özel Çevre Koruma Bölgeleri

Kıyı ve deniz alanları, sınırlı ve yeniden üretilmesi son derece zor olan kaynaklardır. Aşırı kullanımları, bilinçsiz tüketimleri ve tahrip edilmeleri, bu alanların nicelik ve niteliklerini kaybetmelerine neden olabilmekte; morfolojik, jeolojik ve klimatolojik yapıları, bitki ve canlı dokuları zarar görebilmektedir. Oluşan zararların onarılması uzun zaman ve yüksek yatırım gerektirebileceği gibi imkânsız dahi olabilmektedir. Son yıllarda, bilinçsiz, tahripkâr ve çarpık yapılaşmaların yaygınlaşmasıyla birlikte, yerleşim alanlarının yanı sıra kıyı ve deniz ekosistemleri de olumsuz şekilde etkilenmektedir (Sağlık, ve diğ., 2012b). Brondizio ve diğerlerine (2019) göre tüm dünyada insan faaliyetlerinden kaynaklanan baskılara ek olarak, iklim değişikliğinin de etkisiyle gittikçe kötüleşen bir tablo ortaya çıkmakta; bitki, hayvan vb. canlı popülasyonları azalmakta ve habitat bozulmaları kaydedilmektedir. Hızla

değişen bu dünyada insanların sürekli artan ürün ve hizmet ihtiyacı, günümüz deniz ve kıyı ekosistemleri için oldukça büyük bir tehdit oluşturmaktadır (O'Leary ve diğ., 2023). Kıyıların bilinçsiz kullanımları sonucunda kıyılarda uyumsuz kullanım biçimleri ortaya çıkmakta, kıyılara özgü doğal kaynaklar tahrip edilmekte ve ekolojik denge bozulmaktadır. Plansız gelişme eğilimleri artarak çeşitli sosyal, ekonomik, çevresel ve mekânsal sorunlara yol açmaktadır (Mekânsal Planlama Genel Müdürlüğü, 2024a). Bu kapsamda Mekânsal Planlama Genel Müdürlüğü'nden (2024b) elde edilen verilere göre kıyılarda; hızlı ve denetimsiz yapılaşma, kirlilik, iklim değişikliği, deniz seviyesinin yükselmesi, kıyı erozyonu vb. afet riskleri, arkeolojik, tarihi ve kültürel değerlerin bozulması başta olmak üzere çeşitli ekonomik, yasal, uygulama ve koruma kaynaklı sorunlar ortaya çıkabilmektedir. Van der Ryn ve Cowan'e (1996) atfen Doğan ve Erginöz (1997) kıyı kullanımlarında önemle üzerinde durulması gereken konunun, kıyılarda seçilecek kullanımların birbiri ile çelişmeden, bir arada ve doğal kaynaklara zarar vermeyecek nitelikte olması gerekliliğine vurgu yapmaktadır. Kıyıların kullanım kararlarında ekonomik, fiziksel, biyolojik, sosyal ve kültürel değerler göz önüne alınmalıdır (Koçan, 2021). Kıyı peyzajlarının insanlar için tartışmasız değeri göz önüne alındığında (Guldberg, 2015) biyolojik çeşitliliği korumak ve yeniden inşa etmek için harekete geçmek, böylece kıyıları, doğa korumayı arttıran doğal süreçlerin teşvik edilmesi ve iklim değişikliğinin olumsuz etkilerinin önüne geçilmesi yönünde harekete geçilmesi gerekliliği kaçınılmazdır (O'Leary ve diğ., 2023).

KIYI PEYZAJLARINDA ÇEVREYE UYUMLU YAKLAŞIMLARLA KULLANIM ZARARLARININ AZALTILMASI

Kıyı peyzajları, başta insan faktörünün etkisiyle çeşitli kullanımlardan dolayı birçok zarar görmekte ve bu zararların önüne geçilememesi durumunda geri dönülemez zararlar ortaya çıkabilmekte, çeşitli tahribatlar yaşanabilmektedir. Bu noktada kıyı peyzajlarının kullanım zararlarının azaltılmasında çevre ile uyumlu yaklaşımlar benimsenmeli; planlama, kullanım, onarım ve yönetim kararlarının bu doğrultuda verilmesi büyük önem taşımaktadır. Bu çerçevede kıyı peyzajlarının kullanım zararlarının azaltılmasına yönelik birçok çalışma literatürde yer almaktadır. Bu çalışma doğrultusunda bu kapsamda yürütülen bütünleşik kıyı alanları yönetimi, ekosistem yaklaşımı ve mavi ekonomi kavramlarına değinilecek, yenilikçi bir yaklaşım olan doğa temelli çözümler üzerinde durulacaktır. *Bütünleşik kıyı alanları yönetimi* kıyı bölgelerindeki çeşitli kullanımların ve kaynakların sürdürülebilir bir şekilde yönetilmesini hedefler. Mekânsal Planlama Genel Müdürlüğü'ne (2024d) göre, 1980'lerde çok sektörlü bir yaklaşım benimsenerek uygulamaya konulan bütünleşik kıyı alanları yönetimi, kıyı alanlarında sürdürülebilir gelişme için önceden alınmış ve uyarlanmış

bütünsel kaynak yönetim süreci olarak tanımlanır. Bu yaklaşım, temelde sürdürülebilir kalkınma ile kıyı alanlarının korunması ve biyolojik çeşitliliğin sürdürülmesini amaçlar. Bu hedeflere, kıyı alanlarının tüm kullanımlarının etkileşimlerini göz önünde bulundurarak daha etkin bir yönetim yoluyla ulaşmayı hedefler.*Ekosistem Yaklaşımı,* SCBD'ye (2015) göre, ekosistem ve doğal habitatların yönetimi, insan ihtiyaçlarını karşılamak için biyolojik çeşitliliği ve ekolojik süreçleri sürdürürken, ekosistem veya habitatların kompozisyonunu, yapısını ve işlevlerini korumak için gerekli doğal kaynakların kullanımını hedefler. Bu süreçte, önemli olan araştırma ve izleme çalışmalarının sonuçlarına dayanarak düzenli olarak güncellenmiş belirli amaçlar ve uygulamaların oluşturulmasıdır (Cerim, 2015). Deniz ve kıyı ekosistemlerindeki kaynakların sürdürülebilir bir şekilde kullanılmasını ve ekonomik kalkınmanın sağlanmasını hedefleyen bir yaklaşım *mavi ekonomidir*. Önder'e (2018) göre, mavi ekonomi kavramı, ekonomik kalkınmayı desteklerken deniz ve okyanusların ekolojik sınırlar içinde kullanılmasını önerir ve yerel kaynakların ve düşük enerji seçeneklerinin kullanılmasını teşvik eder. Bu nedenle, mavi ekonomi, deniz ekosisteminin ve biyolojik çeşitliliğin korunması ve sürdürülebilir kullanımını içeren kapsamlı bir yaklaşımdır (Öktem ve diğ., 2021). Ceylan (2019)'a göre, bu yaklaşım, ekosistem temelli bir ekonomik kalkınma paradigmasıdır; Çoban ve Ölmez'e göre ise deniz ve okyanuslardan elde edilen ürünler, hizmetler, sulak alanların korunması, kıyı yenileme çalışmaları, gri su geri kazanım sistemleri, akıllı su sistemleri gibi konuları içeren eylem planları ve faaliyetleri içerir (Öktem ve diğ., 2021).Tüm bu yaklaşımlara ek olarak doğa temelli çözümler kapsamında değerlendirilen yaklaşımların da kıyı peyzajlarının kullanım zararlarının azaltılmasında uygulanabilirliği bulunabilir. Çünkü Avrupa Komisyonu'na (2016) göre *doğa temelli çözümler,* çevresel sorunlara yönelik geliştirilen ekolojik, toplumsal ve ekonomik sistemlere fayda sağlayan doğal süreçler ve yapılar ile desteklenmiş yaşayan çözümleri kapsamaktadır.Doğa, canlı refahını destekleyen birçok ekosistem hizmeti sunmaktadır. Dolayısıyla doğadan faydalanmak, toplumsal zorlukları ele almak için kritik bir değere sahiptir (Millennium Ecosystem Asssment, 2005). Bu sürecin bir parçası olarak doğa temelli çözümler ile çevresel, sosyal ve ekonomik çeşitli faydalar sağlama amacını taşıyan ve doğayı geliştiren sistematik eylemler önerilmektedir. Bu eylemler aynı anda birden fazla soruna çözüm üretebilmektedir. Bu sebeple doğa temelli çözümler, çevreye nasıl baktığımızı ve çevreyi nasıl kullandığımızı tartışan diyologların önde gelen sürdürülebilir yaklaşımlarından biridir. Bu kapsamda doğa temelli çözümlerin deniz ve kıyı ekosistemleri üzerindeki etkileri değerlendirilecek olursa oldukça genel bir ifade ile çevresel, ekonomik ve sosyal olarak üçe ayırmak mümkündür. Çevresel olarak deniz ve kıyı ekosistemlerinin dayanıklılığını yeniden

inşa ederek iklim değişikliği başta olmak üzere çeşitli toplumsal sorunları ele alma konusunda güçlü fırsatlar sunmaktadır. Ekonomik olarak kıyıların ekonomik değerini maksimize etmeye yardımcı olarak sürdürülebilir mavi ekonomi yaklaşımlarına katkı sağlayabilmektedir. Sosyal olarak ise toplumsal fayda sağlamak ve risk azalımları elde etmek için çeşitli bireysel, sivil, kamusal ve politik etkinleri desteklemektedir (O'Leary ve diğ., 2023).

SONUÇ

Kıyılar çeşitli kullanımlara olanak sağlayan ve görsel sınırlarının çok ötesinde üstün değer sunan, hassas alanlardır. İnsanlığın varoluşundan günümüze, kıyılar farklı amaçlarla kullanılmış ve bu kullanımları genişlemiştir, bu durum kıyıları çeşitli riskler ile karşı karşıya bırakmış ve kıyıların bozulmalarına neden olmuştur. Bu bağlamda, kıyı ekosistemlerinin sunduğu üstün hizmetlerin sürdürülebilirliğini sağlamak için kullanımlar dengelenmeli ve çeşitli koruma yaklaşımları benimsenmelidir. Bu yaklaşımların ise temelinde, çevreyle uyum ve sürdürülebilirlik ilkeleri yer almalıdır.Araştırmalar, kıyı ekosistemlerinde sürdürülebilirliği sağlamaya yönelik birçok yaklaşımın olduğunu göstermektedir. Bu yaklaşımlardan biri ve belki de son yıllarda (elde edilen verim sebebiyle) en çok durulması gerekeni, doğa temelli yaklaşımlardır. Bu kavram O'Leary ve diğerlerine (2023) göre günümüzde karasal alanlarda yaygın olarak araştırılmasına rağmen kıyılar üzerindeki potansiyelleri hakkında hala araştırılmaya ve geliştirilmeye ihtiyaç duyulmaktadır. Ancak kıyılarda doğa temelli çözümler belirlenen standartlara uygun şekilde uygulandığında, başta iklim değişikliği ile mücadele, uyum ve çevresel sağlık olmak üzere birçok konuda katkı sağlayabilmektedir. Bu kapsamda doğa temelli uygulamaların daha iyi anlaşılması ve etkili bir şekilde tasarlanması için daha fazla araştırma ve katılım gerekmektedir. Sonuç olarak kıyıların dinamik yapısı ve kullanımlarının devamlılığı göz önüne alındığında, olası olumsuzluklardan etkilenmemesi mümkün değildir. Bu bilinç ile hareket edilerek koruma yaklaşımlarının geliştirilmesi ve çevreye uyumlu her yaklaşımın kıyılar üzerindeki işlevselliğinin farklı perspektiflerden değerlendirilmesi gerekmektedir. Böylece sürdürülebilir kıyılar için somut yararlar sağlayabilmek adına adımlar atılabilir, yaklaşımların etkinliğini değerlendirme fırsatları yaratılabilir.

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KÜLTÜREL MİRAS VE KÜLTÜREL MIRASIN KORUNMASI

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ÖZET
Toplumun en temel yapı taşlarından biri olan kültürün oluşumunda ortaya çıkan tüm değerler geçmişin bir ürünüdür. Bu nedenle insanlık tarihine paralel gelişim gösteren bu kavram (Biçici, 2021) Güner'e (2019) göre zamansal süreç içerisinde çağın gerekliliklerine uygun olarak artan etkileşimler, geçmişte yaşamış ve gelecekte yaşayacak bir toplumun yansıtıcısı olarak zaman ve mekân fark etmeksizin, toplumsal dinamizmi yansıtır. Bu nedenle kültürel miras, toplumların sahip oldukları başarı, inanç, değer (Biçici, 2021), yaşam biçimleri vb. çeşitleri unsurların bir ifadesi olarak görülebilir.İnsanlığa ait ortak bir hazine olan kültürel miras (Armağan, 2022), evrensel bir değerdir (Öztürk Yıldız, 2023). Dolayısıyla kültür varlıklarının sürdürülebilirliğini sağlamak ve miras olarak devir alınan tüm unsurları Ahunbay'a (1999) göre gelecek nesillere bırakmak, koruma ideolojisini benimsemeyi gerektirmektedir. Çünkü kültürel mirasın korunması, tarihsel birer belge niteliği taşıyan unsurların korunmasını sağlar, dolayısıyla kültürel sürekliliği ve kimlik oluşunu destekler. Ayrıca özgün ve estetik zengin bir çeşitlilik sunarak yaşanabilir çevreler yaratılmasına, aidiyet ve mekân duygusunun gelişmesine, ekonomik kalkınma ve toplumsal bir bilinç oluşmasına katkıda bulunur (Çatalbaş, 2022).Kültürel mirasın çok yönlü yapısı ve geniş kapsamı göz önüne alındığında bu çalışma, kültür ve kültürel mirasın çeşitli tanımlarını ve kültürel mirası koruma yaklaşımlarını incelemektedir. Bu çerçevede, dünyada ve ülkemizde kültürel mirasın korunmasına ilişkin yürütülen çalışmalara yer verilmiştir.
Anahtar Kelimeler: Kültürel miras, kültürel mirasın korunması, Türkiye'de kültürel miras, koruma örnekleri

CULTURAL HERITAGE AND ITS PRESERVATION

ABSTRACT
One of the fundamental building blocks of society, culture, emerges as a product of the past, as stated by Güner (2019), evolving parallel to human history in accordance with the necessities of the time. As such, it reflects societal dynamism regardless of time and place, through increasing interactions in temporal processes, as highlighted by Biçici (2021). Consequently, cultural heritage can be perceived as an expression of various elements such as achievements, beliefs, values, lifestyles, and other forms possessed by societies.Cultural heritage, a shared treasure of humanity (Armağan, 2022), holds universal value (Öztürk Yıldız, 2023). Therefore, ensuring the sustainability of cultural assets and passing down all inherited elements as a heritage to future generations, as advocated by Ahunbay (1999), necessitates embracing a conservation ideology. Preserving cultural heritage ensures the safeguarding of elements that serve as historical documents, thereby supporting cultural continuity and identity formation. Furthermore, it contributes to the creation of livable environments by offering original and aesthetically rich diversity, fostering a sense of belonging and place, and promoting economic development and societal consciousness (Çatalbaş, 2022).Considering the multifaceted nature and broad scope of cultural heritage, this study examines various definitions of culture and cultural heritage, as well as approaches to cultural heritage preservation. Within this framework, it also touches upon efforts related to the conservation of cultural heritage both globally and in our country.
Keywords: Cultural heritage, preservation of cultural heritage, cultural heritage in Turkey, examples of preservation

GIRIŞ

Kültür kelimesinin etimolojik kökeni, Latincede toprağı işlemek veya planlı bir şekilde ekip biçmek anlamına gelen "colere" kelimesine dayanmaktadır. Zaman içerisinde bu kavram, "cultura" şeklinde gelişmiştir (Köktürk, 2024). Toplumun temel unsurlarından biri olan ve insan varlığından günümüze değin oluşan her şeyin bütününü yansıtan kültür genel bir ifadeyle düşünce, inanç ve duygular sonucunda ortaya çıkan yaratılar, değerler ve kuşaktan kuşağa aktarılan davranışlardır (Gümüştekin, 2023). Başka bir deyişle kültür, insanın yarattığı ve insan varlığıyla şekillenen bir olgudur. Dolayısıyla, insan eliyle üretilenlerin çeşitlenerek artması, kültür kavramının kapsamını genişletir. Bu yüzden kültür kavramı üzerinde tam bir uzlaşma olmamasına rağmen (Köktürk, 2024), Binark'a (2015) göre genel olarak tanımlamalardaki ortak vurgu, bir topluluğa ait ortak özellikleri barındırmasıdır (Yücel Batmaz ve Biçici, 2021). Bu doğrultuda bir toplumun yaşam tarzını, düşünce biçimini, iletişim şekillerini ve toplumsal ilişkilerini belirleyen unsurların tümü olarak nitelendirilebilir.Miras ise bir kuşağın gelecek kuşaklara bıraktığı her şeydir (Cengiz, 2024). Her insanın bir toplumda ve bir kültür çerçevesinde doğduğu düşünüldüğünde, kültürün kişilerden önce var olduğu ve onlara miras olarak bırakıldığı anlamı ortaya çıkar. Kültür, her kuşak tarafından bilinir, tanınır ve yeniden üretilir. Her kuşak, kültürle yüzleşir ve onu yeniden kurgular. Kültür, toplumun gelecek nesillerine aktarılır ve devam eden bir süreçtir, başlangıç ve sonu olan bir olgu değil, sürekli bir akışı temsil eder (Köktürk, 2024). Bu yüzden devamlı olarak değişir, gelişir ve çeşitlenir. Ahunbay'a (2009) göre tarih boyunca yaşanan bütün olaylar, toplum açısından belirli bir kültürel birikim sağlamış ve kültürel miras olarak adlandırılan ögeleri oluşturacak tecrübeleri ortaya çıkarmıştır (Yücel Batmaz ve Biçici, 2021). Kültürel miras, Polat'a (2019) göre bir medeniyetin düşünce yapısını ve yaşam biçimini yansıtan unsurlar ve geleneklerden oluşur (Yolaçan, 2024). Toplumun üyelerinin ortak geçmişlerini anlatan, dayanışma ve birlik duygularını güçlendiren çeşitli betimlemeler, bilgiler ve kültürleri yarına aktaran büyük bir hazinedir (ICOMOS, 1999; Firik, 2024). Toplumların kimliği, tarihi ve kültürü ile ilgili somut ve soyut değerleri ifade eder; geçmiş ile bugün arasında bağlantı kurarak, içinde yaşanılan kültüre ve dünyaya bir temel oluşturur (İSMEP, 2014). Bu temel üzerine yeni değerler eklenerek katmanlar oluşturur ve gelişim gösterir. Kültürel miras kavramı, tarihsel olarak değişen değer sistemlerine dayanmakta, bu süreçlerin sonucunda gelişmekte ve sürekli olarak evrilmektedir (Central European University, 2023). Bu nedenle evrenseldir; kitle, toplum ve medeniyetlerin gelişim belgelerinin yansımalarıdır (Şahin ve Güner, 2006; Firik, 2024). İnsanlık tarihi boyunca yaşamış olan tüm toplulukların oluşturduğu değerler adeta bir

yapbozun parçaları gibi birbirini tamamlamaktadır (Rukancı, 2018:99-116; Cengiz, 2024). Bu yüzden kültürel miras bir ülkeye veya bir topluma ait değil, bütün insanlığı ilgilendiren bir olgudur.İnsanlık tarihi boyunca biriktirilen deneyimlerin ve geleneklerin devamlılığını, gelecek kurgusunun doğru bir şekilde yapılmasını sağlar (İSMEP, 2014). Bu sebeple kültürel miras ögelerin korunması büyük önem taşımaktadır.

KÜLTÜREL MİRASIN KORUNMASI

Koruma kavramı, genel olarak bir şeyi ya da birini dış etkilerden, tehlikelerden veya zor durumlardan uzak tutmak anlamına gelir (Türk Dil Kurumu, 2024). Ancak kültürel miras için tanımlandığında, toplumun miraslarını güvence altına almak ve sürdürülebilirliğini sağlamak anlamında kullanılmaktadır (Olcay Uçkan, 2023). Ayrıca koruma, kültür varlıklarının uygun koşullarda muhafaza edilmesinin yanı sıra bu varlıkların coğrafi, tarihi, toplumsal ve ekonomik bütünlüklerine saygı duymayı gerektirmektedir (Erdoğan ve Çetinkaya, 2019). Dolayısıyla Asatekin'e (2004) göre kültürel mirasın korunması, kimliğin kültür ayağını oluşturan fiziksel tanıkların yaşatılması ve gelecek kuşakların da bu tanıklıktan yararlanabilmeleri için içerdikleri bilgileri yanılgıya neden olmayacak biçimde aktarmaya yönelik müdahalelerin tümünü ifade etmektedir (Mumcu, 2023). Sürücü ve Başar'a göre (2016), kültürel mirasın korunması ve gelecek kuşaklara aktarılması toplumların temel sorumluluğudur. Gelecek kuşakların da bu mirasla buluşması ise temel bir haktır (Çilem Soylu ve Şahin, 2023). Çünkü Kuban'a (1987) göre, toplumlar kültürel birikimlerini koruyarak gelişirler(Şentürk, 2012). Bu bağlamda, Tekeli (1972), ulusal kimliğin oluşturulması ve devam ettirilmesinde korumanın önemli bir araç olduğunu vurgulamıştır (Şentürk, 2012). Bu kapsamda, kültürel miras ögelerine yönelik üstün evrensel değer anlayışına ek olarak, yerel nitelik ve yöresellik kavramlarıyla ilgili farklı yaklaşımlar da ortaya çıkmaktadır. Kültürel miras varlıkları, ait oldukları ve özgün konumlarında benzer özellikler gösteren yapılar ve alanlarla bütünleşik bir şekilde ele alınmalıdır; bu doğrultuda çeşitli yaklaşımlar ve stratejiler geliştirilmelidir (Erdoğan ve Çetinkaya, 2019).Bu bağlamda kültürel mirasın korunması için geliştirilen çeşitli yaklaşımlar bulunmaktadır. Her yaklaşımın amacı ve yöntemi farklıdır. Mumcu'ya (2023) atfen bu yaklaşımlar genel hatlarıyla aşağıda verilmiştir;*Sürekli bakım ve risklere hazırlık;* yapının işlevini sürdürebilmesi ve bozulmasını engelleyecek bakımın yapılması, yapısal bütünlüğünü koruyacak onarım faaliyetlerinin gerçekleştirilmesi ve olası risklere ilişkin çeşitli önlemlerin alınmasını içermektedir.

- *Sağlamlaştırma;* ICOMOS'a (2013) göre kültür varlıklarının bozulma sürecinin engellenmesi veya yavaşlatılması amacıyla dayanımlarının arttırılması, mevcut fiziksel ve mekanik özelliklerinin iyileştirilmesine yönelik işlemlerin tamamını kapsamaktadır.
- *Bütünleme;* kültür varlıklarının daha iyi değerlendirilmesi amacıyla gerçekleştirilecek stratejilerin bulunulan alandan daha geniş sınırlarla bütünleştirilmesidir.
- *Rehabilitasyon;* harap ya da terk edilmiş kültür varlıklarının değişen gereksinimleri karşılayacak şekilde onarılması, aynı işlev ya da yeni bir işlev kazandırılarak yeniden çağdaş yaşama katılmasının sağlanmasıdır (Mimari Terimler Sözlüğü, 2011).
- *Yeniden kullanım-uyarlama;* kültür varlıklarının çevresel gerçeklikleri de göz önüne alınarak katılımcı uygulamalar yoluyla sürdürülebilir şekilde devamlılığının sağlanmasıdır.
- *Temizleme;* (Angelova ve diğ., 2011) göre farklı türdeki nesnelerin yüzeylerinde yer alan çeşitli kökenlere ait bileşenler ve kimyasal bilişimlere sahip kirliliklerin ve tortuların uzaklaştırılmasıdır.
- *Çağdaş ek;* farklı nedenler ile ana yapıya ek olarak yeni yapıların (iç ya da dış ek yapı) eklenmesi işlemidir. Farklı zamanlarda eklenmiş olmaları nedeniyle farklı dönemlerin izlerini taşımaktadırlar.
- *Taşıma;* kültür varlıklarının zorunluk etkenler sebebiyle yer değiştirilmesidir.

Kültürel mirasın korunmasına yönelik ülkeler kendi güçleri ve birikimlerine göre çeşitli çabalar sarf etmektedir (Mumcu, 2023). Korumanın ana amacı, doğal ve tarihi zenginliklerin sadece bugünkü kuşaklar için değil, gelecek kuşaklar için de sağlam kalmasını sağlayarak (Şentürk, 2012) onlarında bu mirası deneyimlemesi ve değerlendirmesini mümkün kılmaktır. Bu kapsamda Firik'e (2024) göre kültürel miras unsurlarının mümkün olan en orijinal şekliyle aktarımının sağlamak esastır. Dolayısıyla, kültürel mirasın korunması ve aktarılması çabaları, dünya üzerinde olası olumsuzlukların etkilerini en aza indirmeyi hedeflemektedir. Doğal afetler, savaşlar vb. birçok olumsuzluk mirasın zarar görmesine yol açabilecek potansiyel tehditlerdir. Bu tehditlerle başa çıkabilmek için etkili koruma stratejileri geliştirilmeli ve uygulanmalıdır.

Dünyada Kültürel Mirasın Korunması

Erder'e (1999) göre, insanlığın varoluşundan bugüne, önemli anıtlar, başta dini sebepler ve güç gösterileri olmak üzere farklı nedenlerle sürekli olarak korunmaya çalışılmıştır (Olcay Uçkan, 2023). Bu koruma çabaları zamanla en ilkel formdan hareketle genişleyerek evrimleşmiş ve günümüze kadar ulaşmıştır.

Tablo 1. Kültürel miras ile ilgili uluslararası bazı çalışmalar; Şentürk (2012) ve Ahunbay'a (2019) atfen Yücel Batmaz ve Biçici'den (2021) geliştirilmiştir.

Yıl	Çalışma	Açıklama
1931	Atina Tüzüğü	Koruma işlevinin uluslararası düzeyde ve Birleşmiş Milletler nezdinde gerçekleştirilmesi konusunda tavsiyeler içermiş (Yücel Batmaz ve Biçici, 2021) ve belgelemenin önemi üzerinde durulmuştur (Şentürk, 2012).
1964	Venedik Tüzüğü	Kültürel mirasın korunmasına yönelik önemli kavramsallaştırmalar (Yücel Batmaz ve Biçici, 2021) ile II. Dünya Savaşı'nın yarattığı yıkımlara karşı, yapı ve yakın çevresinin korunması gerekliliğini işlemiştir (Şentürk, 2012).
1972	UNESCO ve Dünya Mirası Sözleşmesi	Kültürel miras tanımlanmış; anıtlar, yap toplulukları ve sit kavramlarına yer verilmiştir (Yücel Batmaz ve Biçici, 2021). Dünya mirası kavramı ve listesine, üstün evrensel değere, bütünlük, özgünlük ve alan yönetim kavramlarına değinilmiştir (Şentürk, 2012).
1975	Avrupa Mimari Mirasının Korunması Sözleşmesi	Avrupa Konseyi üye devletlerinin mimari mirasın korunması ve bu korumanın yaygınlaştırılması konusunda ortak bir politikanın ana ilkeleri üzerine anlaşmaya varılmasının önemi kabul ederek, bazı konularda mutabakatlarını göstermektedir (Mevzuat Bilgi Sistemi, 2024).
	Amsterdam Bildirgesi	ICOMOS'a (2019) göre tüm dünyanın kültürel miraslarının ayrılmaz birer parça olduğunu fikri başta olmak üzere kültürel mirasın korunmasını destekleyici bazı temel hususlar üzerine vurgu yapılmıştır (Mumcu, 2023).
1979	Burra Tüzüğü	10 adımlık koruma süreci tanımlanmıştır (Şentürk, 2012).
1985	Avrupa Mimari Mirasının Korunması, Granada Tüzüğü	Mirası ögelerinin korunmasına ilişkin sanatsal, toplumsal ve bilimsel önem üzerinde durulmuştur (Şentürk, 2012).
1992	Avrupa Arkeolojik Mirasın Korunması Sözleşmesi	
1994	Nara Özgünlük Belgesi	Koruma kavramı, bir yapıtı anlamaya, tarihini ve anlamını tanımaya, maddi olarak korunmasını sağlamaya ve gerektiğinde restore ederek değerlendirmeye yönelik tüm işlemler olarak yeniden tanımlanmıştır (Yücel Batmaz ve Biçici, 2021).
2000	Avrupa Peyzaj Sözleşmesi	

Ahunbay'a (1996) göre yazılı ilk koruma çabalarının Perslere dayandığını ve iktidara ait eserlerin tahribatını önlemeye yönelik çabalar sonucu ortaya çıktığını söylemek mümkündür (Şentürk, 2012). Bu dönemden 20.yüzyıla uzanan süreçte koruma amaçlı bazı adımlar atılmış olsa da ICOMOS'a (1931) göre ilk kez uluslararası düzeyde koruma yaklaşımları, 1931 yılında Atina Tüzüğü ile gündeme gelmiştir (Şentürk, 2012). Kuşçuoğlu ve Taş'a (2017) göre tarih boyunca birçok olay, insanlık tarihine ilişkin miras ögelerini yadsınamaz bir biçimde etkilemiş, bu olaylardan olumsuz olanları kültürel miras üzerinde olumsuz ve

hatta yıkıcı etkiler yaratmıştır. Bu kapsamda 20. yüzyıldan günümüze kültürel miras üzerindeki olumsuzlukların ve yıkıcı etkilerin önüne geçilebilmesi adına çeşitli çalışmalar (Tablo 1.) yürütülmüştür (Yüzel Batmaz ve Biçici, 2021). Özellikle II. Dünya Savaşı sonrası, anıt, sit alanı vb. değerlerin insanlığın ortak mirası olduğunun kabul edilmesi ve bireysellikten bütüncül yaklaşımlara doğru yönlenmesi ile uluslararası önlemler ve çeşitli yaptırımlar gündeme gelmiştir (Erdoğan ve Çetinkaya, 2019). Yapılan tüm çalışmalarda ortak odak noktası, kültürel mirasın bir millete ait olmayan, insanlık tarihi açısından evrensel önem taşıyan bir kavram olduğudur (Yücel Batmaz ve Biçici, 2021).

Türkiye'de Kültürel Mirasın Korunması

Köroğlu ve diğerlerine (2018) göre Türkiye birçok medeniyete ev sahipliği yapmıştır (Firik, 2024). Binlerce yıllık tarihi geçmişe ve coğrafi konuma sahip olan Türkiye, kendi kültürel birikimine ek olarak tarih boyunca sürekli doğu ve batı (Yücel Batmaz ve Biçici, 2021) kültürleri ile harmanlanmıştır. Bu durum, farklı kültürlerin etkileşimiyle zengin bir miras birikimine sahip olmasını sağlamıştır. Bu bağlamda, Erdoğan ve Çetinkaya'ya (2019) göre, Türkiye doğal, kültürel ve tarihi varlıkların çeşitliliği ve zenginliği açısından koruma perspektifinden uluslararası öneme ve sorumluluğa sahip bir ülke konumundadır.

Çeşitli yazınsal kaynakların incelenmesi (Tablo 2.), Türkiye'de kültürel mirasın korunmasıyla ilgili yaklaşımların ve yasal düzenlemelerin 19. yüzyılda ortaya çıktığını göstermektedir. Bu çerçevede, yapılan ilk yasal düzenlemenin 1869 tarihli Âsâr-ı Atîka Nizamnamesi olduğu bilinmektedir. Akabinde, Türkiye'de kültürel mirasın korunması amacıyla bu tarihten günümüze kadar birçok yasal düzenleme yapılmıştır (Coşkun ve Kurt, 2021).

Tablo 2. Kültürel miras ile ilgili ülkemizdeki bazı çalışmalar; Hemitli, Erkan (2014), Karayaka Eyckmans (2016), Solmaz Şakar (2022), Yücel Batmaz ve Biçici (2021), Olcay Uçkan (2023) ile T.C. Vakıflar Genel Müdürlüğü'nden (2024) geliştirilmiştir.

Yıl	Çalışma	Açıklama
1869 1874 1884 1906	Âsâr-ı Atîka Nizamnamesi	Madran'a göre (1996) çoğunlukla arkeolojik kazılara yönelik çıkarılmış, sürekli genişletilerek 1906'da son şeklini almıştır (Karayaka Eyckmans, 2016). Osmanlı topraklarında yapılacak kazılar ile ilgili kuralları sıkılaştıran ve yurt dışına eser götürülmesine engel olan hükümleri içermektedir (Olcay Uçkan, 2023).
1924	Evkaf ve Şeriye Vekâleti	Osmanlı Devleti'nden devir alanın vakıf mallarının korunduğu kurum olarak faaliyete geçmiş; 1936'san sonra Vakıflar Genel Müdürlüğü adını almıştır (Olcay Uçkan, 2023).
1924	İstanbul Eski Eserleri Koruma Encümeni	
1933	Anıtları Koruma Kurulu	Tarihi yapıların belgelenmesi ve onarımı çalışmalarını yürütmüş (KBGS, 2010; Karayaka Eyckmans, 2016); tarihi yapıların korunmasına yönelik uygulamalar başlatılmıştır (Olcay Uçkan, 2023).
1951	Gayrimenkul Eski Eserler ve Anıtlar Yüksek Kurulu	Dağıstan Özdemir'e (2005) göre koruma ilkelerinin oluşturulması, tarihi yapılara müdahale şekillerinin belirlenmesi, rölöve, restitüsyon, restorasyon projelerinin hazırlanma esasları vb. konularda görevlendirilmiştir (Karayaka Eyckmans, 2016).
1954	Vakıflar Bankası	Kültür varlıklarının onarımı için kaynak oluşturulması amaçlanmıştır (Olcay Uçkan, 2023).
1973	1710 sayılı Eski Eserler Kanunu	Ülkemizde tarihi çevrenin doku bütünlüğü ile korunmasını öngören ilk kanundur Hemitli, Erkan (2014). Yasa metninde ilk kez sit, tarihi sit, arkeolojik sit ve doğal sit kavramları yer almıştır (Olcay Uçkan, 2023).
1983	2863 sayılı Kültür ve Tabiat Varlıkları Koruma Kanunu	Konun ile "Korunması gerekli taşınır ve taşınmaz kültür ve tabiat varlıkları ile ilgili tanımları belirtmek, yapılacak işlem ve faaliyetleri düzenlemek, bu konuda gerekli ilke ver uygulama kararlarını alacak teşkilatın kuruluş ve görevlerini tespit etmektir (2863 s. Kanun, md.1; Yücel Batmaz ve Biçici 2021).
1984	Vakıflar Genel Müdürlüğü	
1985	3194 sayılı İmar Kanunu	Kültür ve tabiat varlıklarını, sit alanlarında gerçekleştirilecek olan koruma amaçlı uygulama planı süreçlerini yapılandıran ana kanundur Hemitli, Erkan (2014).
1989	Kültür Bakanlığı	
	5226 sayılı Kültür ve Tabiat Varlıkları Koruma Kanunu ile Çeşitli Kanunlarda Değişiklik Yapılması Hakkında Kanun	2863 sayılı Kültür ve Tabiat Varlıklarını Koruma Kanunu'nun yeniden düzenlenmesiyle oluşturan kanun ile koruma konusunda yerel yönetimlere yetki ve sorumluluklar verilmiş, tescilli yapı onarımlarında kullanılmak üzere kaynak oluşturulmuş; muafiyet ve katkı geliştirilmiştir (Karayaka Eyckmans, 2016).
2005	5366 sayılı Yıpranan Tarihi ve Kültürel Taşınmaz Varlıkların Yenilerek Korunması ve Yaşatılarak Kullanılması Hakkında Kanun	Sit alanlarına ait koruma alanlarında, bölgesel gelişime uygun yeniden inşa çalışmalarının yapılması, sosyal alanların oluşturulması, tarihi ve kültürel varlıkların yenilerek korunması ve yaşatılmasını amaçlamaktadır Hemitli, Erkan (2014).
	5393 sayılı Belediye Kanunu	
2011	Kültür ve Tabiat Varlıkları Koruma Kanunu'na ek 648 sayılı Kanun Hükmünde Kararname	T.C. Çevre, Şehircilik ve İklim Değişikliği Bakanlığı bünyesinde Tabiat Varlıkları Koruma Bölge Komisyonları kurularak konu ile ilgili tüm işlemlerin bu komisyona devri yapılmıştır Hemitli, Erkan (2014).

Günümüzde hala yürürlükte olan yasal düzenlemelerin yanı sıra, kültürel mirasın korunması konusunda ülkemizin de taraf olduğu küresel çapta imzalanan antlaşmalar ve çeşitli üyelikler bulunmaktadır. Bu antlaşmalar ve üyelikler, kültürel mirasın korunması konusunda uluslararası iş birliğinin önemini vurgularken, aynı zamanda ulusal çapta yapılması gereken çalışmalara da ışık tutmaktadır. Ancak, kültürel mirasın mümkün olan en orijinal haliyle korunabilmesi ve için bu çabaların hız kesmeden devam etmesi gerekmektedir. Özellikle, bu çalışmaların ulusal düzeyden başlayıp yerel düzeye kadar yayılması ve toplumsal bilincin arttırılması yönündeki çabaların desteklenmesi gerekliliği de göz ardı edilmemelidir (Olcay Uçkan, 2023).

SONUÇ

Kültür, bir toplumun değerleri, inançları, gelenekleri, sanatı, dili ve yaşam tarzını içeren geniş bir kavramdır ve insanları bir arada yaşatarak birbirlerine bağlayan unsurların bütünüdür. Kültürel miras ise bir toplumun geçmişten gelen ve gelecek nesillere aktarılan maddi ve manevi varlıklarının tümünü kapsar. Bu miras, somut tarihi eserlerden geleneksel el sanatlarına, folklorik müziklere kadar geniş bir yelpazede değerleri içerir.Kültürel mirasın korunması, bir toplumun geçmişinden gelen değerleri, gelenekleri, sanat eserlerini, mimari yapıları ve diğer önemli unsurları koruma, koruma ve gelecek nesillere aktarma sürecidir. Bu süreç, toplumların kimliklerini ve kökenlerini korurken, aynı zamanda tarihlerini ve kültürel miraslarını yaşatmalarına da olanak sağlamaktadır. Bu açıdan kültürel mirasın korunması, bir toplumun geçmişle olan bağını güçlendirmekte ve gelecek nesillere değerli bir miras bırakma sorumluluğunu da beraberinde taşımaktadır. Bu kapsamda, her ülke bireysel ve küresel ölçekte kültürel mirasın evrensel insanlık değeri olduğunu kabul etmiş ve bu değerlerin korunması ile ilgili birçok çalışma gerçekleştirmiştir. Gerek bağımsız gerekse ortak yürütülen bu çalışmalar, kültürel mirasın korunmasına yönelik farkındalık kazanılması, koruma çalışmalarının arttırılarak devam ettirilmesi, bu ögelerin ekonomik büyümeye katma değer sağlaması açısından birçok olumlu etkiyi de beraberinde getirmektedir.

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COVID-19 SALGIN DÖNEMİNİN HAYVANSAL ÜRETİME ETKİLERİ VE YAPILAN BAZI ÇALIŞMALAR

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ÖZET
COVID-19, Aralık 2019'da Çin'de başladı, hızla dünyaya yayıldı ve birçok sektörü etkiledi. Dünya çapındaki diğer birçok sektörde olduğu gibi, küresel hayvancılık tedarik zincirlerinde de 2020'nin başlarında COVID-19'un ortaya çıkması nedeniyle önemli bir aksama yaşandı. Tarım sektörünün yaşadığı başlıca etkiler arasında; uygulanan karantina ve kısıtlamalar nedeni ile hem hayvansal hem de bitkisel üretimde yetiştiricilik faaliyetlerinde yaşanan aksaklıklar, gecikmeler üreticilerin optimum üretim seviyelerinin altında kalmasına ve dolaylı olarak elde edilen gelirin de düşmesine neden olmuştur. Ayrıca tarım ürünlerinin pazarlanmasının yürütülmesindeki zorluklar, insanların satın alma gücündeki düşüş ve hanelerin uygun fiyatlı gıdaya erişim gücünün azalması, çiftçilerin ve yetiştiricilerin ekonomik dayanıklılığını da etkilemiştir. Bu çalışmada COVID-19 salgın döneminin hayvansal üretime etkilerinin yanı sıra önemine dikkat çekmek ve yapılan bazı çalışmaların bir araya getirilerek derlenmesi amaçlanmıştır.
Anahtar Kelimeler: COVID-19, Hayvansal Üretim, Et, Süt

THE EFFECTS OF THE COVID-19 PANDEMIC PERIOD ON ANIMAL PRODUCTION AND SOME STUDIES

ABSTRACT
COVID-19 started in China in December 2019, quickly spread around the world, and affected many sectors. As with many other sectors around the world, global livestock supply chains have experienced significant disruption due to the emergence of COVID-19 in early 2020. Among the main impacts experienced by the agricultural sector are disruptions and delays in breeding activities in both animal and plant production due to the quarantine and restrictions imposed, which have caused producers to remain below optimum production levels and indirectly reduced the income obtained. In addition, the difficulties in the marketing of agricultural products, the decline in people's purchasing power, and the reduced ability of households to access affordable food have also affected the economic resilience of farmers and breeders. In this study, it was aimed at drawing attention to the importance of the COVID-19 pandemic period as well as its effects on animal production and compiling some of the studies conducted.
Keywords: COVID-19, Animal Production, Meat, Milk

GİRİŞ

COVID-19, 2019'da Çin'in Wuhan şehrinde başladı. Bulaşıcı bu hastalık hızla dünyaya yayıldı ve birçok sektörü etkiledi (Guan ve ark., 2020; Vidaurreta ve ark., 2020; Lone ve Ahmad, 2020). Bu virüs, ortaya çıkışından bu yana hem gelişmiş hem de gelişmekte olan ülkeler de dahil olmak üzere dünyaya yaygın zararlar verdi. Hastalığın sağlık üzerindeki etkilerinin yanı sıra, hayvancılık sektörü gibi tarımsal değer zinciri de dahil olmak üzere diğer önemli alanlar, beslenme, geçim kaynağı ve gıda güvenliğindeki rolü göz önüne alındığında, etkilerden payını almıştır (Bisson ve Hambleton, 2020). Küresel hayvancılık tedarik zincirlerinde de 2020'nin başlarında COVID-19'un ortaya çıkması nedeniyle aksamalar yaşandı (Hashem ve ark., 2020; Almadani ve ark., 2021). Tarım sektörünün yaşadığı başlıca etkiler arasında; uygulanan karantina ve kısıtlamalar nedeni ile hem hayvansal hem de bitkisel üretimde yetiştiricilik faaliyetlerinde yaşanan aksaklıklar, gecikmeler üreticilerin optimum üretim seviyelerinin altında kalmasına ve dolayısı ile elde edilen gelirinin de düşmesine neden olmuştur. Ayrıca tarım ürünlerinin pazarlanmasının yürütülmesindeki zorluklar, insanların satın alma gücündeki düşüş ve hanelerin uygun fiyatlı gıdaya erişim gücünün azalması, çiftçilerin ve yetiştiricilerin ekonomik dayanıklılığını da etkilemiştir (Faturokhman ve ark., 2022). COVID-19 salgını sırasında hayvancılık sektöründe özellikle büyükbaş ve küçükbaş hayvanların ve ürünlerinin pazarlanması ile ilgili sorunlar yaşanmasına ve bu durum çiftçilerin gelirlerinin azalmasına neden olmuştur (Faturokhman ve ark., 2022). Gıda üretimi ve pazarlanması, iklim değişikliği ve son yaşanan COVID-19 salgını gibi gıda tedarik zincirlerini etkileyen çok sayıda şok ve stres faktörü tarafından etkilenmiştir (Garnett ve ark., 2020; Thornton ve ark., 2014; Payne-Giffo ve ark., 2022).COVID-19 salgını tüm dünyada yayılırken, hastalığın farklı ülkeler ve endüstriler üzerinde farklı etkileri olmuş ve bu yönde yönetimlerin uygulamaları farklılık göstermiştir (Gauly ve ark., 2021). Avustralya'da, salgın döneminde tüketiciler panikle et ürünlerini satın almaya yönelmiş ve et işleme tesisi çalışanlarında COVID-19 enfeksiyonu yayılması sebebiyle et işleme tesislerinin kapasitesi yavaşlamıştır. Buna ek olarak, restoranlardan et ürünlerine olan talebin azalması ve aynı anda ürün ihracatını azaltan ulusal sınırların kapatılması da yaşanan etkilerdendir. Bu durum çiftlikteki maliyetler ve hayvan popülasyonlarını artırmaya yönelik kümülatif bir etki meydana getirmiştir (D'Souza ve Dunshea, 2021). Amerika Birleşik Devletleri'nde de COVID-19 salgınında benzer sonuçlar gözlemlendi. Çiftliklerdeki domuz sayılarındaki büyük artış, endüstri için zorluk teşkil ettiği bildirilmiştir (Tokach ve ark., 2021). Bu sürecin en az kayıplarla atlatılabilmesi için üreticiler, endüstri yöneticileri ve bilim adamları hep birlikte yönetim ve beslenme

yaklaşımları geliştirmek için çalıştılar. Yine birçok ülkeye benzer şekilde, Amerika Birleşik Devletleri de gıda hizmeti sektöründe ani bir düşüşle karşı karşıya kaldı, buna bağlı tüketiciler tarafından aşırı mal alımı ve ardından krize hızlı bir şekilde yanıt veremeyen tedarik zincirlerinde bir aksama yaşandı (Peel, 2021). COVID-19 salgınının işgücündeki etkisi, sığır yetiştiriciliği ve ürünlerinin azalmasına neden olarak tüketiciler için daha fazla kıtlığa yol açtı (Peel, 2021). Arjantin'de virüsün yayılmasını önlemek için ülke çapında katı bir karantina ve insan temasına ciddi kısıtlamalar getirilmiştir. Bu kısıtlamalar sebebiyle kısmen sığır eti ürünleri geleneksel pazarlardan diğer ülkelere nakledilemediği için hayvancılıkta aksamalar yaşanmış ve bununla birlikte, ülkede ekonomik koşullar kötüleşmiştir (Arelovich, 2021). COVID-19 Çin'deki ekonomiyi de etkiledi. Çin, normal malzeme tedariki, satış ve nakliye üzerinde ciddi etkileri olan bir ülkedir. Bu salgın döneminde Çin içinde ve dışında tedarik zincirlerinde aksamalara neden olan seyahat kısıtlamaları uygulanmıştır (Ding ve ark., 2021). Hayvancılık sektöründe canlı hayvan ve et fiyatları %80,8 artmıştır. Buna ek olarak, COVID-19'un küresel etkileri, hayvan yemi ve ürünlerinin normal ithalat ve ihracatında ciddi aksamalara neden olmuştur. Benzer şekilde Gana'da da, protein ithalatında ciddi aksamaların yanı sıra beslenme, yönetim ve hastalık kontrolü üzerinde olumsuz etkiler meydana gelmiştir (Obese ve ark., 2021). Bunun bir sonucu ise hayvanlar için yem katkı maddesi temininde yaşanan kıtlık olmuştur. Tüm bunlar, Gana'da da et ve diğer ürünlerin fiyatlarının artmasına ve çiftçiler için kâr marjının düşmesine neden olmuştur (Obese ve ark., 2021). Çek Cumhuriyeti'nde süt ve sığır işletmeleri daha az etkilenmiş olsa da diğer birçok Avrupa ülkesinde olduğu gibi çiftçi pazarlarının, restoranların ve okulların kapatılmasının gıda maddeleri ve sığır fiyatları üzerinde etkileri olmuştur (Brzakova ve ark., 2021). Ayrıca, karantina mevcut çiftlik işçiliğini azaltmış ve ek komplikasyonlara neden olmuştur. Bu durum çiftçiler ve mezbahalar için devlet desteklerine ihtiyacı artırmıştır (Obese ve ark., 2021). COVID-19 salgınının hayvansal üretim endüstrisinin belirli kesimleri üzerindeki etkilerinin araştırılması bazı sonuçları ortaya çıkarmıştır. Hayvan yetiştiricileri döl veriminde düşüş ve devlet desteklerindeki azalmalardan kaynaklanan sorunlarla karşı karşıya kalmıştır (David, 2021). Genetik alanında, etkiler henüz bilinmemektedir (Gandini ve Hiemstra, 2021). Eğitimde, mal ve malzemelerin sınır ötesi hareketinde kısıtlamalar, uluslararası ticarette aksamalar, evden çalışma ve meslektaşlarla kritik etkileşimlerden uzakta çalışma sebebiyle hayvanların üreme ve genetik kaynaklı yaşanan problemlerin yeteri kadar çözümlenememesine yol açmıştır (Semianer ve Reimer, 2021).Ay, (2021) COVID-19 salgınının, Türkiye'nin ihracatı üzerine etkilerini analiz etmeyi amaçladıkları çalışma sonuçlarına göre; COVID-19 salgını

Türkiye'nin ihracatına yönelik daraltıcı etkilerinin, 2020'nin ilk aylarında başladığı özellikle Nisan ve Mayıs aylarında daralmanın zirve yaptığını belirtmiştir. 2020 Haziran ayı ile ekonomide toparlanma başlamasına karşın, salgının yeni dalgaları ile karşılaşılması, kısıtlayıcı tedbirlerin tekrar devreye sokulmasına yol açmıştır. Salgındaki dalgalanma, ekonomideki ve dış ticaretteki dalgalanmayı belirleyici hale geldiği bildirilmiştir. Çalışmanın sonucunda küresel ekonomi üzerinde küresel olumsuz şokların ancak küresel iş birliği ile daha kolay ve etkin yönetilebileceği bildirilmiştir.Akan (2021) yaptığı çalışmada COVID-19 salgının Türkiye dış ticaretine etkilerini, küresel arz zincirini de dikkate alarak incelemeyi amaçlamıştır. Ülkeler ve sektörler düzeyinde geçmiş yıllara ait tablolar ve COVID-19'un ortaya çıkış sürecindeki bu tablolarda meydana gelen değişimler izlenerek salgının ilk etkileri açıklanmaya çalışılmıştır. İlk şok etkilerinin görüldüğü Mart-Nisan-Mayıs döneminde önceki yıla oranla Türkiye'nin ihracatı %30'dan fazla küçülmüştür. Bu dönem için imalat ekonomisi faaliyetlerinde ihracat %30'dan fazla küçülmüştür. İthalatta ise %15'ten fazla daralmalar meydana geldiği bildirilmiştir.Alapala Demirhan ve Şahinler (2020) yaptıkları çalışmada, salgın sürecinin Türkiye hayvancılığı üzerine olan etkilerini değerlendirmişlerdir. Sonuç olarak çalışmada COVID-19 salgını ülkemizde hayvancılık üzerinde meydana getirdiği etkiler olarak küresel piyasalarla birlikte maliyetlerde artış olduğu ve maliyetlerdeki artışın halen devam ettiğini ve üreticiyi zor duruma soktuğunu belirtmişlerdir. Salgın sürecinde hayvancılık sektöründe üretimin devam etmesi olası gıda krizini önlediği bildirilmiştir. Restoran ve otellerin kapalı olması, turizm sezonunda yasakların olması nedeniyle tüketimde daralmalar olmuştur. İthalata bağımlı olduğumuz yağlı tohumlar, kimyevi gübre, mısır, soya gibi ürünlerde yaşanan artışlar ve ilgili ülkelerin yasakları sonucunda bu piyasalarda da fiyat dalgalanmaları görülmüştür. Üretim maliyetlerinin artması ile süt ve süt ürünlerinde fiyat artışına gidilmiştir. Salgın sürecinde Türk Lirası'nın Dolar/Euro karşısında değer kaybetmesi, başta yem girdileri olmak üzere, gübre, ilaç, tohum vb. ürünlerin ithal edilmesinde üreticileri zor durumda bırakmıştır.Sariözkan ve ark., (2021) yaptıkları çalışmada; Türkiye'de salgın öncesi ve salgın dönemindeki hayvansal ürün (et, süt, yumurta) ve yem fiyatlarındaki değişimlerin sektörel bazda araştırılmasını amaçlamışlardır. İncelenen hayvansal ürünlerin fiyatları açısından değerlendirme yapıldığında, salgın döneminde tüm ürünlerde farklı oranlarda artış yaşandığı (%1,82-11,57) bildirilmiştir. Salgın öncesi ve sırasında sığır eti ve piliç eti üretici fiyatları arasındaki fark istatistiksel olarak anlamlı bulunmuştur. Diğer taraftan, girdi maliyetleri yönünden yaşanan değişiklikleri göstermesi bakımından yem fiyatları da incelenmiş ve %9,71-12,57 oranında arttığı tespit edilmiştir. Sonuç olarak, salgın döneminde

hayvansal ürün fiyatları artmış ancak girdi fiyatlarında artış daha fazla olmuştur.Koçtürk ve Nuhoğlu (2022) yaptıkları çalışmada küreselleşmenin etkisiyle ülkelerin birbirleri ile ticari faaliyetlerinin arttığı, birçok sektörde olduğu gibi ticarette de ülkelerin birbirlerine bağımlı olduğunu belirtmiştir. Türkiye elverişli tarım arazileri ve tarım ürünlerinin ihracatının ekonomisinde büyük öneme sahip olduğunu ve bu süreçte, ihracatını kısıtlayan ve ithalatını arttırma politikalarına sahip ülkeler tarafından en önemli muhtemel tedarikçiler arasında olduğunu belirtmiştir. Bu bağlamda Türkiye, tarım sektöründe radikal politikalar uygulayıp, tarım sektörüne destekler sağlamalı, gençler ve tarım ile ilişkili olan kişileri tarıma özendirmek için çalışmalar yapması gerekliliğini ifade etmiştir. COVID-19 ile, sağlıklı yaşamın, beslenme alışkanlıklarının ve insanların organik, iyi tarım uygulamalarına olan bakış açılarının daha önem kazanması Türkiye için bir fırsat kapısı olarak karşımıza çıkabileceği bildirilmiştir.

COVID-19 Salgın Döneminin Hayvansal Üretime Etkileri

COVID-19 salgınının tarım, gıda ve dolayısıyla yem sektörü üzerindeki etkilerinin şiddeti ülkeden ülkeye değişmektedir (Elleby ve ark., 2020). COVID-19 salgınına karşı ülkelerin aldığı önlemler, alınan önlemlerin gücü, ülkelerin ekonomik yapısı, toplumun salgın açısından bilinç düzeyi gibi birçok faktör etkisiyle olmuştur (Defo Deeh ve ark., 2020).

Salgın, hayvan ıslah programlarının kesintiye uğramasına, hareket kısıtlamalarına ve işçilerde yaşanan sağlık problemleri sebebiyle işgücünde aksamalara neden olmuştur (FAO, 2020). Yayla ve meraya çıkışlarda kısıtlamalar, yemleme ile ilgili zorluklarla karşı karşıya kalınmasına neden olmuş ve yoğun bir üretim sistemi için gerekli olan konsantre yem sağlanamaması ıslah programlarında aksamalara sebep olmuştur. İşçilerin hastalanması ve diğer çalışanların güvenlik nedenleriyle çalışmaktan kaçınmaları, hayvan yetiştirme program zaman çizelgelerinin düzenli uygulanmasını etkilemiştir (Obese ve ark., 2021).Afrika'da yapılan bir çalışmada; Gana'daki hayvancılık üretim sisteminin ağırlıklı olarak ekstansif sistemler olduğu ve bu nedenle çoban ve hayvan hareketlerine getirilen kısıtlamaların beslenme ve üretim üzerinde önemli etkileri olduğu bildirilmiştir. Yapılan çalışmada çobanların çoğu, yıl boyunca hayvanlarına bakmak için işletme sahipleri tarafından işe alınan genç erkeklerden meydana geldiğini, bu süreçte ne yazık ki COVID-19'un patlak vermesiyle çobanların çoğunun başka geçim kaynakları aramak için ayrıldığını ve bunun işleyişleri üzerinde büyük bir etkisi olduğu bildirilmiştir. Hareket kısıtlamaları hayvanların besin ihtiyaçlarını ve dolayısı ile yaylacılığı da olumsuz etkilemiştir (FAO, 2020). Fiziksel mesafe ve ek kişisel koruyucu ekipman gereksinimlerinin bir sonucu olarak hayvan yemlerine erişimin azalması, endüstriyel yem işletmelerinin verimliliğini azaltmıştır

(FAO, 2020). Ayrıca veteriner hekimler tarafından hayvancılık yapan çiftçilere verilen hizmetler de kısıtlamalar nedeniyle kötü etkilenmiştir. Genel olarak, Gana'da da bazı hayvancılık işletmelerinin, nispeten düşük veteriner hekim sayısı ve yüksek hizmet ve ilaç maliyeti nedeniyle hayvanları için veterinerlik hizmetlerine erişemedikleri bildirilmiştir (Obese ve ark., 2021).

Hayvan Yemi Fiyatlarına Etkileri

Hayvancılığın hammaddesi olan yemlerin ithalat ve ihracatının yapılamaması hayvansal ürün pazarının daralmasına, hayvansal üretimin devamlılığı ve ürünlerin maliyetine zarar vermektedir. Karma yem sanayi bir ara sanayi dalıdır ancak hammaddesini daha çok bitkisel üretimden almakta ve nihai ürününü hayvansal üretime vermektedir. COVID-19 salgınının karma yem sektörü üzerindeki etkileri, hammadde temininde ve karma yem talebinin arzında yaşanan sorunlar olarak görülmektedir (Elleby ve ark., 2020).Defo Deeh ve ark., (2020) yaptıkları çalışmada; Türkiye'de mısır, arpa ve buğday fiyatlarının 2020 yılının Ocak ayından Haziran ayına kadar düştüğünü bildirmiştir. Aynı dönemde, tam yağlı soya küspesi, soya küspesi, kanola küspesi, ayçiçeği küspesi, pamuk tohumu küspesi, mısır glüteni yemi, buğday kepeği, razmol, melas ve kurutulmuş tahılların fiyatların da istikrarsızlık söz konusu olduğu bildirilmiştir. Örneğin, salgının başlangıcında (Ocak-Şubat 2020 arası) neredeyse sabit olan kurutulmuş tahılların fiyatı, Şubat'tan Nisan'a kadar artmış, ardından düşmeye başlamış ve Haziran 2020'de taban değerine ulaşmıştır, bu da üretim ve tüketim arasında bir dengeye işaret etmektedir. Buna ek olarak, melas fiyatı artmaya devam ederken, buğday kepeği ve razmol fiyatları düşmeye devam etmiştir. Melas için yüksek talep ve düşük üretimin yanı sıra buğday kepeği ve razmol için düşük talep sebebi ile satışlar azalmış ve fiyatların düşmesine neden olmuştur.

Yapılan başka bir çalışmada; yem ithalatı yapılamaması nedeniyle rasyonların istenildiği gibi hazırlanamadığı belirtilmiştir. Rasyon hazırlanırken dikkate alınan temel ilke, hayvanlara minimum maliyetle maksimum verim elde etmeleri için ihtiyaç duydukları karbonhidrat, protein, yağ, vitamin ve mineralleri vermektir. Hayvan yemlerinde temel besin maddelerinin bulunmaması nedeniyle hayvan başına verimliliğin düşmesi muhtemeldir (Defo Deeh ve ark., 2020).

Hayvan Yemleri ve Hayvansal Üretim Ürünlerinin Taşınmasına Etkileri

COVID-19 salgını sırasında, hayvansal üretim ürünleri de dahil olmak üzere hayvan yemleri ve gıdalarının taşınması birçok engelle karşılaşmıştır. Örneğin, Çin'de süt taşımacılığı sıkı karayolu trafik kontrolleri nedeniyle kesintiye uğramış ve bu da süt dampingine yol açmıştır (Xie ve ark., 2020). Ayrıca, Çin limanlarındaki insan gücü eksikliği, bazı limanların Çin'den

gelen gemilere uyguladığı denizde minimum süre gibi çeşitli faktörlere bağlı olarak deniz taşımacılığının ithalat ve ihracat zorlukları, Çin ile komşu ülkeler arasında hayvansal ürünlerin taşınmasını ciddi şekilde bozmuştur. Filipinler'de, işlenmek üzere hammadde taşıyan araçlardaki gecikmeden kaynaklanan et kıtlığı riski, hareket kısıtlaması durdurularak önlenmiştir. Avrupa Birliği ülkeleri içinde, üye ülkeler arasında sığır etinin %35'i ihraç edilmektedir. İhracat yasakları, Polonya'da fiyatların düşmesine neden olmuştur ve iç tüketim, üretimin yalnızca %15'ini temsil etmiştir. Latin Amerika'da, özellikle Arjantin ve Uruguay'da, hayvansal ürünlerin taşınması ve et ihracatı üzerindeki kısıtlamalar, çiftçilerin ve çiftçilerin gelirlerini düşürmüş ve birçoğunu işsizliğe sürüklemiştir. Batı Afrika'da, COVID-19 krizi nedeniyle hayvan yemi ithalatının kısıtlanması, kümes hayvanı ve domuz üretimini azaltmıştır (FAO., 2020).

COVID-19 Salgını Sonrası Hayvansal Ürünler Ekonomisine ve Geleceğine Etkileri

COVID-19 krizi sırasında pazarların kapanması, üretim ve tüketim arasında bir dengesizlik meydana getirerek talebin düşmesine, satışların düşmesine ve fiyatların düşmesine neden olmuştur. Birçok ülkede uygulanan hareket kısıtlaması, hayvansal üretim tesislerinde istihdam edilen işçi sayısının azalması (enfekte veya şüpheli işçilerin karantinaya alınması nedeniyle) üretim kapasitesini olumsuz etkilemiş ve ekonomik başarısızlığa neden olmuştur. Elleby ve ark., (2020) yaptıkları çalışmada IMF'nin 2020 ve 2021 yılları için ekonomik büyüme tahminleri üzerinde küresel bir tarım piyasası modeli kullanarak senaryo bazlı bir analiz yapmışlar ve ekonomik büyümedeki düşüşün 2020 yılında uluslararası et fiyatlarını %7-18, süt ürünlerini ise %4-7 oranında düşüreceği sonucuna varmışlardır.Hafez ve Attia, (2020) tarafından bildirildiği gibi, COVID-19 salgını sonrası gelecekte stratejik esas olarak hastalık kontrolüne odaklanılmalıdır. Örneğin, kümes hayvanı endüstrisinde, gıda kaynaklı ve zoonotik patojenlerin ortadan kaldırılması ve kontrolü büyük bir zorluk teşkil etmektedir. Ayrıca ülkeler, özellikle COVID-19 salgınından sonra, pazar, hayvan beslenmesi ve veterinerlik uygulamaları için ilaç ve aşı ruhsatlandırması ile ilgili mevzuatlarını senkronize etmelidir (Hafez ve Attia, (2020). Defo Deeh ve ark., (2019) yaptıkları çalışmada; COVID-19 krizinin hayvansal üretim üzerindeki etkisinin ciddi olduğunu belirtmişlerdir. Hayvansal üretim faaliyetlerinin sürdürülmesi öncelikli sektörler arasında görülmeli ve hükümetlerin kararları bu yönde olmalıdır. Ayrıca gıda maddesi veya ambalajı yoluyla hastalık bulaştığına dair bir kanıt bulunmamakla birlikte, tüketicilerin gıda maddelerinin tüketimine yaklaşımındaki endişeleri ortadan kaldırmak için mevcut hijyen kurallarının güçlendirilmesi ve daha özenli hale getirilmesi önemlidir. Hayvansal ürünlere olan talebi karşılamak ve ekonomiyi canlandırmak için, hayvan yemi ve diğer hammaddelere erişimin devlet bazında

çözülmesi esas olduğunu vurgulamışlardır. Endüstriyel hayvancılık da dahil olmak üzere hiçbir endüstri bu krize karşı bağışık değildir. COVID-19, hayvansal üretim uygulamalarının savunmasızlığını ortaya çıkarmış ve sistemik değişime olan acil ihtiyacı ortaya koymuştur (Garcés, 2020).

SONUÇ

Dünya genelinde yaşanan salgınlar tek bir ülkeyi değil tüm dünya ülkelerini etkilediği yaşanan COVID-19 salgını ile görülmüştür. Özellikle insan besin kaynaklarının tedariği ile yaşanan sorunlar farklı çözüm stratejileri geliştirilmesini gerekli kılmıştır. Hayvancılık sektöründe ihtiyaç duyulan tüm hammaddelerin temini ve nakliyesinde yaşanan aksamalar hayvansal üretimi olumsuz etkilemiştir. Hayvanların meraya nakliyesi ve otlatılmasında yaşanan kısıtlamalar ve insan işgücünde yaşanan sağlık problemleri hayvan temini ve yetiştiriciliğinin etkilenmesine neden olmuştur. İnsan beslenmesinde önemli olan protein kaynağının temininde hayvansal üretimin sürdürülebilirliği önemlidir. Bu yönüyle küresel salgınlarda hayvansal üretimin devamlılığını sağlamak için yem hammaddelerinin üretimi teşvik edilmeli, tedarik zincirlerinde aksama yaşanmaması için bölgesel yem depoları oluşturulmalıdır. Hayvanların otlatılmasında ihtiyaç duyulan çoban sorununun çözülmesi için bölgesel çoban birimleri geliştirilmelidir. Küresel salgınlara karşı hayvansal üretimin devamlılığını sağlamak ve elde edilen ürünlerin hijyenik koşullarda dağıtımı için stratejik programlar geliştirilmelidir. Gelecekte yaşanabilecek salgın veya iklimsel etkilere yönelik hayvan yetiştiriciliğinde tüm girdilerin temini için bölgesel depolar oluşturulmalı ve elde edilen ürünlerin değer fiyatla pazarlanması, nakliyesi için stratejik planlamalar yapılmalıdır.

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RATLARDA DERİ VE MESANE ÜZERİNE E VE D VİTAMİNLERİNİN ETKİSİ

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ÖZET
Vitamin E, normal reprodüksiyon, kas hareketleri ve daha pek çok vücut fonksiyonu için gerekli bir vitamindir. Daha çok kas membranında bulunan vitamin E'nin en aktif formu α-Tokoferol'dur. Aynı zamanda güçlü bir antioksidan olduğu da bilinmektedir. Steroid bir hormon ve yağda çözünen bir vitamin olan D vitamininin yapı ve benzerlik olarak iki türü bulunmaktadır. Eergokalsiferol (D_2 Vitamini) ve kolekalsiferol (D_3 Vitamini) aynı şekilde metabolize olduğundan dolayı D vitamini olarak ortak şekilde isimlendirilmektedir. Çalışmada, ağırlıkları yaklaşık 200-220 gram ağırlığında 8-10 haftalık Wistar Albino cinsi erişkin dişi rat kullanıldı. Hayvanlar standart pellet yem ve çeşme suyu ile beslendi ve oda ısısında, 12 saat aydınlık-12 saat karanlık periyodlar oluşturularak yetiştirildi. Hayvanlar kontrol ve deney grupları şeklinde belirlendi. Kontrol grubu için 1mg/kg serum fizyolojik enjekte edildi. Deney grubu hayvanlara ise intraperitonal 0.3 mg/kg dozunda E vitamin (d dl-alfa-tokoferil asetat) ve 1mcg/kg dozunda D_3 vitamin enjeksiyonu uygulandı. 24 saat sonrasında hayvanların deri ve mesane dokuları alındı. Doku örnekleri %10 tamponlanmış nötral formalin çözeltisinde tespit edildikten sonra parafin bloklardan 3 µm kalınlığında kesitler alındı, devamında örnekler picro serius red ve hematoksilen-eozin ile boyanarak uygun alanlardan fotoğraflar çekildi. Kontrol grubu ile deney grubu karşılaştırıldığında E ve D vitaminlerinin, ratların deri ve mesane bölgesinin özellikle kollajen lif alanları üzerinde etkili olduğu belirlendi.
Anahtar Kelimeler: E vitamini, D vitamini, Rat, Mesane, Deri

EFFECT OF VITAMINS E AND D ON SKIN AND BLADDER IN RATS

ABSTRACT
Vitamin E is an essential vitamin for normal reproduction, muscle movements and many other body functions. The most active form of vitamin E, which is mostly found in the muscle membrane, is α-Tocopherol. It is also known to be a powerful antioxidant. Vitamin D, a steroid hormone and a fat-soluble vitamin, has two types in terms of structure and similarity. Since ergocalciferol (Vitamin D_2) and cholecalciferol (Vitamin D_3) are metabolized in the same way, they are commonly called vitamin D. In the study, 8-10 week old Wistar Albino adult female rats weighing approximately 200-220 grams were used. The animals were fed with standard pellet feed and tap water and raised at room temperature with 12-hour light and 12-hour dark periods. Animals were determined as control and experimental groups. For the control group, 1mg/kg physiological saline was injected. Animals in the experimental group were administered intraperitoneal injection of vitamin E (dl-alpha-tocopheryl acetate) at a dose of 0.3 mg/kg and vitamin D_3 at a dose of 1mcg/kg. After 24 hours, the skin and bladder tissues of the animals were removed. After the tissue samples were fixed in 10% buffered neutral formalin solution, 3 µm thick sections were taken from paraffin blocks, then the samples were stained with picro serius red and hematoxylin-eosin and photographs were taken from appropriate areas. When the control group and the experimental group were compared, it was determined that vitamins E and D were effective on the skin and bladder area of the rats, especially on the collagen fiber areas.
Keywords: Vitamin E, Vitamin D, Rat, Bladder, Skin

GİRİŞ

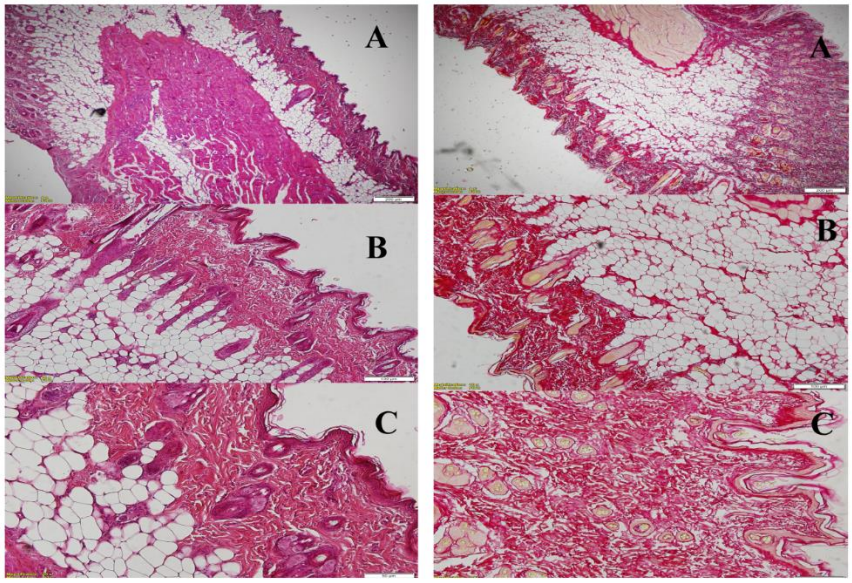
E vitamini, bitkiler tarafından üretilen ve birbirine benzer yapılara sahip 8 farklı vitamin formundan oluşmaktadır. Bu vitamin formları, trimetil, dimetil, monometil, tokoferol ve bunlara karşılık gelen tokotrienollerdir. Tokoferoller yüksek bitkiler gibi fotosentez yapan organizmalarda yoğun şekilde sentezlenmektedirler (Traber ve Arai, 1999). E vitaminin, hücresel ve moleküler etkileri, antioksidan olarak reaktif oksijen çeşitlerini ve nitrik oksiti temizlemektir (Traber ve Atkinson, 2007). Bununla beraber, spesifik enzimler ve transkripsiyon faktörleri ile de etkileşime girerek zar ve lipit alanları gibi hücresel yapıları korumanın yanısıra, hücre zarlarında bulunan uzun zincirli çoklu doymamış yağ asitlerinin bütünlüğünü korumak gibi görevleri de bulunmaktadır (Zingg ve Azzi, 2004). Optimum hücre fonksiyonu için oldukça önemli olan vitamin E'nin, reaktif oksijen molekülleri ile lipit hidroperoksitlerin hücresel ve doku konsantrasyonlarının ortadan kaldırılmasına katkı sağladığı bilinmektedir (Niu vd,. 2009). D vitaminin büyük bir kısmı, ultraviyole B (UVB) güneş ışığından, deride steroid öncüsü, , 7- dehidrokolesterol dönüşümü ile doğal şekilde elde edilirken besinlerden D vitamini oldukça az miktarda sağlanmaktadır (Z hou vd., 2019). Kalsiyum homeostazı ve sağlıklı iskelet gelişinde görev alan D vitamini, bağırsak, böbrek, paratiroid bezi ve kemik gibi dokularda da oldukça önemli işlev görmektedir (Bentes vd., 2018). Yağda çözünen bir vitamin olan D vitamini uzun bir yarı ömre sahip olmasının yanısıra vücut yağında depolanmaktadır (Holick vd., 2011). Çalışmamızda, vücut için önemli olan bu D ve E vitaminlerinin, deri ve mesane üzerinde herhangi bir etkisinin olup olmadığının belirlenmesi amaçlanmıştır.

YÖNTEM

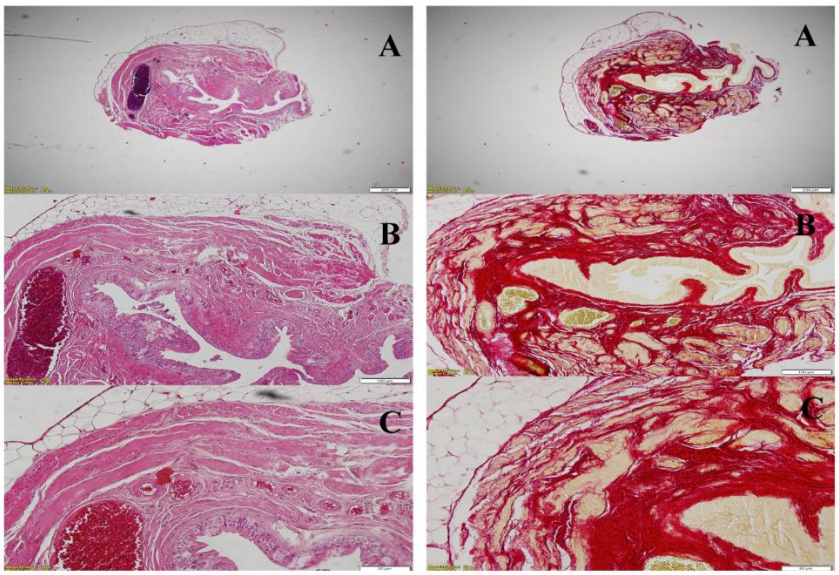
Çalışmada, ağırlıkları yaklaşık 200-220 gram ağırlığında 8-10 haftalık Wistar Albino cinsi 18 adet erişkin dişi rat kullanıldı. Hayvanlar standart pellet yem ve çeşme suyu ile beslenerek, oda ısısında, 12 saat aydınlık-12 saat karanlık periyodlar oluşturularak yetiştirildi. Hayvanlar deney ve kontrol grupları şeklinde 3 grup olarak belirlendi. Kontrol grubu hayvanlara 1mg/kg serum fizyolojik enjekte edildi. Deney grubu hayvanlara ise intraperitonal 0.3 mg/kg dozunda E vitamin (d dl-alfa-tokoferil asetat) ve 1mcg/kg dozunda D_3 vitamin enjeksiyonu uygulandı. 24 saat sonrasında hayvanlardan deri ve mesane dokuları alındı. Doku örnekleri %10 tamponlanmış nötral formalin çözeltisinde tespit edildikten sonra parafin bloklardan 3 µm kalınlığında kesitler alındı, devamında örnekler picro serius red ve hematoksilen-eozin ile boyanarak uygun alanlardan fotoğraflar çekildi.

BULGULAR

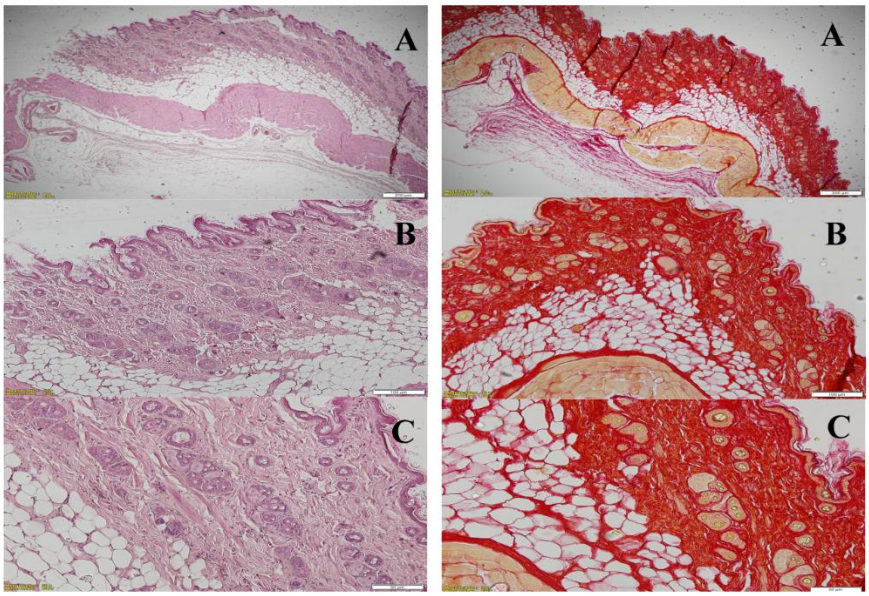
Kontrol ve deney grupları karşılaştırıldığında çeşitli farklılıklar bulundu. Kontrol grubu deri dokusu (Şekil 1), D ve E vitamin grubu ile karşılaştırıldığında D vitamin grubu dokusunda hipodermis alanlarında kontrole oranla azalma gözlenirken (Şekil 3), E vitamin grubunda da hipodermis alanlarıyla beraber kollajen lif alanlarında da azalma izlendi (Şekil 5). Kontrol grubu mesane dokusu (Şekil 2), D ve E vitamin grubu ile kıyaslandığında ise, her iki grubunda tunika muscularis eksterna tabakalarında azalmalar gözledi (Şekil 4,6).



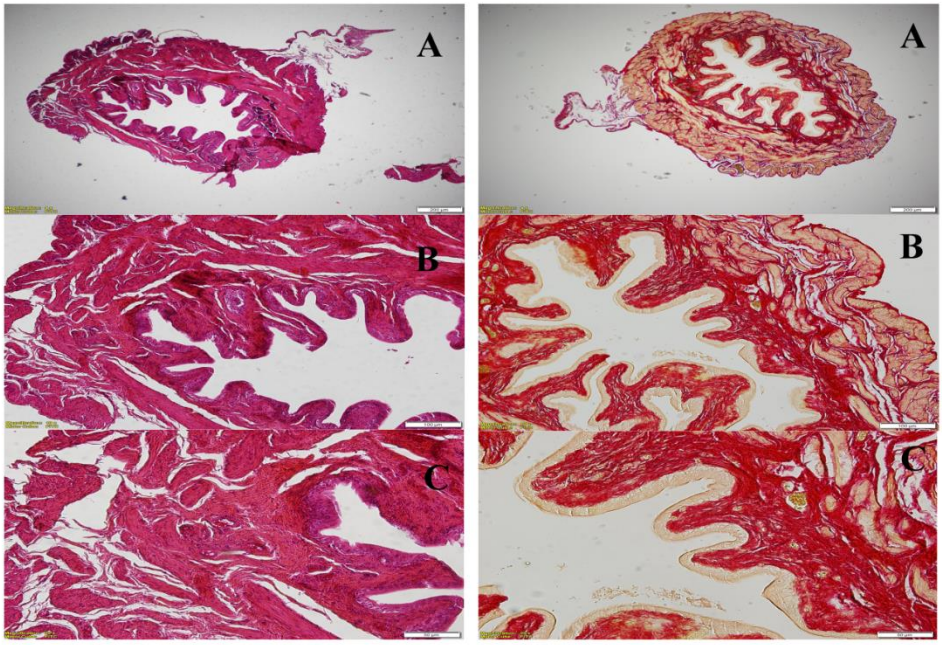
Şekil 1. Kontrol deri grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).



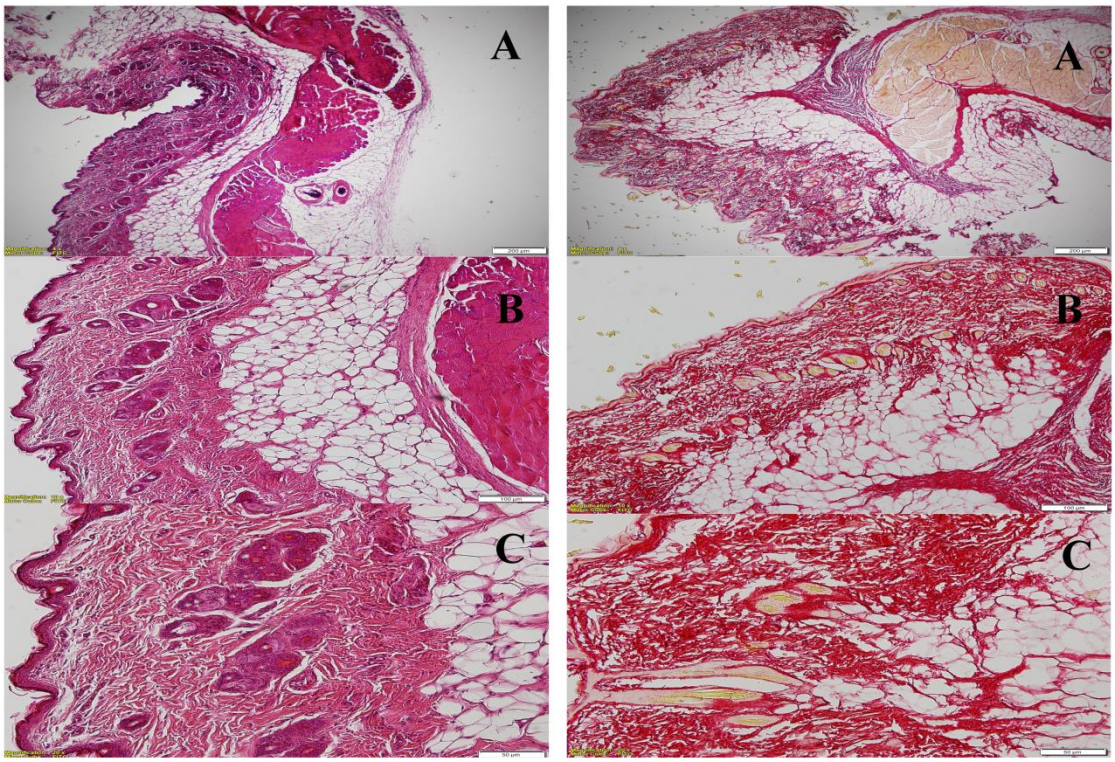
Şekil 2. Kontrol mesane grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).



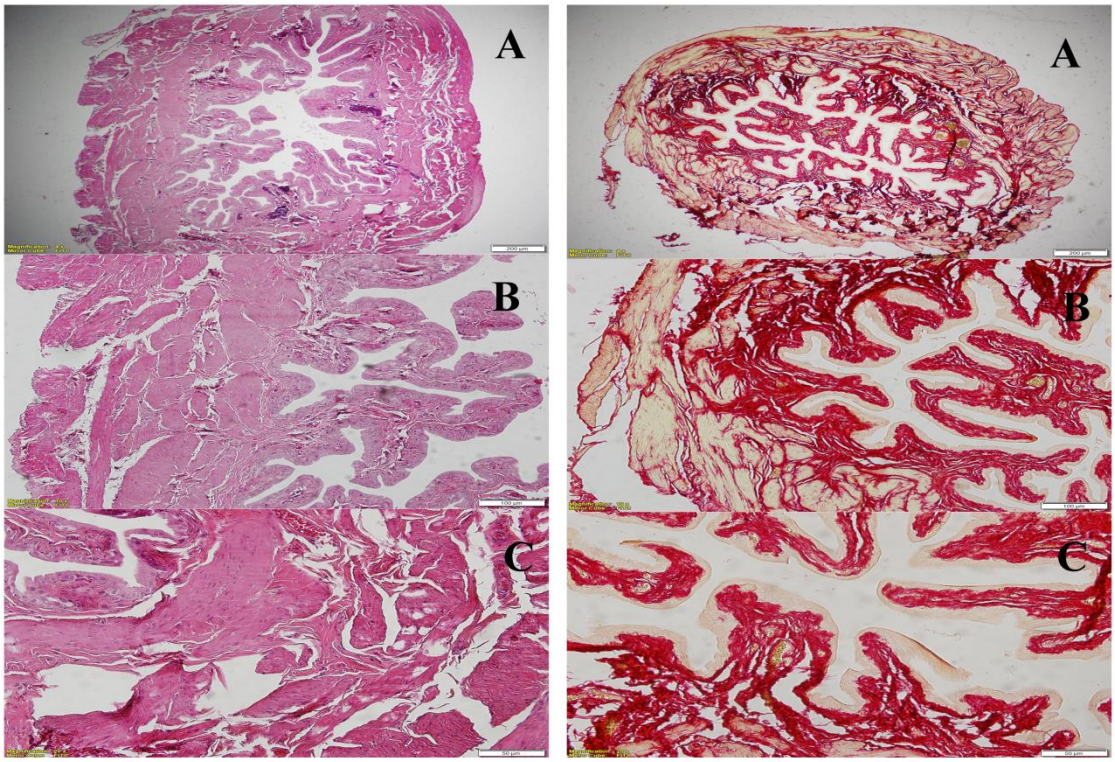
Şekil 3. D vitamini deri grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).



Şekil 4. D vitamini mesane grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).



Şekil 5. E vitamini deri grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).



Şekil 6. E vitamini mesane grubu, A) 4X, B)10X, C)20X, (H+E, Picro serius red).

TARTIŞMA

D vitamini kalsiyum ve fosfor metabolizmasının düzenlemesinde esas olarak rol oynayan bir hormon olmakla beraber stereoid ve yağda çözünen bir vitamindir (Chabas ve Alluin., 2008). Önemli görevleri arasında, kemik mineralizasyonu ve metabolizması, nöromüsküler fonksiyonlar ve kalsiyum fosfor dengesinin düzenlenmesi yer almaktadır (Sam ve Sitrin., 2008). D vitamini plazma membranının stabilizasyonunu sağlayarak lipid peroksidasyonunun azalmasında etkilidir. Oksidatif stres pekçok kronik hastalığın patofizyolojisinde rol almasına karşın, vitamin D ve oksidatif stres ilişkisini gösteren sınırlı veri mevcuttur (Salum vd.,2013). E vitamini, hücre zarında bulunan uzun zincirli çoklu doymamış yağ asitlerinin bütünlüğünü korurken biyoaktivitelerinin devamını da sağlamaktadır. Ayrıca, steroid hormon üreten dokularda yoğun şekilde yer almaktadır (Sen vd.,2008). Oksidadif stresin artış gösterdiği durumlarda α-tokoferol gibi antioksidanların hücre membranı ile ilişkili enzimlerin üzerinde etkili olarak aktivitelerini azaltması beklenmektedir. Dolayısıyla oksidadif stres düzeyi muhtemelen E vitaminin doku tarafından alınımını da etkilemektedir (Baldi., 2005). Dolayısıyla, bizim çalışmamızda, deney gruplarında vitamin E ve D'nin deri ve mesanede doku kayıplarına yol açmasının oksidadif stres ile ilişkili olabileceği fikri akla gelmektedir. Bu alanda yapılan sınırlı sayıda çalışma olmasından kaynaklı, oksidadif stres kaynaklı kollajen lif ve hipodermis bölgelerini indükleyebildiğini düşünmekteyiz. Bu bulguları doğrulayabilmek için daha fazla araştırma ve çalışmaya ihtiyaç vardır.

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INVESTIGATION OF B_c MESONS WITH DIFFERENT SPIN-PARITIES

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ABSTRACT

Masses *m* and decay constants *f* of the Bc mesons with quark content $b\bar{c}$ and spin-parities $J^P = 0^-, 0^+, 1^-$ and 1^+ are calculated in the QCD two-point sum rule framework. Computations are carried out by taking into account gluon condensates up to dimension 12. Obtained results for spectroscopic parameters of these mesons are compared with existing experimental data. They are also confronted with available theoretical predictions obtained using different methods.

Keywords: QCD sum rules, Mass and decay constant, Bottom-charm mesons, Quarkonia

INTRODUCTION

The charm-bottom mesons $\overline{b}$c with different spin-parities are very interesting objects for both theoretical and experimental investigations. They are composed of two heavy quarks of different flavors and occupy in hadron spectroscopy a place between charmonium and bottomonium systems. Their quark content $\overline{b}$c predetermines some features of these particles. Thus, because quark and antiquark of different flavors cannot annihilate into gluons, B_c mesons should have considerably longer lifetime than various charmonia and bottomonia states. The $\overline{b}$c mesons already were in the focus of attention of researches [1–9], but first observation of the pseudoscalar particles $B_c^{\pm}$ (1S) by the CDF Collaboration in the decays $B_c^{\pm}$ (1S) → J/$\psi l\pm X$ and $B_c^{\pm}$ (1S) → J/$\psi^{\pm}\overline{\nu}_l$ in $p\overline{p}$ collisions [10, 11] renewed this interest. The experimental studies of the Bc mesons were continued by CDF and other collaborations. Investigations were concentrated on measurements of the lifetime and mass of the meson B_c (1S) [12–16]. The first radially excited state B_c (2S) of the pseudoscalar meson $\overline{b}$c (and $\overline{c}$b) was fixed by the ATLAS Collaboration in the $B_c^{\pm}$ (2S) $\pi^+\pi^-$ invariant mass distribution [17]. Till now the Particle Data Group included into hadron spectroscopy only these ground-state pseudoscalar B_c (1S) and first radial excited B_c (2S) mesons [18]. At the same time, the charmonium and bottomonium states are represented there by numerous members. The discovery of the charm-bottom mesons triggering new publications devoted to analyses different aspects of B_c physics [19–32]. In these articles the authors employed numerous methods and models to calculate spectroscopic parameters of B_c mesons bearing different quantum numbers, to study their production mechanisms and possible decay channels. Investigations were performed using the potential model [5, 29], relativistic and relativized quark models [21, 22], QCD sum rule method [23–26, 30–32], lattice simulations [27], the light-front Hamiltonian formalism [28]. The spectroscopic parameters of B_c mesons, i.e., their masses and decay constants are necessary to investigate different strong and weak decays, radiative transitions of these particles. These parameters are also required to study other processes, for instance, decays of $bb\overline{cc}$ tetraquarks to Bc meson pairs [33–35]. In the present work, we calculate the masses and decay constants of the charm-bottom B_c mesons with spin-parities $J^P = 0^-, 0^+, 1^-$ and 1^+. We perform our analysis in the framework of QCD two-point sum rule method [36, 37], which is one of powerful techniques to study conventional hadrons. In computations we take into account gluon vacuum condensates up to dimension 12. This work is organized in the following manner. In Sec. II we study the mass and decay constant of the pseudoscalar B_c (1S) and scalar Bc(1^3P_0) mesons. The section

III is devoted to investigation of the vector and axial-vector mesons. In the lass section, we compare our results with experimental data, and theoretical predictions obtained in other publications for the same parameters by means of different methods.

II. MASS AND DECAY CONSTANTS OF THE PSEUDOSCALAR B_c (1S) AND SCALAR B_c (1^3P_0) MESONS

The mass $m_{PS(S)}$ and current couplings $f_{PS(S)}$ of the pseudoscalar (PS) and scalar B_c mesons are important parameters which appear as input quantities in calculation of different processes with these particles. The pairs of spectroscopic parameters m_{PS}, f_{PS} and m_S, f_S can be obtained using the QCD sum rule (SR) method [36, 37].

To determine the sum rules for these parameters, we consider the correlation function

$$\Pi(p) = i \int d^4x e^{ipx} < 0 \left|T\{J(x)J^{\dagger}(0)\}\right|0 > . \quad (1)$$

where J (x) is an interpolating current for one of these particles. The symbol T above indicates the time-ordering of two J (x) and $J^{\dagger}$ (0) currents' product.

In the case of the pseudoscalar particle the current J_{PS}(x) has the following form

$$J_{PS}(\mathrm{x}) = \overline{c}(\mathrm{x})\mathrm{i}\gamma_5\mathrm{b}(\mathrm{x}), \quad (2)$$

whereas J_S (x) is given by the expression

$$J_S(\mathrm{x}) = \overline{c}(\mathrm{x})\mathrm{b}(\mathrm{x}). \quad (3)$$

Let us consider in a detailed form the pseudoscalar mesons B_c (1S). Formulas for the scalar meson $B_c(1^3P_0)$ can be obtained from them after some replacements and modifications. The physical side of the sum rule $\Pi_{PS}^{Phys}(p)$ is

$$\Pi_{PS}^{Phys}(p) = \frac{\langle 0|J_{PS}|B_c(1S)\rangle\langle B_c(1S)|J_{PS}^{\dagger}|0\rangle}{m_{PS}^2 - p^2} + \cdots, \quad (4)$$

where the term presented explicitly is a contribution to $\Pi_{PS}^{Phys}(p)$ coming from the ground-state particle. Here, the dots indicate effects of higher resonances and continuum states.

We can rewrite $\Pi_{PS}^{Phys}(p)$ by employing the mass and decay constant of this particle. For these purposes, we use the following matrix element

$$\langle 0|J_{PS}|B_c(1S)\rangle = \frac{f_{PS}m_{PS}^2}{m_b+m_c}. \quad (5)$$

Having substituted this matrix element into $\Pi_{PS}^{Phys}(p)$, we get

$$\Pi_{PS}^{Phys}(p) = \frac{f_{PS}^2 m_{PS}^4}{(m_b+m_c)^2}\frac{1}{m_{PS}^2 - p^2} + \cdots . \quad (6)$$

The correlation function $\Pi_{PS}^{Phys}(p)$ has a trivial Lorentz structure which is proportional to I, therefore the right-hand side of Eq. (6) constitutes the invariant amplitude $\Pi_{PS}^{Phys}(p^2)$ required for our analysis.

The QCD side $\Pi_{PS}^{OPE}(p)$of the SR should be computed in terms of quark propagators with certain accuracy in the operator product expansion (OPE). In the case of the PS meson the correlator $\Pi_{PS}^{OPE}(p)$ is given by the expression

$$\Pi_{\mathrm{PS}}^{\mathrm{OPE}}(p) = i \int d^4x e^{ipx}\, Tr\left[\gamma_5 S_b^{ab}(x)\gamma_5 S_c^{ba}(-x)\right], \tag{7}$$

where $S_{b(c)}(x)$ are b and c-quark propagators (Q = b, c)

$$S_Q^{ab}(x) = i\int \frac{d^4k}{(2\pi)^4} e^{-ikx}\left\{\frac{S_{ab}(\not{k}+m_Q)}{k^2-{m_Q}^2} - \frac{g_s G_{ab}^{\alpha\beta}}{4}\frac{\sigma_{\alpha\beta}(\not{k}+m_Q)+(\not{k}+m_Q)\sigma_{\alpha\beta}}{(k^2-{m_Q}^2)^2}\right.$$
$$+\frac{{g_s}^2 G^2}{12}\delta_{ab}m_Q\frac{k^2+m_Q\not{k}}{(k^2-{m_Q}^2)^4}$$
$$\left.+\cdots\right\}. \tag{8}$$

In Eq. (8), we introduced the notations

$$G_{ab}^{\alpha\beta} = \frac{G_A^{\alpha\beta}\lambda_{ab}^A}{2},\quad G^2 = G_{\alpha\beta}^A G_A^{\alpha\beta}, \tag{9}$$

with $G_A^{\alpha\beta}$being the gluon field-strength tensor. Above λ^A are the Gell-Mann matrices and index A runs in the range 1, 2, ...8.

The $\Pi_1^{OPE}(p)$ has also simple Lorentz structure and is characterized by the invariant amplitude $\Pi_{PS}^{OPE}(p^2)$. The SRs for the m_{PS} and f_{PS} are derived by equating the invariant amplitudes $\Pi_{PS}^{OPE}(p^2)$ and $\Pi_{PS}^{Phys}(p^2)$, applying the Borel transformation to obtained equality and performing continuum subtraction using the assumption on quark-hadron duality [36, 37]. Then, it is not difficult to find that

$$\frac{f_{PS}^2 m_{PS}^4}{(m_b+m_c)^2} e^{-m_{PS}^2/M^2} = \Pi_{PS}(M^2, s_0), \tag{10}$$

where $\Pi_{PS}(M^2, s_0)$ is the amplitude $\Pi_{PS}^{OPE}(p^2)$ after the Borel transformation and continuum subtraction operations. Here, $M^2$and s_0 are the Borel and continuum subtraction parameters, respectively.

The equality Eq. (10) allows one to determine the mass and decay constant of interest

$$m_{PS}^2 = \frac{\Pi'_{PS}(M^2, s_0)}{\Pi_{PS}(M^2, s_0)}, \tag{11}$$

and

$$f_{PS}^2 = \frac{(m_b+m_c)^2}{m_{PS}^4} e^{\frac{m_{PS}^2}{M^2}} \Pi_1(M^2, s_0). \quad (12)$$

In Eq. (11) a symbol $\Pi'_{PS}(M^2, s_0) = d\Pi_{PS}(M^2, s_0)/d(-1/M^2)$ is used.

The amplitude $\Pi_{PS}(M^2, s_0)$ has the form

$$\Pi_{PS}(M^2, s_0) = \int_{4M^2}^{s_0} ds\, \rho_{PS}^{OPE}(s) e^{-s/M^2} + \Pi_{PS}(M^2), \quad (13)$$

where $M = (m_b + m_c)$, and $\rho_{PS}^{OPE}(s)$ is a two-point spectral density which is determined as an imaginary part of the invariant amplitude $\Pi_{PS}^{OPE}(p^2)$.The term $\Pi_{PS}(M^2)$ stands for nonperturbative contributions extracted directly from $\Pi_{PS}^{OPE}(p^2)$.Explicit expressions of the functions $\rho_{PS}^{OPE}(s)$ and $\Pi_{PS}(M^2)$ are rather lengthy, therefore we do not provide them here.

The sum rules for m_{PS} and f_{PS} contain as input parameters the gluon condensates and masses of b and c quarks. Below, we present their numerical values

$$\langle \alpha_s G^2/\pi \rangle = (0.012 \pm 0.004)\text{GeV}^4, \langle g_s^3 G^3 \rangle = (0.57 \pm 0.29)\text{ GeV}^6$$

$$m_c = (1.27 \pm 0.02)\text{GeV}, m_b = 4.18^{+0.03}_{-0.02}\, GeV. \quad (14)$$

Equations (11) and (12) depend also on the parameters $M^2$and s_0 which have to be fixed to satisfy constraints of SR computations. Stated differently, they should ensure the dominance of the pole contribution (PC) in physical quantities extracted from the sum rules. For SR analysis are important convergence of the OPE and stability of obtained results on M^2, as well. We define the pole contribution through the formula

$$PC = \frac{\Pi(M^2, s_0)}{\Pi(M^2, \infty)}. \quad (15)$$

Convergence of OPE can be estimated by means of the expression

$$R(M^2) = \frac{\Pi^{\text{DimN}}(M^2, s_0)}{\Pi(M^2, s_0)}, \quad (16)$$

where $\Pi^{DimN}(M^2, s_0) = \sum_{N=8,10,12} \Pi^{DimN}$ is a sum of last three terms in OPE which are proportional to $\langle g_s^2 G^2 \rangle^2$, $\langle g_s^2 G^2 \rangle \langle g_s^3 G^3 \rangle$ and $\langle g_s^3\, G^3 \rangle^2$, respectively.

Numerical computations prove that in the case of the PS meson the regions

$$M^2 \in [10, 12]\, GeV^2, s_0 \in [47, 49]\text{ GeV}^2, \quad (17)$$

satisfy all requirements of SR calculations. Indeed, at M^2= 12 GeV^2 and M^2 = 10 GeV^2 on the average in s_0 the pole contribution is PC ≈ 0.52 and PC ≈ 0.62, respectively. Dependence of PC on the Borel parameter M^2 is plotted in Fig. 1.

The mass m_{PS} and current coupling f_{PS} are evaluated as mean values of these quantities over the regions Eq. (17): They are equal to

$$m_{PS} = (6270 \pm 46)\, MeV, f_{PS} = (395 \pm 14)\, MeV, \quad (18)$$

respectively. The results in Eq. (18) correspond to the SR predictions at the point M^2= 11 GeV^2 and s_0 = 48 GeV^2. At these values of M^2 and s_0 the pole contribution is PC$_S$ ≈ 57, which ensures its dominance in the results, and proves ground-state nature of B_c (1S). The mass and decay constant of the pseudoscalar B_c (1S) meson are plotted in Figs. 2 and 3, respectively.

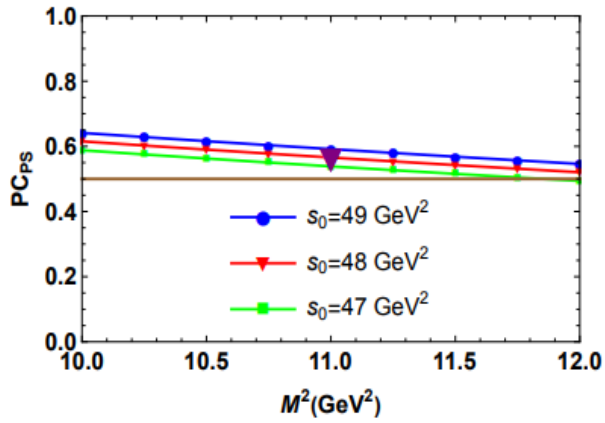


FIG. 1: *The pole contribution PC$_{PS}$ of the pseudoscalar meson B_c as a function of the Borel parameter M^2 at different s_0. The triangle marks the point, where the mass m_1 has been computed.*

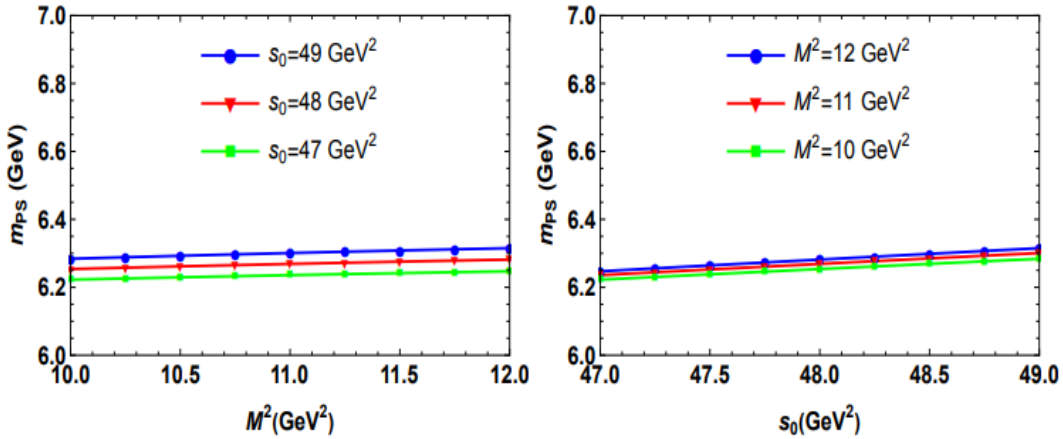


FIG. 2: *Mass (m_{PS} of the pseudoscalar meson B_c(1S) as a function of the Borel M^2 (left panel), and continuum threshold s_0 parameters (right panel*).

In the case on the scalar meson $B_c(1^3 P_0)$ the differences which should be taken into account are connected with the QCD side of the sum rules, as well as with matrix element of this meson. Thus, the correlation function Eq. (1) for the current $J_2(x)$ takes the form

$$\Pi_S^{OPE}(p) = i \int d^4 x e^{ipx} Tr\left[S_b^{ab}(x) S_c^{ba}(-x)\right]. \quad (19)$$

The matrix element of this meson is

$$\langle 0|J_S|B_c(1^3P_0)\rangle = f_S m_S, \quad (20)$$

with m_S and f_S being the mass and decay constant of $B_c(1^3 P_0)$, respectively. The matrix element Eq. (20) modifies the SR for the decay constant f_s which now is given by the expression

$$f_s^2 = \frac{e^{\frac{m_S^2}{M^2}}}{m_S{}^2} \Pi_S(M^2, s_0), \quad (21)$$

where $\Pi_S(M^2, s_0)$ is a scalar counterpart of the amplitude $\Pi_{PS}(M^2, s_0)$. It is worth noting that the SR for the mass m_S preserves its standard form Eq. (11) with evident replacement $\Pi_{PS}^{(\prime)}(M^2, s_0) \to \Pi_S^{(\prime)}(M^2, s_0)$.

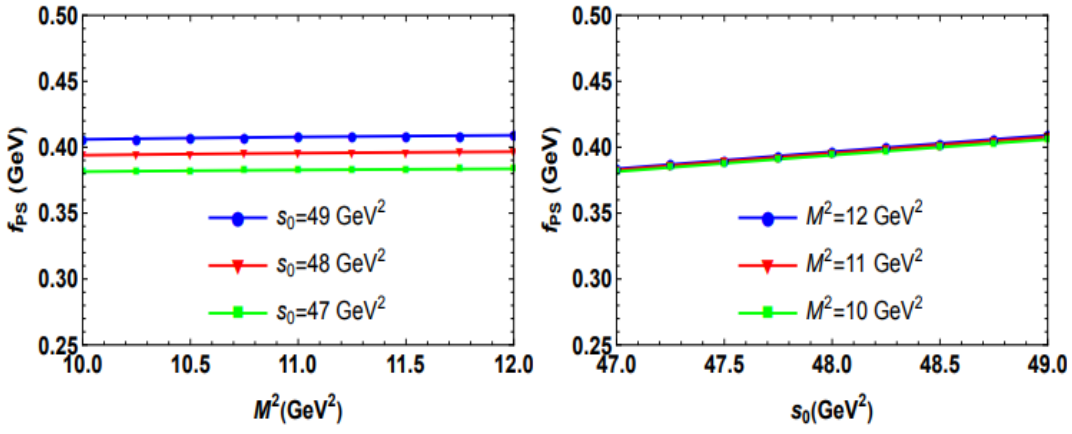


FIG. 3: *Dependence of the pseudoscalar B_c (1S) meson's decay constant f_{PS} on the Borel parameter M^2 (left panel), and on the threshold s_0 of the continuum subtraction (right panel).*

Numerical analyses lead to following working windows for M^2 and s_0

$$M^2 \in [10.5, 12.5]\, GeV^2\,,\ s_0 \in [55, 57]\, GeV^2, \quad (22)$$

where the pole contribution changes within limits

$0.63 \geq \text{PC} \geq 0.53.$ (23)

The mass and decay constant of the meson $B_c(1^3P_0)$ extracted using the regions Eq. (22) are

$$m_S = (6675 \pm 61)\text{MeV},\ f_S = (365 \pm 17)\text{MeV}\,. \quad (24)$$

III. SPECTROSCOPIC PARAMETERS THE VECTOR B_c^* AND AXIAL-VECTOR $B_c(1^1P_1)$ MESONS

The SRs for the spectroscopic parameters of the vector and axial-vector mesons B_c can be obtained from analyses of the correlation function

$$\Pi_{\mu\nu}(p) = i \int d^4x e^{ipx} < 0 \left|T\{J_\mu(x)J_\nu^\dagger(0)\}\right|0 >, \quad (25)$$

where now $J_\mu(x)$ is interpolating current for these mesons. In the case of the vector particle it is determined by the formula

$$J_\mu^V(x) = \bar{b}(x)\gamma_\mu c(x), \quad (26)$$

whereas for the axial-vector meson we have

$$J_\mu^{AV}(x) = \bar{b}(x)\gamma_\mu\gamma_5 c(x). \quad (27)$$

Let us consider the vector meson B_c^* in a detailed way. The phenomenological side of the SRs are determined by the expression

$$\Pi_{\mu\nu}^{Phys}(p) = \frac{f_V^2 m_V^2}{m_V^2 - p^2}\left(-g_{\mu\nu} + \frac{p_\mu p_\nu}{m_V^2}\right) + \cdots . \quad (28)$$

Here, m_V and f_V are the mass and decay constant of the meson. To calculate Eq. (28), we make use of the matrix element

$$\langle 0\left|J_\mu^V(x)\right|B_c^*\rangle = f_V m_{V\epsilon_\mu}, \quad (29)$$

with ϵ_μ being the polarization vector of $\boldsymbol{B_c^*}$ .The correlator $\Pi_{\mu\nu}^{Phys}(p)$ consists of two terms proportional to $g_{\mu\nu}$ and $p_\mu p_\nu$, respectively. Because the term $\sim g_{\mu\nu}$ receives contributions only from spin-1 particles, we use this term and corresponding invariant amplitude $\Pi_V^{Phys}(p^2)$ for our further studies.

The QCD side of the SRs is given by the formula

$$\Pi_V^{OPE}(p) = i \int d^4x e^{ipx}\, Tr\left[\gamma_\mu S_b^{ab}(x)\gamma_\nu S_c^{ba}(-x)\right]. \quad (30)$$

Standard SR analysis leads to the following regions for the Borel and continuum subtraction parameters

$M^2 \in [13, 15]\ \text{GeV}^2$, $s_0 \in [52, 53]\ \text{GeV}^2$, (31)

where PC varies inside of the borders

$0.60 \geq \mathrm{PC} \geq 0.52.$ (32)

The mass and decay constant of the vector meson B_c^* read

$$m_V = (6323 \pm 48)\mathrm{MeV} \ , \ f_V = (517 \pm 12)\ \mathrm{MeV}. \quad (33)$$

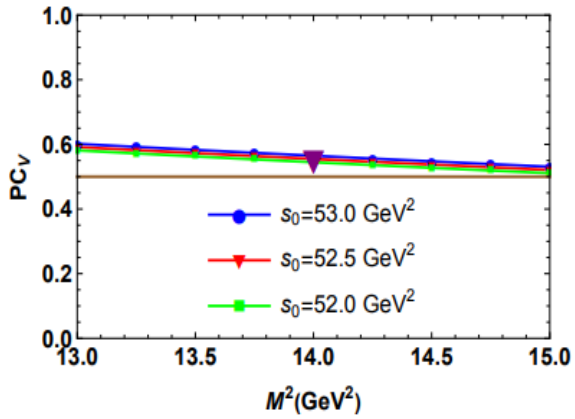


FIG. 4: *The pole contribution PC_V of the vector meson B_c^* as a function of the Borel parameter M^2. The triangle notes the position M^2=14 GeV^2, s_0=52.5 GeV^2, where the mass m_V has been computed. At this point PC_V=0.56*

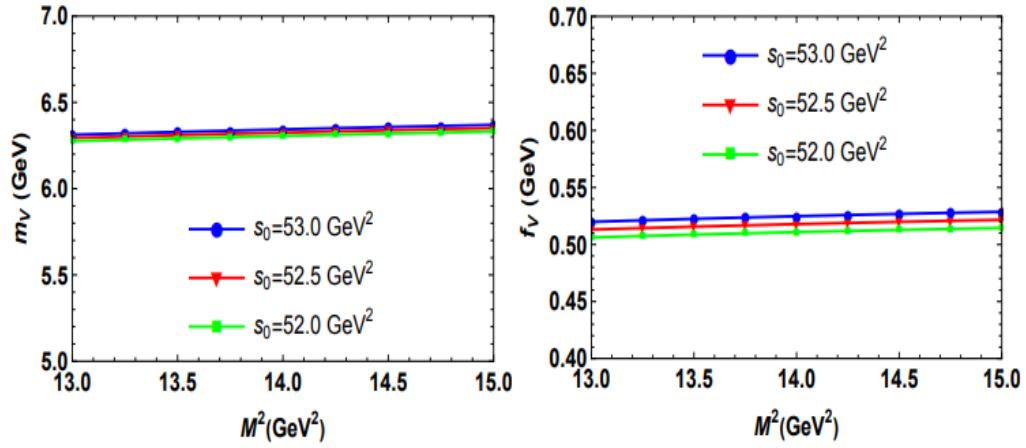


FIG. 5: *Mass m_V (left) and decay constant f_V (right) of the vector meson B_c^* as a function of the Borel parameter M^2.*

The similar investigations can be carried out for the axial-vector meson $B_c(1^1P_1)$. Omitting further details, we provide only the windows for M^2 and s_0

$$M^2 \in [11, 13]\ \mathrm{GeV}^2 \ , s_0 \in [57, 59]\ \mathrm{GeV}^2, \quad (34)$$

J^{PC}	This work	[22]	[21]	[27]	[29]	[32]
0^-	6270 ± 46	6271	6270	$6276 \pm 3 \pm 6$	6275	6274 ± 54
0^+	6675 ± 61	6706	6699	$6712 \pm 18 \pm 7$	–	6702 ± 60
1^-	6323 ± 48	6338	6332	$6331 \pm 4 \pm 6$	6329	–
1^+	6739 ± 61	6750	6734	$6736 \pm 17 \pm 7$	–	–

TABLE I: *Masses (in MeV units) of the $\bar{b}c$ mesons predicted in this work and in other publications.*

and spectroscopic parameters of $B_c(1^1P_1)$

$$m_{AV} = (6739 \pm 61)\text{MeV}, \quad f_{AV} = (334 \pm 15)\text{MeV}. \tag{35}$$

IV. ANALYSIS AND CONCLUSIONS

In the present work, we have calculated the masses and decay constants of B_c mesons with the quark content $b\bar{c}$ and quantum numbers $J^P = 0^-, 0^+, 1^-$ and 1^+. Investigations have been performed in the QCD two-point sum rule framework, in which contributions of the gluon condensates up to dimension 12 have been taken into account.

It should be noted that experimental information about charm-bottom mesons is limited by masses of the pseudoscalar particle $B_c(1S)$ and its first radial excitation $B_c(2S)$. Our result m_{PS} nicely agrees with the mass

$$m_{B_c(1S)} = 6274.47 \pm 0.27 \pm 0.17 \tag{36}$$

of the meson $B_c(1S)$.

In Table I, we have presented the masses of the different $b\bar{c}$ mesons obtained in the present work and in other articles. As is seen, there are some differences between them but, in general, within errors of the methods they agree with each another.

Situation changes when one compares predictions for the decay constants of the B_c mesons. It is enough to analyze the decay constant of the best-studied pseudoscalar meson $B_c(1S)$. In the present work, we extracted the parameter f_{PS} = (395±14) MeV. The same decay constant in Refs. [4, 6, 31, 32] was found equal to (360 ±60) MeV, (360 ± 65) MeV, (371 ± 17) MeV and (371 ± 37) MeV, respectively. It is worth emphasizing that these estimates were made using the QCD sum rule method, and there are wide overlapping regions between them. In the case of the present work and Ref. [32] one can see full overlapping of this parameter. It is also interesting to note decreasing of errors in the decay constant by increasing accuracy of calculations.

The f_{PS} was computed also in the context of other approaches. For example, it was evaluated in the potential model [29] and found equal to 498 MeV. In the light-front formalism it was estimated as (523 ± 62) MeV [28].

It is clear that there are not a mutual agreement about decay constants of the charm-bottom mesons. Because these quantities determine widths of weak and strong decays, and radiative

transitions of B_c mesons, as well as widths of other hadronic processes, there is a necessity to improve accuracy of analyses and reach an agreement between outputs of different methods.

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SAĞLIK ÜZERİNE ETKİLERİ AÇISINDAN BOR MİNERALİ

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ÖZET
Kimyasal gösterimi B olan ve periyodik cetvelin 3A grubu 2. periyodunda yer alan bor minerali doğada borat ve borik asit formunda bulunmaktadır. Besinsel kaynakları bazı meyveler (ananas, üzüm, vişne, avokado, kayısı, vs.), sebzeler (taze fasulye, brokoli, vs.) ve sert kabuklu meyvelerdir (ceviz, fındık, badem, yer fıstığı, vs.). İnsan vücudunda biriktiği doku ve organlar ise karaciğer, beyin, kemik, adipoz doku ve beyin omurilik sıvısı olarak sıralanabilir. Bor vücuttaki önemli metabolik işlevlerde görev alır. Bu nedenle sistemsel olarak geniş bir etki alanına sahiptir. Kas-iskelet, üreme ve sinir sistemleri borun etkili olduğu yapıların başlıcalarıdır. D vitamini, fosfor, kalsiyum ve magnezyum emilimleri arasındaki dengeyi sağlar. Kemik dokusunu oluşturan temel bileşenlerin kalsiyum ve fosfat olduğu dikkate alındığında bor yetersizliğinin kemik mineralizasyon bozuklukları ile sonuçlanması kaçınılmazdır. Menopoz dönemi sonrası düzenli olarak bor alımının anti-osteoporotik etki gösterdiği bildirilmiştir. Kadınlarda testosteron ve 17-β-östradiol, erkeklerde ise testosteron seviyelerini iyileştirdiğine ilişkin bulgular mevcuttur. Bor yetersizliği azalmış beyin elektriksel aktivitesi, kısa süreli hafıza kayıpları, bozulmuş dikkat ve algı problemleri ve hızlı motor aktivite ile ilişkili bulunmuştur. Tüm bu sağlık etkilerinin yanı sıra immünmodülatör, antimikrobiyal ve antioksidan fonksiyonlar açısından da yararlı bulunmuştur. İmmün yanıtta görev alan mediyatörlerden biri olan tümör nekroz faktör-α (TNF-α) üretiminde etkilidir. Bor yetersizliğinde bakteriyel antijenlere karşı oluşan immün yanıtın baskılandığı bildirilmiştir. Bor içeren biyoaktif bileşenlerden olan boromisin bazı mantarlara ve gram (+) bakterilere karşı etkili bulunmuştur. Ayrıca indirgenmiş glutatyon miktarını artırarak antioksidatif sisteme katkı sunmaktadır. Son olarak çeşitli kanser türleri üzerine koruyucu ve tedavi edici etkilerinin olduğu bilinmektedir. Bor bileşiklerinin sentezi ile ilgili dikkat çeken tedavi yöntemlerinden biri olan bor nötron yakalama terapisi nöroonkolojide kullanılmaktadır. Amerika Birleşik Devletleri Tıp Enstitüsü Gıda ve Beslenme Kurulu bor minerali için tolere edilebilir üst alım düzeyini 20 mg/gün olarak, Dünya Sağlık Örgütü ise 0,4 mg/kg/gün olarak belirlemiştir. Öte yandan oral yolla alınan borik asidin en düşük öldürücü dozu 640 mg/kg olarak saptanmıştır. Çalışmalar borun çok yüksek dozlarda olmadığı sürece genel sağlık açısından yararlı olduğuna işaret etmektedir. Yine de bu yararlı etkilere ilişkin kanıt düzeyi yeterli değildir ve daha ileri çalışmaların yürütülmesi önemlidir.
Anahtar kelimeler: Bor, borat, borik asit, kas-iskelet sistemi, sinir sitemi, kanser.

BORON MINERAL IN TERMS OF ITS EFFECTS ON HEALTH

ABSTRACT

The mineral boron, which has the chemical designation B and is located in group 3A, period 2 of the periodic table, occurs in nature in the form of borate and boric acid. Dietary sources include some fruits (pineapples, grapes, cherries, avocados, apricots, etc.), vegetables (green beans, broccoli, etc.) and nuts (walnuts, hazelnuts, almonds, peanuts, etc.). The tissues and organs where it accumulates in the human body are liver, brain, bone, adipose tissue, and cerebrospinal fluid. Boron is involved in important metabolic functions in the body. Therefore, it has a wide range of systemic effects. Musculoskeletal, reproductive, and nervous systems are the main structures where boron is effective. It provides the balance between vitamin D, phosphorus, calcium, and magnesium absorption. Considering that the basic components of bone tissue are calcium and phosphate, it is inevitable that boron deficiency will result in bone mineralization disorders. It has been reported that regular boron intake after menopause has anti-osteoporotic effect. There are findings that it improves testosterone and 17-β-estradiol levels in women and testosterone levels in men. Boron deficiency has been associated with decreased brain electrical activity, short-term memory loss, impaired attention and perception problems, and rapid motor activity. In addition to all these health effects, it has also been found to be beneficial in terms of immunomodulatory, antimicrobial, and antioxidant functions. It is effective in the production of tumor necrosis factor-α, one of the mediators involved in the immune response. It has been reported that the immune response against bacterial antigens is suppressed in boron deficiency. Boromycin, one of the bioactive components containing boron, was found to be effective against some fungi and gram (+) bacteria. It also contributes to the antioxidative system by increasing the glutathione level. Finally, it is known to have protective and therapeutic effects on various cancer types. Boron neutron capture therapy, one of the remarkable treatment methods related to the synthesis of boron compounds, is used in neuro-oncology. The Food and Nutrition Board of the United States Institute of Medicine has set the upper tolerable intake level for boron at 20 mg/day and the World Health Organization at 0.4 mg/kg/day. On the other hand, the lowest lethal dose of boric acid taken orally has been determined as 640 mg/kg. Studies indicate that boron is beneficial for general health as long as it is not in very high doses. However, the level of evidence for these beneficial effects is insufficient and further studies are important.

Keywords: Boron, borate, boric acid, musculoskeletal system, nervous system, cancer.

Giriş

Kimyasal gösterimi B olan ve periyodik cetvelin 3A grubu 2. periyodunda yer alan bor minerali doğada serbest olarak bulunmamaktadır. Su ve toprakta borat ve borik asit formunda bulunan bor minerali daha çok olumsuz etkileri ile bilinse de 20. yüzyılın sonlarından itibariyle beslenme ve klinikteki önemi gündem oluşturmaya başlamıştır. Bor mineralinin besinsel kaynakları meyveler (elma, kayısı, üzüm, muz, avokado, vs.), sebzeler (domates, kereviz, taze fasulye, brokoli, vs.), sert kabuklu ve kuru meyveler (kuru üzüm, badem, ceviz, fındık, yer fıstığı, vs.) gibi bitkisel gıdalardır (Söğüt & Acar 2020). Bor canlı fizyolojisi için önemli bir yeri olan dinamik bir besin ögesidir. Bazıları sürpriz sayılabilecek etkilerinin ortaya çıkması bu eser elementin önemini daha da belirginleştirmiştir. RNA'nın ana bileşeni olan ribozu stabilize etmesi önemlidir (Khaliq ve ark. 2018).Bor ^{10}B ve ^{11}B olmak üzere iki izotopa sahip olup, özellikle ^{10}B olağanüstü bir nötron emicidir (Panza & Prosperi 2012; Smith & McBroom 2000). Türkiye, Brezilya, Rusya, Çin ve Amerika Birleşik Devletleri'nin (ABD) batısı bor rezervleri bakımından zengindir. Dünyanın en büyük bor yatakları Akdeniz ülkelerinden Kazakistan'a kadar uzanan topoğrafik bir bölgede bulunur (Kabu & Akosman 2013; Smith & McBroom 2000). Mevcut ticari bor rezervlerinin %73.4'üne sahip olan Türkiye dünyanın en büyük bor ürünleri tedarikçisidir (TENMAK BOREN, 2017).Yaklaşık %85-90'ı hiçbir değişime uğramadan idrarla atılan borun geriye kalan kısmı borat olarak bağırsaklardan emilir. İnsan vücudunda biriktiği doku ve organlar ise karaciğer, beyin, kemik, adipoz doku ve beyin omurilik sıvısı olarak sıralanabilir (Söğüt & Acar 2020). Borun, çeşitli reaksiyonların sentezinde ve metabolizmasında rol oynayan hidroksilasyon reaksiyonlarına katıldığı bilinmektedir (Kabu & Civelek 2012). Büyüme ve gelişmede dolaylı olarak aldığı rol önemlidir. D vitamini, fosfor, kalsiyum ve magnezyum emilimleri arasındaki dengeyi sağlar. Kemik dokusu sağlığı için elzem olan bu minerallerin düzeylerini etkileyebilmesi borun ne denli esansiyel olduğunu göstermektedir (Pizzorno 2015). Bor artrit için etkili bir tedavi seçeneği olarak sunulmaktadır. Kemik, eklem ve kıkırdağa kalsiyum entegrasyonunu etkili bir şekilde artırır (Devirian & Volpe 2003). Bazı kan koagülasyon faktörlerini etkilediği ve kalp yetmezliği üzerine olumlu etki gösterdiği bildirilmiştir. Kolesterolün uzaklaşmasını sağlayarak lipit birikiminin azalmasını destekler. Böylece pıhtı oluşumu, ateroskleroz, kalp krizi ve felç riskini azaltır (Moustafa 2015). Cinsiyet hormonlarını artırması, hafıza, algı ve motor aktiviteyi etkilemesi bu eser elementin üreme ve sinir sisteminde de etkili olduğunu göstermektedir (Kuru & Yarat 2017; Naghii ve ark. 2011). Ayrıca immüniteyi güçlendirip ve oksidatif stresi azaltır (Söğüt & Acar 2020). Borat yara ve genotoksisiteye karşı ve mitokondriyal membran modülasyonunda anti-

inflamatuar ve antioksidan ajan olarak etkinlik gösterir (Khaliq ve ark. 2018). Son zamanlarda kanser tedavisinde kullanımı ile gündeme gelmiştir (Söğüt & Acar 2020). Mevcut metin kapsamında bor mineralinin organsal ve sistemsel düzeyde insan sağlığı üzerine etkilerinin ilgili literatür ışığında derlenmesi amaçlanmıştır.

Bor ve Kemik Sağlığı

Bor minerali kemiklerin metabolizmasında, mineralizasyonunda ve rejenerasyonunda önemli bir role sahiptir (Khaliq ve ark. 2018). Kemik metabolizmasında görevli olan magnezyum, D vitamini ve kalsiyum ile etkileşime girer (Devirian & Volpe 2003). Kalsiyum ve magnezyum homeostazı ile olan bu sinerjistik ilişkisi sayesinde kemiklerin güçlenmesine katkı sağlar (Nielsen & Shuler 1992). Borun kalsiyum akışı yoluyla osteoblastik aktiviteyi hızlandırdığı saptanmıştır (Capati ve ark. 2016). Bir bitki-mineral formülasyonu olan kalsiyum fruktoboratın serum C-reaktif protein düzeylerini azalttığı ve inflamasyonu kontrol altına alarak kemik gücünü artırdığı belirtilmiştir (Scorei & Scorei 2013). Borun osteoblast proliferasyonu ve sağkalımının yanı sıra MC3T3-E1 (osteoblast proteini) mRNA ekspresyonu ve mineralizasyon açısından fayda sağladığı bildirilmiştir (Hakki ve ark. 2010).Bor yetersizliği anormal kemik gelişimi ile sonuçlanabilir (Devirian & Volpe 2003). Borun osteoblast aktivitesinde kemik gelişimini teşvik etmedi rol oynayabileceği düşünülmektedir (Gorustovich ve ark. 2008). Borik asidin lokal veya sistematik uygulanmasının kemik bozukluklarının tedavisinde etkili olduğu bildirilmiştir (Güzel ve ark. 2016). Ratlarda bor eksikliği artmış trabeküler ayrılma ve azalmış kemik hacmi ve femur gücü ile ilişkili bulunmuştur (Nielsen & Stoecker 2009). Cheng ve ark. (2011) ise içme suyuna 100, 200 ve 400 mg/L dozlarında eklenen bor takviyesinin kemik gelişimi ve gücü ile ilgili bazı parametreler üzerine etkisini incelemiş, 200 mg/L dozundaki takviyenin kemik gücünü artırmada etkili olduğunu saptamıştır.

Borun osteoporoz ve osteoartrit üzerine olumlu etkilerini rapor eden çalışmalar mevcuttur. Menopoz sonrası dönemde alınan 119 günlük 3 mg/gün dozundaki borun idrarla kalsiyum ve magnezyum atımını azalttığı, serum 17-β-östradiol ve testosteron konsantrasyonlarını iyileştirdiği ve osteoporozu önlediği bildirilmiştir (Nielsen ve ark. 1987). Diyabetli farelere 30 gün boyunca 40 µg bor (0.5 ml sulu çözelti olarak) verildiğinde ise trabeküler kemik hacmi, spesifik kemik yüzeyi ve kalınlık gibi parametrelerin iyileştiği görülmüştür. Diyabetin osteoporoz için bir risk faktörü olduğu dikkate alındığında söz konusu bulgular borun osteoporoz üzerindeki koruyucu etkinliği açısından önemlidir (Dessordi ve ark. 2017). Bor içeren biyoaktif camın kemik oluşumunu artırdığı gözlenmiştir (Wu ve ark. 2011). Doğal kemik yenilenmesinde doku iskeleti olarak kullanılan biyoaktif cam anjiyogenetik

olarak etkisini gösterir. Bor içeren biyoaktif camın anjiyogenezi artırdığı bildirilmiştir (Balasubramanian ve ark. 2017).

Bor ve Karaciğer Sağlığı

Bor vücudun detoksifikasyon merkezi olan karaciğerin korunmasında da olumlu etkilidir. Hayvanlarda oral bor tedavisinin serum VLDL kolesterol ve trigliserit düzeylerini azalttığı bildirilmiştir (Basoglu ve ark. 2002). Gebe sığırlara 28 gün boyunca 30 g/gün dozunda verilen bor karaciğer için gerekli olan serum metabolitlerini modüle etmiştir. Karaciğer metabolizmasını iyileştirmiş ve erken laktasyon döneminde karaciğer hasarını azaltmıştır (Kabu & Civelek 2012). Kesin mekanizmalar bilinmemekle birlikte borun oksidatif stresin etkilerini önleyerek karaciğer fonksiyonunu iyileştirdiği düşünülmektedir (Pawa & Ali 2006).

Borun mitokondri üzerinde etkili olarak karaciğer hasarını azalttığı ve Krebs ve glukoz-alanin döngüleri ile metiyonin metabolizmasını etkilediği, böylece oksidatif stresi azaltarak lipit profilini iyileştirdiği bildirilmiştir (Basoglu ve ark. 2011). Başka bir çalışmada günde 4 g bor uygulamasının bir hafta içinde serum insülin, glukoz ve apolipoprotein B-100 düzeylerini düşürdüğü, ikinci hafta sonunda ise serum trigliserit ve VLDL kolesterol seviyelerini azalttığı rapor edilmiştir (Basoglu ve ark. 2000). Bu bulgular borun karaciğerdeki lipit düzeylerini etkili bir şekilde azalttığı, glikojen depolanması ve metabolizması dahil olmak üzere hepatosit fonksiyonlarını etkilediği hipotezini desteklemektedir (Khaliq ve ark. 2018).

Bor ve Nörolojik Sağlık

Beyin mineral yapısını etkileyen ve beyin aktivitesini destekleyen önemli minerallerden biri bordur. Bor yetersizliği beyin elektriksel aktivitesinde düşüşe neden olmuştur (Penland 1998). Yaklaşık 63 gün boyunca 0.25 mg/2000 kcal bor içeren bir diyete ek olarak 3 mg/gün dozundaki bor takviyesinin düşük frekanslarda daha az aktivite ve yüksek frekanslarda daha fazla aktivite göstermek koşuluyla elektroensefalogramı (EEG) değiştirdiği saptanmıştır. Yüksek frekans aktivitesinin düşük olması hafıza bozukluğu ile ilişkilidir (Soriano-Ursúa ve ark. 2014). Ratlar üzerinde yapılan bir çalışmada kolekalsiferol yetersizliğinde beyin kalsiyum ve serebellum fosfor konsantrasyonlarının azaldığı kolekalsiferol yetersizliğine bor yetersizliği de eşlik etiğinde bu düzeylerin daha da düştüğü saptanmıştır (Nielsen ve ark. 1988).

Bor takviyesi yaşlı bireylerde psikomotor becerilerin ve kısa süreli hafızanın gelişmesi, uyuşukluğun azalması ve zihinsel performansın artmasıyla ilişkili bulunmuştur (Penland 1995, 1998). Bor eksikliğinin ardından bor takviyesi dikkat ve hafıza bozukluklarını

iyileştirmiş, el becerisini ve psikomotor hızı artırmıştır (Penland 1998). Bor eksikliği olan hayvanların (0.1 g/kg/gün) diyetle yeterli bor alan hayvanlara (3 mg/kg/gün) göre daha düşük lokomotor aktivite sergilediği bildirilmiştir (Nielsen & Penland 2006).

Bor ve Oksidatif Stres

Besinlerde insektisit olarak kullanılan organofosfat bileşikleri oksidatif stres ve antioksidan durumunu etkileyebilir (El-Demerdash & Nasr 2014). Bu bileşikler membran bileşenlerine zarar vererek reaktif oksijen türlerinin (ROS) oluşumunda etkin rol oynayabilir (El-Demerdash 2011). Bor yeterliliğinin organofosfat kaynaklı oksidatif stres ve enzim aktivitesinden korunmada etkili olduğu gösterilmiştir (Coban ve ark. 2015). Endotoksin indüklü oksidatif stresin de bor tarafından tersine döndürüldüğü gösterilmiştir. Endotoksin serbest radikaller oluşturarak organları etkiler, ancak bor proteinlerde işlevsel ve yapısal değişikliklere neden olarak organları oksidasyondan koruyabilir (Balabanlı & Balaban 2015). Bor takviyesinin dalakların antioksidan kapasitesini artırdığı, dalak doku yapısını iyileştirdiği ve hepatosit hasarında oksidatif stresi hafiflettiği bildirilmiştir (Khaliq ve ark. 2018). Kronik alkol tüketiminin neden olduğu oksidatif stresi de azaltmıştır (Sogut ve ark. 2018). Borun glutatyon düzeyini artırarak oksidatif stresi azalttığı düşünülmektedir. Ayrıca ROS ve Ca^{+2} iyon düzeylerini azaltarak antioksidan kapasiteyi artırır ve apoptozu önler. Son olarak bazı boratların ağır metal indüklü oksidatif stresi ve genototksisiteyi en aza indirdiği rapor edilmiştir (Khaliq ve ark. 2018).

Bor ve Üreme Sistemi

Bor cinsiyet metabolizmasında etkinlik gösterir. Erkeklerde düşük testosteron düzeylerinin ve menopozal dönemdeki kadınlarda östrojen düzeylerinin artmasını sağlar (Naghii & Samman 1997; Nielsen ve ark. 1987). Profesyonel olamayan sporcularda 2 aylık ağır egzersizin neden olduğu testosteron bozuklukları bor takviyesi ile iyileştirilmiştir (Green & Ferrando 1994). Ayrıca menopozla ilişkili olan gece terlemeleri de bor takviyesi ile hafiflemiştir (Nielsen ve ark. 1987). Hormon replasman tedavisi alan postmenopozal kadınlarda 17-β-östradiol düzeylerini artırmıştır (Miljkovic ve ark. 2004). Yumurtalıkları alınmış dişi ratlarda 17-β-östradiol tedavisine ek olarak alınan 5 mg/kg dozundaki bor takviyesinin kemik trabeküler yoğunluğunu ve trabeküler hacmi iyileştirdiği bildirilmiştir (Sheng ve ark. 2001a). 17-β-östradiolün bor ile birlikte verilmesi kalsiyum ve magnezyum emilimini ve tutulmasını önemli ölçüde artırmıştır (Sheng ve ark. 2001b).

Bor ve Kanser

Borik asidin insan prostat kanseri hücreleri üzerinde antikarsinojenik etki gösterdiği bildirilmiştir (Barranco & Eckhert 2006). Bu etkisini kanser hücrelerinde NAD ve Ca^{+2}

salınımını düzenleyerek gerçekleştirdiği düşünülmektedir (Belenky ve ark. 2007; Pollak ve ark. 2007). Hücrenin hayatta kalması Ca^{+2}'nin hücre içi ve dışına hareket etmesine bağlıdır. Aynı zamanda NAD/NADP üretimi de hücrenin çalışmasını etkiler. Boratın kanser hücre çoğalmasını %30-97 azalttığı bildirilmiştir (Barranco ve ark. 2009). Borik asidin kanser hücre hatlarında Ca^{+2} kanalını inaktif tuttuğu belirtilmiştir (Henderson ve ark. 2009). Radyasyon tedavisiyle hücre uzaklaştırma esnasında kemo-önleyici ajanlar olan selenometiyonin ve genisteinin anti-proliferatif etkisini artırmak için borik asidin de gerekli olduğu saptanmıştır (Barranco ve ark. 2007). Borik asit tedavisi tümör migrasyonunu bozan GRP78'i ve prostat kanseri hücre hattında metastaz ve büyümeyi inhibe eden kalretikülini güçlendirmiştir (Kobylewski ve ark. 2017). Boratlar ayrıca hücrelerin büyümesini destekleyen sitokimyasalların, MAPK ve A-E siklinlerin azalmasına katkı sunmuştur. Borat tedavisi ile adezyon, F-aktin modifikasyonları, invaziv aktivite ve migrasyon azalmıştır (Belenky ve ark. 2007). Borik asit prostata ait LNCaP ve DU-145 tümör hücre hatlarının proliferasyonunu doza bağlı bir şekilde baskılamıştır (Barranco & Eckhert 2004). LNCaP hücre hattı aşılanan farelerde oral borik asit tedavisinin tümör hacmini %25-38, prostat spesifik antijen (PSA) seviyelerini ise %86-88 azalttığı saptanmıştır. Ayrıca insülin benzeri büyüme faktörü-1'i de önemli ölçüde azaltmıştır (Gallardo-Williams ve ark. 2004). Borun akciğer kanseri ile ilişkisi net olmasa da antioksidan ve anti-inflamatuar doğası bu kanser türü üzerinde de etkili olabileceğini düşündürmektedir (Bakirdere ve ark. 2010). Düşük sosyoekonomik düzeye sahip kadınlar üzerinde yürütülen bir çalışmada bordan zengin ve yetersiz topraklarda yaşayan kadınların servikal smear örnekleri karşılaştırılmıştır. Bordan zengin olan bölgede kadınlarda sitopatolojik olarak servikal kanser bulguları gözlenmezken, bordan yetersiz olan bölgede yaşayan kadınların %2.6'sında servikal kanser bulguları saptanmıştır (Korkmaz ve ark. 2007).

Epitermal nötronların ^{10}B tarafından nükleer yakalama reaksiyonunu kullanan bor nötron yakalama terapisi (BNCT) lokalize bir nükleer fisyon reaksiyonuna ve hücre ölümüne dayalı kanser tedavi yöntemi olarak geliştirilmiştir (Hosmane 2012). Hücrelerin öldürülmesi çaplarıyla ilişkilidir, bu nedenle yalnızca nötron alanında büyük oranlarda bor içeren hücreler yok edilir. Ancak tümör seçici bor içeren ajanların azlığı BNCT'nin kanser tedavisinde yaygın olarak kullanımını sınırlandırmaktadır (Luderer ve ark. 2015). Bu nedenle klinikte yalnızca L-boronofenilalanin ve sodyum borokaptat kullanılmaktadır. Bu iki bor ajanı klinik çalışmalarda etkili bulunmuştur. Tümör hücrelerinin seçiciliği nedeniyle yeni bor ajanlarının keşfinin elzem olduğu kanısı hakimdir (Barth ve ark. 2012).

Borun Diğer Sağlık Etkileri

Bor testosteron, östrojen, glukoz ve insülin metabolizmasını etkiler. Glikoproteinler, glikolipitler ve hidroksil grubuna sahip diğer moleküller borik asit ile kompleks oluşturabilirler, böylece membran bütünlüğünü değişebilir (Nielsen 2008). Ratların 0.2 mg/kg bor içeren yemlerine eklenen 2 mg/kg dozundaki borun plazma insülin düzeylerini düşürdüğü bildirilmiştir (Nielsen 2014). Bor eksikliği olan civcivlerde insülin salınımının yeterli bor düzeylerine sahip civcivlere göre yaklaşık %75 fazla olduğu rapor edilmiştir (Bakken & Hunt 2003).Bor tüm bu sağlık etkilerinin yanı sıra antimikrobiyal ajan ve yara iyileştirici olarak da bilinir (Blech ve ark. 1990). Yara iyileşmesindeki etki şekli belirsiz olsa da bazı çalışmalarda protein, kolajen ve proteoglikan sentezinde rol oynayabileceği bildirilmiştir (Benderdour ve ark. 2000; Nzietchueng ve ark. 2002). Proteinlerin, kolajenin ve proteoglikanların salınımı bor tedavisi ile artmış ve böylece yara iyileşme sürecinde önemli rol sahibi olan hücre dışı matrisin düzenlendiği saptanmıştır. Bor tedavisi ayrıca TNF-α üretimini de teşvik etmiştir (Benderdour ve ark. 1998; Benderdour ve ark. 2000).Periodontal defektlerde rejenerasyonu artırmak için kemik greftleri kullanılır (Shirakata ve ark. 2002). Borik asit içeren materyallerden AN0128'in periodontal hastalıklarda kemik kaybı ve inflamasyonu azalttığı bildirilmiştir (Luan ve ark. 2008). Bor bileşikleri peridontal doku yıkımında anahtar enzim olan proteinazı inhibe eder (Hunt 2003). Kronik periodontitisli bireylerde rutin tedaviye ek olarak subgingival borik asit (%75) tedavisinin dişeti oluğu sıvısında metalloproteinaz-8 düzeylerini azalttığı rapor edilmiştir (Demirer ve ark. 2012).

Borun Toksik Etkisi

Yüksek doz bor maruziyeti toksit etki oluşturur. Sağlıklı bireylerde vücuda alındıktan kısa bir süre sonra vücuttan atılır. Dolayısıyla kan dolaşım bozukluğu ve böbrek yetmezliği olan bireylerde yüksek düzeylerde bor alımı mortalite riskini artırır (Söğüt & Acar 2020). En düşük öldürücü dozları oral yolla 640 mg/kg, intravenöz yolla 29 mg/kg ve haricen 8600 mg olarak saptanmıştır (EFSA 2004; Smallwood ve ark. 2004). Akut yüksek doz bor maruziyeti kusma, bulantı, ishal, ateş, baş dönmesi, ciltte kızarıklık ve sarılığa neden olabilir. Kronik bor maruziyeti ise anemi, halsizlik, iştahsızlık, konvülsiyon ve gastrointestinal problemler ile sonuçlanır (Söğüt & Acar 2020).

Amerika Birleşik Devletleri Tıp Enstitüsü Gıda ve Beslenme Kurulu bor mineralinin yeterli alım düzeyine ilişkin herhangi bir değer aralığı belirlememiştir. Ancak, tolere edilebilir üst alım düzeyini 20 mg/gün olarak bildirmiştir. Dünya Sağlık Örgütü önceleri 13 mg/gün olarak rapor ettiği güvenli üst alım düzeyini 0.4 mg/kg/gün olarak güncellemiştir (WHO 1998).

Avrupa Birliği ise bor minerali için güvenli üst alım düzeyini 10 mg/gün olarak belirtmiştir (EFSA 2004).

Sonuç

Çalışmalar yeterli bor alımının olumlu sağlık etkilerine işaret etmektedir. Kemik, karaciğer ve beyin sağlığına ve üreme hormonları üzerine iyileştirici etkiler göstermiştir. Kanser profilaksi ve tedavisinde de yerini almıştır. Buna karşın yüksek dozlarda bor alımı toksik etkilere sahiptir. Bu nedenle ko-adjuvan terapi ajanı olarak kullanımı oldukça sınırlıdır. Çok yönlü etkilere sahip olan borun diyette yeterli miktarlarda bulunmasını sağlamak ve zararlı etkilerini ortadan kaldırmak için ileri çalışmalara ihtiyaç söz konusudur.

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FEN BİLİMLERİ ÖĞRETMENLERİNİN YAPAY ZEKÂ İLE İLGİLİ AÇIĞA ÇIKAN EĞİTİM İNANÇLARI

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Özet
Fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançları, günümüzün teknoloji odaklı eğitim ortamında önemli bir araştırma konusunu oluşturur. Bu inançlar, öğretmenlerin yapay zekâ teknolojisinin eğitimdeki rolü, etkisi ve potansiyeli hakkındaki düşüncelerini yansıtmaktadır. Fen bilimleri öğretmenlerinin yapay zekâ ile ilgili eğitim inançlarını anlamak, eğitim politikalarının ve uygulamalarının geliştirilmesinde önemli bir rol oynayabilir. Bu inançlar, öğretmenlerin yapay zekâyı eğitimde nasıl kullanacaklarına ve bu teknolojinin öğrenci başarısını nasıl etkileyebileceğine yönelik algılarını da şekillendirmektedir. Bu doğrultuda yapılan bu çalışma fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançlarını açığa çıkarmayı hedeflemektedir. Çalışmanın katılımcıları maksimum çeşitleme örnekleme yöntemine göre belirlenmiştir. Çalışmaya değişik branşlarda 25 fen bilimleri öğretmeni katılmıştır. Öğretmenler ile dört perspektif üzerinden ve on temel sorudan oluşan yarı yapılandırılmış görüşmeler yapılmıştır. Verilerin elde edilmesi yarı yapılandırılmış görüşme ile sağlanmış, analiz edilmiş ve yorumlanmıştır. Öğretmenler ile dört perspektif açından yapılan görüşmelerin analizinde; verilerin kodlanması, temaların bulunması, kodların ve temaların düzenlemesi ve bulguların tanımlanması, yorumlanması basamakları takip edilmiştir. Yapılan bu çalışma yapay zeka teknolojisinin eğitim alanındaki etkilerini daha iyi anlamak ve bu teknolojinin etkili bir şekilde entegre edilmesini sağlamak için öğretmenlerin inançlarının dikkate alınmasının önemini vurgulamaktadır. Bunun yanı sıra bu inançlar, eğitimde yapay zekâ teknolojisinin nasıl kullanılacağına dair politika kararlarını ve öğretmen eğitimini de etkileyecektir. Bu nedenle, öğretmenlerin yapay zekâ hakkındaki inançlarının araştırılması, eğitimde teknoloji kullanımının optimize edilmesi ve öğrencilerin başarısının artırılması için son derece önemlidir.
Anahtar Kelimeler: Eğitim inançları, fen bilimleri eğitimi, yapay zekâ

SCIENCE TEACHERS' EDUCATIONAL BELIEFS ABOUT ARTIFICIAL INTELLIGENCE

Abstract
Science teachers' educational beliefs about artificial intelligence constitute an important research topic in today's technology-oriented educational environment. These beliefs reflect teachers' thoughts about the role, impact and potential of artificial intelligence technology in education. Understanding science teachers' educational beliefs about artificial intelligence can play an important role in the development of educational policies and practices. These beliefs also shape teachers' perceptions about how to use artificial intelligence in education and how this technology can affect student achievement. In this direction, this study aims to reveal science teachers' educational beliefs about artificial intelligence. The participants of the study were determined according to the maximum variation sampling method. Twenty-five science teachers from different branches participated in the study. Semi-structured interviews were conducted with the teachers from four perspectives and ten basic questions. The data were obtained through semi-structured interviews, analysed and interpreted. In the analysis of the interviews with teachers from four perspectives; the steps of coding the data, finding the themes, arranging the codes and themes, defining and interpreting the findings were followed. This study emphasises the importance of considering teachers' beliefs in order to better understand the effects of artificial intelligence technology in the field of education and to ensure the effective integration of this technology. In addition, these beliefs will affect policy decisions on how to use artificial intelligence technology in education and teacher training. Therefore, investigating teachers' beliefs about AI is extremely important for optimising the use of technology in education and increasing students' achievement.
Keywords: Educational beliefs, science education, artificial intelligence

Giriş

Fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançları, günümüzün hızla değişen teknolojik ortamında önemli bir konudur. Yapay zekâ, son yıllarda eğitim alanında giderek artan bir şekilde kullanılmaktadır ve bu durum, öğretmenlerin eğitim uygulamaları ve öğrenci başarısı üzerindeki etkisini değerlendirmelerini gerektirmektedir. Yapay zekâ, öğretim materyallerinin kişiselleştirilmesinden öğrenci ilerlemesinin izlenmesine kadar bir dizi alanda potansiyel avantajlar sunmaktadır, ancak aynı zamanda bu teknolojinin eğitim sistemindeki rolüne yönelik çeşitli endişeler de bulunmaktadır.Yapay zekânın eğitimdeki kullanımıyla ilgili olarak, fen bilimleri öğretmenlerinin inançları, teknolojinin eğitim süreçlerini nasıl dönüştürebileceği konusunda önemli ipuçları sunabilir. Öğretmenlerin, yapay zekâ destekli öğrenme araçlarının öğrenci başarısını artırabileceğine ve öğretim pratiğini geliştirebileceğine dair olumlu inançları olduğu gözlemlenebilir. Bununla birlikte, yapay zekâ teknolojisinin etik ve sosyal boyutlarının göz önünde bulundurulması gerektiği gibi, bazı öğretmenlerin bu teknolojiyi kullanmaya ilişkin endişeleri ve belirsizlikleri de olabilir (Choi vd., 2023).Bu bağlamda, fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançlarını anlamak, eğitimde teknolojinin rolünü ve öğretmenlerin bu değişime nasıl uyum sağladığını anlamamıza yardımcı olabilir. Bu inançların değerlendirilmesi, yapay zekânın eğitim sisteminde nasıl daha etkili bir şekilde kullanılabileceğini ve öğrencilerin başarısını artırabileceğini belirlemede kritik bir öneme sahiptir. Bu nedenle, fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançlarını anlamak, eğitim politikaları ve uygulamaları üzerinde önemli bir etkiye sahip olabilir (Polak vd.,2022).Yapay zekâ teknolojisinin eğitimdeki kullanımıyla ilgili fen bilimleri öğretmenlerinin inançları, öğretmenlerin profesyonel gelişimine ve eğitim programlarının tasarımına da yansıyabilir. Öğretmenlerin yapay zeka hakkındaki inançları, eğitim kurumlarının ve eğitim politikalarının bu teknolojiyi nasıl entegre edeceği konusunda önemli bir rol oynayabilir. Aynı zamanda, fen bilimleri öğretmenlerinin bu alandaki eğitim ihtiyaçlarını belirlemek ve onlara yapay zekâ teknolojisini etkili bir şekilde kullanma becerileri kazandırmak için eğitim programlarının ve profesyonel gelişim fırsatlarının geliştirilmesi gerekebilir (Yue vd., 2024). Sonuç olarak, yapay zekâ hakkındaki eğitim inançları, eğitim alanındaki teknolojik dönüşümünün yönetilmesinde kritik bir rol oynamaktadır. Fen bilimleri öğretmenlerinin bu alandaki inançlarının derinlemesine incelenmesi, yapay zekâ teknolojisinin eğitimdeki rolünü daha iyi anlamamıza ve bu teknolojinin etkili bir şekilde kullanılmasını sağlamamıza yardımcı olabilir. Bu, öğrencilerin eğitiminde daha iyi sonuçlar elde etmek ve geleceğin eğitim ortamlarını şekillendirmek için önemli bir adım olabilir.

Bulgular

Tablo 1. Fen Bilimleri Öğretmenlerinin Yapay Zekânın Bilgi Üretme Yeteneği İle İlgili Eğitim İnançları

Tema	Alt Tema	Kodlar	Öğretmen Betimleme Örnekleri
Yapay zekâ ve bilgi üretme yeteneği	Yapay zekânın veri analiz yeteneği	• Büyük veri kümelerinin analizi • Derinlemesine analiz • Örüntü tanıma • Objektiflik • Yenilikçilik • İşbirlikçilik • Sürekli gelişme	• Yapay zekânın bilgi üretme kapasitesine güven duyabiliriz. • Yapay zekâ büyük miktarda veriyi analiz edebilir ve bu verilerden anlamlı sonuçlar çıkarabilir. • Öğrencilerin bu teknolojiyi kullanarak bilgi edinmeleri ve analiz etmeleri teşvik etmeliyiz. • Yapay zekâ, büyük veri kümelerini analiz ederek desenler ve ilişkiler keşfedebilir. • Karmaşık fen bilimleri konularında derinlemesine analiz yapmak ve belirli trendleri veya örüntüleri tanımak için potansiyel bir avantaj sunabilir.

Tablo 1, fen bilimleri öğretmenlerinin yapay zekâ ve bilgi üretme yenekleri ile ilgili eğitim inançlarını göstermektedir. Bu bağlamda fen bilimleri öğretmenleri yapay zekânın objektif bir şekilde veri analizi yapabildiğine ve bu sayede tarafsız sonuçlar üretebildiğine inanmaktadırlar. Onlara göre, insan hatalarından arındırılmış olan yapay zekâ sonuçları, daha güvenilir ve nesnel bir bakış açısı sunmaktadır. Bunun yanı sıra fen bilimleri öğretmenleri yapay zekânın karmaşık konuları anlamakta ve derinlemesine yorumlamakta sınırlı olduğunu da düşünmektdirler. Bu durum, yapay zekânın sadece belirli veri desenlerini tanıyabildiği ve insan deneyimini veya kavramsal anlayışı yansıtamadığı yönünde bir eğitim inancı açığa çıkardığını söyleyebiliriz. Bu temayla ilgili diğer bir eğitim inancı öğretmenlerin, yapay zekânın beklenmedik keşifler ve ilişkiler ortaya çıkarabileceğine inanmalarıdır. Onlara göre, yapay zekâ geniş veri kümelerini analiz ederek, insanların gözünden kaçabilecek desenleri ve ilişkileri belirleyebilir ve yeni bakış açıları sunabilir. Yine bu tema ile ilgili öğretmenlerin yapay zekânın insanlarla işbirliği yaparak daha etkili bir şekilde çalışabileceğine inanmalarıdır. Onlara göre, insanların yapay zekâ tarafından üretilen sonuçları yorumlaması ve anlamlandırması, teknolojinin bilgi üretme yeteneğini

güçlendirerek daha sağlam sonuçlar elde edilmesine olanak tanıyacaktır. Bu tema ile ilgili son olarak öğretmenler, yapay zekânın sürekli olarak geliştirilerek daha karmaşık analizler yapabileceğine ve daha doğru sonuçlar üretebileceğine inanmaktadırlar. Bu inanç bizleri yapay zekânın bilgi üretme yeteneğinin zamanla daha da iyileştirilebileceğini ve bu teknolojinin fen bilimleri alanında daha önemli bir rol oynayabileceğini şeklinde bir sonucu götüreceği söylenebilir.

Tablo 2. Fen Bilimleri Öğretmenlerinin Öğrencilerin Yapay Zekâyı Anlama Kapasiteleri İle İlgili Eğitim İnançları

Tema	**Alt Tema**	**Kodlar**	**Öğretmen Betimleme Örnekleri**
Öğrencilerin yapay zekâyı anlama kapasiteleri	Bilgi ve deneyim seviyeleri	• Sınırlı kavrayış • Bilgi düzeyi • Makine öğrenimi • Temel kavramlar • Derinlemesine anlayış • Algoritma • Deneyim	• Öğrencilerin yapay zekâ hakkında kavrayışları sınırlıdır. • Yapay zekâ hakkında temel bir anlayış geliştirmek için özel bir çaba harcanması gerekmektedir. • Öğrencilerin yapay zekâ konusundaki bilgi ve deneyim seviyeleri, genellikle öğrenme geçmişleri, eğitim seviyeleri ve ilgi düzeyleriyle yakından ilişkilidir. • Bazı öğrenciler, yapay zekâ hakkında temel kavramlara sahip olabilirler, ancak bu konuda derinlemesine bir anlayışları olmayabilir. • Öğrencilerin yapay zekâ hakkındaki deneyim seviyeleri de önemlidir. • Daha önce yapay zekâ projelerinde veya kurslarında yer almış öğrenciler, bu konuda daha fazla pratiğe ve uygulamaya sahip olabilirler

Tablo 2, fen bilimleri öğretmenlerinin öğrencilerin yapay zekâyı anlama kapasiteleri ilgili eğitim inancılarını göstermektedir. Bu tema açısından öğretmenler öğrencilerin yapay zekâ hakkındaki bilgilerinin nasıl edinildiği ve anlaşıldığı üzerine daha çok odaklanmışlardır. Öğretmenler, öğrencilerin yapay zekâ hakkında bilgi edinme sürecini daha da önemsiyerek bu sürecin, öğrencilerin teknoloji hakkında daha derinlemesine bir anlayışa sahip olmalarını sağladığına inanmaktadırlar. Bu tema açısından diğer bir eğitim inancı öğretmenler

öğrencilerin yapay zekâ hakkındaki bilgi ve anlayışlarını etkileyen deneyimlerin önemini vurgulaması olarak kendini göstermiştir. Öğrencilerin daha önce yapay zekâ ile ilgili deneyimleri varsa, bu konuda daha derinlemesine bilgiye ve anlayışa sahip olabiliceklerini ifade etmişlerdir. Yine bu tema açısından karşımıza çıkan diğer bir eğitim inancı öğrenci merkezli öğrenme yaklaşımını benimseyen öğretmenlerin, öğrencilerin ilgi alanlarına ve deneyimlerine dayanarak yapay zekâ hakkında kendi anlamlarını oluşturacakları ifadeleri olmuştur. Bu durum ise öğrencilerin yapay zekâ konusunda daha derinlemesine anlayışa sahip olmalarını ve konuyu daha kişisel ve anlamlı bir bağlamda ele almalarını sağlayabileceği yine karşımıza çıkan eğitim inancı olarak kendini göstermiştir. Bu tema açısından son olarak öğretmenler öğrencilerin yapay zekâ hakkındaki bilgi ve anlayışlarının değerlendirilmesi sürecinde bilgi ve deneyim seviyelerinin önemini sıkça dile getirmişlerdir.

Tablo 3. Fen Bilimleri Öğretmenlerinin Yapay Zekânın Öğretim Süreçlerine Etkisi İle İlgili Eğitim İnançları

Tema	Alt Tema	Kodlar	Öğretmen Betimleme Örnekleri
Yapay zekânın öğretim süreçlerine etkisi	Öğretmen rolünün değişmesi	• Öğrenme platformları • Öğrenme engelleri • Bireysel öğrenme • Öğrenci rehberliği • Yönlendirici • Gelişimi izleme • Teknoloji uzmanlığı	• Yapay zekâ, öğrencilerin bireysel ihtiyaçlarını belirleyebilir ve kişiselleştirilmiş öğrenme deneyimleri sunabilir. • Öğretmenler, yapay zekâ destekli öğrenme platformlarını kullanarak öğrencilerin ilerlemesini izleyebilir, öğrenme engellerini tanımlayabilir ve bireysel öğrenme planları oluşturabilirler. • Yapay zekâ, öğretmenlerin sınıf içi ve dışı işlerini otomatikleştirebilir ve verimliliklerini artırabilir. • Yapay zekâ, öğrencilere uygulamalı deneyimler sunarak öğrenmeyi derinleştirebilir. • Yapay zekâ, farklı öğrenme stillerine ve ihtiyaçlarına sahip öğrenciler için daha fazla erişilebilirlik sağlayabilir.

Tablo 3, fen bilimleri öğretmenlerinin yapay zekânın öğretim süreçlerine etkisi hakkında eğitim inancılarını göstermektedir. Bu tema açısından öğretmenler yapay zekâ destekli öğrenme ortamlarında, öğretmenler daha çok bir rehber veya danışman rolünü

üstlenebileceklerini ifade etmişlerdir. Öğrencilerin öğrenme süreçlerini yönlendirirken, yapay zekâ tarafından sağlanan verilere dayanarak öğrencilere bireysel geri bildirimler ve öneriler sunabiliceklerini dile getirmişlerdir. Bu ifadeler öğrencilerin öğrenme yolculuklarını desteklemek ve onları doğru yönde yönlendirmek adına öğretmenlerde açığa çıkan eğitim inancı olarak değerlendirilmiştir. Yine bu tema açısından öğretmenler yapay zekâ, öğrencilerin ilerlemesini izlemek ve değerlendirmek için kullanılabileceğini dile gitirmişlerdir. Öğretmenler, yapay zekâ destekli araçlar aracılığıyla öğrenci performansını analiz edebileceklerini ve öğrencilerin güçlü ve zayıf yönlerini daha hızlı bir şekilde tanımlayabileceklerini ileri sürmüşlerdir. Bu tema açısından karşımıza çıkan son eğitim inancı ise öğretmenler, yapay zekâ tarafından sağlanan verilere dayanarak öğrencilerin bireysel ihtiyaçlarını daha iyi anlayabilecekleri ve öğretim materyallerini buna göre uyarlayabilicekleri olmuştur. Bu durum ise öğrencilerin daha etkili bir şekilde öğrenmelerini sağlayarak öğretmenlerin sınıf içinde daha kapsayıcı bir ortam oluşturmalarına yardımcı olacağı yine öğretmenler tarafından ileri sürülen ifadeler olarak yerini almıştır.

Tablo 4. Fen Bilimleri Öğretmenlerinin Yapay Zekânın İnsan Yaratıcılığına Etkisi İle İlgili Eğitim İnançları

Tema	**Alt Tema**	**Kodlar**	**Öğretmen Betimleme Örnekleri**
Yapay zekânın insan yaratıcılığına etkisi	Eğitim ve öğrenme araçları	• Yaratıcılık • Teşvik etme • Farklı öğrenme stilleri • İnteraktif öğrenme • Yaratıcı düşünme • Problem çözme • Yaratıcı projeler	• Yapay zekâ destekli eğitim araçları, öğrencilerin yaratıcılığını teşvik edebilir ve farklı öğrenme stillerine uygun ortamlar sağlayabilir. • Yapay zekâ, veri analizi, desen tanıma ve öngörülemeyen ilişkilerin keşfi gibi alanlarda insan yaratıcılığını destekleyebilir. • Yapay zekâ, farklı disiplinlerden bilgileri bir araya getirerek insanların yaratıcılığını teşvik edebilir. • Yapay zekâ destekli eğitim araçları, öğrencilerin yaratıcılığını teşvik edebilir ve farklı öğrenme stillerine uygun ortamlar sağlayabilir.

Tablo 4, fen bilimleri öğretmenlerinin yapay zekânın insan yaratıcılığına etkisi ile ilgili eğitim inançlarını göstermektedir. Bu tema ile ilgili fen bilimleri öğretmenleri yapay zekânın, öğrencilerin bireysel öğrenme ihtiyaçlarını belirleyebileceğini ve kişiselleştirilmiş öğrenme deneyimleri sunabilecekleri şeklinde bir eğitim inancı sergilemişlerdir. Özellikle özelleştirilmiş öğrenme platformları, öğrencilere uygun içerikler, öğrenme planları ve geri bildirimler sağlayarak öğrencilerin ilerlemesini destekleyecek olması bu tema açısından yine öğretmenlerde açığa çıkan bir eğitim inancı olarak kendini göstermiştir. Bu tema açısından öğretmenlerde açığa çıkan diğer bir eğitim inancı ise yapay zekânın, öğrencilerin güçlü ve zayıf yönlerini belirleyebileceğini ve öğrencilere kişiselleştirilmiş öğrenme yolculukları sunarak daha etkili bir öğrenme deneyimi sağlayabileceğidir. Bu tema açısından son olarak elde edilen eğitim inancı ise öğretmenlerin yapay zekânın öğrencilerin sesli veya metin tabanlı etkileşim araçlarıyla etkileşime girmelerini sağlayabileceği inancına sahip olmalarıdır. Bu tür araçlar, öğrencilerin öğrenme materyallerini daha iyi anlamalarına ve öğretmenlerin öğrencilerle etkileşim kurmalarını kolaylaştırabilmeleri şeklindeki ifadeler yine öğretmenlerde bu tema açısından karşılaşılan eğitim inancı olmuştur.

Sonuç

25 Fen bilimleri öğretmeni ile nitel bir eksende gerçekleştirilen bu çalışmada fen bilimleri öğretmenlerinin yapay zekâ hakkındaki eğitim inançlarının açığa çıkarılması hedeflenmiştir. Bu doğrultuda dört ana tema üzerinden öğretmenlerin yapay zekâ hakkındaki eğitim inançlarına ulaşılmıştır. Sırasıyla bu dört tema açısından fen bilimleri öğretmenlerinde karşılaşılan eğitim inançları şu şekşilde olmuştur:"Yapay zekânın bilgi üretme yeteneği" temelinde, öğretmenlerin büyük veri analizi, desen tanıma ve öngörüsel modeller gibi yapay zekâ araçlarının bilgi üretme potansiyeli ile ilgili eğitim inançları daha çok kendini göstermiştir. Öğretmenlerin, yapay zekânın karmaşık veri setlerinden anlamlı bilgiler çıkarma yeteneğine güvendikleri görülmüştür. Ancak, yapay zekânın insan faktörünün önemini göz ardı etmemeninde önemli olduğunu da dile getirmişlerdir; bu nedenle, insan kontrolünün ve öğretmen rehberliğinin gerekliliğini özellikle vurgulamışlardır.“Öğrencilerin yapay zekâyı anlama kapasitesi” ile ilgili olarak, fen bilimleri öğretmenlerinin genellikle öğrencilerin teknolojik yetkinliklerinin arttığını ve yapay zekâ hakkında temel bir anlayışa sahip oldukları gözlemlenmiştir. Bununla birlikte, bazı öğretmenlerin, öğrencilerin yapay zekâyı sadece teknolojik bir araç olarak değil, etik ve sosyal etkileriyle birlikte anlama kapasitesini geliştirmeye odaklanmaları gerektiği inancında olduğu fark edilmiştir. Dolayısıyla, yapay zekâ hakkında bilgi ve anlayışın sadece teknik yönleri değil, aynı zamanda etik ve sosyal boyutları da kapsaması gerektiği görüşüde

yine öğretmenlerde açığa çıkan bir eğitim inancı olarak değerlendirilmiştir.“Yapay zekânın öğretim süreçlerine etkisi" temasında, fen bilimleri öğretmenlerinin yapay zekânın öğrenme deneyimlerini dönüştürme potansiyeline dair genel bir heyecan gösterdikleri gözlemlenmiştir. Yapay zekâ destekli öğrenme araçları ve adaptif sistemlerin, öğrencilerin bireysel ihtiyaçlarına daha iyi yanıt verme, öğrenmeyi kişiselleştirme ve öğretmenlerin etkili rehberlik sağlama konularında büyük bir potansiyel sunabileceği inancı öğretmenlerde açığa çıkmıştır. Ancak, yapay zekânın öğretim süreçlerine entegrasyonu sürecinde karşılaşabilecekleri zorluklar ve bu teknolojinin dikkatli bir şekilde kullanılması gerekliliği de bu tema açısından öğretmenlerde açığa çıkan diğer bir eğitim inancı olmuştur.Son olarak, "yapay zekânın insan yaratıcılığına etkisi" üzerine fen bilimleri öğretmenlerinin inançlarını değerlendirdiğimizde, bir dizi karmaşık duygu ve düşünce ile karşılaşılmıştır. Bazı öğretmenler, yapay zekânın insan yaratıcılığını destekleyebileceğine ve yeni keşiflerin ve yeniliklerin ortaya çıkmasına olanak tanıyabileceğine inanırken, diğerleri ise bu teknolojinin insan yaratıcılığı üzerindeki etkilerini daha dikkatli bir şekilde değerlendirme gerekliliğini vurgulamışlardır. Bu bağlamda, yapay zekânın yaratıcılığı destekleme potansiyeli ile birlikte, insan kontrolünün ve etik değerlerin korunması gerekliliğinin ön plana çıkabileceği yine bu tema açısından bir eğitim inancı olarak yerini almıştır.

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PROJE TABANLI ÖĞRENME YAKLAŞIMINI TEMEL ALAN ETKİNLİKLERİN HAFİF DÜZEY ZİHİNSEL YETERSİZLİĞİ OLAN ÖĞRENCİLERİN SOSYAL GELİŞİMİNE ETKİSİ

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ÖZET
Hafif düzey zihinsel yetersizliği olan öğrencilerin sosyal gelişimine yönelik destekleyici, güvenli ve kapsayıcı etkinliklerin yapılması önemlidir. Bu nedenle eğitimciler, öğrencilerin sosyal becerilerini desteklemek için özel eğitim programları ve etkinlikler geliştirmektedir. Böylece öğrencilerin kendilerini ifade etmelerine, başkalarını anlamalarına ve toplumsal normlara uyum sağlamalarına yardımcı olmaktadır. Bu öğrencilere yönelik gerekli çevre düzenlemeleri yapıldığında kendilerini ifade edebilecekleri fikri çalışmanın çıkış noktası olmuştur. Gerçekleştirilen çalışmada, hafif düzey zihinsel yetersizliği olan öğrencilerin, yeteneklerini ortaya çıkararak sosyalleşmesini sağlamak ve farkındalıklarını arttırmak amaçlanmıştır. Mevcut çalışma, "Engelleri Takmaz Aşarım" adlı eTwinning projesi kapsamında 7 okul ortaklığında yenilikçi öğrenme uygulamalarıyla hazırlanmıştır. Bu doğrultuda, proje tabanlı öğrenme yaklaşımı kullanılarak 10 – 13 yaş aralığında, 21 hafif düzey zihinsel yetersizliği olan öğrenciye yer verilmiştir. 3 ay süren çalışmada; grup çalışmaları, işbirliği ve iletişim becerilerini geliştirmeye yönelik etkinlikler yapılmış, akran ilişkileri ve sosyal etkileşimlerin teşvik edildiği ortamlar oluşturulmuştur. Ayrıca karma okul takımlarıyla öğrenciler arasında dayanışma ve empati duygularının gelişimine yönelik işbirliği içerisinde hazırlanan öğrenci merkezli etkinlikler yapılmıştır. Sonuç olarak, hafif düzey zihinsel yetersizliği olan öğrencilerin sosyal gelişimine yönelik hazırlanan etkinliklerin ve destekleyici öğrenme ortamlarının önemli bir etkiye sahip olduğu görülmüştür. Bu etkinlikler, öğrencilerin sosyal becerilerini geliştirmeye, akran ilişkilerini güçlendirmeye ve topluma uyum sağlamalarına yardımcı olmuştur. Ayrıca öğrencilerin özgüvenlerini arttırmış ve kendilerini daha iyi ifade etmelerini sağlamıştır. Bu sonuçlar, hafif düzey zihinsel yetersizliği olan öğrencilerin sosyal ortama uyum sağlamalarını ve topluma aktif bir şekilde katılmalarını desteklemek için uygulanabilecek etkili yöntem ve tekniklerin kullanılması gerektiğini ortaya koymaktadır. İleriki araştırmalarda ailenin de yer aldığı çalışmalar yapılabilir. Farklı öğrenme yaklaşımlarıyla öğrencilerin sosyal gelişimi üzerindeki etkileri karşılaştırılabilir.
Anahtar Kelimeler: Hafif Düzey Zihinsel Yetersizliği Olan Öğrenciler, Proje Tabanlı Öğrenme, Sosyal Gelişim

THE EFFECT OF ACTIVITIES BASED ON PROJECT-BASED LEARNING APPROACH ON THE SOCIAL DEVELOPMENT OF STUDENTS WITH MILD INTELLECTUAL DISABILITY

ABSTRACT

It is important to provide supportive, safe and inclusive activities for the social development of students with mild intellectual disabilities. For this reason, educators develop special education programmes and activities to support students' social skills. Thus, it helps students to express themselves, understand others and adapt to social norms. The idea that these students can express themselves when necessary environmental arrangements are made for them has been the starting point of the study. In the current study, it was aimed to enable students with mild intellectual disabilities to socialise by revealing their talents and to increase their awareness. The current study was prepared with innovative learning practices in partnership with 7 schools within the scope of the eTwinning project named "I Overcome Obstacles". In this direction, 21 students with mild intellectual disabilities between the ages of 10 and 13 were involved by using project-based learning approach. In the 3-month study; group work, activities to develop cooperation and communication skills were carried out, and environments where peer relations and social interactions were encouraged were created. In addition, student-centred activities prepared in cooperation with mixed school teams were carried out to develop feelings of solidarity and empathy among students. As a result, it was observed that the activities and supportive learning environments prepared for the social development of students with mild intellectual disabilities had a significant effect. These activities helped students to improve their social skills, strengthen peer relations and adapt to society. They also increased students' self-confidence and enabled them to express themselves better. These results reveal that effective methods and techniques should be used to support students with mild intellectual disabilities to adapt to the social environment and actively participate in society. In future studies, studies involving the family can be conducted. The effects of different learning approaches on students' social development can be compared.

Keywords: Students with Mild Intellectual Disability, Project-Based Learning, Social Development

INTRODUCTION

Social skills are an important factor that determines people's ability to interact and their capacity to build healthy relationships with other people. Having good social skills improves people's emotional intelligence and enables them to establish healthier relationships with their environment. The individual's relationships with his/her environment and the environment in which he/she is located significantly affect especially his/her social and emotional development, thus all areas of development (Samancı & Uçan, 2017). At the same time, social skills are very important for success in social and educational environments. It also enables individuals to be successful in areas such as communicating, cooperating, empathising, problem solving and adapting to society in daily life. These skills are the ability to use appropriate communication methods for social adaptation and conflict prevention (Matson, et al., 2007). Therefore, it is a basic need for people to interact socially (Samancı & Uçan, 2017). For this, it is necessary to comply with social rules generally accepted by the society (Durualp & Aral, 2010). Co-operation, leadership skills and conflict resolution abilities are based on social skills. Therefore, the development of social skills in schools is considered as a fundamental element that enables individuals to be successful in their personal and professional lives. Knowing the age-appropriate developmental characteristics of students enables teachers to create an effective learning and teaching environment (Özet, 2022).Social skills are the abilities that facilitate the individual's positive interaction with his/her environment and acceptance in society. These skills are generally linked to interaction, co-operation, self-confidence and personal harmony. They are also related to the acceptance of the individual by the society. Social skills are abilities that significantly affect a person's life in adulthood. People with strong social skills are generally accepted by their environment despite their disability (Sucuoğlu, 2009). Intellectual disability is a condition that is difficult to adapt to environmental changes quickly and effectively enough and is characterised by developmental or irregular brain syndromes before the age of 18 (Ainsworth & Baker, 2004). Therefore, intellectual disability is an important condition in terms of health, education and social aspects (Mcdermoot, et al., 2007). In this respect, they have difficulty in making friends and generally do not have a strong sense of self (Eripek, 2003). In this context, Kaner (2009) states that children with intellectual disabilities are often not preferred by their friends. Social skills inadequacies of children with intellectual disabilities negatively affect their friendship relationships in their environment and cause them to be alone (Özkan, 2014). Since they lack leadership qualities in play or school environments, they usually act in a dependent manner. Since they have difficulty in adapting

to social rules, they may not be willing to participate in social activities. They may have problems in harmonising with their peers (Esen, 2003). Therefore, they are generally not preferred by their friends and participate in social activities with reluctance.

Many researchers for the social development of students with disabilities; drama method in students with hearing impairment (Akfırat, 2004), rhythm and dance training in students with mild intellectual disability (Karacan, et al, 2003), physical education and sports (Çavdar, 2011; Demirdağ, 2010; İlhan, 2008; Özkan, 2014), drama method (Avcıoğlu, 2012), direct instruction (Alptekin, 2010), verbal and visual feedback (Diler, et al., 2008), mother and father education level (Karadağ, 2008), age, gender and education level (Özkubat, 2010) on social skills. However, there is no study on the effect of activities based on project-based learning approach on the social development of students with mild intellectual disabilities. The development of social skills of these students enables them to be accepted in the society and to realise their potential. With the current study, it is thought that it will help to improve the social skills of students with mild intellectual disability and to ensure adaptation to society. In addition, supporting the social development of students increases their self-esteem and strengthens their ability to express themselves. Therefore, studies on the social development of students with mild intellectual disabilities are important in terms of helping them to continue their lives more successfully. In this context, the aim of this study was to determine the effect of activities based on project-based learning approach on the social development of students with mild intellectual disability.

2. RESEARCH AND FINDINGS

2.1. Research Model

In this study, in order to determine the effect of activities based on project-based learning approach on the social development of students with mild intellectual disability, one-group pretest posttest quasi-experimental design was preferred among quantitative research methods. This design is a study model in which the intervention applied to determine the cause-effect relationship is directly controlled by the researcher (Karasar, 2015). For this purpose, a study group is formed to represent the target population in accordance with the purpose of the study. Then, the effectiveness of the intervention is investigated by following the pre-test, intervention and post-test steps (Creswell, 2016). Activities based on the project-based learning approach were used as the intervention tool of the study.

2.2. Participants

The study was prepared with innovative learning practices in partnership with 7 schools within the scope of the eTwinning project called "I Overcome Disabilities". The idea that

students affected by disabilities can express themselves when necessary environmental arrangements are made has been the starting point of the project. In this direction, using a project-based learning approach, 21 volunteer students with mild intellectual disabilities between the ages of 10 and 13 were involved. In accordance with the purpose of the study, convenience sampling method, one of the non-probability based sampling methods, was used. This method involves selecting samples from easily accessible and applicable units, taking into account various limitations (Büyüköztürk, et al., 2016). "Parent Consent Form" was filled out by the parents before the study.

2.3. Application Process

- A pre-test survey was conducted with students, teachers and parents to determine the level of readiness of the participants.
- All studies were determined to be appropriate to the age level and special situation of the students. Small group work and collaborative work techniques were used.
- Students discussed the project rules among themselves using the discussion method and brainstormed. The project plan was determined in co-operation with teachers and students.
- All students participating in the project participated in the work done every week.
- Students created avatars and introduced themselves through simulation. Self-esteem, self-efficacy, self-expression skills, empathy, creativity, language development, self-confidence and presentation skills were helped to develop.
- With computer assisted instruction, mixed teams were formed with students and acrostic work was carried out. The development of skills such as empathy, taking responsibility, and using Turkish correctly was supported with the acrostic work done with mixed teams under the guidance of counsellor teachers.
- Awareness of Turkish spelling and spelling rules was raised. Students exchanged information with each other through peer learning.
- Students participated in artistic works by organising a painting activity.
- Students prepared a word cloud with collaborative work.
- Internet safety cartoon painting activity was carried out with students and exhibited on the school board.
- Students' imagination and the ability to use Turkish correctly were supported by short story work.

- Groups were formed with the students and each school created its own slogan in co-operation. Then, the slogan of the project was determined by a survey among the slogans determined. With the work of creating slogans with students, students worked collaboratively and made discussion method in small groups.
- With the survey studies, students' decision-making skills were developed in a democratic environment.
- Students were helped to develop their oral expression skills by writing poems.
- Students designed logos and posters. The first logo and poster were determined by a survey conducted in a democratic election environment in the school. Afterwards, the logo and poster of the project were determined through an inter-school survey. The development of students' artistic and technological skills was supported by designing logos and posters.
- The kinaesthetic abilities of the students were revealed through sports activities.
- Special days (8 March, Green Crescent, 23 April, forest week, autism awareness, elderly week) were celebrated to socialise students.
- Social awareness was created through book reading activities and a science library was established throughout the school.
- Students' perspective on the educational environment was changed through material design activities. Educational support tools were created.
- With the activities of designing and playing intelligence games, students were supported to learn by having fun and to reveal individual talents.
- All works were exhibited on the school board and exhibition technique was used. Thus, attention was drawn to the work done in the school. Students' self-confidence was increased.
- At the end of the project, a post-test was conducted and the opinions of students, teachers and parents at the end of the project were analysed.

2.4. Findings

In this section, findings obtained from students, teachers and parents are presented.

2.4.1. Findings Related to Students

In this section, findings related to the students are presented.

The answers given by the students to the question "Did the project " I Overcome Obstacles" contribute to your social development?" are presented in Figure 2.1.

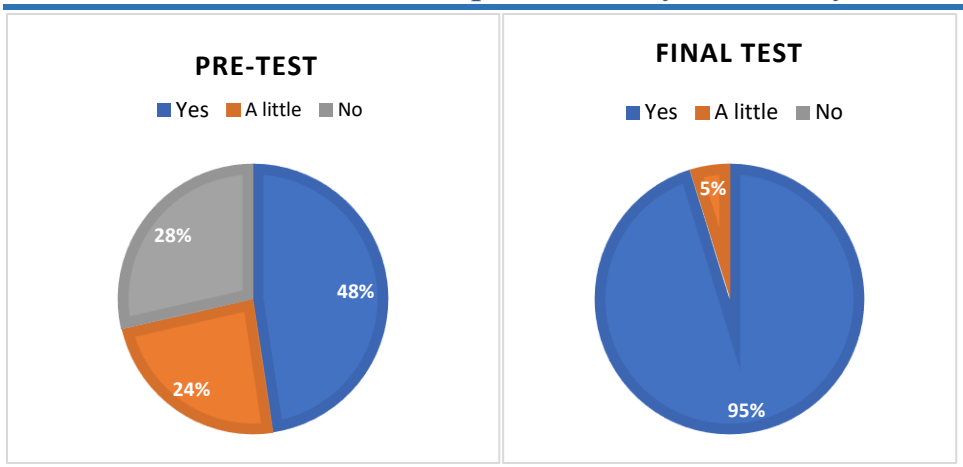


Figure 2.1. According to the students, the effect of project-based learning approach on students' social development

According to Figure 2.1, while 48% of the students answered yes, 24% answered somewhat and 28% answered no before the project, 95% answered yes and 5% answered somewhat after the project.The answers given by the students to the question "How was your relationship with your friends you worked with during the project-based learning process?" are presented in Figure 2.2.

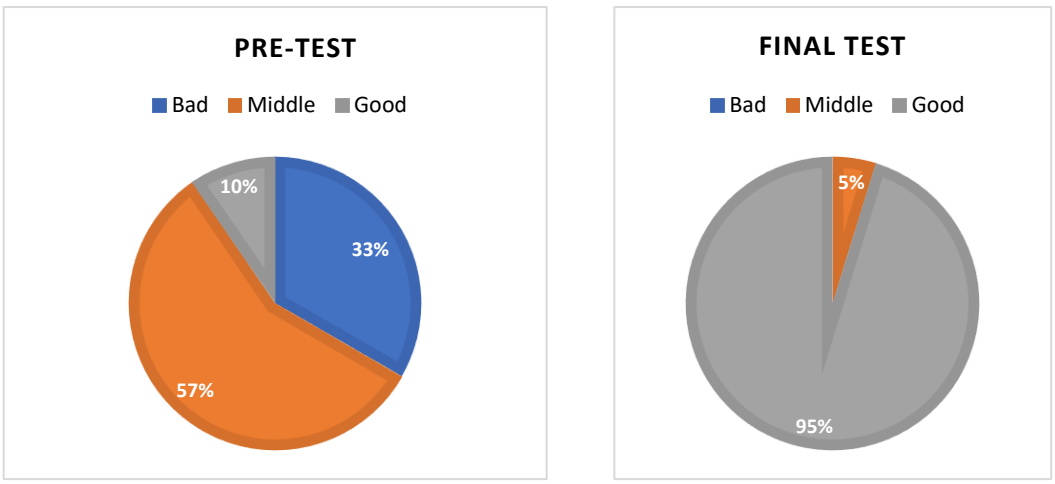


Figure 2.2. According to the students, the effect of the project-based learning approach on the relationships of the friends they work with

According to Figure 2.2, while 57% of the students answered moderate, 33% answered bad and 10% answered good before the project, 95% answered good and 5% answered moderate after the project.

The answers given by the students to the question "Which were the activities or events that supported social development?" are presented in Figure 2.3.

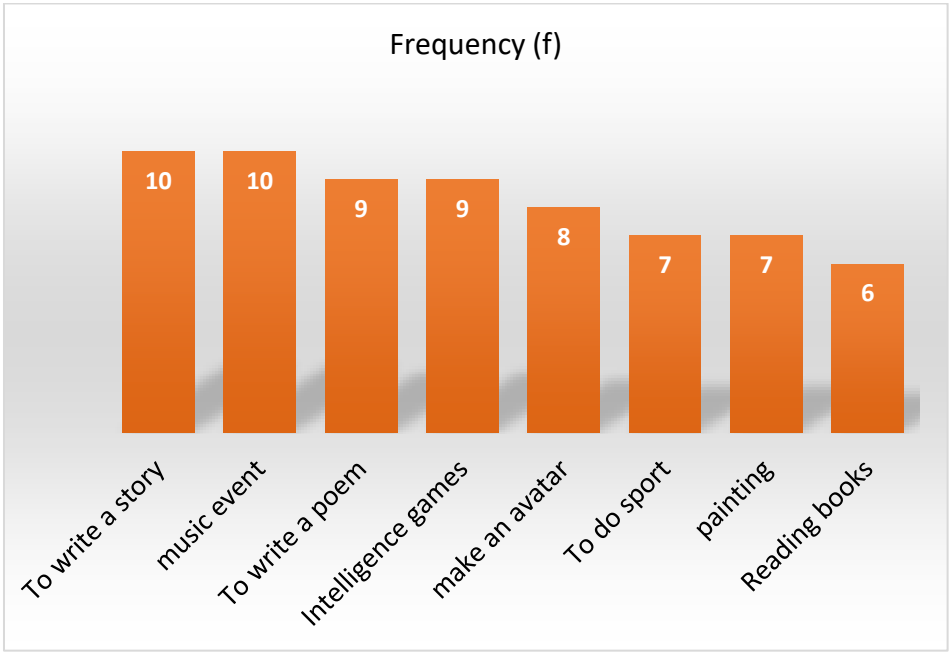


Figure 2.3. According to the students, the effect of the activities on the social development of the students

According to Figure 2.3, students think that the activities of writing stories (10), music activities (10), writing poems (9), intelligence games (9), making avatars (8), doing sports (7), painting (7) and writing books (6) are effective for the social development of students in the project-based learning approach.

2.4.2. Findings Related to Parents

In this section, findings for parents are presented.

The answers given by the parents to the question "What do you think about the effect of project-based learning approach on students' social development?" are presented in Figure 2.4.

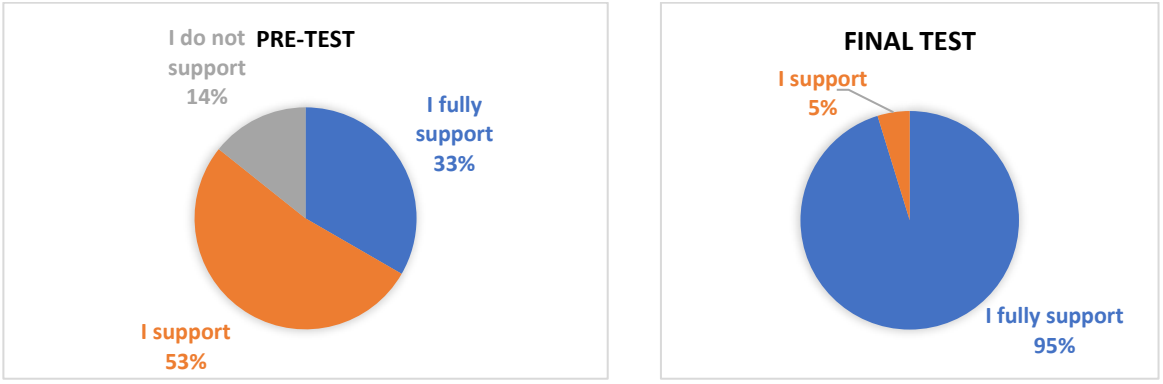


Figure 2.4. According to parents, the effect of project-based learning approach on students' social development

According to Figure 2.4, before the project, 53% of the parents answered "I support", 33% answered "I fully support" and 14% answered "I do not support"; after the project, 95% of the parents answered "I fully support" and 5% answered "I support".

The answers given by the parents to the question "Which social skills have developed in your child within the scope of the "Barriers Don't Wear Barriers I Overcome" project are presented in Figure 2.5.

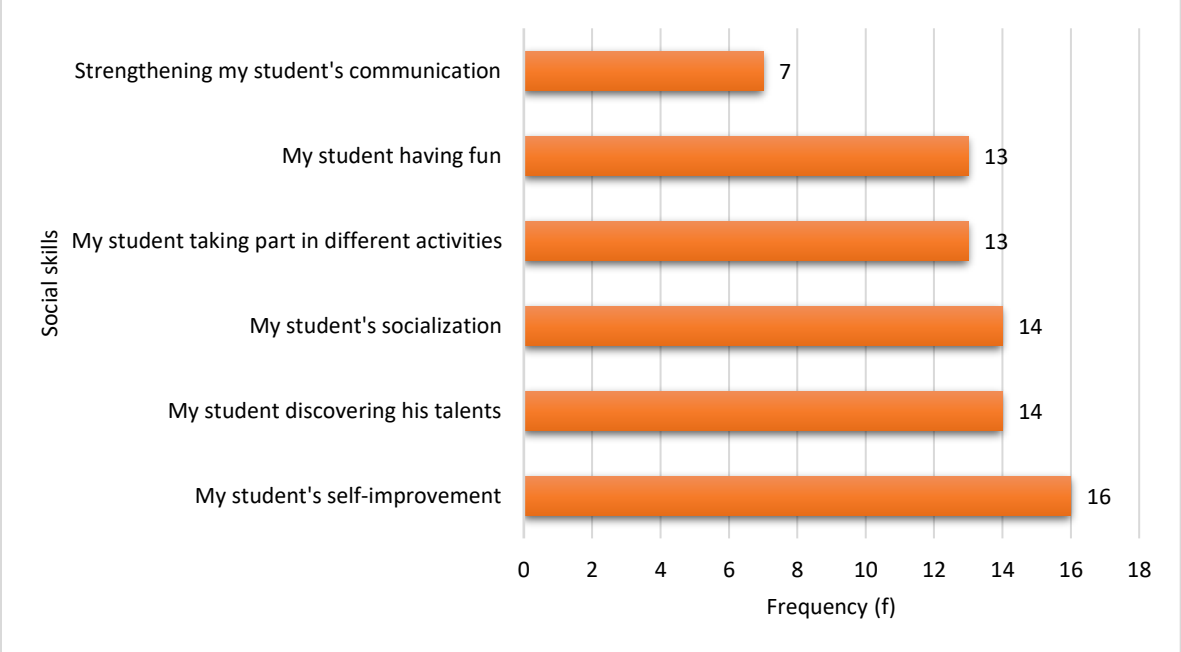


Figure 2.5. According to the parents, the impact levels of the social skills developed by the students in the project-based learning approach

According to Figure 2.5, parents think that the project-based learning approach is effective in terms of my student's academic development (16), my student's discovery of his/her talents (14), my student's socialisation (14), my student's participation in different activities (13), my student's having fun (13) and my student's communication skills (7).

2.4.3. Findings Related to the Teacher

In this section, findings for teachers are presented.

The answers given by the teachers to the question "What is the effect of students' success or failure in projects on their social learning process?" are presented in Figure 2.6.

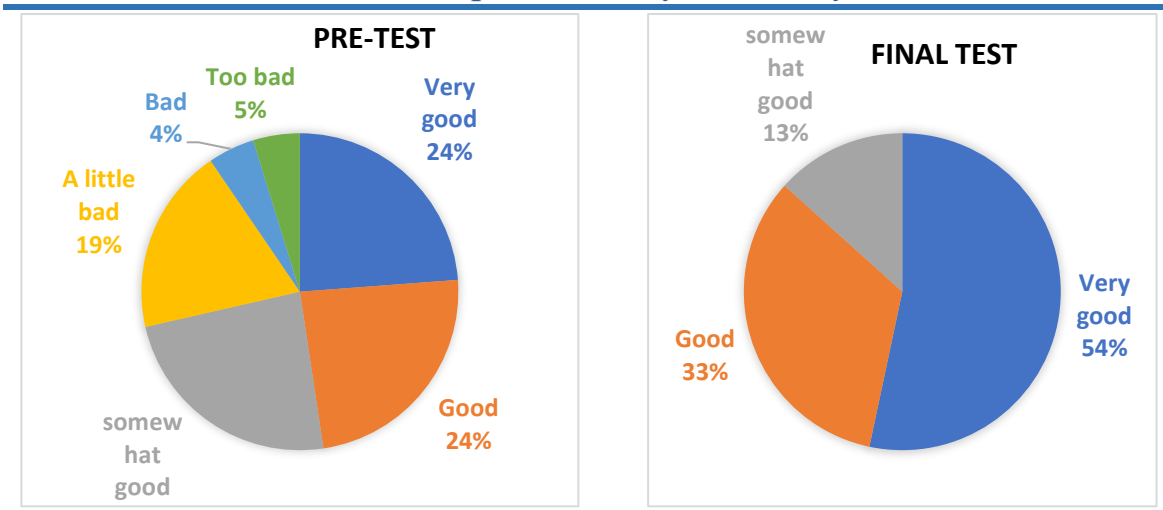


Figure 2.6. According to the teachers, the effect of students' achievements on the social learning process in the project-based learning approach

According to Figure 2.6, the teachers answered that the effect of students' achievements on the social learning process in the project-based learning approach was 24% very good, 24% good, 24% somewhat good, 19% somewhat bad, 5% very bad and 4% bad before the project. After the project, 54% very good, 33% good and 13% a little good.

What are your observations about your students' social interactions in the projects? How do these interactions improve students' social skills? The answers given by the teachers to the question are presented in Figure 2.7.

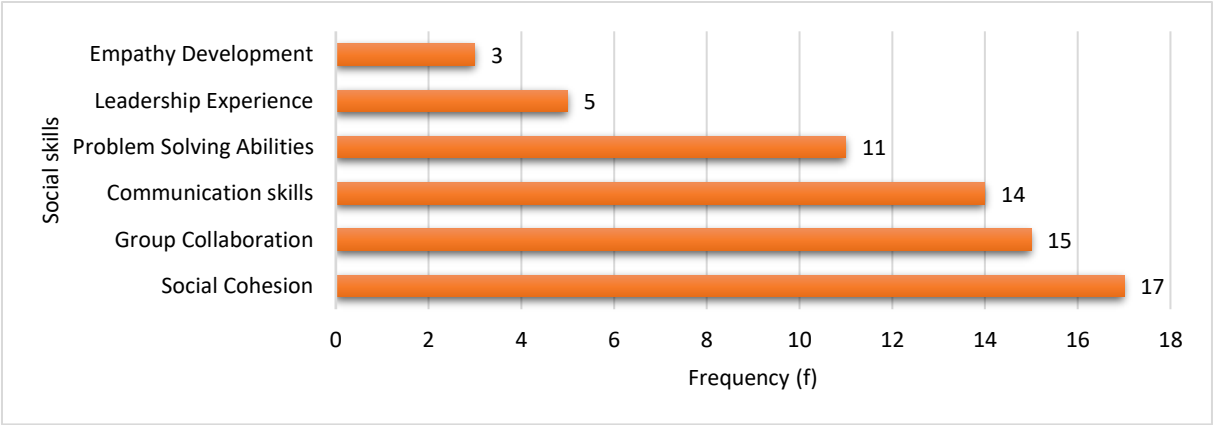


Figure 2.7. According to the teachers, the impact levels of the social skills developed by the students in the project-based learning approach

According to Figure 2.7, teachers think that the project-based learning approach is effective in the social development of students' social adaptation (17), group cooperation (15),

communication skills (14), problem solving skills (11), leadership experience (5) and empathy development (3) skills.

3. CONCLUSIONS

In this study, an interdisciplinary project study was conducted to determine the effect of activities based on project-based learning approach on the social development of students with mild intellectual disability. By creating a science library in the science applications course, the students demonstrated the outcomes of "Recognise the contribution of different societies and cultures to the development of scientific knowledge, recognise the importance of imagination and productivity at every stage of scientific knowledge, and act in accordance with scientific ethics in their studies" in their behaviours. In addition, they also realised the outcomes of "Observes scientific ethics in accessing, using and producing information based on scientific thinking, identifies the common characteristics of inventors and scientists."

With activities such as introducing themselves and the city they live in, conducting experiments, making exhibitions, and preparing panels, students achieved the learning outcomes in the Turkish lesson: "Makes a prepared speech, organises what he/she writes, is limited to spelling and punctuation rules appropriate to the class level, shares what he/she writes."

Students introduced themselves and the city they live in, received parental permission petitions, and gained the gains of "Defining communication technologies and listing their types, explaining the basic concepts of ethics and informatics ethics" in the information technologies course through internet safety activities. In addition, with the use of Web 2.0 tools, the gains of "Explains the basic concepts of information technologies, notices the change in information and communication technologies from the past to the present, explains the concept of web browser and uses the browser, conducts simple research using search engines." were transformed into behaviours.With the activities of animation preparation, avatar creation, voice-over, logo preparation, poster preparation and panel preparation, students were able to acquire the gains of "Uses digital technology in visual art work, uses art elements and design principles while creating visual art works" in the visual arts course. In addition, with logo and poster making, it was ensured that the acquisition of the gains of "Explains image file formats, carries out editing processes related to visuals" was transformed into behaviour.The students' work of analysing and interpreting the results of the survey in a democratic environment enabled them to acquire the achievements of "Creates and interprets a circle graph for a data group and creates and interprets a line graph for data" in the mathematics course.The students' research, collaborative work and

participating in the meeting enabled them to achieve the learning outcomes in the social studies course: "Explains the multidimensionality of an event based on an example experienced in his/her immediate environment, acts in accordance with the duties and responsibilities required by the roles he/she takes in the groups he/she participates in as an individual who is aware of his/her rights."According to the results of the student pre-test - post-test questionnaire; it was determined that the students were happy to do the activities in the project and wanted to take part in other eTwinning projects.According to the teacher pre-test - post-test questionnaire results; it was determined that teachers found the project very good and stated that the project achieved its purpose, contributed to their professional development, and supported the education of students with special needs with technology by actively using web 2.0 tools.According to the results of the parent pre-test - post-test questionnaire; it was determined that the parents stated that they supported the project by taking part in the project and that they were satisfied with the project at the end of the project.Positive opinions about the project were determined in teacher, student and parent questionnaire evaluations. In addition, it was observed that other students in the school were motivated when they saw the work done by the project students, wanted to participate in the activities and wanted to take part in the project.Games for social interactions in projects strengthen students' group co-operation skills. According to Rauf and Bakar (2019), children who play games can manage themselves more effectively, work more harmoniously with other people around them, and communicate better with their peers. Games teach children to co-operate and act together. During games, children encounter situations in which they may feel uncomfortable with their peers, which helps them develop problem-solving skills and control their relationships with peers.Students' communication skills improve through interactions in projects. According to Gutstein and Whitney (2002), sharing an object or experience with others strengthens friendship relationships. Sharing between children strengthens mutual communication. In this way, children gain important social skills such as understanding the feelings of others and expressing their own feelings and empathising.Social cohesion and acceptance are strengthened through social interactions in the projects. According to Özyeğin (2022), as an individual experiences positive and healthy social interactions with his/her environment, he/she becomes self-confident, develops a sense of independence and can have an entrepreneurial spirit. The individual grows and matures mentally, socially and emotionally through positive relationships. This situation positively affects the social development of the individual.Social interactions in projects contribute positively to students' social development by improving their social skills.

According to Çetrez (2004), the development of children's knowledge and skills related to social issues can be explained by the fact that they engage in more social interactions as they grow up and that these interactions increase with increasing independence.As a result of the interactions in projects, students' ability to cope with difficulties and problem-solving skills increase. According to Noz (2018), among the skills that teachers care most about and aim to help students acquire are skills such as personal expression, communication skills, problem-solving ability, social responsibility and co-operation.Thanks to the survey studies, slogans, posters, logos and project rules carried out in co-operation with students, students' ability to make their own decisions in a democratic environment has improved. As a result, activities based on project-based learning approach had a positive effect on the social development of students with mild intellectual disabilities. Problem solving, analytical thinking and reasoning skills of the students were supported with the activities they carried out. Thus, students' self-confidence, tolerance, responsibility taking skills, technology usage skills, presentation, public speaking, collaborative work, scientific research and digital skills have improved. In addition, a positive effect was observed in the development of their curiosity, researcher and imagination. In the studies to be carried out as a continuation of the current study, research can be carried out with different approaches and longitudinal studies can be included.

Awards

The eTwinning Project has received the "National Quality Label".

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VERTİGODA FONKSİYONEL SAĞLIK ÖRÜNTÜLERİNE GÖRE HEMŞİRELİK BAKIMI: OLGU SUNUMU

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Özet
Vertigo, vestibüler sistem, görme sistemi ve somatosensöriyel sistem arasındaki uyumsuzluk sonucunda gelişir. Prevalansı gittikçe artmakta olup kadınlarda erkeklere oranla daha fazla görülmektedir. Farklı tipleri olan vertigonun, belirtileri de bu tiplere göre değişiklik göstermektedir. Bu yazıda baş dönmesi, mide bulantısı, baş ağrısı ve bayılma şikayetleri ile önce acile, daha sonra nöroloji polikliniğine başvuran hasta tartışıldı. Hastaya Gordon'un fonksiyonel sağlık örüntüleri modeli kullanılarak, "düşme riski, yaralanma riski, etkisiz bireysel baş etme, anksiyete, bilgi eksikliği" tanıları konuldu, hemşirelik bakımı verildi ve sonuçlar değerlendirildi.
Anahtar Kelimeler: Baş dönmesi, Gordon'un fonksiyonel sağlık örüntüleri modeli, hemşirelik bakımı, vertigo

NURSING CARE ACCORDING TO FUNCTIONAL HEALTH PATTERNS IN VERTIGO: A CASE REPORT

Abrasct
Vertigo develops as a result of incompatibility between the vestibular system, visual system and somatosensory system. Its prevalence is gradually increasing and it is more common in women than in men. There are different types of vertigo, and their symptoms vary depending on these types. In this article, the patient who first applied to the emergency room and then to the neurology outpatient clinic with complaints of dizziness, nausea, headache and fainting is discussed. Using Gordon's functional health patterns model, the patient was diagnosed with "risk for fall, risk for injury, ineffective coping, anxiety, deficient knowledge", nursing care was given and the results were evaluated.
Keywords: Dizziness, Gordon's functional health patterns model, nursing care, vertigo

GİRİŞ

Vertigo; genellikle, hareketsiz durumdayken hareket algısı ya da normal kafa hareketi ile bozuk (çarpık) hareket algısı olarak tanımlanır. Ayrıca dönme hissi de vertigo ile bağlantılıdır. Bu his dış çevrenin döndüğü algısına sebep olan dış vertigo olarak adlandırılan vestibüler görsel bir semptomdur. Sonuç olarak, vertigo vestibüler sistemin işlev bozukluğu ile ortaya çıkmaktadır.[1,2]

Baş dönmesi ve vertigo terimleri bazen birbirinin yerine kullanılsa da, vertigo belirli bir hissi tanımlar ve baş dönmesinin geniş semptomunun bir sınıflandırması olarak kabul edilir.[2] Aralarında net bir sınır olmadığı halde farklı isimlerle ifade edilen denge bozuklukları mevcuttur. Dizziness, unsteadiness ve lightheahedness bu ifadelerdendir.[3] Ataklar tipik olarak en az 20 dakika ile saatler arasında sürebilmektedir.[4,5] Vertigo ve dizziness, baş ağrısından sonra hekime başvuruda en sık yakınmadır. Yapılan epidemiyolojik çalışmalar vertigo ve dizzinessın nüfusun %20-30'nunu etkilediğini göstermiştir.[6-8] Günlük pratikte bu yakınmalarla çok sık karşılaşıldığı için bu şikayetlerle gelen hastaların iyi değerlendirilerek yönlendirilmesi gerekmektedir.Bu olgu sunumunda, hemşirelik bakımının amaçları; düşme ve yaralanma riskini azaltmak, yaşam kalitesini yükseltmek, bilgi eksikliğini gidererek hasta ve ailesinin eğitimidir. Olgu, bireyleri biyo-psiko-sosyal boyutta ele alan Gordon'un Fonksiyonel Sağlık Örüntüleri (FSÖ) Modeli ile değerlendirildi. Bu model bireylerin gereksinimlerini sistematik ve standardize ederek, bilgi toplamayı ve bilginin analiz edilmesini sağlayan 11 fonksiyonel alanda açıklamaktadır.[9] Bu fonksiyonlar birbirleriyle ilişkilidir. Bu model, hasta/sağlıklı bireyden veri toplamayı standardize etmek ve hemşirelik tanısını belirlemeyi kolaylaştırmak amacıyla Marjory Gordon tarafından geliştirilmiştir.[10] FSÖ modeli rehberliğinde geliştirilen eğitim modülü[11] kullanılarak değerlendirilen hastanın hemşirelik bakımı ise Kuzey Amerika Hemşirelik Tanıları Birliği (NANDA-North American Nursing Diagnosis Association) tanıları ve hemşirelik girişimleri[12,13] kullanılarak sunuldu. G.O. çalışma hakkında bilgilendirildi. Çalışmaya katılmaya istekli olduğuna dair bilgilendirilmiş sözlü onam alındıktan sonra çalışmaya dahil edildi.

OLGU SUNUMU

Baş dönmesi, baş ağrısı, mide bulantısı ve bayılma şikayetleri ile ambulans ile acile getirilen 28 yaşındaki G.O. vaka olarak sunulmuştur. İş yerinde baş dönmesinin ardından baygınlık geçirmesi üzerine ambulansla acil servise getirilmiştir. Bekar ve memur olan kadın hasta G.O. son 3 haftada baş dönmesi, mide bulantısı ve kulakta dolgunluk yaşadığını ve son 1 haftada ise baş ağrılarının arttığını, aralıklarla işitme kaybı yaşadığını belirtmiştir. Tam kan tahlillerine bakılan hastaya "Bayılma- Senkop" ön tanısı konularak, tedavisi uygulandıktan

sonra nöroloji polikliniğine gitmesi önerilerek taburcu edilmiştir. Baş dönmesi, bulantı-kusma ve bayılma şikayetleri devam eden hasta, 1 hafta sonra nöroloji polikliniğine başvurmuştur. Hastadan MR istenmiş olup "Bulantı ve Kusma" ön tanısı ile Dramamine 50 mg 12 tablet (1×1) şeklinde reçete edilip, MR sonuçlarından sonra tekrar polikliniğe gelmesi istenmiştir. MR sonuçlarından sonra hekime başvuran hastaya "Baş Dönmesi/ Vertigo" tanısı konularak Vasoserc Bıd 24 Mg 30 Tablet (2×1) ve Dramamine 50 mg 12 tablet (1×1) şeklinde reçete edilmiştir.

Fonksiyonel Sağlık Örüntüleri Modeline Göre Değerlendirilme	
1. Sağlığı algılama-sağlığın yönetimi:	Hasta 1 aydan uzun bir süredir baş dönmesi ve bulantı yaşadığını ifade etmiştir. Bu durumu iş yerindeki yoğun çalışmaya bağladığı için hastaneye başvurmamıştır. İş yerinde yaşadığı yoğun baş dönmesi sonucunda baygınlık geçirdiği için iş arkadaşları tarafından ambulansla hastaneye getirilen hastanın semptomlara yönelik bilgi eksikliği mevcuttur. Hasta 10 yıl önce düşme sonucunda kafasını çarptığını ve alın bölgesine dikiş atıldığını belirtmiştir. Hastanın ek bir hastalığı bulunmamaktadır.
2. Beslenme ve metabolik durum:	Boyu 166 cm, kilosu 63olan G.O. hanımın beden kütle indeksi (BKİ) 22,9 (normal) olarak hesaplanmıştır. Hasta iş yerindeki yoğunluktan dolayı beslenme düzeninde aralıklarla bozulmalar olduğunu ifade etmiştir. Günlük su tüketimi 1,5-2 lt olan hasta tuz tüketiminin günde 2 gr kadar olduğunu belirtmiştir.
3. Boşaltım:	Hastanın bağırsak alışkanlığı normal olup bir kezdir. Distansiyonu bulunmamaktadır. İdrar yaparken herhangi bir sorun yaşamamaktadır.
4. Aktivite-egzersiz:	Yaşam aktivitelerini yapmakta sorun yaşamadığını ifade eden G.O. son 1 ayda aralıklarla yaşadığı baş dönmelerinden dolayı ayaktayken iş arkadaşlarının yardımı ile oturtulduğunu ifade etmiştir. Ayrıca kimsenin olmadığı anlarda yaşadığı baş dönmelerinden dolayı bir yerlere tutunarak yürüdüğünü ifade etmiştir. Baş dönmesinden sonra baygınlık geçirip burnunu çarptığı için burun kanaması yaşadığını belirtmiştir. Eğilip yerden bir şey almaya çalıştığında baş dönmesi yaşadığını da ifade etmiştir.
5. Uyku-istirahat:	G.O. hanım günde 6-8 saat uyuduğunu, uykuya dalmada sorun yaşamadığını ifade etmiştir.
6. Bilişsel- algısal:	G.O. hanımın yer, zaman, kişi oryantasyonu vardır. Miyop için gözlük kullandığı belirlenmiştir. Gözlüksüz bilgisayar ekranına baktığında baş dönmesinin arttığını ifade etmiştir.
7. Kendini algılama:	İletişimde ve kendini ifade etmekte sorun yaşamamaktadır. Baş dönmelerinin olduğu günlerde yorgun olduğunu ifade etmiştir. "Sağlığınızla ilgili en önemli korkunuz nedir?" diye sorulduğunda "Bu hastalığın hayatım boyunca devam edecek olması ve

	iş yerimdeki yoğunluktan dolayı tekrarlamalar olma olasılığı beni endişelendiriyor." cevabını vererek endişeli olduğunu ifade etmiştir.
8. Rol –ilişki şekli:	Anne, baba ve kardeşlerden oluşan çekirdek ailede yaşadığı belirten G.O. hanım aile içi ilişkilerinin çok iyi olduğunu belirtmiştir. Kız kardeşinin hemşire olduğu ifade eden G.O. hanım bu süreçte ondan yardım aldığını, çoğunluklabu durumu onunla konuştuğunu ifade etmiştir. Baş dönmelerinin yoğun olduğu dönemlerde iş yerindeki işlerini aksattığını düşündüğü için üzüldüğünü belirtmiştir. Haftasonu evde annesine yardım edip temizlik yaptığı zaman eğilme hareketlerinden dolayı baş dönmesi yaşadığını belirten G.O. hanım bu durumun kendisini üzdüğünü ifade etmiştir.
9.Cinsellik ve üreme:	Bekar olan G.O. hanımın cinsel yaşamında bir sorunu olmadığı belirlenmiştir.
10. Baş etme, stres toleransı:	Baş dönmesinin hayatını olumsuz etkilediğini ifade eden G.O. bu durumun kendisinde strese neden olduğunu belirtmiştir. Kız kardeşiyle bu durumu paylaştığını onun desteğini alarak bu durumla baş ettiğini belirtmiştir. Baş dönmesine neden olacak davranışlardan ve hareketlerden kaçındığını, iş yerindeki arkadaşlarının bu konuda kendisine yardımcı olduğunu; evde ise kız kardeşi ve annesinin bu konuda yardımcı olduğunu ifade etmiştir.
11. Değer-inanç:	G.O. hanım baş dönmesinin yoğun olduğu zamanlarda namaz kılarken zorluk yaşadığını ifade etmiştir. İlaçlarını düzenli kullanınca baş dönmelerinin azalacağını ve namazını rahatlıkla kılacağını düşündüğünü belirtmiştir.

Hemşirelik Bakım Planı

Hemşirelik Tanısı 1: **Düşme Riski** (Alan 1. Sağlığı algılama- sağlığın yönetimi)

Etyolojik faktörler: Baş dönmesi

Beklenen hasta sonuçları: Hastanın düşme riskinin en aza indirilmesi, hastanın güvenliğinin sağlanması

Hemşirelik Girişimleri

- Gece banyo veya lavaboya giden koridorda ışıklandırma yapılır.
- Yatak seviyesini alçak pozisyonda tutması öğretilir.
- Telefon, gözlük, gibi bireyin sık kullandığı eşyalarının kolay ulaşılabilir konumda olması sağlanır.
- Bireyin ihtiyacı olduğunda yardım istemesi gerektiği açıklanır.
- Çalışma ortamı veya ev ortamı düşme riskine göre dizayn edilir.
- Yürümede dengesizlik ve denge problemi olan hastalar için yürüyüş ve dengeyi arttırmaya yönelik egzersiz programları fizyoterapist eşliğinde uygulanır.

- Baş dönmesine neden olabilecek ani hareketlerden kaçınması öğretilir.
- Hasta gerekirse İTAKİ ölçeği ile değerlendirilir.

Değerlendirme

- Hemşirelik girişimleri uygulanarak hastanın düşme riski en aza indirilip, hastanın güvenliği sağlanmaya çalışıldı.

Hemşirelik Tanısı 2: **Yaralanma Riski** (Alan 1. Sağlığı algılama- sağlığın yönetimi)

Etyolojik faktörler: Baş dönmesi, düşme, baygınlık geçirme

Beklenen hasta sonuçları: Hastanın yaralanma riskinin ortadan kaldırılması

Hemşirelik Girişimleri

- Çarpma, düşme ve yaralanmalara karşı dikkatli olması için ortam düzenlemesi yapılır.
- Geceleri ışıkla odalarda yeterli aydınlatma sağlanır.
- Dışarıda ışık parlamasını azaltmak için güneş gözlüğünü vb. kullanması gerektiği açıklanır.
- Ortostatik hipotansiyona sekonder olarak vertigoya bağlı yaralanma riski oluşabilir. Bu hastaların yatak kenarında oturup dinlendikten sonra ayağa kalkması öğretilir.
- Sıvı volüm kaybı, uzun süreli yatak istirahati, valsalva manevrası kullanımı gibi durumlar bireylerde düşerek yaralanma riskine neden olabileceği için bu etmenlere bağlı durumlar gözden geçirilir.

Değerlendirme

- Hemşirelik girişimleri uygulanarak hastanın yaralanma riski ortadan kaldırıldı ve hastanın güvenliği sağlandı.

Hemşirelik Tanısı 3: **Etkisiz Başetme** (Alan 10. Baş etme- stres toleransı)

Etyolojik faktörler: Vertigo hastalığı

Beklenen hasta sonuçları: Olumlu baş etme girişimleri göstermesi, korku ve endişelerinin giderilmesi

Hemşirelik Girişimleri

- Destekleyici bakım sağlayarak vakit geçirilir.
- Duyguların ifade edilebilmesi için birey cesaretlendirilir.
- Gerçekçi bir değerlendirme sunulur.

- Bireyin önceden karşılaştığı sorunları nasıl çözdüğü ile ilgili düşünmesi, şimdiki sorununda da bunları uygulayıp uygulayamayacağı tartışılır.
- Baş dönmesini tetikleyici olmayacağı düşünülen aktiviteler için günlük en az 30 dakika zaman ayırabilmesi için cesaretlendirilir.
- Baş dönmesine sebep olmayacak ya da tetiklemeyecek şekilde bazı gevşeme aktiviteleri için zaman ayırması gerektiği söylenir.
- Baş dönmesine neden olmayacak stres yönetimi tekniklerini öğrenmek ve kullanmak için fırsatlar sunulur.
- Kendisini ifade edebileceği yakınlarından destek alması konusunda bilgilendirilir.
- İlaçları nasıl kullanacağı konusunda bilgilendirme yapılır.

Değerlendirme

- Hemşirelik girişimleri uygulanarak hastanın olumlu baş etme girişimleri ve hastalık yönetimi desteklendi.

Hemşirelik Tanısı 4: **Anksiyete** (Alan 7. Kendini algılama)

Etyolojik faktörler: Baş dönmesi, ilaç kullanımı

Beklenen hasta sonuçları: Hastanın korku ve endişelerinin giderilmesi

Hemşirelik Girişimleri

- Anksiyete düzeyi belirlenir (hafif, orta, şiddetli).
- Mevcut baş etme mekanizmaları desteklenir.
- Konuşmasına ve kendini ifade etmesine izin verilir.
- Kişisel alana saygı gösterilir.
- Bir çözüm bulma konusunda güvence sağlanır.
- Vertigo sorununu sıklıkla yaşayan bireylerde şiddetli anksiyete ve panik oluşabilir bu durumlarda kişinin yanında birinin bulunması sağlanmalıdır.
- Ailesinden veya yakın arkadaşlarından destek siistemleri oluşturulur ve anksiyetesi konusunda destek olunması sağlanır.
- Özellikle baş dönmesinin tetiklenmesine neden olan uyaranların azaltılması, sessiz ve hafif ışıklandırılmış bir ortam, anksiyeteyi azaltabilir.

Değerlendirme

- Hemşirelik girişimleri uygulanarak hastanın korku ve endişeleri giderildi ve aile/ arkadaş gibi destek sistemleri oluşturuldu.

Hemşirelik Tanısı 5: **Bilgi Eksikliği** (Alan 6. Bilişsel- algısal)

Etyolojik faktörler: İlaç kullanımı, hastane başvursunun geç olması

Beklenen hasta sonuçları: İlaçlarını düzenli kullanacağını söylemesi, gerektiğinde hekim kontrolüne gideceğini ifade etmesi

Hemşirelik Girişimleri

- İlaç tedavisinin dozu, kullanım şekli, yanlış kullanımı, yan etkileri konusunda bilgilendirme yapılır.
- İlaçla etkileşim oluşturabilecek diğer ilaçlar veya besinler varsa bunlara yönelik bilgilendirme yapılır.
- Baş dönmesi yan etkisi olan ilaçlar hakkında bilgilendirme yapılır.
- Bireyin durumuna göre baş dönmesine sebep olan tetikleyiciler konusunda kişi bilgilendirilir.
- Vertigo hakkında sözlü/ yazılı materyaller kullanılarak bilgi verilir.
- Baş dönmesine neden olabilecek hareketler hakkında bilgilendirme yapılarak, bu hareketlerden kaçınması sağlanır.
- Baş dönmesinin yoğun olduğu dönemlerde dinlenme periyotları yapması sağlanır.
- Tuz tüketimini günlük 2gr altında tutması konusunda bilgi verilir.
- Kafein tğketimi fazlaysa azaltması sağlanır.
- Vestibüler egzersizlerin uygulanma şekli konusunda bilgilendirme yapılır.

Değerlendirme

- Hemşirelik girişimleri uygulanarak hastanın bilgi eksikliği giderildi, hastalık yönetimi konusunda hasta desteklendi.

SONUÇ

Sonuç olarak vertigo sık görülen bir durum olsa bile ilaç tedavisine uyum olmadığı zaman yaşam kalitesini düşüren, yaralanma riskini artıran ve anksiyeteye neden olan bir hastalıktır. Bu çalışmada, alınacak önlemler ve uygulanacak hemşirelik girişimleri sayesinde vertigoya bağlı düşen yaşam kalitesinin yükseltilebileceği görülmüştür. Gordon'un fonksiyonel sağlık örüntüleri modeli ile ana sorunları kısa sürede belirlemek hemşireler için önemlidir. Ayrıca bu model, hemşirelik bakımında profesyonelliğin artmasını sağlayarak hemşirelik bakımını sistematik bir hale getirmektedir.

Bu çalışmanın hem hemşirelere hem de hemşirelik öğrencilerine bir rehber niteliğinde olması, benzer vakalarda profesyonel hemşirelik bakımı sunmalarında kolaylık sağlaması beklenmektedir.

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ALBERT MALCHE'S IMPACT ON THE DEVELOPMENT OF HIGHER EDUCATION IN TÜRKİYE

Rıfat SAİDOĞLU

Bünyamin AĞALDAY

Abstract
This research aims to reveal the role and influence of Albert Malche in developing higher education in Türkiye. Higher education in Türkiye has reached its point after several challenging historical development stages. In this historical development process, Albert Malche, a Swiss, native French speaker of Jewish origin and a professor of pedagogy at the University of Geneva, has an important place and role. Albert Malche graduated from the Faculty of Literature at the University of Geneva, started to work as an assistant doctor, and became a professor there. He is a renowned European academic specializing in education, especially primary and secondary education. Albert Malche was invited to Türkiye in 1932 on the recommendation of Akil Muhtar, the teacher of the then Minister of National Education Reşit Galip from the Faculty of Medicine (Akil Muhtar studied medicine at the University of Geneva and became an associate professor there) and with the blessing of Atatürk. As a result of a three-month study, he prepared a report that would be read by Atatürk himself, with handwritten notes, and that would shed light on the state of higher education at that time. In this study, Albert Malche's studies on the transition from Darülfünun to Istanbul University in Türkiye, his thoughts on higher education in both Türkiye and Europe at that time, and the content of his report on the reform of higher education in Türkiye will be tried to be revealed. In this way, an important turning point in the field of higher education in Türkiye will be illuminated.
Keywords: Albert Malche, higher education, Türkiye

TÜRKİYE'DE YÜKSEKÖĞRETİMİN GELİŞİMİNDE ALBERT MALCHE'İN ETKİSİ

Özet
Bu çalışmanın amacı, Türkiye'de yükseköğretimin gelişimi aşamalarında Albert Malche'nin rolünü ve etkisini ortaya koymaktır. Türkiye'de yükseköğretimin bulunduğu noktaya gelmesi bir takım meşakkatli tarihsel gelişim evrelerinden sonra gerçekleşmiştir. Bu tarihsel gelişim süreçleri içerisinde de İsviçreli, ana dili Fransızca, Musevi kökenli ve Cenevre Üniversitesinde çalışmış bir pedagoji profesörü olan Albert Malche'nin de önemli bir yeri ve rolü vardır. Albert Malche, Cenevre Üniversitesinde Edebiyat Fakültesini bitirmiş, aynı üniversitede asistan doktor olarak çalışmaya başlamış ve aynı üniversitede profesör ünvanı almıştır. Kendisi özellikle eğitim alanında bilhassa da ilkokul ve ortaokul eğitimi alanında uzmanlaşmış ve Avrupa'da bu alanda ün salmış bir akademisyendir. Albert Malche, dönemin Milli Eğitim Bakanı Reşit Galip'in Tıp Fakültesi'nden hocası Akil Muhtar'ın tavsiyesi (Akil Muhtar Cenevre Üniversitesi'nde tıp eğitimi almış ve orada doçent olmuştur) ve Atatürk'ün tensipleriyle, 1932 yılında Türkiye'ye davet edilmiştir. Kendisi üç aylık bir çalışma sonucunda, Atatürk'ün kendisi tarafından bizatihi okunacak, üzerinde el yazısıyla notlar tutulacak önemde ve o dönemki yükseköğretimin durumuna ışık tutacak bir rapor hazırlamıştır. Bu çalışmayla Albert Malche'nin Türkiye'de Darülfünun'dan İstanbul Üniversitesi'ne geçiş aşamasında, kendisinin yaptığı çalışmalar, o dönemdeki hem Türkiye hem de Avrupa'daki yükseköğretime ilişkin düşüncelerine, Türkiye'de yükseköğretimin ıslahat reformuna ilişkin yazdığı raporun içeriği ortaya koyulmaya çalışılacaktır. Bu şekilde Türkiye'de yükseköğretim alanında önemli bir dönüm noktası aydınlatılacaktır.
Anahtar Kelimeler: Albert Malche, yükseköğretim, Türkiye

Giriş

Türkiye yükseköğretimi, Medrese, Darülfünun ve 1933'te çıkarılan 2252 sayılı İstanbul Darülfünununun ilgasına ve Maarif vekâletince yeni bir Üniversite kurulmasına dair kanun aracılığıyla İstanbul Üniversitesi'nin kurulmasıyla (1 Ağustos 1933) birlikte bugünkü üniversite modeline kavuşan süreçlerden geçmiştir (2252 Sayılı Kanun, 1933). Türkiye'de yükseköğretim bu önemli süreçlerden geçerken, tarih içinde bu süreçleri etkileyen önemli şahsiyetler de ortaya çıkmıştır. Bu şahsiyetlerden birisi de Türkiye yükseköğretiminin Darülfünun'dan üniversite modeline geçişte yazdığı rapor ve sonrasında yapılan ıslahat hareketlerine müşavirlik yaparak katkı sunan Albert Malche olmuştur. Albert Malche, aslen İsviçreli, ana dili Fransızca olan, Musevi kökenli, Cenevre Üniversitesi'nde Edebiyat alanında eğitim görmüş, aynı üniversitede çalışmaya başlamış, bu üniversitede pedagoji profesörü ünvanı alarak çalışmalarını sürdürmüş ve Türkiye'de Yükseköğretimin reforme edilme çalışmalarında bulunmuş ve bu anlamda önemli katkılar sunmuş bir akademisyendir. Albert Malche, İsviçre'nin Cenevre şehrinde 22 Şubat 1876'da doğmuş ve 29 Aralık 1956'da vefat etmiştir. Bir pedagoji profesörü olan Albert Malche'ın eğitim anlayışının üç önemli sacayağı vardı. Bunlardan birincisi çocukların geçmişin deneyimlerinden elde ettikleri bilgileri kümeleyen ve bu şekilde bir bilgi birikimi sağlayan zihin yapısına sahip oldukları görüşüdür. İkinci ilkesi ise "Uygulamalı Okul" anlayışıdır. Ona göre okullarda öğrenciler, uygulamalı metotlarla daha kalıcı ve verimli bir öğrenme faaliyetinde olabileceği görüşündedir. Üçüncü ilkesi ise okulların ve öğrenme metotlarının hayatın temel gerçekliğinden kopmaması gerektiğidir. Öğretme ve öğrenme etkinlikleri gerçek hayatın kendisinden kesitler içermelidir (Şimşek, 2024). Albert Malche, Türkiye'de Cumhuriyetin ilanından sonra başlayan Darülfünun ıslahat çalışmalarının son evresi olan "İstanbul Darülfünun" un modernleştirilmesi aşamasında adından söz ettirmiş bir isimdir. Dönemin Milli Eğitim Bakanı Reşit Galip, Atatürk'ün de tensipleriyle kendisini yükseköğretimin yapısını incelemek, konuyla ilgili görüşlerini sunacak bir rapor hazırlamak üzere Türkiye'ye davet etmiştir. Milli eğitim Bakanı Reşit Galip'e Albert Malche isminin Cenevre üniversitesinde okumuş ve bu üniversitede doçent olmuş aynı zamanda da Reşit Galip'in tıp fakültesinden hocası olan Akil Muhtar tarafından önerildiği dile getirilmektedir. Albert Malche, kendisinden istenen incelemeyi yapmak ve bu doğrultuda rapor hazırlamak için 18.01.1932'de resmi olarak görevine başlamış, bu amaçla dönemin başbakanı ve milli eğitim bakanı ile Ankara'da bir görüşme gerçekleştirmiş ve görüşmenin ardından İstanbul'a dönerek çalışmaya başlamıştır (Malche, 1939). Hazırladığı raporu Milli Eğitim Bakanı Esat Sagay'a arz etmiştir (Erdem, 2012). Malche'nin hazırladığı raporun tamamının doksan beş

sayfa olduğu bilinmektedir (Güler, 1994). Albert Malche'nin uzun uğraşılar sonucunda hazırladığı rapor üç ana bölümden oluşmaktadır. Bu raporun ilk bölümü, çalışmanın gayesinin yani raporun hazırlanma amacının ayrıntıları ve nedenleriyle ortaya konulduğu kısımdır. Raporun ikinci bölümünde, Darülfünunun bütün yönleriyle mevcut halinin fotoğrafı çekilmeye çalışılmıştır. Akademik ve idari yapısı, bütçesi, fiziki durumu, laboratuvarları, klinikleri, hocalarının seviyesi, öğrencilerin durumu, barınması ve kütüphane durumları ortaya konulmaya çalışılmıştır. Raporun son kısmı yani üçüncü kısmında da İstanbul Darülfünunu için yapılabilecek yeniliklere ve ıslahat çalışmalarına değinilmiş, bu amaçla önerilerde bulunulmuştur (Kocatürk, 2021).

Albert Malche raporunun ilk kısmında raporu hazırlarken neler yaptığını anlatmıştır. Bu minvalde Darülfunun'a bağlı tüm birimleri, binaları, fakülteleri, klinikleri, laboratuvarları, kütüphaneleri, şehrin içinde yer alan yüksekokulların hepsini incelemiştir. Kendisi, bu birimlerde çalışan dekanlar, profesörler, hocalar, yetkililerle ve tedrisat gören öğrencileriyle görüşmeler gerçekleşmiştir. Bu konuda bilgi sahibi olup, görüş beyan eden farklı kesimlerden aydınlarla görüşmeler yapmıştır. Bilgi sahibi olmayı gerektirecek dersler, konferanslar, seminerleri takip etmiştir. Albert Malche, hatta lise tahsili ile ilgili malumat sahibi olmak için Galatasaray Lisesi, Pertevniyal Lisesi, Fevziati Lisesi ve Robert Koleji ziyaret etmiş ve dönemin lise eğitimi ile ilgili bilgiler toplamıştır (Malche, 1939). Konuya daha iyi vakıf olabilmek adına 15 sorudan oluşan bir anket hazırlatmış ve bakanlık tarafından uygulanmasını istemiştir. Bakanlık tarafından kendisinden çalışmaya başladığı senenin Haziran ayına kadar çalışmasını bitirmesi talep edilmiştir. Malche, dört ay gibi kısa bir sürede her yönüyle mükemmel bir raporun çıkmasını kendisi de beklememekte ve raporunun bazı hataları içerebileceğini dile getirmiştir (Malche, 1939). Malche, Darülfünundaki birimlerin idari yapısını, teşkilatlanmasını, bütçesini, yönetim şekillerini incelemiş ve bu kurumu her yönüyle ortaya koymaya çalışmıştır (Şimşek, 2024). İlk bölümün son kısmında da kendisine her yönüyle yardımcı olan hükümet ve bakanlık yetkililerine teşekkür etmiştir. Albert Malche, İstanbul Üniversitesi Hakkındaki Raporunun ikinci kısmında incelemeleri sonucunda gördüğü eksiklik ve sorunları ise dile getirmeye çalışmıştır. Bunlardan öne çıkanlar şöyle sıralanabilir.

- Öğrencilerin mezun oldukları okulların çeşitliliği, bulundukları ilin seviyesi ve akademik yeterliliği nedeniyle öğrenci seviyeleri, birbirlerinden farklılıklar göstermektedir ve bu durum da başarılarını etkilemektedir.

- Özellikle köy ve ilçelerden eğitime gelen öğrencilerin eğitim yaşantısını, ekonomik zorluklar çok etkilemektedir ve bu durum şehirlerden gelen öğrenciler ile aralarında bir makas oluşturmaktadır.
- Çok sık ıslahat hareketleri ve söylemleri olup, bunların hayata bir türlü geçirilememiş olmasından ötürü yeni ıslahat hareketlerine karşı mesafeli kalınmaktadır.
- Türkçe yapılmış bilimsel yayın sayısı yok denecek kadar azdır.
- Yabancı dil bilen hoca ve öğrenci sayısı azdır. Yabancı dilde yapılan bilimsel yayınlar yeteri kadar takip edilememektedir. Bu nedenle de ders kitapları yeteri sayı ve kalitede değildir.
- Bilimsel özerklik nispeten sağlandığı gibi hocaların, diğer personelin çalışma özgürlüğü, sürekli başka yere tayin edilme endişeleri ortadan kaldırılmalıdır.
- Darülfünun hocalarının ücretleri yeteri kadar değildir, profesörlerin ve diğer hocaların maaşları arasındaki farklar çok belirgin değildir.
- Darülfünun için ayrılan bütçe yeteri kadar değildir.
- Kayıtlı gözüken öğrenci sayısının 2500 kişi olmasına rağmen devam eden öğrenci sayısı azdır. Devam edemeyen öğrencilerin akıbeti belli değildir.
- Hocalara ve memurlara ayrılan odalar iyi olmasına rağmen, derslikler, seminer odaları, kütüphaneler, klinikler eski ve dökülmüş durumdadır. Bayezitte bulunan binaların bazıları atıl durumdadır.
- Kurumun sevk ve idaresini yapan eminin (Rektör) görev yükü çok ağırdır. Hem akademik hem de idari işlerle aynı anda ilgilenmektedir.
- Darülfünundaki eğitim ve öğretim çalışmalarının amaç ve hedefi ortaya kümülatif olarak ortaya konamamıştır. Hedef, amaç ve sonuçlar ağır basan bir profesörün, profesör grubunun ve veya bir alanın istediği yönde olabilmektedir. Kurumda güçlü olanın tarafına doğru yönlendirilmektedir.
- Darülfünunda bir kürsü için profesör ve hoca seçimi objektif kriterler ve bilimsel ölçütler dikkat edilerek yapılmamaktadır. Kişisel yakınlıklar ön plana çıkmaktadır.
- Fakültelerin içindeki akademik kadrolarda daha da uzmanlaşmayı sağlayacak dalların ve enstitülerin çıkmasının önünde engeller olmakta ve bu konu düşünülmemektedir.
- Tedrisat programlarının içerikleri ve planlaması öğrencilerin yeteri kadar donanım kazanmasını sağlayacak kalitede değildir. Sınavlar öğrencilerin sadece ansiklopedik bilgilerini ölçmeye dönük olmaktadır ve pratiğe aktarılmış proje sınavlarından uzak kalmaktadır.

- Hocaların ders işleme şekilleri ansiklopedik bilgi aktarımı şeklinde olmaktadır. Farklı kaynaklardan yararlanma az bir seviyede kalmaktadır. Derslerin içeriklerinde bir alt ve bir üst seneye göre değişim yok denecek kadar az olmaktadır.
- Kümülatif, toplu derslerin yanında bireysel gelişimi sağlayacak özel dersler, seminerler yapılmamaktadır. Öğrencilerin kendisi ders hazırlayıp, anlatmamaktadır. Pratik gerektiren ders aktivitelere çok azdır. Laboratuvarlar ve klinikler yeterli sayıda değildir.
- Kütüphanelerin sayısı ve içindeki kitapların sayısı azımsanmayacak sayıda olmasına rağmen işletme sistemi tam oturmadığı için bir kitap hem merkez kütüphanede hem de fakültelerin kütüphanelerinde birden fazla tekrar edebilmektedir. Bu kadar kitaba rağmen bir kaynağı bulmak bazen mümkün olamamaktadır. Kütüphanenin dışına okumak için kitap verilmemektedir.
- Öğrencilerin çoğu özellikle taşradan geldikleri için, kıt imkanlar içerisinde eğitim hayatlarına devam etmekte ve kendilerine sunulan ekonomik imkanlar yetersiz kalmaktadır.
- Yüksek Muallim Mektepleri ve Edebiyat Fakültelerinden lise hocası olmak için mezun olan öğrenciler yeteri donanıma sahip olacak bir eğitim alamamaktadır.
- Darülfünunda hoca yetiştirme geleneği Avrupa'daki üniversitelerde olduğu gibi tam olarak oturmamıştır (Malche, 1939).

Albert Malche raporunun ikinci kısmında gördüğü eksiklikleri belirttikten sonra bir diğer kısma geçmiş ve raporun üçüncü kısmında, tespit ettiği eksikliklerin giderilmesine yönelik kendince çözüm önerileri sunmuştur. Raporuna yansıyan bu öneriler de şöyle sıralanabilir.

- Eğitim sisteminin tamamında her zaman başka yerden bilgi transferi kalıcı bir çözüm olmamaktadır. Bunun yerine bilimin kendisini oluşturacak düşünce sisteminin ortaya çıkarılması gerekli olmalıdır.
- Darülfünunda hala çok eski öğretme metotları kullanılmakta ve bu durumun değişmesi gerekmektedir. Araştırma, inceleme, karşılıklı tartışma ve sentezleme yöntemleri daha etkin kullanılmalıdır.
- Eskisinden daha farklı şekilde oluşturulacak yeni Darülfünun yapısında eski yapısında olduğu gibi Fen, Edebiyat, Hukuk ve Tıp Fakültelerine yer verilmelidir.
- Darülfünunda okutulan derslere ait kitapların hem sayısı hem de içeriği zenginleştirilmelidir.
- Darülfünunda bilimsel özerklik en önemli mesele olmalıdır. Profesörler ilmi değerlendirmelerinde herhangi bir sınırlama ile karşılaşmamalıdır. Hocalara bu konuda bir sınır çizilmemelidir (Güler, 1994). Bu konuda Avrupa'daki üniversiteler örnek alınmalıdır.

- Milli Eğitim Bakanı Darülfünunun yönetiminde daha etkin olmalı, fakültelerin ve diğer birimlerin amirleriyle yakın bir çalışma içinde olmalıdır.
- Darülfünun rektörünün yoğun iş temposu yüzünden fiziki, idari iş ve işlemleri takip edecek bir başka yetkili olmalıdır.
- Türkçe olarak yayınlar nicelik olarak arttırılmalıdır.
- Darülfünun hocalarının halka geniş katılımlı ve her alanda konferanslar vermesi sağlanmalıdır.
- Hükümetin destekleyeceği aylık ve seksen sayfayı bulacak bir Darülfünun dergisi çıkartılabilir.
- Kütüphanelerin imkanları ve fiziki şartları iyileştirilmeli, kütüphane sistemi merkezileştirilmeli ve öğrencilerin dışarda kitap okuyabilmeleri sağlanmalıdır.
- Darülfünun hocalarının terfi işlemleri yeniden gözden geçirilmeli, objektif ve bilimsel kriterler getirilmelidir. Milli Eğitim Bakanı bu konuda daha etkin olmalıdır.
- Dil sorunu aşılmalıdır. Dil öğretimi liselerde başlamalıdır. Yükseköğretim eğitiminin ilk yılının sonunda öğrenciler bir dil yeterliliği sınavına alınmalıdır.
- Haydarpaşa'da bulunan Tıp Fakültesi İstanbul Yakası'na taşınmalıdır.
- Darülfünun içindeki ders anlatım metotlarında yenilik yapılması gerekmektedir. Hocaların klasik anlatım modelinden uzaklaşılmalı ve öğrencilerin daha aktif olacağı modele geçilmelidir. Öğrencilere proje ödevleri ve seminerler verilmelidir.
- Arupa'daki emsallerine göre her ne kadar daha zor şartlarda çalışıyor olsa da Darülfününun ülkenin fikir ve kültür merkezi olmalıdır.

Albert Malche'nin, raporunda bahsettiği noktalar, aslında dönemin yükseköğretim kurumu olan Darülfününun çağın gerisinde kaldığının da özeti mahiyetindedir. Albert Malche göre Darülfünun meselesi, Türkiye'nin düşünce hayatının, manevi dünyasının ve toplumsal bekasının ana unsurlarından birisidir. Dönemin önemli figürü ve lideri olan Atatürk de bu durumun farkındaydı ve Darülfünun müessesinin kendisinin ülkede yapmak istediği reformların gerisinde kaldığının da farkındadır (Irmak, 2001). Aslında 1924 yılında çıkarılan 499 sayılı kanunla, Darülfününa ihtiyaç duyduğu bütçe ve resmi bir hüviyet kazandırılmıştır (Arslan M. , 2005). Kendi içinde rahat çalışmasını sağlayacak bir özerk yapı getirilmiştir. Darülfününa bu yenilikler getirilmesine rağmen, kurumda hala klasik eğitim metotları uygulanmaya devam etmekte, dil gelişimi olmamakta, batıdaki gelişmeler yeterince takip edilememekte, yapılan harf inkılabına karşı ciddi bir muhalefet sergilenmeye çalışılmıştır (Kuruyazıcı, 1999). Darülfünun, ülkede çok ciddi siyasi ve yönetimsel

dalgalanmalar olurken, kendisi bir yabancı gibi davranıp kendi köşesinde kalmıştır. Ekonomi alanında, devlet ve vatandaş hukukunda önemli değişimler olurken, Darülfünun tüm bu gelişmelere sessiz kalmakla büyük eleştiriler almıştır. Bunun en güzel ve sade örneğini dönemin Milli Eğitim Bakanı Reşit Galip'in 1933'te, Üniversitesi'nin açılış konuşmasında bu minvalde yaptığı konuşmasıdır (Vatandaş, 2010).

Atatürk, Albert Malche'nin hazırladığı raporu büyük bir dikkatle okumuş ve okuduğu müsvedde üzerinde seksen maddeye yakın el yazısıyla notlar yazmıştır (Turan, 1998). Bu notlardan ön plana çıkanları ise Darülfününun artık ömrünü yitirdiği, kapatılması gerektiği ve yerine İstanbul Üniversitesinin kurulması gerektiği, bunu da ancak Milli Eğitim Bakanlığının yapabileceği notlarıdır (Özata, 2007). Atatürk ayrıca öğrencilerin yabancı dil öğrenilmesi, bilimsel anlamda özgürlüğün sağlanması, Darülfününun idari işleyişinin kontrol edilmesi gerektiği, tayinlerin ve program yapılmasında bakanlığın etkin olması gerektiği, rektörün görevlerinin net şekilde belirlenmesi, memurların görev tasnifi, Darülfünundaki bilimsel seviyenin düşüklüğü, üniversitelerin toplumun içinde ne yapması gerektiği, üniversitede takip edilecek öğretme metotları ve teknikleri, hocaların yetiştirilme usul ve esasları, yurt dışından hoca takviyesi, kütüphanelerin daha efektif hale getirilmesi gerektiği şeklinde notlar da yazmıştır (Özata, 2007). Atatürk'ün tüm notlarından sonra meseleye dair daha geniş bir pencereden bakmasını sağlayan görüşü ise Darülfünun reform hareketlerini özetler niteliktedir. Atatürk, yükseköğretimin ıslahı meselesinin ülkenin tamamında topyekûn yapılacak bir kültür ve kalkınma hareketi olarak görmektedir (Özata, 2007). Asıl sorunun sadece Darülfününun ıslahından ibaret bir sorun olmadığına, ülkenin tamamında yapılacak bir eğitim ıslahı meselesi olduğunu düşünmektedir. Bu minvalde ülkeyi üç büyük kültür bölgesine ayırmanın ve ona göre hareket etmenin faydalı olacağına inanmaktadır. Atatürk'e göre yurdun batı tarafı İstanbul'da kurulacak üniversiteyle, yurdun ortası ise Ankara'da kurulacak bir üniversite ile, yurdun doğusu ise Van'da kurulacak bir üniversite ile topyekûn bir kültür reformuna sokulabilecek ve bunun sonucunda da yükseköğretimde ve diğer alanlarda arzu edilen seviyeye gelinebilecektir (Gürüz, Dünyada ve Türkiye'de yükseköğretim (Tarihçe ve bugünkü sevk ve idare sistemleri), 2001).

Albert Malche'nin hazırladığı rapor, başta Atatürk, dönemin başbakanı ve Milli Eğitim Bakanı'nın Darülfünun hakkındaki düşüncelerinin ve eylem planlarının netleşmesini sağlamıştır. Bunun ilk adımı olarak da 2252 sayılı kanun çıkarılmış, 31 Temmuz 1933'te İstanbul Darülfünun resmen kapanmış (Madde 1) ve 1 Ağustos 1933 tarihi itibarı ile İstanbul Üniversitesi kurulmuştur (Madde 2) (Irmak, 2001). Bu yasayla Türkiye'de ilk defa rektör, üniversite, dekan, fakülte gibi tanımlamalar yapılmıştır (Güler, 1994). 2252 sayılı yasayla

artık üniversite rektörü Milli Eğitim Bakanı'nın önerisine istinaden üçlü kararnameyle atanacaktır. Dekanlar, fakülte kurulu kararı ve bakanın onaylamasıyla atanacaktır. 1933'te yapılan bu değişim Türkiye yükseköğretim tarihinde bir dönüm noktası olarak değerlendirilmekte ve Avrupai tarzda üniversite modeline geçişin ilk adımı olarak görülmektedir (Gürüz, Şuhubi, & Şengör, Türkiye'de ve Dünya'da Yükseköğretim, Bilim ve Teknoloji , 1994). Yasanın çıkartılmasından sonra İstanbul Üniversitesi'nde büyük bir hoca kıyımı yaşanmış ve üniversite hocalarının sayısında belirgin bir düşüş yaşanmıştır. Üniversite ile ilişikleri kesilen hocaların yerine yabancı hocalar istihdam edilme yoluna gidilmiştir (Namal & Karakök, Atatürk ve Üniversite Reformu (1933), 2011). Yabancı hocaların yanında eğitim almak için yurt dışına gönderilen talebelerden de bu anlamda faydalanılmıştır (Taşdemirci, 1994)

Albert Malche, rapor hazırlamakla kalmamış aynı zamanda eğitim sisteminin yapılacak ıslah çalışmalarında müşavir olarak da görev yapmıştır. Malche, raporunda yükseköğretimin reform çalışmalarında akademisyen istihdamının bir yönüyle yabancı hocalardan temin edilebileceğini belirtmiş ve bu konuda aracılık yapabileceğini eklemiştir. Türkiye'de bu gelişmeler yaşanırken, 1.Dünya Savaşı'nda Osmanlı Devleti'nin müttefiki olan Almanya'da da çok büyük siyasi ve politik çalkanmalar yaşanmaktadır. Almanya'da Nazilerin aşırı baskısı yüzünden yahudi kökenli bilim adamlarının çalışma şartları çok kısıtlanmış ve büyük bir baskı altına alınmışlardır. Kendi alanlarında yetkin Yahudi bilim insanları bu baskıdan kurtulmak için başka ülkelere kaçıp, orada çalışmayı çare olarak görmüşlerdir. Almanya'dan kaçan bilim insanları özellikle İsviçre'ye yerleştiler ve orada "Alman Bilim Adamları Yardım Cemiyeti" çatısı altında teşkilatlanmışlardır. Bu cemiyetin başını çeken "Profesör Philip Schwartz ve Profesör Rudolf Nissen" ile Malche'nin girişimleri ve dönemin Milli Eğitim Bakanının çabalarıyla iletişime geçilmiş, Türkiye'ye davet edilmiş ve yaptıkları ziyaretten sonra her türlü desteği sağlamaları konusunda ikna edilmişlerdir (Arslan A. , 1992). Hükümet 10 Nisan 1934'te çıkardığı 2397 sayılı kanunla yükseköğretimde istihdam edilecek yabancı uyruklu akademisyenlerle ilgili şartları ilan etmiştir. Bu kanuna göre sözleşmeler on yılı geçmeyecektir. Gelen akademisyenler üniversitelerde her türlü ders aktivitesi içinde olacaklar, öğrenci yetiştirecekler, Türkçe öğrenmek zorunda olacaklar, başka bir işte çalışamayacaklar ve Türkçe ders kaynakları hazırlayacaklardır. Bu yabancı uyruklu akademisyenler, Türk hocalara göre 3-4 kat daha fazla aylık ücret alabiliyorlardır (Özata, 2007).

Almanya'dan politik baskıdan Yahudi kökenli bilim insanlarının Türkiye'de yükseköğretimin Avrupa emsali gibi oturmasında, işlemesinde, ilerlemesinde, öğrenci

yetiştirilmesinde, yeni kürsülerin kurulmasında, yeni yayınların yapılmasında, ders işleme metotlarının yenilenmesinde, öğrencilerde analitik düşünce tarzının yerleşmesinde, yükseköğretimin batıya kapılarını açmasında, Avrupa'daki muadilleriyle ilişkilerinin artmasına sebep olmuşlardır. Kurulan yeni üniversitenin batıyla entegrasyonunu sağlamada bir köprü görevi görmüşlerdir (Namal, Türkiye'de 1933-1950 Yılları Arasında Yükseköğretime Yabancı Bilim Adamlarının Katkıları, 2012). Prof. Dr. Münir Olgur, dünyanın önde gelen Alman Yahudi kökenli bilim insanlarından Albert Einstein ile Amerika'da yaptığı görüşmede, kendisine İstanbul Üniversitesi'nin kuruluş yıllarında yapılan reform hareketleri minvalinde Türkiye'ye davet aldığını söylemiştir (Özata, 2007). Sonuçları bakımından değerlendirildiğinde Atatürk'ün önderliğinde yapılan yeni üniversite modeli aslında bir bakıma Alman üniversite modelini taklit ediyor denilebilir (Namal & Karakök, Atatürk ve Üniversite Reformu (1933), 2011). Almanların özellikle mühendislik ve teknik alanlarda yetişmiş kaliteli insan gücüne sahip olmaları hoca gelişlerini daha cazip hale getirmiştir. Türkiye'ye gelen Alman Yahudi bilim insanları yükseköğretimde derin bir Alman modeli etkisi oluşturmuş ve bir zamanlar etkili olan Fransız kültürünün şiddetinin erimesine neden olmuştur (Dölen, 2010).

Türkiye'de yükseköğretim, süreç içerisinde medreseler dönemini, akabinde Darülfünun dönemini atlatmış ve gelişimini devam ettirmiştir. Bu yenilik hareketlerinin nihayetinde Avrupa'da görülen modern bir üniversite kurma girişiminin alt yapısı oluşmuştur (Widmann, 1981). Albert Malche'in hazırladığı raporun ışığında gerçekleştirilen ve ilk kez reform olarak adlandırılan 1933 üniversite reformu, Türkiye yükseköğretim tarihinde bir ilki başlatmış ve bu yenilik hareketlerinin sürmesini sağlamıştır. 1933 yılında yükseköğretimde yapılan bu reformlar sonucunda Türkiye'de batılı tarzda ilk üniversite olan İstanbul Üniversitesi'ni ortaya çıkarmıştır. Türkiye yükseköğretimindeki gelişme ve yenilikler süregelen yıllar içinde devam etmiş ve beraberinde 4936 sayılı kanunu 1946 yılında, 115 sayılı kanunu 1960 yılında, 1750 sayılı kanunu 1973 yılında ve nihayetinde bugün kullanılan 2547 sayılı yükseköğretim kanununun 1982 yılında gerçekleşmesini sağlamıştır (Namal & Karakök, Atatürk ve Üniversite Reformu (1933), 2011).

Sonuç

Cumhuriyetin ilanından sonra İstanbul Darülfünunu'nun işleyişinin çağın ihtiyaçlarına cevap veremez bir duruma geldiği görülmüştür. Kuruma yönelik yıllar içinde oluşan eleştiriler giderek artmış ve yükseköğretim kurumu işleyemez hale gelmiştir. Ülke çok önemli bir zaman diliminden geçerken, böylesine önemli bir kurum ve hocaları, tüm bu gelişmelerden uzak durmayı bazen de karşısında olmayı tercih etmişlerdir. Yükseköğretim

kurumunun ıslah edilmesine yönelik çalışmalar kapsamında Albert Malche'a hazırlatılan rapor, dönemin yöneticilerine ve Atatürk'e önemli bir ışık olmuştur. Dönemin Başbakanı, Milli Eğitim Bakanı ve Atatürk'ün kendisi Malche'ın raporunu dikkatlice incelemiş ve yapmış olduğu tespitleri yerinde bulmuşlardır (Özata, 2007). Albert Malche'in görüşleri beğenilmiş ve kendisinin yapılacak ıslahat hareketlerinde müşavir olarak kalması istenilmiştir.Albert Malche'in hazırladığı rapor, İstanbul Darülfünunun'un kapatılıp, İstanbul Üniversitesi'nin kurulmasına sebep olan 2252 sayılı kanunun hazırlanıp, yürürlüğe girmesine ışık tutmuştur (Gazete, 1933). Malche'ın raporu Hükümetin yükseköğrenim konusundaki yol haritasının ana hatlarının çizilmesini sağlamıştır (Malche, 1939). Darülfünunda aksayan, eksik olan ve ortadan kaldırılması gereken yönler görülmüştür. Darülfünunun Avrupa üniversiteleri ile kıyaslandığında geride kaldığı tüm yönlerin net bir şekilde görülmesine vesile olmuştur. Albert Malche kendi alanında yetkin bir akademisyen olarak aslında Hükümet kanadında ve konuyla alakadar taraflarda ciddi bir beyin fırtınasının kopmasına neden olmuştur. Malche'ın raporunun tuttuğu ışıkla Darülfünun içinde ciddi bir akademisyen kitlesiyle ilişik kesilmiştir. Avrupa'ya eğitime gönderilen Türk talebelerin çağırılıp, İstanbul Üniversitesi'nde hocalık yapmalarına neden olmuştur. Malche, hazırladığı raporda belirttiği yabancı uyruklu hoca istihdamı minvalinde Nazi zulmünden kaçan Almanya'da ve İsviçre'deki Yahudi kökenli bilim insanlarıyla irtibata geçmiş ve onların İstanbul Üniversitesi'nde istihdam edilmelerini sağlamıştır (Günay, 2004).Albert Malche, özellikle Almanya'dan Nazi baskısı nedeniyle göç etmek zorunda kalan ve bu nedenle işsiz kalıp, zor duruma düşen Yahudi bilim insanlarının başka ülkelerde istihdam edilmelerine vesile olması üzerine 1951-53 senelerinde "Nobel Barış Ödülü'ne" aday gösterilmiştir (Şimşek, 2024). Albert Malche'ın açtığı yol sayesinde üniversitede bilimsel ve idari muhtariyet yasalaşmış, üniversitede kadrolar belli bir nizam ve usule bağlanmış, kurumun ödenek durumu belirlenmiş ve eskiye göre daha da arttırılmış, tüm dallarda bilim adamı yetiştirebilecek bir duruma gelmiştir (Irmak, 2001). Albert Malche hazırladığı rapor ve ülkeye gelmesine vesile olduğu alanında yetkin bilim insanları sayesinde, emeklemeye başlayan İstanbul Üniversitesi'ni birden Avrupa üniversiteleri ile eş değer bir konuma gelmesine yardımcı olmuş ve çok keskin bir dikey hareketin oluşmasına vesile olmuştur. Gelen bilim insanları bilgi birikimlerini kullanarak hazırlanmaları ve yazılmaları çok uzun zaman alabilecek kitapların yazılmasını, ders araç gereçlerinin hazırlanmasını sağlamışlardır (Namal, Türkiye'de 1933-1950 Yılları Arasında Yükseköğretime Yabancı Bilim Adamlarının Katkıları, 2012).Elbette ki her hareketi destekleyenler olduğu gibi bu hareketin karşısında duran görüşler de olmuştur. Örneğin 1933 reformu nedeniyle çok sayıda bilim

insanı belki de gerekçeleri çok net ortaya konulmadan üniversiteyle ilişikleri kesilmiştir. Bu eylemin tamamıyla siyasal ve ideolojik kaygılardan kaynaklandığı ve bu bilim insanlarının yerine başka bir ülkenin vatandaşı, aynı zamanda Yahudi olan bilim insanlarının tercih edildiği türünde de eleştiriler olmuştur. Üniversitenin ödeneklerinin kesin bir şekilde belirlenmesi, her uygulamanın ve yetkinin sınırlarının çizilmesi, aslında üniversite özerkliğinin de zedelenmesine yol açtığı eleştirisi de dile getirilmiştir (Günay, 2004).

Albert Malche, hazırladığı rapor, bu raporun ışığında hazırlanan yasa, yasa gereği yapılan icraatlar, ülke dışından getirilen yabancı bilim insanlarının çalışmaları, yetiştirdikleri öğrenciler, yazdıkları kitaplar, hazırladıkları ders araç gereçleri, ülke dışına yaptıkları tanıtım ve tüm birikimlerini ülkemize aktarmaları sebebiyle Türkiye Yükseköğretim tarihinde önemli yere sahip olmuş ve kendisi Türkiye yükseköğretim sistemi tarihini etkileyen bir şahsiyet olmuştur.

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DÜŞÜK PROFİL MM-DALGA BANDI 5G UYGULAMALARI İÇİN İLETİ DİZİ ANTEN TASARIMI

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ÖZET
İleti dizi antenler, elektromanyetik dalgaların yönünü, şeklini ve genliklerini kontrol etmek amacıyla tasarlanmış yenilikçi anten sistemleridir. Bu antenler, birden fazla elemanı bir araya getirerek yüksek yönlülük ve hedefe yönelik sinyal iletimi sağlarlar. Bu özellikleriyle ileti dizi antenler, özellikle haberleşme uyduları, radar sistemleri ve kablosuz haberleşme ağlarında önemli avantajlar sunmaktadır. Bu çalışmada, mm-dalga bandında, 28 GHz frekansında çalışan düşük profilli ileti dizi anten tasarımı sunulmuştur. Önerilen yapı, katmanlar arası boşluk bulunan 4 özdeş katmandan oluşmaktadır ve bu katmanlarda dielektrik tabaka olarak Rogers RT6002 ($\epsilon_r = 2{,}94$) kullanılmıştır. Tasarımı yapılan $0{,}37\lambda_0$ uzunluğuna ve $0{,}37\lambda_0$ kalınlığına sahip birim hücre, eleman boyut değiştirme yöntemi ile 360º iletim faz aralığı sağlamaktadır. Dört adet kare ve dört yandaki çubuklardan oluşan birim hücre geometrisi basit bir tasarıma sahiptir. Kareler ve dört yanlardaki çubuklara ait tasarım parametreleri denklemlerle birbirine bağlı şekilde ifade edilmiştir. Böylece belirli bir parametre değişimi ile metalik geometriye ait tüm boyut değiştirilmekte ve bu şekilde 360º iletim faz aralığı sağlanmaktadır. 19 x 19 adet birim hücreden oluşan ileti dizi antenin benzetim sonuçları CST Microwave Studio ile elde edilmiştir. Bu benzetim sonuçları, tasarlanan ileti dizi antenin 28 GHz frekansında etkin alanının 76 cm^2 ($7{,}1\lambda_0^2$) ve bu frekanstaki maksimum kazancın 22,9 dB olduğunu göstermiştir. Besleme anteninin ileti dizi antene uzaklığının, dizi antenin en büyük boyutuna oranı (F/D) 0,55 olarak seçilmiştir. Tasarlanan ileti dizi anten %7,96 1-dB kazanç bant genişliğine ve %21,20 etkin alana sahiptir.

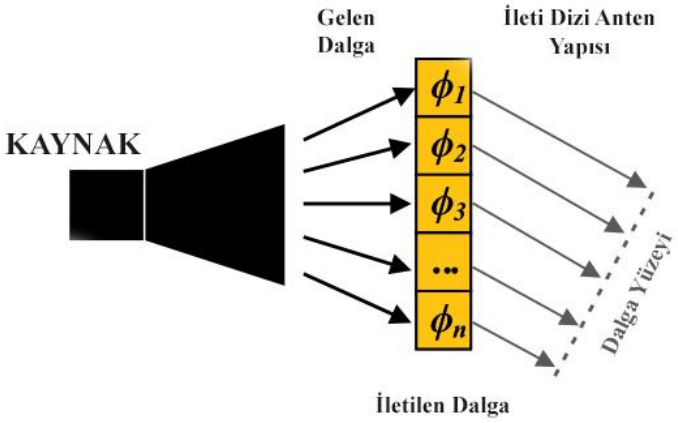
Anahtar Kelimeler: İleti dizi anten, 5G, Düşük profil, mm-Dalga Bandı.

LOW PROFILE MM-WAVE TRANSMITARRAY DESIGN FOR 5G APPLICATIONS

ABSTRACT
Transmitarray antennas are innovative antenna systems designed for controlling the direction, shape, and amplitude of electromagnetic waves. These antennas integrate multiple elements to provide high directivity and targeted signal transmission. Such capabilities make transmitarray antennas particularly beneficial for communication satellites, radar systems, and wireless communication networks. This study introduces a low-profile transmitarray antenna design operating in the mm-wave band at 28 GHz. The proposed structure consists of four identical layers with interspersed gaps, utilizing Rogers RT6002 (ϵ_r=2.94) as the dielectric layer. The unit cell, measuring $0.37\lambda_0$ in length and $0.37\lambda_0$ in thickness, achieves a 360-degree transmission phase range through an element resizing method. The geometry of the unit cell, composed of four squares and bars on each side, features a simple design. The design parameters of the squares and side bars are interconnected through equations, allowing for a comprehensive dimension change in the metallic geometry with specific parameter adjustments, thereby facilitating a 360-degree transmission phase range. Simulation results for the transmitarray antenna, composed of 19 x 19 array, were obtained using CST Microwave Studio. These simulations indicate that the designed transmitarray antenna at 28 GHz has an aperture size of 76 cm² ($7.1\lambda_0^2$) and a maximum gain of 22.9 dB. The distance ratio between the feed antenna and the transmitarray antenna (F/D) was selected as 0.55. The proposed transmitarray antenna possesses a 7.96% 1-dB gain bandwidth and an aperture efficiency of 21.20%.
Keywords: Transmitarray, 5G, Low Profile, mm-Wave

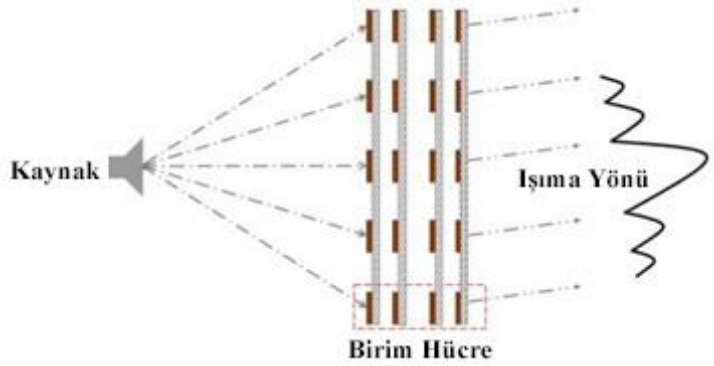
Giriş

Uydu ve noktadan noktaya iletişimler veya radar uygulamaları gibi bir çok uygulama alanında iletilen gücü belirli bir yöne yoğunlaştırmak, alıcıya iletilen gücü iyileştirmek veya aynı frekans bandında çalışan diğer sistemlerle elektromanyetik girişimi en aza indirmek gerekebilir [1]. Bu tür durumlarda, yüksek kazanç ve yönlülük özelliklerine sahip antenlere ihtiyaç duyulmaktadır [2]. Yüksek kazançlı ışıma gerektiren kablosuz iletişim, radar ve uydu uygulamaları için ileti dizi antenler tercih edilen anten seçenekleri olarak öne çıkmaktadırlar [4]. Geleneksel yansıtıcılara ve lenslere kıyasla, ileti dizi anten ve yansıtıcı dizi antenlerin düzlemsel olarak yapılandırılabilmeleri önemli bir avantaj sağlamaktadır [5].



Şekil 1. Genel ileti dizi anten modeli [3]

İleti dizi antenlerini tasarlarken, iki temel kriter faz açısı ve genliktir. Bir ileti dizi anteninin birim hücresi, 360° veya daha fazla bir iletim faz açısına sahip olmalıdır [6]. Bu fazı elde etmek için, çok katmanlı Frekans Seçici Yüzey tabanlı değişken boyutlu birim eleman yöntemi kullanılabilir, yansıtıcı yama eleman döndürülebilir veya her birim hücredeki faz kaymasını elektronik olarak kontrol etmek için ayarlanabilir cihazlar kullanılabilir. Analog ayar için varaktörler gibi elemanlar veya PIN diyotlar ve radyo frekansı mikroelektromekanik sistemler (RF MEMS) gibi cihazlar kullanılabilir. Çok katmanlı elemanlar için kalınlığın azaltılması basit bir teknolojidir [4]. Ancak, bu yaklaşım, elemanlardaki kaybı artırması nedeniyle daha düşük anten verimlilikleri ve daha dar bant genişliklerine yol açacaktır [7].

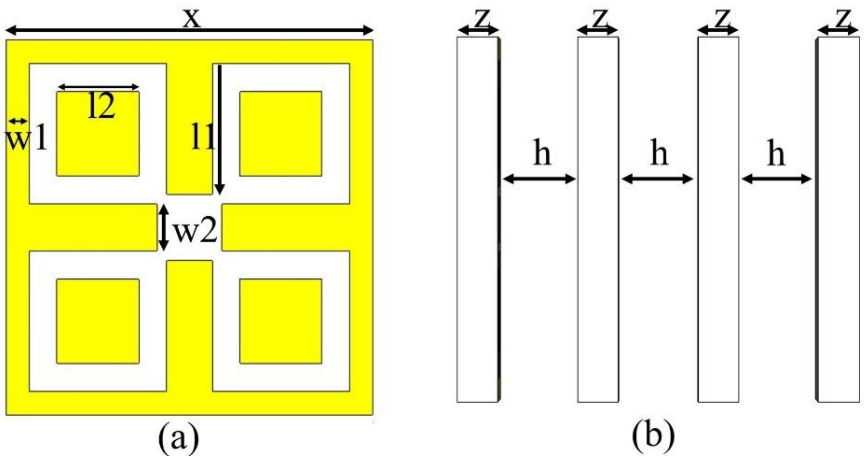


Şekil 2. M-FSY mikroşerit ileti dizi anten konfigürasyonu [8]

Nguyen ve arkadaşları, çok katmanlı Frekans Seçici Yüzeylere (M-FSY) dayalı olarak, çok geniş bir iletim bant genişliği ve geniş bir iletim faz aralığı elde etmek için polarizasyon dönüşüm tekniği kullanmıştır [9]. Araştırmada, birim hücrenin 11,8 GHz ile 13,7 GHz arasında %15,2' lik geniş bir 1-dB iletim bant genişliği sergilediği görülmüştür. Birim hücre, toplam kalınlığı yaklaşık λ/7,7 olan düşük profilli bir tasarıma sahiptir. 21-31 GHz frekansları için tasarlanmış bir çalışmada [10], birim hücre yapısı, iki özdeş dielektrik tabaka üzerine basılmış üç metal katmandan oluşan yapı, 21 GHz ile 31,5 GHz arasında geniş bir -1dB iletim bant genişliği içinde 45°' lik faz adımlarıyla sekiz faz durumu elde etmek için polarizasyon döndürme tekniğine dayanmaktadır. 28/38 GHz mobil uygulamalar için yapılan bir tasarımda [11], alt bant her iki faz değişim durumu için teorik minimum 0,94 dB araya girme kayıplarına sahiptir. Üst bant ise her iki faz değişim durumu için teorik minimum 0,72 dB araya girme kayıplarını sergilemektedir.

II. İleti Dizi Anten Tasarımı

A. Birim Hücre Tasarımı



Şekil 3. Birim Hücre Uzunlukları (a) Ön Yüz (b) Yan Görünüm

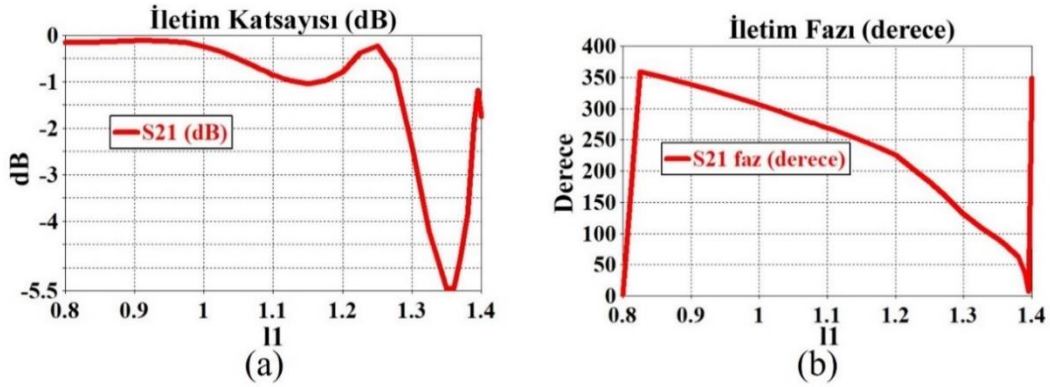
Şekil 3.a' da görüldüğü üzere, birim hücre ön yüzde bir kare halka ile dört özdeş kare ve dört yanında eşit uzunluktaki çubuklardan oluşmaktadır. Şekil 3.b'de görüldüğü gibi 4 özdeş

katmanın sadece ön yüzlerinde metal yamalar bulunmaktadır. Bu özdeş katmanlar 1 mm kalınlığında hava boşluğu ile birbirinden ayrılmıştır. Birim hücre tasarımında dielektrik tabaka olarak kalınlığı 0,508 mm olan Rogers RT6002 ($\epsilon_r = 2{,}94$) kullanılmıştır. Birim hücrenin boyutu 4 mm (0,37 λ_0) ve toplam kalınlığı ise yaklaşık 0,37λ_0 olarak tasarlanmıştır. Sunulan birim hücreye ait tasarım parametreleri Tablo 1' de verilmiştir.

Tablo 7. Önerilen Birim Hücre için Tasarım Parametreleri

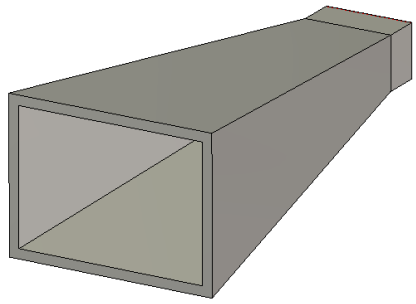
Parametre	Uzunluk (mm)	Parametre	Uzunluk(mm)	Parametre	Uzunluk (mm)
x	4	$l1$	0,825-1,375	z	0,508
$w2 = 2 * w1$	0,5	$l2$	$0{,}8 * l1$	h	1

Şekil 4.a' da $l1$ parametresinin 0.8 ile 1.4 aralığındaki değişimine göre iletim katsayısı karakteristiği görülmektedir. Şekil 4.b' de ise yine değişken $l1$ parameresi için iletim faz karakteristiği görülmektedir ve bu grafikte iletim fazı normalize (0° -360°) haldedir. Birim hücre kullanılarak ileti dizi anten tasarımı yapılırken, dizide her bir eleman için gerekli faz değeri bu grafik yardımı ile hesaplanır sonra birim hücreler diziye hesaplanan fazı sağlayan boyuta göre yerleştirilir.



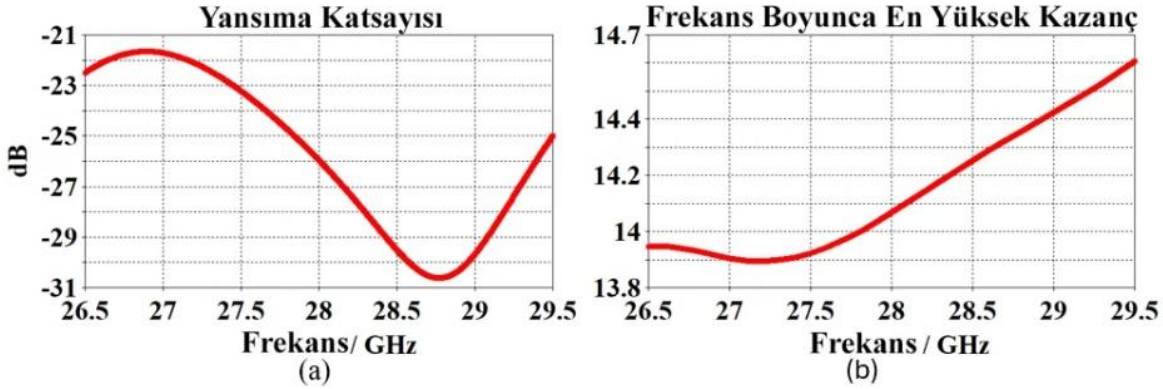
Şekil 4. İletim Katsayısı Sonuçları (a) İletim Genliği, (b) İletim Fazı

B. Kaynak Anten Tasarımı



Şekil 5. Kaynak Anteni

İleti dizi antenin beslenmesinde kullanılacak olan huni anten (Şekil 5) CST Microwave Studio paket programı ortamında tasarlanmıştır.



Şekil 6. Besleme Anteni Benzetim Sonuçları (a) Yansıma Katsayısı (b) Kazanç

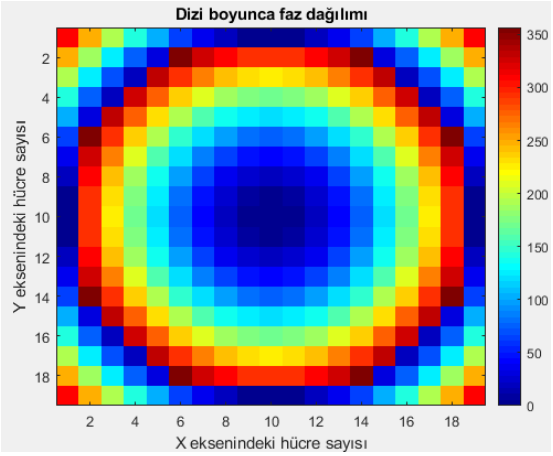
Tasarlanan horn antenin çalışma frekansı boyunca Şekil 6.a' da verilen yansıma katsayısı grafiği ve Şekil 6.b' de verilen kazanç grafiği incelendiğinde, anten 26,5 – 29,5 GHz frekansları arasında verimli şekilde çalışmakta ve bu frekans boyunca kazancı 13,9 ile 14,7 dB arasında değer almaktadır.

C. İleti Dizi Anten

Her bir birim hücre için kaynak antenin o hücreye olan faz gecikmesini telafi ederek belirli bir yönde hüzme odaklamak amacıyla belirli bir faz dağılımı oluştururken gerekli iletim fazı, ileti dizi antenlerde genelleştirilmiş olarak şu şekilde hesaplanır:

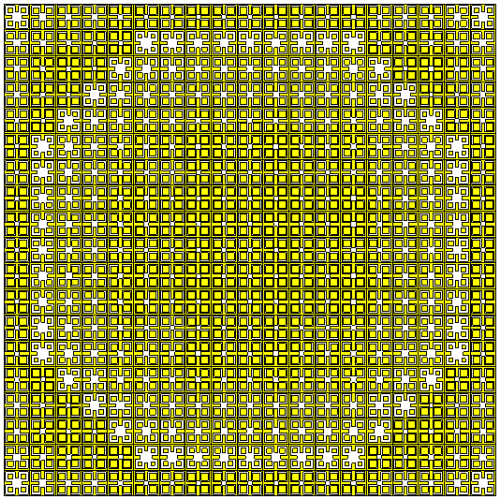
$$\psi_{ij} = k\left(R_{ij} - \vec{r}_{ij}.\hat{r}_0\right) + \psi_0 \qquad (1)$$

Denklem (1)' de ψ_{ij} ij'inci birim hücre için gerekli olan iletim fazını, k serbest uzaydaki yayılım sabitini, R_{ij} ij'inci elemanın besleme anteninin merkezine olan uzaklığını, $\vec{r}_{ij}$ ij'inci eleman için pozisyon vektörünü, $\hat{r}_0$ ana hüzme birim vektörünü ve ψ_0 faz sabitini temsil etmektedir.



Şekil 7. Dizi Boyunca Faz Dağılım Grafiği

Denklem (1) kullanılarak dizi boyunca oluşan faz dağılım grafiği MATLAB programı ile elde edilmiştir. Şekil 5'te merkez 0°'den başlayarak dizi boyunca 360°' yi kapsayacak şekilde oluşan bir faz dağılımı görülmektedir. Daha sonra Şekil 4.b'deki değişken parametre – faz grafiği bilgileri ile dizi oluşturulmuştur.

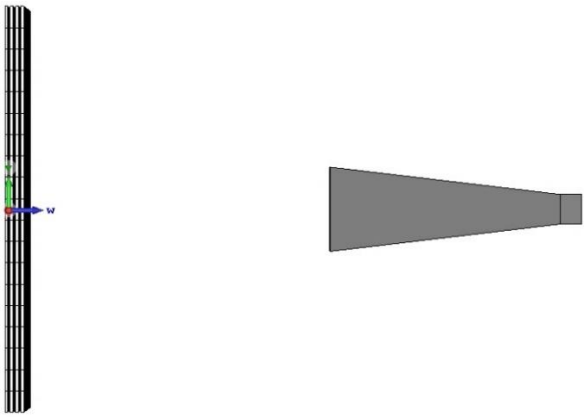


Şekil 8. Önerilen İlei Dizi Anten

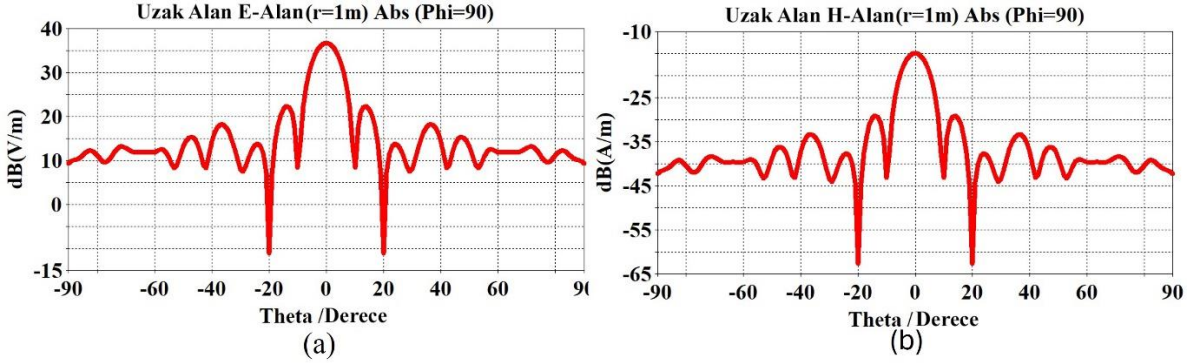
CST Microwave Studio paket programı kullanılarak oluşturulan ileti dizi anten Şekil 6'da görülmektedir. Toplamda 361 birim hücreden oluşan dizi, 360° faz değişimini kapsayacak şekilde oluşturulmuştur.

III. İleti Dizi Anten Benzetim Sonuçları

Tasarımı yapılan ileti dizi anten ile besleme anteninin arasındaki mesafe F/D=0,55 olacak şekilde ayarlanmıştır (Şekil 9). Şekil 10 (a), antenin 28 GHz frekansındaki E- düzlemindeki ve Şekil 10 (b) antenin 28 GHz frekansındaki H-düzleminde ışıma örüntülerini göstermektedir.



Şekil 9. İleti Dizi Anten

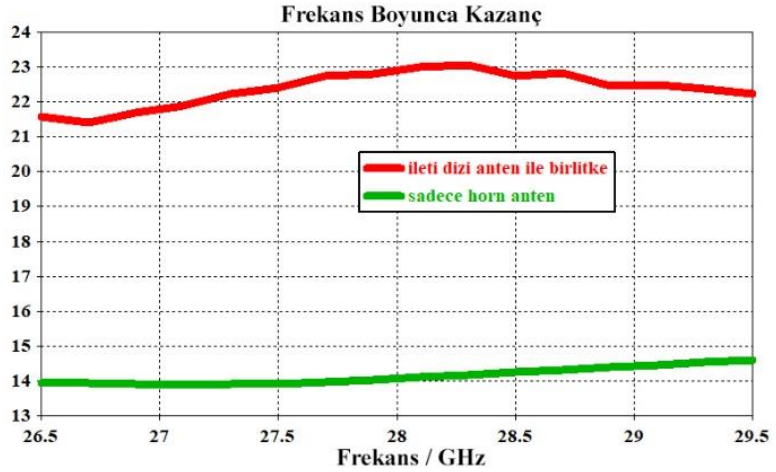


Şekil 10. İleti Dizi Antenin 28 GHz Frekansındaki Işıma Örüntüsü Benzetim Sonuçları (a) E-Alan (b) H-Alan

Şekil 11, kaynak anteninin tek başına iken ve ileti dizi anten ile birlikte kazanç benzetim sonuçlarını göstermektedir. Burada görüldüğü üzere tasarlanan anten, 28 GHz frekansında 22,9 dB maksimum kazanca ulaşmıştır yani 28 GHz frekansında yaklaşık 8.5 dB kazanç artırımına denk gelmektedir. Antenin 1 dB bant genişliği %7.96 olarak elde edilmiştir. Son olarak da tasarlanan ileti dizi antenin etkin alan %21,20 olarak hesaplanmıştır. Etkin alan denklem (2) kullanılarak hesaplanmıştır;

$$n_{ap} = \frac{G}{D_{max}} , D_{max} = \frac{4\pi A}{\lambda_0^2} \qquad (2)$$

Burada G kazanç, D_{max} maksimum yönlülük, A antenin açıklık alanı, λ_0 serbest uzay dalga boyunu temsil etmektedir.



Şekil 11. İleti Dizi Anten Kazanç Benzetim Karşılaştırması

Tasarımı sunulan ileti dizi antene ait benzetim sonuçları literatürde var olan çalışmalar ile özellikleri bakımıdan Tablo II' de karşılaştırılmalı olarak verilmiştir. Tasarlanan 4 katmandan oluşan yapı düşük profil ve etkin alan bakımından bu frekans bandındaki uygulamalar için iyi bir adaydır.

Tablo II. Performans Karşılaştırması

Referans	**Katman**	**Frekans (GHz)**	**Faz Aralığı (º)**	**Via**	**Profil Büyüklüğü ($\lambda_0 x \lambda_0$)**	**Etkin Alan (%)**
[12]	4	30	360	Hayır	86.5x86.5	22.1
[13]	3	28	315	Hayır	67.2x67.2	10
[14]	3	27	1-Bit	Evet	8.6x8.6	28
Bu Çalışma	4	28	360	Hayır	7.7x7.7	21.2

IV. Sonuç

Bu çalışmada, 28 GHz'de çalışan 5G uygulamaları için düşük profilli ileti dizi anten tasarımı sunulmuştur. 4 katmandan oluşan birim hücre 360º'lik iletim faz aralığı sağlamıştır. Tasarımı yapılan ileti dizi anten, 7,6 cm genişliğinde ve yaklaşık 0,4 cm kalınlığındadır. Sunulan ileti dizi anten, %7,96 1-dB bant genişliğine ve %21,20 etkin alana sahiptir. Literatürdeki diğer çalışmalar ile karşılaştırıldığında önerilen ileti dizi anten düşük profil özelliğiyle ön plana çıkmaktadır.

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ORAJLARIN GÜN İÇİ KARAKTERİSTİKLERİNİN BELİRLENMESİ: SAMSUN İÇİN GECE-GÜNDÜZ ORAJLARININ KARŞILAŞTIRILMASI

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ÖZET
Oraj, genellikle şimşek ve gök gürültüsü eşliğinde yağmur, dolu veya bazen kar şeklinde görülen şiddetli meteorolojik olaydır. Havacılık sektörü başta olmak üzere birçok endüstri için afet boyutunda zararlara ve can kaybına yol açabilmektedir. Bu nedenle, orajın oluşum mekanizmasının ve şiddetinin önceden tahmin edilebilirliği oldukça önemlidir. Bu çalışmada, 2013-2022 yılları arası 10 yıllık periyot dahilinde, Samsun Çarşamba Havalimanı tarafından yayımlanan havacılık rasatları (Meteorological Aerodrome Report – METAR) analiz edilerek öncelikle orajın meydana geldiği zamanlar belirlenmiştir. Yer seviyesi meteorolojik parametreler havacılık rasatlarından sağlanırken, yukarı seviye meteorolojik değişkenler için Samsun Bölge Ravinsonde İstasyonu verileri temin edilmiştir. Çalışmanın nihai amacı, orajların gece ve gündüz dağılımını inceleyerek, olayın meydana geldiği yer ve yukarı seviye atmosferik koşulları ortaya koymaktır. Analiz sonuçlarına göre, gündüz vakitlerinde orajlar gece vaktine göre daha fazla meydana gelmiştir. Aylık bazda yapılan incelemelerde, Samsun için orajın en yüksek sayıda meydana geldiği ay Haziran ve bunu takiben Mayıs ayı olmuştur. Gün içerisinde orajların çoğunlukla 14:50 UTC'de meydana geldiği tespit edilmiş ve genellikle öğleden sonra oraj frekanslarının maksimuma ulaştığı tespit edilmiştir. Orajların büyük çoğunluğu 0-2 saat aralığında sürmüştür. Hem gece hem de gündüz orajlarında hava sıcaklıkları 16-25 °C ve çiy noktası sıcaklıkları 14-23 °C aralığında ölçülmüştür. Bağıl nem değerleri genellikle %80'nin üzerinde yer almıştır. Oraj tipleri içerisinde en çok rastlanan TSRA koduyla orajla birlikte yağmur hadisesi olmuştur. Termodinamik indeks ve atmosferik kararlılık parametrelerinin performans analizlerine bakıldığında, K-Indeks (KI) en başarılı indeks olurken, Konvektif Yeterlikli Potansiyel Enerji (CAPE – Convective Available Potential Energy) ise en başarısız atmosferik kararlılık parametresi olmuştur.
Anahtar Kelimeler: Oraj, Boran, Gök gürültülü fırtına, Şiddetli yağış, METAR, Atmosferik sondaj, Termodinamik indeks, Atmosferik kararlılık.

DETERMINATION OF DIURNAL CHARACTERISTICS OF THUNDERSTORMS: COMPARISON OF NOCTURNAL-DAYTIME THUNDERSTORMS FOR SAMSUN

ABSTRACT

A thunderstorm is an intense meteorological phenomenon typically accompanied by lightning and thunder, resulting in rain, hail, or occasionally snow. It can lead to disaster-level damages and loss of life in various industries, particularly in aviation. Therefore, predicting the formation mechanism and intensity of thunderstorms beforehand is crucial. This study focuses on analyzing aviation observations (Meteorological Aerodrome Report - METAR) published by Samsun Çarşamba Airport between 2013 and 2022 to determine the timing of thunderstorm occurrences. Surface meteorological parameters are obtained from aviation observations, while upper-level meteorological variables are sourced from the Samsun Regional Radiosonde Station data. The ultimate goal of the study is to examine the diurnal distribution of thunderstorms and reveal the atmospheric conditions at both surface and upper levels where these events occur. According to the analysis, thunderstorms are more frequent during daytime hours compared to nighttime. Monthly examinations indicate that June has the highest number of thunderstorm occurrences in Samsun, followed by May. Thunderstorms predominantly occur around 14:50 UTC, with afternoon hours exhibiting maximum thunderstorm frequencies. The majority of thunderstorms last between 0-2 hours. Both daytime and nighttime thunderstorms exhibit air temperatures ranging from 16-25°C and dew point temperatures ranging from 14-23°C. Relative humidity values generally exceed 80%. The most common thunderstorm type is identified as TSRA, indicating thunderstorm with rain. Performance analyses of thermodynamic indices and atmospheric stability parameters reveal that the K-Index (KI) is the most successful index, while Convective Available Potential Energy (CAPE) is the least successful atmospheric stability parameter.

Keywords: Thunderstorm, Storm, Heavy rainfall, METAR, Atmospheric sounding, Thermodynamic index, Atmospheric stability.

GİRİŞ

Oraj (TS) ya da gök gürültülü fırtına, gök gürültüsü ve şimşek-yıldırım ile birlikte gelişen, çoğu zaman yağmur ve dolu yağışlarının beraberinde gözlendiği meteorolojik bir hadisedir. Kuvvetli ve hamleli rüzgarların genellikle eşlik ettiği ve dikey gelişimli kümülonimbüs (Cb) bulutlarının meydana geldiği bu hadise, karalar üzerinde ciddi tahrip edici etkiler ve felaket boyutlarında olumsuz koşullar meydana getirmektedir (Türkeş, 2019). Sakin veya hareket halindeki kuru ve nemli havadaki sıcaklık değişim oranı (Lapse rate), nem ile birlikte hava kütlesinin kararlılık özelliğini belirlemektedir. Bu özellik, söz konusu hava kütlelerinin sıcaklık, bulut oluşturma, yağış meydana getirme, kuvvetli rüzgar ve fırtına üretme olasılığını belirleyen temel bir faktördür (Eken ve diğ., 2005). En küçük bir dış etki bile yere yakın seviyedeki hava parselinin yükselmesine neden olarak dikey hava akımları, kümülüform tip bulutlar, oraj ve sağanak yağmurların oluşmasına neden olabilmektedir (Eken ve diğ., 2005). Orajlar, Amerika Birleşik Devletleri'nin birçok eyaletinde, tropikal ve nemli subtropikal kuşaklarda, aynı zamanda Türkiye dahil Akdeniz ülkeleri ile orta enlemlerin güney bölgelerinde, afet boyutunda şiddetli atmosferik koşullar meydana getirerek, her yıl binlerce kişinin yaralanmasına, yüzlerce kişinin ölmesine, evsiz kalmasına ve milyonlarca dolarlık maddi kayıp yaşanmasına neden olmaktadır (Türkeş, 2019). Dünya çapında her an yaklaşık 2,000 oraj meydana gelmektedir. Yalnızca Amerika Birleşik Devletleri'nde yılda yaklaşık 100,000 oraj gerçekleşmekte ve bunların neredeyse %10'u ciddi düzeyde tahribatlara yol açmaktadır (NSSL, 2023). Bu sebeple, orajların zamansal ve mekânsal dağılımları, birçok sektör için önemli bir konu haline gelmektedir. Literatürde, orajlarla ilgili dünyanın farklı birçok bölgesinde hazırlanmış binlerce çalışma bulunmaktadır. Crowley (1994), gece meydana gelen şimşek ve gök gürültüsünün sebebini araştırdığı çalışmasında, soğuk ve sıcak cephe ile termal kararsızlık koşullarından bağımsız olarak meydana gelen gök gürültülü fırtınaları incelemiştir. Gece gerçekleşen fırtınaların süperadyabatik kararsızlığın, orta ve yüksek seviyelerde soğuk-sıcak hava taşınımının, yüksek seviyelerde daha soğuk hava ile orta troposferik seviyelerde daha sıcak hava taşınımının meydana gelen hadiselerle ilişkili olduğu sonucuna varmıştır. King ve diğ. (2017), soğuk mecsimde düşük CAPE değerleri ile karakterize edilen şiddetli gök gürültülü fırtınaların meydana geldiği atmosferik koşulları ve fırtınaların hızlı evrimini incelemiştir. Amerika'nın güneydoğu kesimlerinde CAPE değeri düşük şiddetli fırtınaların daha fazla gözlendiği tespit edilmiştir. Yüzey ısınmasının genel olarak sıcak adveksiyona dayandığı, ve şiddetli ile şiddetli olmayan olarak simüle edilen olaylar arasında önemli bir farkın ortaya çıktığı bulunmuştur. Şiddetli fırtınaların gece görüldüğü zamanlarda şiddetli olmayan

fırtınalara göre daha büyük alçak seviye rüzgar kaymasına maruz kaldığı da tespit edilmiştir. Sahu ve diğ. (2020), Agartala ve Guwathi için orajlı ve orajsız zamanlarda, bazı termodinamik indekslerin eşik değerlerindeki değişimleri 30 yıllık süreçte ravinsonde rasatı verilerini kullanarak gerçekleştirmiştir. Eşik değerlerin 12:00 UTC'deki değişim oranlarının 00:00'a göre daha fazla olduğu belirlenmiştir. Agartala için Lifted Index (LI), Cross Total Index (CTI), Showalter Index (SI) ve CAPE değerleri iyi performans gösterirken, Guwahati için daha iyi performans gösteren indeksler LI, CAPE, CTI ve Bulk Richardson Number (BRN) olduğu belirlenmiştir. SWEAT değeri, Guwahati'de 12:00 UTC için eşik değerinde artış, Agartala'da hem 00:00 UTC hem de 12:00 UTC için düşüş eğilimi göstermiştir. Bu durumda, Guwahati'de gündüz saatlerinde orajların şiddetli hale geldiği, Agartala'da ise şiddetini kaybettiği sonucuna ulaşılmıştır.Sharma ve ekibi (2023), Hindistan'daki gözlem istasyonlarının oraj raporlarına dayanarak 2016-2020 yılları arasında Hint bölgesindeki tropikal konveksiyonun günlük döngüsünü analiz etmişlerdir. Araştırmanın sonuçlarına göre, orajların genellikle öğleden sonra ve akşam saatlerinde meydana geldiği belirlenmiştir. Bu saatler, güneşin etkisiyle atmosferin ısınmasıyla birlikte termodinamik koşulların uygun hale geldiği zaman dilimini işaret etmektedir. Gözlem verileri incelendiğinde, orajların genellikle Kuzeydoğu Hindistan'da sabah erken saatlerde ve öğleden önce yaygın olduğu, Batı Hindistan'da ise öğleden sonra ve akşam saatlerinde yaygın olduğu bulgusuna ulaşılmıştır. Bu durum, bölgesel olarak gün içindeki döngünün farklılık gösterdiğini göstermektedir.

ÇALIŞMA ALANI, VERİ VE YÖNTEM

Bu çalışmada, Karadeniz Bölgesi'nin sosyal ve kültürel açıdan zengin şehirlerinden biri olan Samsun, çalışma alanı olarak seçilmiştir. Samsun, Türkiye'nin kuzey sahilinde, Karadeniz Dağları'nın daha alçak kesimlerinde, Kızılırmak ve Yeşilırmak nehirleri arasında yer almaktadır. Aynı zamanda deniz ve kara taşımacılığı arasında bir transfer noktası olarak hizmet veren bir liman şehridir (Yılmaz, 2015). İklim açısından, doğu ve batı bölgelerinden farklılık göstermektedir. Samsun ve çevresinde, Doğu Karadeniz boyunca uzanan sıra dağlar iç kesimlerde yer alır ve yükseklikleri azalır. Bu nedenle, orografik yağışlar, doğu ve batı kıyılarına kıyasla daha azdır. Yazlar genellikle aşırı sıcak geçmezken, kışlar da aşırı soğuk geçmemektedir (Kosif, 2001).

Analiz için Samsun'daki Samsun Çarşamba Havalimanı Meydan Meteoroloji Müdürlüğü ve Meteoroloji 10. Bölge Müdürlüğü'nde bulunan Samsun Bölge Ravinsonde İstasyonu verileri kullanılmıştır. Çalışma alanıyla ilgili bilgiler Şekil 1 ve Tablo 1'de gösterilmiştir.



Şekil 1: Çalışma alanı.

Tablo 1: Çalışma alanına ait istasyon bilgileri.

İstasyon Adı	İstasyon Kodu	Koordinat Bilgisi	Rakım	Referanslar
Çarşamba Havalimanı	LTFH	41°15′15″K 36°34′03″D	5 metre	(All Met Sat, 2023)
Samsun Bölge Radyosonde İstasyonu	17030	41°20'39"K 36°15'23"D	4 metre	(Meteoroloji Genel Müdürlüğü, 2023)

Bu çalışmada, 2013-2022 yılları için Çarşamba Havalimanı Meydan Meteoroloji Müdürlüğü tarafından yayımlanan METAR raporları kullanılmıştır. Hava durumu kodlarına ek olarak, sıcaklık, çiy noktası sıcaklığı, rüzgâr hızı ve bağıl nem gibi meteorolojik değişkenler de veri setine dahil edilmiştir (Iowa State University, 2023).

Samsun Bölge Ravinsonde İstasyonu'nda, 2013-2022 yılları arasındaki orajlı günler için termodinamik indeks ve atmosferik kararlılık parametrelerinin elde edilmesi amacıyla her gün 00:00 UTC ve 12:00 UTC saatlerinde yapılan atmosferik sondajların verileri sağlanmıştır (University of Wyoming, 2023).Çalışmanın ilk aşamasında, 2013-2022 yıllarına ait METAR gözlemlerinden, şiddetlerine bakılmaksızın tüm fırtına hadiseleri (TS)

içeren günler belirlenmiştir. Bu doğrultuda, tüm TS türleri (TS, TSRA, TSGR, TSSN, VCTS), filtrelenerek analizler gerçekleştirilmiştir. Gece-gündüz analizlerinin yapılabilmesi için her ayın gün doğumu ve gün batımı saatleri belirlenmiş ve gözlemler ayın gece ve gündüz saatlerine göre ayrılmıştır. Sonrasında, tüm dönem için her ayın gece-gündüz gözlemleri birleştirilerek toplamda gözlemlenen orajlı günlerin gece ve gündüz sayıları tespit edilmiştir. Tüm döneme ait orajlı günler için sıcaklık, çiy noktası sıcaklığı, rüzgar hızı ve bağıl nem gibi meteorolojik değişkenlerin grafikleri hazırlanmıştır. TS olaylarını tanımlamak için, rapor edilen TS kodları arasında en fazla üç saat aralık olanlar tek bir olay olarak kabul edilmiştir. Aynı gün içinde bile olsa, iki farklı TS kodu arasında üç saatten fazla zaman varsa, bu durum iki ayrı oraj olayı olarak kabul edilmiştir. Yapılan analizler sonucunda, on yıllık dönem boyunca 499 TS kodlu olay rapor edilmesine rağmen, 234 TS olayı tespit edilmiştir. Rasat edilen oraj türlerine ait ICAO hava durumu kodları ve açıklamaları Tablo 2'de bulunmaktadır.

Tablo 2: ICAO hava durumu kodlarının açıklamaları.

Hava Durumu Kodları	Açıklama
TS	Oraj
TSRA	Oraj ile Yağmur
TSGR	Oraj ile Dolu
TSSN	Oraj ile Kar
VCTS	Civarda Oraj

Çalışmanın ikinci aşamasında, 2013-2022 yılları için Samsun Bölge Ravinsonde İstasyonu'ndan elde edilen sondaj verileri kullanılmıştır. Tüm sondaj gözlemleri incelenerek, oraj olayına en yakın gözlem saati baz alınarak TS analizleri gerçekleştirilmiştir. On yıllık dönem boyunca sondaj verilerinin %0,93'lük bir kısmı eksik olduğundan, analizler %99,07'lik tamamlanmış sondaj verisi üzerinden yapılmıştır. Gece orajları için 00:00 UTC sondajları, gündüz orajları için ise 12:00 UTC sondajları kullanılmıştır. Bu değerlendirme için sondajlardaki beş termodinamik indeks ve üç atmosferik kararlılık parametresi dikkate alınmıştır. Termodinamik indeksler; Lifted Index (LI), K-Index (KI), SWEAT Index (SWEAT), Showalter Index (SI), Totals Totals Index (TTI). Atmosferik kararlılık parametreleri ise; Convective Available Potential Energy (CAPE), Convective Inhibition (CIN) ve Bulk Richardson Number (BRN) olarak belirlenmiştir. Kullanılan bu sekiz indeks ve kararlılık parametresinin, gece ve gündüz zamanlarındaki orajlı günlerdeki değişimleri R programlama dili kullanılarak kutu grafikleri (box-plot) hazırlanarak analiz edilmiştir.

Analizler için kullanılan termodinamik indeksler ve atmosferik kararlılık parametrelerinin eşik değerleri literatürde Türkiye için ortaya konulan eşikler dikkate alınarak belirlenmiştir (Yavuz 2023).

Çalışmanın son aşamasında termodinamik indeks ve atmosferik kararlılık parametrelerinin performansını değerlendirmek için başarım testi uygulanmıştır. Başarım testini uygulamak için, analizlerde kullanılan orajlı günler ile indeks ve parametrelerden elde edilen analiz sonuçları sınıflandırılmıştır. Bu doğrultuda, her koşul için başarım testlerinde kullanılacak Olasılık Tablosu, Tablo 3'te verilmiştir.

Tablo 3: Olasılık Tablosu.

Element	**Gerçek Olay**	**Tahmin**	**Tanım**
A	VAR	VAR	Doğru olay doğru tahmin
B	VAR	YOK	Sürpriz olay
C	YOK	VAR	Yanlış Tahmin
D	YOK	YOK	Olay Yok

Bu çalışmanın başarım testi için Critical Success Index (CSI) kullanılmıştır. CSI, doğru olay tahmini sayısının (A), sürpriz olay sayısı (B), yanlış tahmin sayısı (C) ve doğru olay tahmini sayısının (A) toplamlarına bölünmesi sonucu elde edilmektedir. Formülü şu şekildedir :

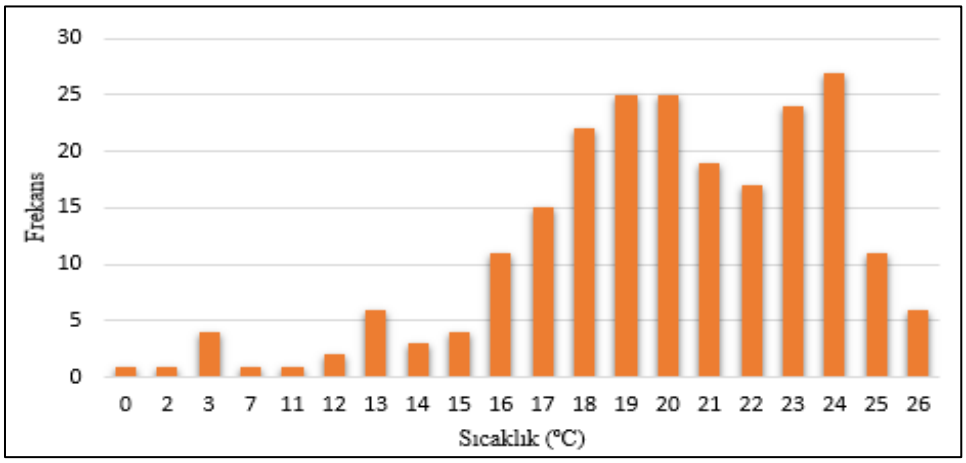
$$\mathbf{CSI} = A/(A+B+C)$$

(1.1)

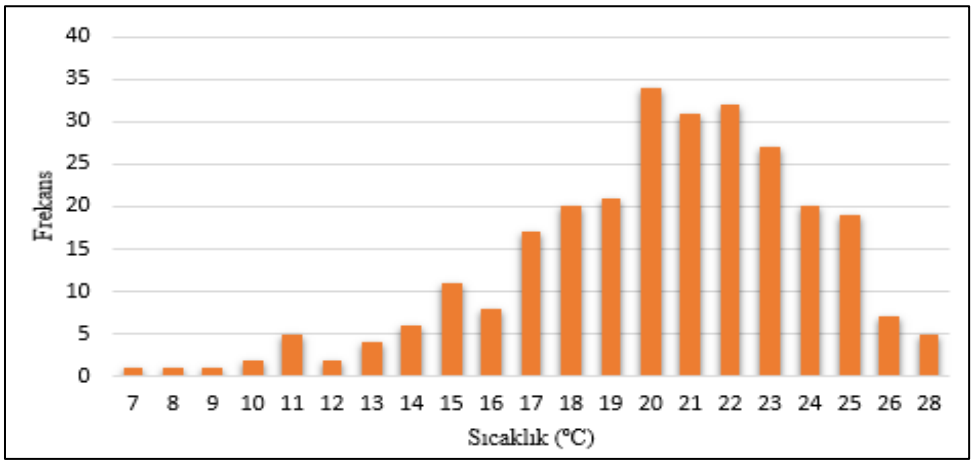
1. SONUÇLAR VE ÖNERİLER

Çarşamba Havalimanı tarafından yayımlanan METAR raporlarından seçilen TS gözlemleri, 10 yıllık bir dönem (2013-2022) için analiz edilmiştir. Analiz sonuçlarına göre, bu dönem içinde toplamda 499 TS içeren gözlem bulunmuştur. Orajların gün içindeki özelliklerini incelemek için, her ay için gün doğumu ve gün batımı saatleri (UTC) belirlenmiş ve yayımlanan TS gözlemleri aylara göre ayrılmıştır. Yapılan sınıflandırma ile gece ve gündüz gerçekleşen orajlar analiz edilmiştir. Elde edilen verilere göre, gece orajlarından 225, gündüz orajlarından ise 274 adet tespit edilmiştir. Bu analizde, orajlı günlerin sıcaklık, çiy noktası sıcaklığı, bağıl nem, rüzgar hızı ve oraj türü için gece ve gündüz grafikleri hazırlanmıştır.Samsun'da 10 yıllık bir dönem boyunca (2013-2022), yayımlanan METAR raporlarında bulunan tüm TS gözlemlerinin sıcaklık durumuna bakıldığında, gece orajlarında sıcaklığın genellikle 16°C ile 25°C arasında değiştiği ve en sık ölçülen sıcaklığın 24°C olduğu görülmüştür (Şekil 2). Gündüz orajlarında ise sıcaklık yine 16°C ile 25°C

arasında değişmiş, ancak en sık olarak 20°C ölçülmüştür (Şekil 3). Bu sıcaklık aralığının dışında kalan sıcaklıklarda, oraj gözlemlerinde düşük sayıda gözlem yapılmıştır.

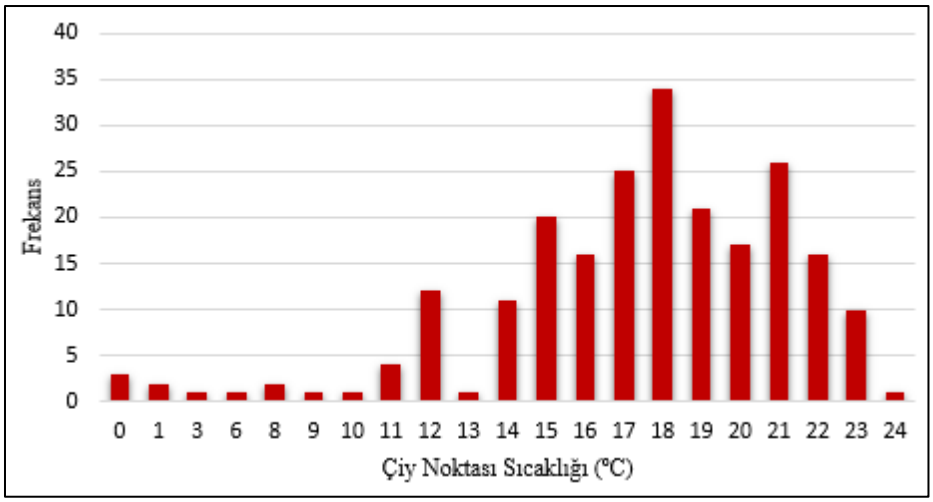


Şekil 2: Gece orajları için sıcaklık (ºC) grafiği.

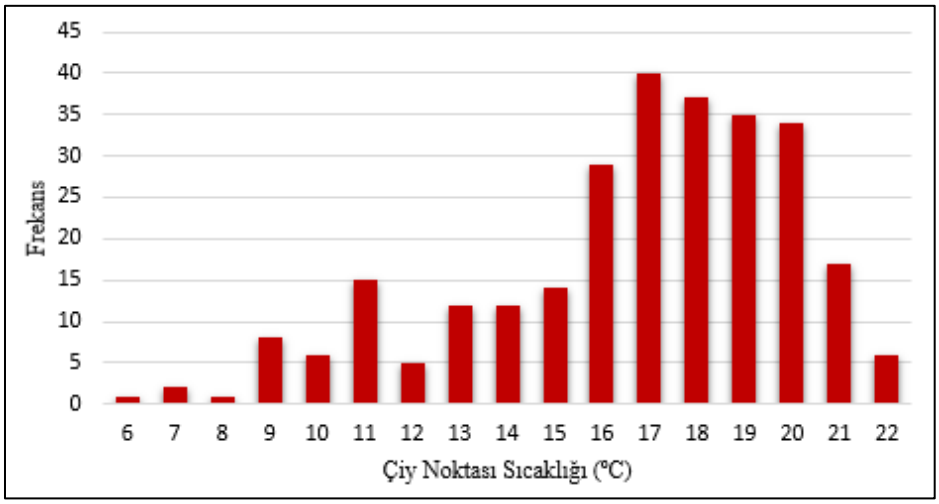


Şekil 3: Gündüz orajları için sıcaklık (ºC) grafiği.

Samsun'da 2013-2022 yılları arasında 10 yıllık bir dönem boyunca, yayımlanan METAR raporlarında bulunan tüm TS gözlemlerinin çiy noktası sıcaklığı incelendiğinde, geceleyin genellikle 14°C ile 23°C arasında olduğu ve en sık olarak 18°C ölçüldüğü görülmüştür (Şekil 4). Gündüz orajlarında ise çiy noktası sıcaklığının, geceyle neredeyse aynı olduğu gözlenmiştir (Şekil 5). Bu aralığın dışında kalan çiy noktası sıcaklıklarında, oraj gözlemlerinde belirgin bir düşüş olduğu tespit edilmiştir.

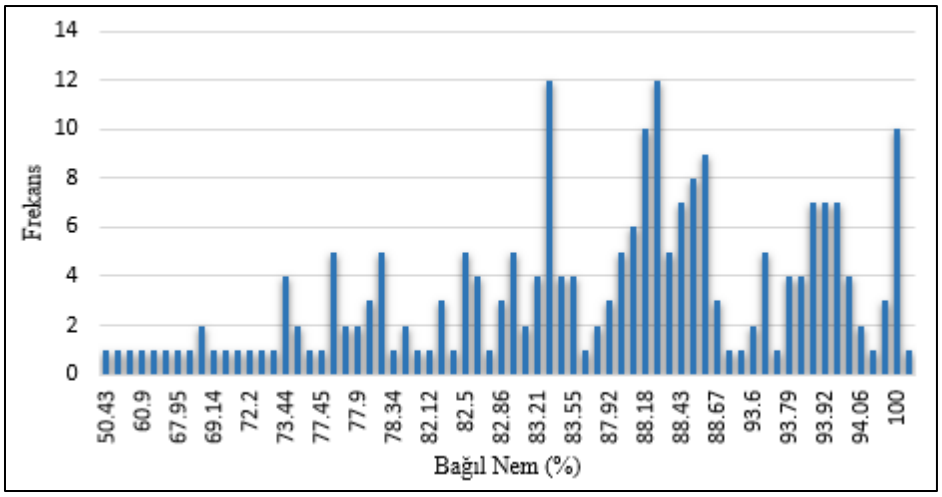


Şekil 4: Gece orajları için çiy noktası sıcaklığı (ºC) grafiği.

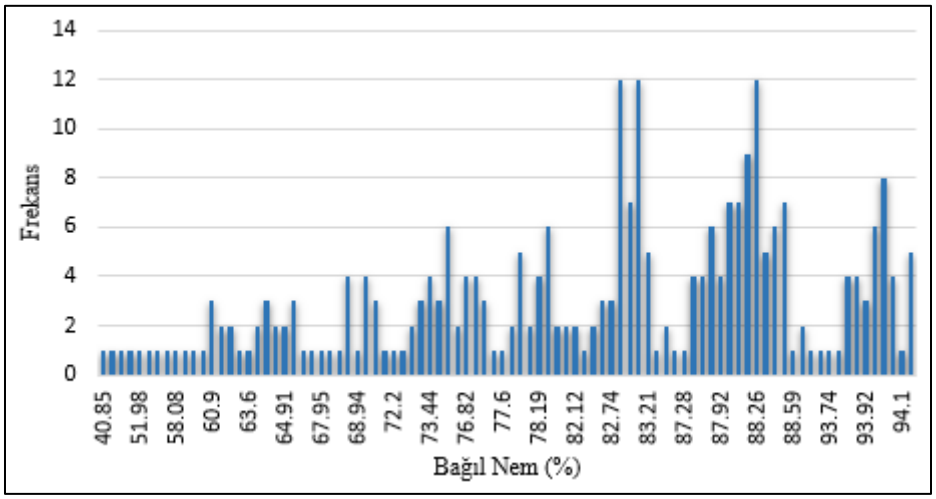


Şekil 5: Gündüz orajları için çiy noktası sıcaklığı (ºC) grafiği.

Samsun'da 2013-2022 yılları arasında 10 yıllık bir dönem boyunca, yayımlanan METAR raporlarında bulunan tüm TS gözlemlerinin bağıl nem değerleri incelendiğinde, geceleri çoğunlukla %80'in üzerinde olduğu görülmüştür (Şekil 6). Gece meydana gelen orajlarda, bağıl nemin birçok kez %100'ün üzerinde ölçüldüğü de gözlenmiştir. Gündüz orajlarında ise, gece orajlarında olduğu gibi bağıl nem değerinin genellikle %80'in üzerinde olduğu görülmüştür (Şekil 7). Bağıl nem, hava sıcaklığı ile doğrudan ilişkilidir. Bu nedenle, bu değerlerden daha düşük bağıl nem değerlerinde orajların daha az sıklıkta gözlendiği sonucuna varılmıştır.

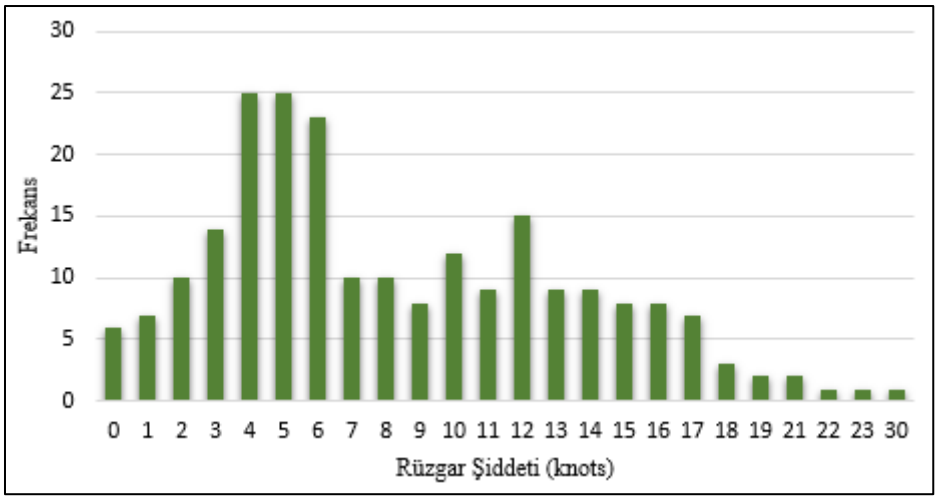


Şekil 6: Gece orajları için bağıl nem (%) grafiği.

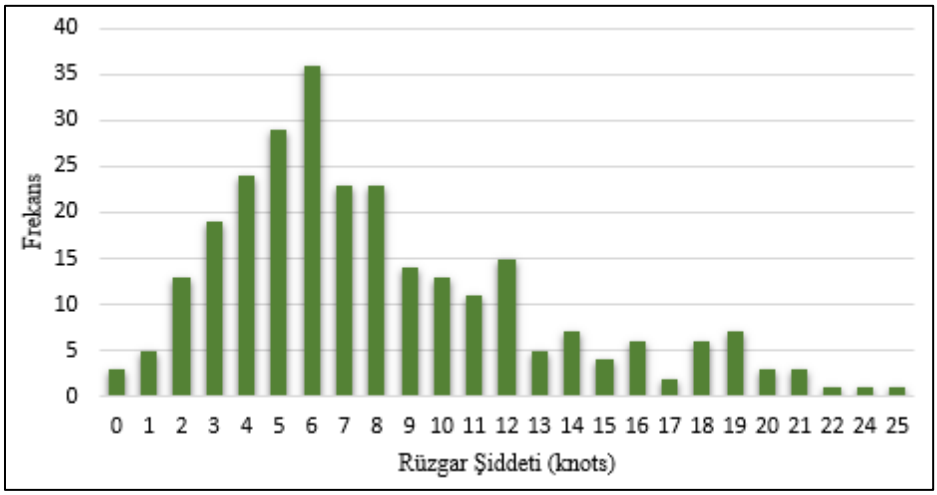


Şekil 7: Gündüz orajları için bağıl nem (%) grafiği.

Samsun'da 2013-2022 yılları arasındaki 10 yıllık dönem boyunca, yayımlanan METAR raporlarında yer alan tüm TS gözlemlerinin rüzgâr şiddeti değerleri incelendiğinde, geceleyin meydana gelen orajlar sırasında genellikle hafif rüzgâr (4-6 knots) olduğu belirlenmiştir (Şekil 8). Gündüz orajlarında ise benzer şekilde hafif rüzgâr (4-6 knots) gözlenmesine rağmen, gece orajlarına kıyasla rüzgâr şiddetinde bir artış olduğu tespit edilmiştir (Şekil 9). Hafif rüzgârın hakim olduğu atmosfer koşullarında, afet riskinin düşük olduğu ve etki alanının sınırlı olduğu tek hücreli orajlar, tipik fırtınalar veya hava kütlesi orajlarının meydana gelebileceği bilinmektedir (Türkeş, 2015).

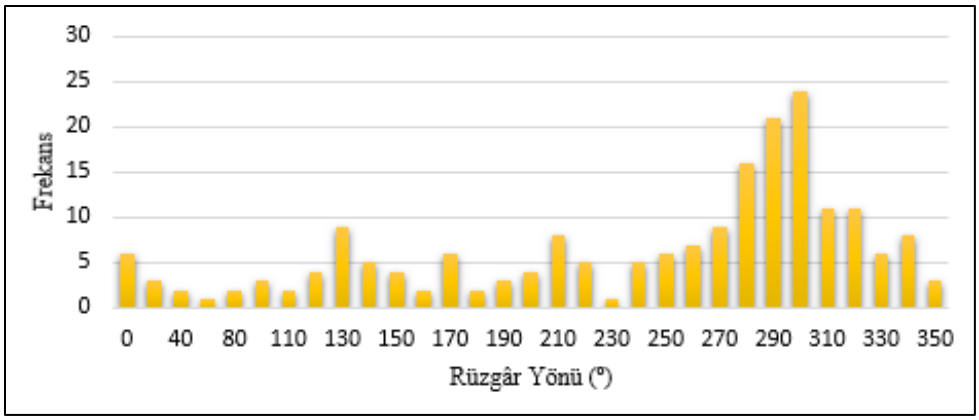


Şekil 8: Gece orajları için rüzgâr şiddeti (knots) grafiği.

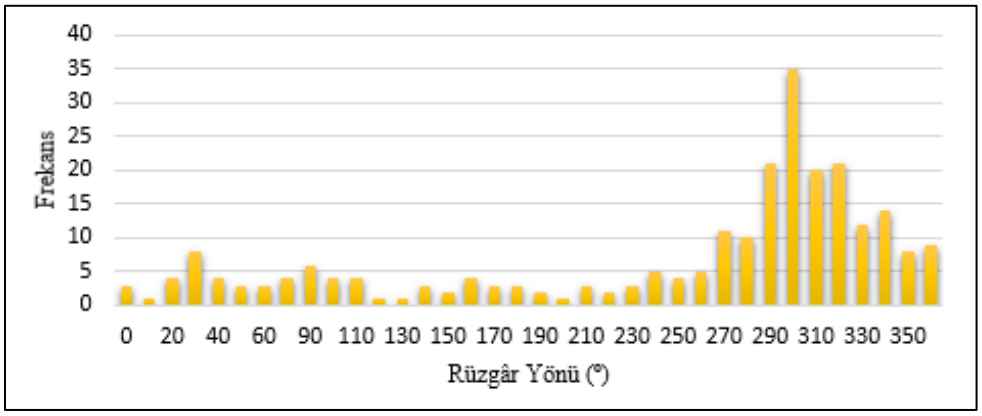


Şekil 9: Gündüz orajları için rüzgâr şiddeti (knots) grafiği.

Samsun'da 2013-2022 yılları arasındaki 10 yıllık dönem boyunca, yayımlanan METAR raporlarında yer alan tüm TS gözlemlerinin rüzgâr yönü değerleri incelendiğinde, geceleyin meydana gelen orajlar sırasında genellikle rüzgâr yönünün 280º ile 300º arasında olduğu görülmüştür (Şekil 10). Gündüz orajlarında ise rüzgâr yönünün 290º ile 320º arasında değiştiği belirlenmiştir (Şekil 11). Gece ve gündüz orajlarında, orajların meydana geldiği zamanlarda rüzgârın genellikle kuzey-kuzeybatı yönünde olduğu gözlemlenmiştir.

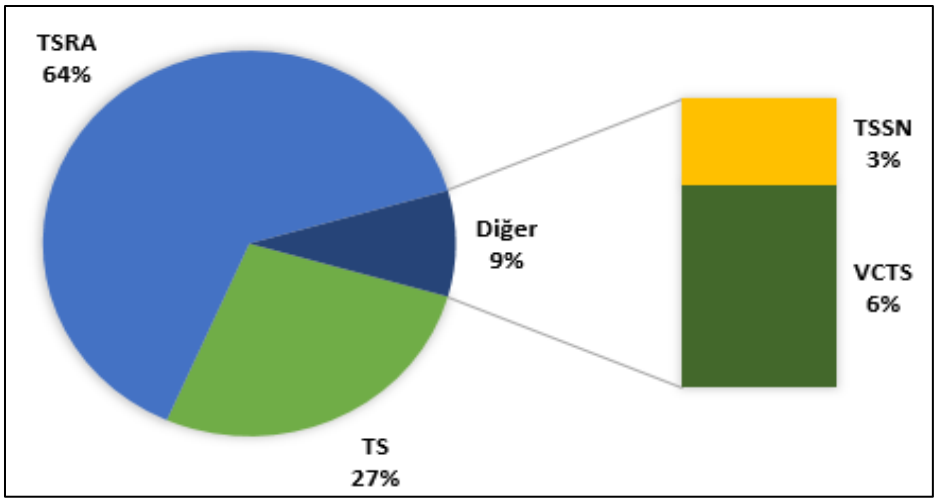


Şekil 10: Gece orajları için rüzgâr yönü (°) grafiği.

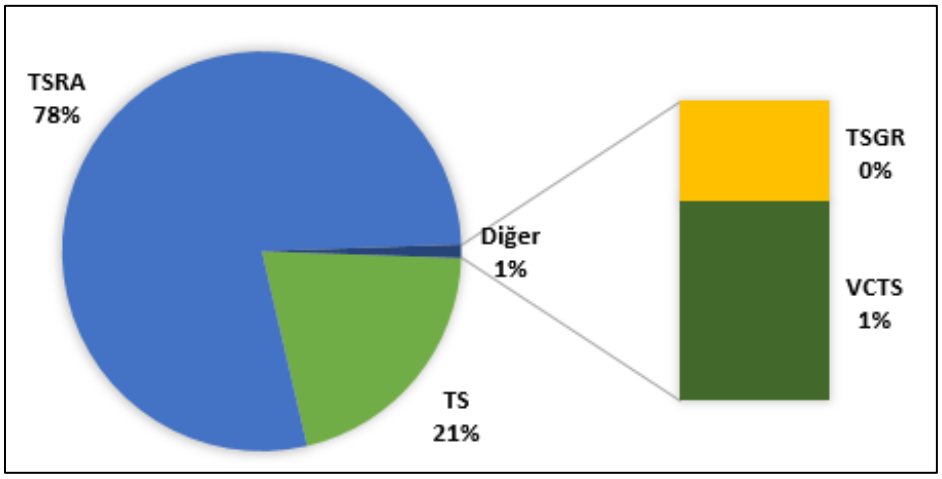


Şekil 11: Gündüz orajları için rüzgâr yönü (°) grafiği.

Samsun'da 2013-2022 yılları arasındaki 10 yıllık dönem boyunca, yayımlanan METAR raporlarında yer alan tüm TS gözlemleri, şiddetine bakılmaksızın hangi meteorolojik olaylarla birlikte gerçekleştiği incelenmiştir. Bu analiz, gece orajları için Şekil 12'de, gündüz orajları için ise Şekil 13'de gösterilmiştir. Gece orajlarında en sık gözlenen olay, %64'lük bir oranla ve 144 gözlemle TSRA (oraj ile birlikte yağmur) olmuştur. Bunun ardından sırasıyla, %27'lik bir oranla 61 gözlemle TS (oraj), %6'lık bir oranla 14 gözlemle VCTS (civarda oraj) ve %3'lük bir oranla 6 gözlemle TSSN (oraj ile birlikte kar) gelmektedir. Bu verilere göre, geceleyin orajlarla birlikte yağış meydana gelme olasılığının, orajın tek başına oluşma olasılığından daha yüksek olduğu sonucuna varılmıştır. Gündüz orajlarında ise en sık gözlenen olay yine TSRA (%78'lik bir oranla ve 214 gözlemle) olmuştur. Bunu sırasıyla, %21'lik bir oranla 57 gözlemle TS, %1'lik bir oranla 2 gözlemle VCTS ve %0'lık bir oranla 1 gözlemle TSGR takip etmektedir. Bu verilere göre, gece orajlarına benzer şekilde, gündüzleri orajlarla birlikte yağış meydana gelme olasılığının, orajın tek başına oluşma olasılığından daha yüksek olduğu sonucuna ulaşılmıştır.

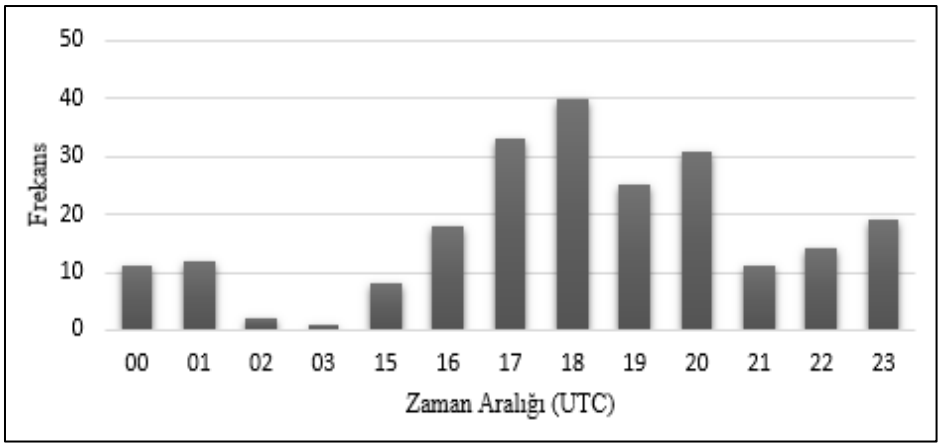


Şekil 12: Gece orajları için oraj hadisesinin türü grafiği.

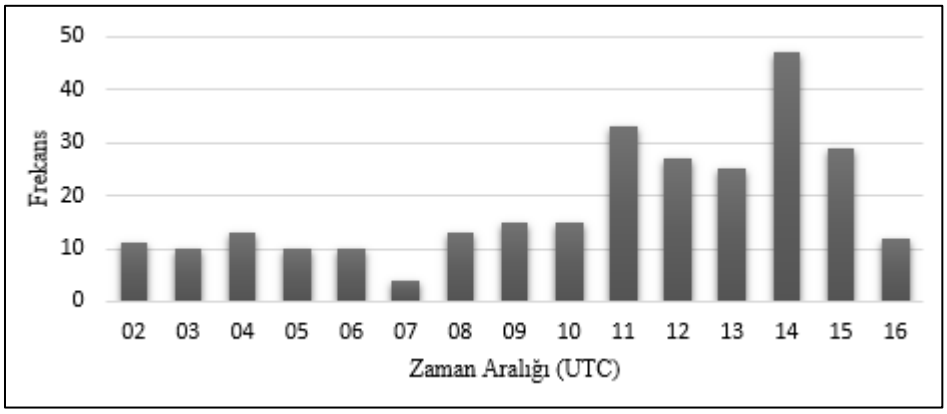


Şekil 13: Gündüz orajları için oraj hadisesinin türü grafiği.

Samsun'da 2013-2022 yılları arasındaki 10 yıllık dönemde, yayımlanan METAR raporlarında yer alan tüm TS gözlemleri ele alınarak, her ay için gün doğumu ve gün batımı saatleri (UTC) belirlenmiş ve bu zaman dilimlerinde gerçekleşen orajların gece ve gündüz analizi yapılmıştır. Bu analizler sonucunda, geceleri orajların çoğunlukla 17:50 UTC ile 20:50 UTC arasında meydana geldiği gözlenmiştir (Şekil 14). Gündüzleri ise, orajların büyük bir çoğunluğunun 11:50 UTC ile 15:50 UTC aralığında gerçekleştiği belirlenmiştir (Şekil 15). Genel olarak bakıldığında, orajların çoğunlukla 11:50 UTC ile 20:50 UTC arasında meydana geldiği görülmektedir. Bu durum, güneşin yeryüzünü maksimum şekilde ısıtması sonucunda, bu saatlerde atmosferde kararsız koşulların oluşmasıyla ilişkilidir. 21:50 UTC ile 10:50 UTC arasında ise oraj sayılarında azalma gözlenmiştir.



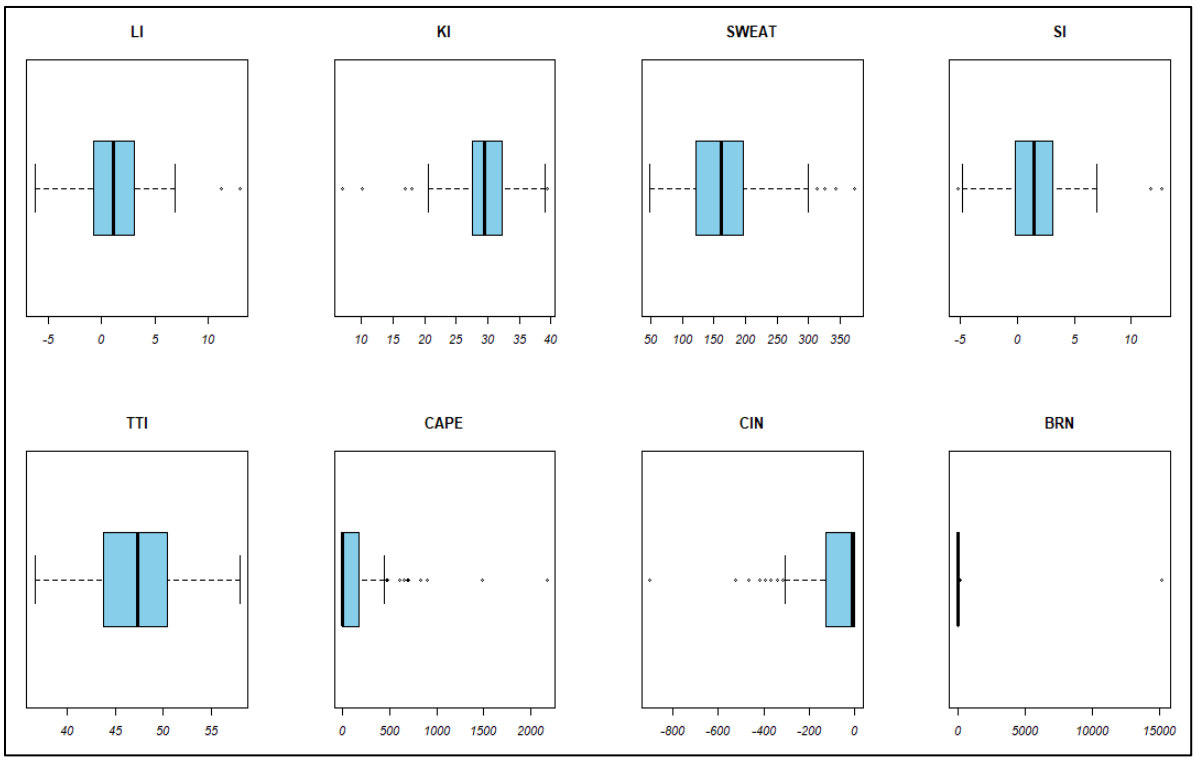
Şekil 14: Gece orajlarının meydana geldiği zaman aralığı (UTC).



Şekil 15: Gündüz orajlarının meydana geldiği zaman aralığı (UTC).

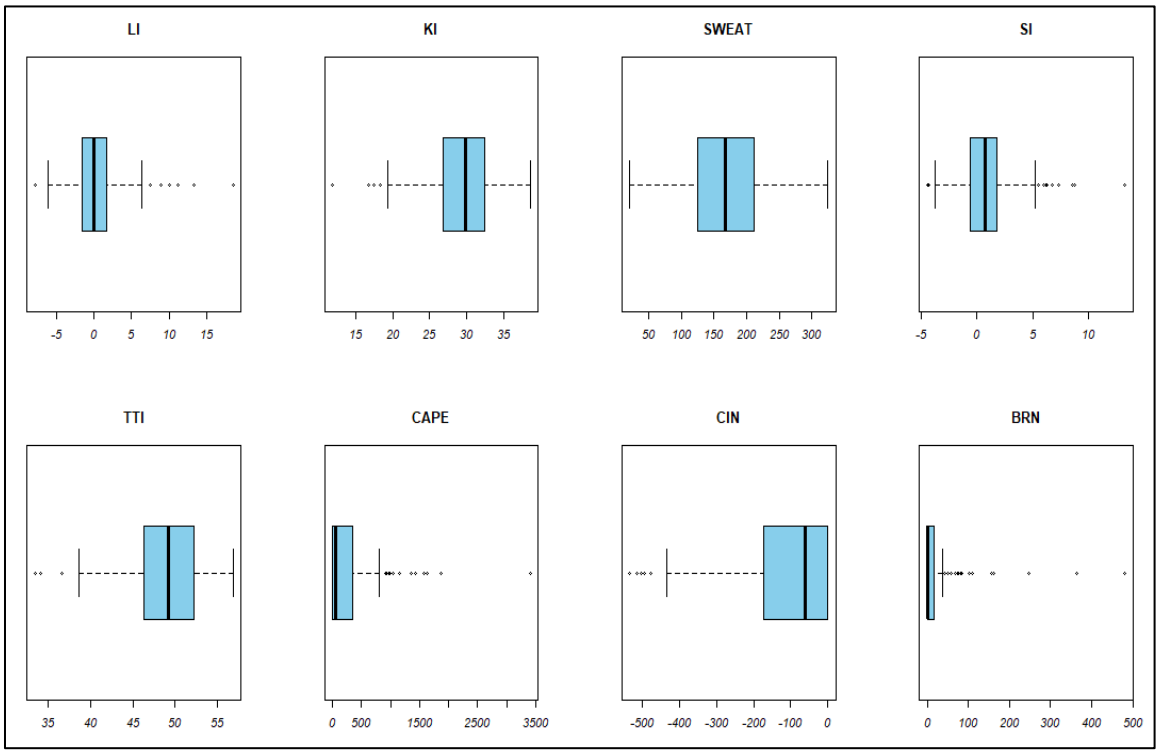
Bu analizlerin ardından, TS orajlarının olay analizi gerçekleştirilmiştir. Bir oraj olayının METAR rasatlarında belirlenmesi için, yayımlanan TS kodlu orajlar arasında üç saatten daha az zaman farkı varsa, bu orajlar tek bir olay olarak kabul edilmiştir. Eğer rasatlar arasında üç saatten daha fazla zaman farkı varsa, bu orajlar iki farklı olay olarak kabul edilmiştir. Yayımlanan 499 TS kodlu rasata yapılan olay analizi sonucunda, 234 olay gerçekleştiği bulunmuştur. Bu olaylardan 94'ü gece olayı iken, 140'ı gündüz olayıdır.Orajların tahmin edilmesi için atmosferin termodinamik yapısını anlamak oldukça önemlidir. Birçok araştırmada, orajlar termodinamik indeksler ve atmosferik kararlılık parametreleri kullanılarak analiz edilir (Yavuz, 2023). Bu aşamada, METAR rasatlarında TS içeren orajlı günlerin beş termodinamik indeks (LI, KI, SWEAT, SI, TTI) ve üç atmosferik kararlılık parametresine (CAPE, CIN, BRN) göre analizi gerçekleştirilmiştir. Bu doğrultuda, Samsun Bölge Radyosonde İstasyonu'nda günde iki kez (00:00 UTC ve 12:00 UTC) yapılan atmosferik sondaj verileri, orajın meydana geldiği zaman dilimine en yakın şekilde ele alınmıştır. Gece orajları için yapılan analizlerde, atmosferde meydana gelen kararsız koşulların, incelenen indeks ve kararlılık parametrelerine yansıdığı gözlenmektedir (Şekil 16). LI ve SI indekslerinin ortalamaları, orajın meydana gelme olasılığının olduğunu

göstermektedir. KI indeksinin ortalaması, dağınık orajların oluşabileceğini belirtmektedir. Şiddetli TS'leri tahmin etmek için kullanılan SWEAT indeksinin ortalaması, hafif şiddetli orajların oluşabileceği potansiyelini işaret etmektedir. TTI indeksinin ortalamasına göre, orajların oluşması muhtemeldir. Atmosferik kararlılık parametrelerine bakıldığında, CAPE değerinin ortalaması, diğer verilerin aksine atmosferin kararlı olduğunu göstermektedir. Ancak, orajlı günler incelendiğinde CAPE değerinin birçok kez kararsızlık gösterdiği görülmüştür. CIN parametresinin ortalaması, atmosferin kararsız olduğunu desteklemektedir. BRN parametresinin ortalaması ise, süper hücreler veya çok hücreli orajların oluşabileceği olasılığını vermektedir.



Şekil 16: 00:00 UTC için orajlı günlerdeki termodinamik indeks ve atmosferik kararlılık parametreleri değerlerinin dağılımı.Gündüz orajları için yapılan analizlerde, gece orajlarında olduğu gibi atmosferde meydana gelen kararsız koşulların, indeks ve parametrelere yansıdığı gözlenmektedir (Şekil 17). LI ve SI indekslerinin ortalamalarına göre oraj oluşma ihtimali yüksektir. KI indeksinin ortalaması, dağınık orajların meydana gelebileceğini göstermektedir. SWEAT indeksinin ortalaması, hafif şiddetli orajların olası olduğunu işaret etmektedir. TTI indeksinin ortalaması, oraj oluşma olasılığının yüksek olduğunu göstermektedir. Atmosferik kararlılık parametrelerinden CAPE değerinin ortalaması, gece orajlarındaki gibi atmosferin kararlı olduğunu göstermektedir, bu da diğer parametrelerden farklı bir durumu işaret etmektedir. CIN parametresinin ortalaması, atmosferin kararsız

durumda olduğunu göstermektedir. Son olarak, BRN parametresinin ortalamasına göre oraj oluşma ihtimali olduğu gözlenmektedir.



Şekil 16: 12:00 UTC için orajlı günlerdeki termodinamik indeks ve atmosferik kararlılık parametreleri değerlerinin dağılımı.Oraj olaylarının tahmininde, termodinamik indeks ve atmosferik kararlılık parametrelerinin performansı CSI kullanılarak gece ve gündüz için ayrı ayrı değerlendirilmiştir (Tablo 4). Başarı testi sonuçları 12:00 UTC'de, 00:00 UTC'ye göre daha yüksektir. CSI, gece ve gündüz orajlarının her ikisinde de en yüksek değerini KI için almıştır. KI indeksi 700 hPa'daki çiy noktası depresyonunu hesaba katarak, atmosferin alt seviyelerindeki nemliliği belirtir. Orajlar için alt seviye nemliliği gerekli koşullardan biridir, bu nedenle KI indeksinin diğer indekslere göre daha başarılı sonuçlar vermesi beklenen bir durumdur. CSI, gece ve gündüz orajlarının her ikisinde de en düşük değerini ise CAPE için almıştır. Bu analizde başarı testi sonuçlarının düşük çıkmasının temel sebebi, kullanılan indeks ve parametrelerin literatürdeki eşik değerlerine uygun olmamasıdır. Ülkemizde CAPE ve diğer indeksler ve kararlılık parametreleri için özel eşik değer aralıkları mevcut değildir. Bu nedenle, özellikle CAPE olmak üzere diğer indeks ve parametreler için ülkemize özgü eşik değerlerin belirlenmesi önemli bir ihtiyaçtır.

Tablo 4: Termodinamik indeks ve atmosferik kararlılık parametrelerinin başarım testi (CSI) sonuçları.

İndeksler/ Parametreler	00 UTC	12 UTC
LI	0,019	0,029
KI	0,024	0,038
SWEAT	0,014	0,022
SI	0,019	0,032
TTI	0,018	0,034
CAPE	0,004	0,011
CIN	0,012	0,024
BRN	0,008	0,012

Tüm bu sonuçlara bakıldığında, orajların çoğunlukla gündüzleri günün en sıcak saatlerinde meydana geldiği görülmüştür. Oraj gerçekleşen zamanlarda dâhi bazı indeks ve parametrelerin eşik değerlere ulaşamamış olması, Samsun için bu eşik değerlerin en etkili şekilde düzenlenmesi gerektiğini göstermektedir. Bu düzenleme yapıldığı takdirde, indeks ve parameterlerin tahmin başarısının artacağı düşünülmektedir. Tahmin başarısının artması, orajların meydana getirebileceği zararların önüne geçmeyi sağlayacaktır.

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UNVEILING THE POTENTIAL OF ESSENTIAL OILS IN MITIGATING WEIGHT LOSS OF GRAPEVINE CULTIVARS (VITIS VINIFERA) ACROSS VARIED TEMPERATURE CONDITIONS

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Abstract
The conservation and nutritional preservation of grapevine (Vitis vinifera) cultivars is seriously impeded by post-harvest weight loss, particularly if changes in temperature take place. The present study analyzes the potential of essential oils—more particularly, the oils of lavender, mint, and thyme—as entirely organic techniques for controlling post-harvest weight loss during an array of temperature variations. Through performing systematic trials conducted within tightly controlled environments that simulated various temperatures (4 and 24 ^{0}C) periods, grapevine cultivars were subjected to essential oil treatments (lavender, mint, and thyme) via spraying approaches. The research further emphasizes the significant role of temperature management plays in storage after harvest circumstances and implies that essential oils are a viable biological nutrient for enhancing the longevity and quality of grapevines. The present study contributes vital new knowledge concerning the obscure topic of essential oil application in post-harvest viticultural environments. These advancements have consequences for the food sector given that they present practical methods for extending the shelf life and the marketability of grapes generate assisting all those associated with the supply chain of goods. The Kabarcık cultivar is more vulnerable to variations in temperature in storing and could decrease the berry proportion of water.
Keywords: Grapevine, essential oils, Kabarcık, weight loss

Introduction

Grapevine cultivars (*Vitis vinifera*) are known to be susceptible after harvesting during storage, which can lead to a reduction in quality and shelf life. The use of essential oils has been proposed as a potential solution to this problem. In this study, we investigate the influence of essential oils on weight loss of grapevine cultivars in room and storage temperatures. We examine the effects of different types of essential oils on the weight loss of grapevine cultivars (*Vitis vinifera*) and compare the results with those of a control group. Our findings provide insights into the potential of essential oils as a natural and effective way to reduce weight loss in grapevine cultivars during storage (Leng, 2022, Salimi, 2013). The past study has presented the antibacterial property of essential oils towards an extensive number of diseases, particularly fungal infection, organisms, and bacteria, in a wide range of crops (Burt, 2004; Dorman & Deans, 2000). Additionally, through decreasing the rate of oxidation and preventing bacterial development, essential oils hold hope for improving the shelf life of vegetable and fruit products (Bakkali et al., 2008; Viuda-Martos et al., 2008). Grapevine cultivars (Vitis vinifera) are widely grown for their fruit, which is used to produce wine, juice, and raisins. However, the quality of the fruit can be compromised during storage due to weight loss. Essential oils have been shown to have antimicrobial and antioxidant properties, which can help preserve the quality of the fruit. In this study, we investigate the influence of essential oils on weight loss of grapevine cultivars (Vitis vinifera) at **4°C and 24°C** temperatures. We aim to determine the optimal concentration of essential oils that can reduce weight loss while maintaining the quality of the fruit. We also aim to investigate the effect of storage temperature on the efficacy of essential oils. The results of this study will provide valuable insights into the use of essential oils for the preservation of grapevine cultivars. Additionally, the unique impact of essential oils—in specifically, lavender, mint leaf, and thyme oil—in mitigating post-harvest weight loss in grapevine varietals under various temperature conditions remain an issue that requires additional studies.

Plant Material

The study was conducted in the horticulture research vineyard of Kahramanmaras Sutcu Imam University. The plant material consisted of Yalova İncisi, Kabarcık and Horoz Karası grape varieties grafted onto Rubestris du Lot rootstock. The experimental site is located at an altitude of 700 m above sea level. Soil analysis revealed a pH of 7.62, salt content of 0.13%, lime content of 6.55%, organic matter content of 1.35%, and a clayey loam texture based on samples collected from a depth of 0-90 cm. The vines were 10 years old, planted at a spacing of 4 x 2 m (between rows x within rows), trained to a 1.5 m high cordon system,

and irrigated by drip irrigation. The experiment followed a randomized plot design with three replications, each replication comprising three vine rows. Clusters were collected at the same time from field and three essential oils (Lavender oil, Mint leaf oil, Thyme oil) in four treatments (Kontrol, 2500 ppm, 500 ppm, 1000 ppm and 200 ppm) were applied in three cultivars (Yalova İncisi, Kabarcık, Horoz Karası). After that, half of the clusters were kept n room and half of them transported to refrigerator. Water loss of berries was determined by the formula below;

$$\text{Weight loss (\%)} = ((\text{Harvest Weight} - \text{Last Weight})/\text{Harvest Weight}) \times 100$$

Statistical Analysis

All descriptive analyses were performed using the agricolae package in R studio. The effects of cultivar (three levels), conditions (two levels), oils (three levels), treatments (five levels) and their interactions on water loss were assessed by analysis of variance (ANOVA) using the agricolae package in R studio. A model that included all main and interaction effects was tested for normality assumptions. Linear model was constructed to determine the main effects (cultivar, conditions, oils, treatments) on water loss. Tukey's Honest Significant Difference (TukeyHSD) test was applied using the agricolae package in R studio to compare means (Team, 2013).

Results and Discussion

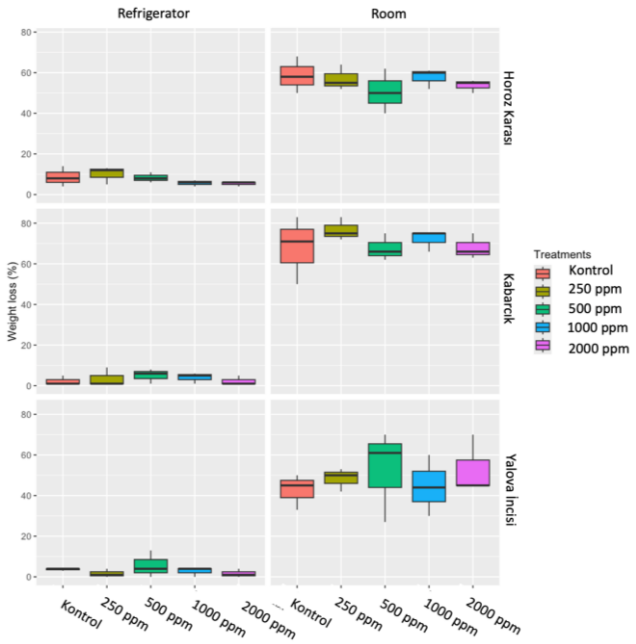
Water loss was affected by conditions and cultivars. Water loss was not affected by oils and their treatments. Room temperature was demonstrated higher water loss (58.11, p=< 2e-16 ***) and compared to storage temperatures (4.71). The Kabarcık and Horoz Karası, consistently displayed higher water loss (36.96 and 31.56, respectively) than Yalova İncisi (25.70) with the p=3.7e-05 *** (Table 1). Figure 1 presents conditions, oils, cultivars and treatments on weight loss and figure 2 is applied treatments of oils on cultivar bases. As grapevine cultivars (Vitis vinifera) are employed to make wine along with other products produced from grapes, they are crucial financially. On the other hand, after-harvest losses caused by weight loss during storing may negatively impact grape' marketing value and quality. Possible uses of essential oils in increasing the shelf life and storing agricultural are attracting interest. The objective of the argument is to examine how natural oils affect weight loss in grapevine cultivars refrigerated and at ambient temperatures. Terpenes, phenol compounds, and aromatic compounds constitute only a few among the numerous bioactive elements that are found in essential oils, which are obtained from aromatic plants.

Considering their widely recognized antimicrobial properties, they have become excellent alternatives for preserving food (Burt, 2004).

Table 1. Comparison of means of conditions, oils, cultivars and treatments on weight loss.

	Weight loss	Significance
Conditions[x]		< 2e-16 ***
4 (^{0}C)	4.71±1.30b	
24 (^{0}C)	58.11±2.75a	
Oils[y]		0.943[ns]
Lavender oil	31.36±1.60	
Mint leaf oil	31.83±1.55	
Thyme oil	31.03±1.69	
Cultivars[z]		3.7e-05 ***
Kabarcık	36.96±1.65a	
Yalova İncisi	25.70±1.50b	
Horoz Karası	31.56±1.69a	
Treatments[w]		0.946[ns]
Kontrol	30.66±2.15	
250ppm	32.88±2.30	
500ppm	31.66±2.55	
1000ppm	31.11±2.15	
2000ppm	30.72±2.03	

Figure 1. Demonstration of conditions, oils, cultivars and treatments on weight loss.



x, Mean seperation in conditions; y, Mean seperation in oils; z, Mean seperation in cultivars; w, Mean seperation in Treatments; For a given factor (different letters within a column represent significant differences (Tukey test, **, Significant at *p*-value < 0.01; ***,

Significant at *p*-value < 0.001; ns, not significant). Data are expressed as mean of the data and standart errors.

Figure 2. Demonstration of treatments of Oils on cultivar bases.



Essential oils, by their capacity to prevent the growth of bacteria, demonstrate their promise in reducing weight loss while preserving fruit health and quality throughout storage (Singh et al., 2005). Study on grapevine varietals indicates how essential oils may help minimize weight loss. In this regard, a study published in 2012 by Mohammadi and Aminifard revealed that essential oils were efficient when avoiding weight loss in grape berries. This was accomplished primarily that the oils had excellent antibacterial qualities. Abdolahi et al. (2010) stated similar favorable outcomes while oregano and thyme essential oils were employed, indicating diminished weight loss and enhanced fruit quality in table grapes. These results have a parallel relation with this study that Yalova İncisi was the least effected cultivar from losing the berry water while Kabarcık has a great potential which might lose the berry water when the storage temperatures (Table 1, Figure 1). Temperature has a multifaceted consequence because essential oils prevent weight loss. The fruit that has been preserved experience enhanced weight loss caused by enzymatic reactions and bacterial growth at the ambient temperature. On the other hand, cooler temperatures might improve the antibacterial properties of essential oils, thus strengthening their efficiency in decreasing weight loss during storage (Olasupo et al., 2003). It is clear that similar results have obtained

from this study which strongly differences have been happened among room and low temperatures (Table1, Figure 1).

Conclusion

An alternative natural method for mitigating weight loss in grapevine cultivars throughout storage is the application of essential oils. Their antimicrobial properties may be useful in controlling the emergence of microorganisms and protecting the nutritional value of fruit. To maximize essential oil methods and concentrations according to different wine cultivars and storage circumstances, additional research is required. Kabarcık has been chosen a risky cultivar which might lose the berry water when the storage temperatures. Therefore, there should be more studies conducted on Kabarcık to protect it during storage life. The reported utility of thyme oil, lavender oil, and mint leaf oil underscores their potential as sustainable options for solving post-harvest weight loss issues in a variety of weather locations. Detailed biochemical study emphasizes the antibacterial attributes and moisture-retention characteristics which are basic to essential oils, indicating their vital role to sustain grapevine freshness during the post-harvest stage.

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ANDROİD MOBİL UYGULAMA KONTROLLÜ MODÜLER TENİS TOPU FIRLATMA MAKİNESİ

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Özet
Tenis günümüzde tüm dünyada ilgi gören bir spor dalıdır. Fiziksel gelişime, teknik ve taktiğe dayalı olan tenis sporu için antrenman süreçleri çok önemlidir ve zordur. Tenis sporcularının fiziksel dayanımını artırması ve vücudunun fiziksel yapısını güçlendirmeleri şarttır. Bu nedenle bu çalışama da antrenmanlarda kullanılmak üzere tenis topu fırlatma makinesi gerçekleştirilmiştir. Makinenin gövdesi alüminyum sigma profiller ve bağlantı elemanları kullanılarak yapılmıştır. Alüminyum sigma profil kullanılarak sistemin ağırlığı azaltılmıştır. Tasarımın ağırlığını azaltmak amacıyla bazı önemli bağlantı parçaları 3 boyutlu yazıcı ile basılmış ve kullanılmıştır. Modüler ve mobil yapıda tasarımı yapılan makine ayarlanabilir hızlarda topu fırlatabilmektedir ve yapılan kort testlerinde optimum atış mesafesinin 13 metre olduğu ölçülmüştür. Tenis topunun fırlatma yüksekliğini ayarlayabilmek amacıyla tasarımın yunuslama açısı 0 ile 14 ° aralığında ayarlanabilmektedir. Yunuslama açısı lineer motor ile ayarlanarak top atış profili eğik atışa benzer hale getirilebilmektedir. Optimum fırlatma hızı 6,5 m/s olarak ölçülmüştür. Makinenin kontrolü için android sistem mobil uygulaması geliştirilmiş ve bluetooth üzerinden uzaktan makinenin kontrolü sağlanmıştır. Sistem 36 V 18.2 Ah lityum iyon batarya ile çalışabilecek şekilde tasarlanmış ve bütün elektronik bileşenler dc güçte çalışacak şekilde seçilmiştir. Makinenin batarya ile çalışabilir olması şebekeden bağımsız olmasına ve istenilen yere taşınabilmesine katkı sağlamıştır. Tasarımın endüstriyel bir geliştirmeden sonra 120 m/s gibi yüksek atış hızlarına, daha ileri atış mesafelerine ulaşma kapasitesi vardır.
Anahtar Kelimeler: tenis topu fırlatma makinesi, uzaktan kontrol, mobil uygulama

ANDROID MOBILE APP CONTROLLED MODULAR TENNIS BALL THROWING MACHINE

Abstract
Tennis is a sport that attracts attention all over the world today. Training processes for tennis, which is based on physical development, technique and tactics, are very important and difficult. It is essential for tennis athletes to increase their physical endurance and strengthen the physical structure of their body. For this reason, in this study, a tennis ball throwing machine was developed to be used in training. The body of the machine is made using aluminium sigma profiles and fasteners. The weight of the system was reduced by using aluminium sigma profile. In order to reduce the weight of the design, some important connection parts were printed and used with a 3D printer. The machine, designed in a modular and mobile structure, can throw the ball at adjustable speeds, and in the court tests, the optimum throwing distance was measured to be 13 meters. In order to adjust the launch height of the tennis ball, the pitch angle of the design can be adjusted between 0 and 14 °. By adjusting the pitch angle with a linear motor, the tennis ball shot profile can be made similar to an oblique shot. The optimum launch speed was measured to be 6.5 m/s. An Android system mobile application was developed to control the machine and remote control of the machine was provided via Bluetooth. The system is designed to operate with a 36 V 18.2 Ah lithium-ion battery and all electronic components have been selected to operate on DC power. The fact that the machine can operate on batteries has contributed to its independence from the grid and its ability to be moved to any desired location. After an industrial development, the design has the capacity to reach high firing speeds of 120 m/s and further firing distances.
Keywords: tennis ball throwing machine, remote control, mobile app

GİRİŞ

Günümüzde tenis dünya çapında ilgi çeken ve uluslararası turnuvalar düzenlenen bir spor dalıdır. Teknik ve taktiğe dayalı olan tenis, fiziksel yeteneklere bağlı olan ve tempolu bir oyundur [1]. Son 20 yılda tenis oyununun evrimi nedeniyle tenise olan ilgi giderek artmıştır ve bu alanda bir çok çalışma yapılmıştır [2], [3], [4], [5], [6], [7], [8]. Tenis oyuncularının hız, güç ve çevikliğe ihtiyaç duymaları nedeniyle fiziksel performanslarının artırılması gereklidir. Başarılı bir performans için bilişsel ve psikolojik süreçlerin yanında fiziksel çalışmaların artırılması da önemli bir etkendir. Fiziksel dayanımın artırılması için zorlu antrenman süreçleri ile vücudun fiziksel yapısı güçlendirilmelidir [9].Bu çalışmada tenis oyuncularının tenis performansını artırmak için fiziksel ve fizyolojik gereksinimlerinin karşılanması amacıyla yapılan antrenmanlarda kullanılmak üzere modüler bir yapıda tenis topu fırlatma makinesi gerçekleştirilmiştir. Makine, oyuncuların tekrarlı antrenman yapabilmelerini hatta kişiye özel kullanılarak kişisel zayıflıkların giderilmesini sağlamaktadır. Makine tasarımı modüler yapılmıştır ve hareketli olarak tasarlanan makinenin batarya kullanılarak enerji beslemesi şebekeden bağımsız hale getirilerek mobilitesi geliştirilmiştir. Uzaktan kablosuz erişim imkânı ile android işletim sistemine sahip telefonlardan kontrol edilebilmesi amacıyla mobil uygulama geliştirilmiştir.

MATERYAL VE METOT

Kullanılan Malzemeler

Tablo 1’de çalışma içerisinde kullanılan malzemeler verilmiştir. Kullanıcıya telefon üzerinden kullanım ve kontrol imkânı tanıyan, bluetooth modülü ve mobil uygulama da kullanılmıştır. Tablo 1’de verilen malzemeler sırasıyla açıklanmıştır.

Tablo 1

Kullanılan Malzeme Listesi

1.	40x40 Sigma Profil
2.	45x90 Sigma Profil
3.	Bağlantı elemanları
4.	36 V 18.2 Ah Lityum İyon Elektrikli Bisiklet Bataryası
5.	Doğrusal Hareketli Motor Kontrol Kartı
6.	Redüktörsüz DC motor
7.	12V DC 300 mm Lineer Aktüator
8.	Dairesel Hareketli Motor Sürücü kartı
9.	Arduino Mega Proje Geliştirme Kiti

Sigma Profiller ve Bağlantı Elemanları

Şekil 1’de gösterilen sigma profiller ve bağlantı elemanları ile tenis topu fırlatma makinesinin mekanik gövdesinin iskeleti oluşturulmuştur. Endüstriyel alüminyum sigma

profiller üzerinde yer alan kanallar ile kolay bir montaj imkanı tanımaktadır. Alüminyumun hafif olması, hava şartlarına ve korozyona dayanıklı olması, tasarım için gerekli mukavemeti sağlaması, işlenmesinin kolay olması nedeniyle çalışmada tercih edilmiştir.



Şekil 1. Sigma Profil ve Bağlantı Ekipmanları

36 V 18.2 Ah Lityum İyon Batarya

Tüm sistemin enerji ihtiyacını sağladığı batarya Şekil 2'de verilmiştir. Batarya ya ait teknik özellikler Tablo 2'de yer almaktadır. Tasarımın şebekeden bağımsız olması hareket imkanını artıracaktır ve kullanım kolaylığı sağlayacaktır. Tüm tenis kortlarında şebeke geriliminin bulunmama durumu da göz önünde bulundurulduğunda tasarımın şebekeden bağımsız olması amacıyla enerji ihtiyacı lityum iyon batarya ile karşılanmıştır. Sistemin bütün elektronik kontrol bileşenleri bataryanın DC gerilimi ve akımı ile çalışacak şekilde oluşturulmuştur.



Şekil 2. 36 V 18.2 Ah Lityum İyon Batarya

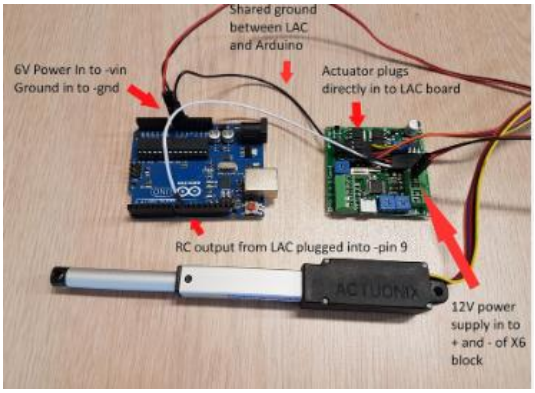
Tablo 2.

Batarya ya ait teknik özellikler

Özellik	**Değer**	**Özellik**	**Değer**
Kimyasal	Li-Ion NMC	Pil konfigürasyonu	10S7P
Şarj gerilimi	42V ± 0.5 V	Hücre kapasitesi	2600 mAh
Voltaj	36 V	BMS	Var
Kapasite	18.2 Ah	Yüksek sıcaklık koruması	70 C°
Enerji kapasitesi	655 Wh	Yüksek akım koruması	25 A
Anlık çekilebilecek yüksek akım	20 A	Yüksek voltaj koruması	43 V
Sürekli çekilebilecek akım	15 A	Düşük voltaj koruması	25 V
Kapasite göstergesi	LED	Balans devresi	Var

Lineer Motor Sürücü Kartı

Tenis topu fırlatma mekanizmasının yukarı-aşağı yönde hareketini sağlayan doğrusal motor ve sürücü kartı devresi Şekil 3'de verilmektedir. Mekanizmanın çalışması arduino kontrol kartı üzerinden L298 motor sürücüye sinyal göndermek suretiyle gerçekleştirilmektedir. L298 motor sürücü kartının kullanılmasının amacı 3A akıma dayanıklı olmasıdır. Lineer (Doğrusal) motorun nominal çalışma akım değeri 2A'dir. Gerilim değeri ise 12-24Volt arasıdır. 36 Voltluk bataryamızdan gerilim regülatörü ile voltaj doğrusal motorun çalışma aralığına indirilerek mekanizmanın çalışması sağlanmıştır.



Şekil 3. Doğrusal Motor ve sürücü kartı

Redüktörsüz DC motor

Sistemimiz üzerinde iki adet redüktörsüz dc motor bulunmaktadır. 250mm çapında kauçuk halkanın dairesel hareketini sağlamak amacıyla kullanılmıştır. Kauçuk halka ile motor milini birbirine bağlayabilmek için katı çizim programı ile tasarım yapılmış ve halkanın içine yerleşecek ebatta konik görünümlü ara parça, 3 boyutlu yazıcı ile üretilmiştir. Bu sayede kauçuk parçanın hareketi sağlanmış ve birbirine zıt yönde dönen dc motorların oluşturduğu

dönme hızı ile araya sıkışmış bir vaziyette ileri hareketi sağlanan tenis topu fırlatılabilmiştir. Yükte 25A akım çekmesi sebebiyle, yüksek akıma dayanımlı motor sürücüler kullanılmıştır.



Şekil 4. Redüktörsüz DC Motor

12V DC 300 mm Lineer Aktüator

Sistemin yukarı-aşağı yönde hareketi Şekil 5'de görülen doğrusal hareket mekanizmalı dc motor ile sağlanmıştır. Lineer motor top fırlatma ünitesinin yunuslama açısını değiştirmek için kullanılmıştır. Yunuslama açısı değiştirilerek tenis topunun ileri atış mesafesi değiştirilmiştir.



Şekil 5. Doğrusal Motor

Dairesel Hareketli Motor Sürücü kartı

Topu fırlatmaya yarayan, dakikada 7500 tur atabilen DC motorun yükte çektiği akım 20 Ampere ulaşabilmektedir. Sistemin sağlıklı çalışabilmesi için gerekli sürücü kartı en az motorun yükteki çektiği değere eşdeğer olmalıdır. Bu sebeple motor sürücü olarak 2 adet BTS7960B 20 Amper Motor Sürücü Kartı kullanılmıştır ve kartın giriş sinyalleri Arduino UNO üzerinden PWM sinyal verilerek sağlanmıştır. Şekil 6'da kartın temsili görüntüsü verilmektedir.



Şekil 6. Motor Sürücü Devresi

Arduino Geliştirme Kiti

Sistemin ana kontrol merkezi olarak Arduino geliştirme kiti kullanılmıştır. 3'de Arduino UNO VE MEGA kartlarının özellikleri verilmiştir.

Tablo 3

Arduino Geliştirme Kartları Özellikleri

• **Arduino UNO**	• **Arduino Mega 2560**
• Mikrodenetleyici: ATmega328.	• Mikrodenetleyici : ATMEGA2560.
• Çalışma Gerilimi: 5V.	• Çalışma Gerilimi : 5V.
• Giriş Gerilimi (önerilir): 7-12V.	• Giriş Gerilimi (önerilir) : 7-12V.
• Dijital G/Ç Pinleri: 14 (6 tanesi PWM çıkışını sağlamak için)	• Dijital G/Ç Pinleri : 54 (14 tanesi PWM çıkışını sağlamak için)
• Analog Giriş Pinleri: 6.	• Analog Giriş Pinleri : 16.
• G/Ç Pin başına DC Akım: 40 mA.	• G/Ç Pin başına DC Akım: 40 mA.
• Flash Hafıza: 32 KB.	• Flash Hafıza : 256 KB.
• Çalışma Frekansı: 16 MHz.	• Çalışma Frekansı : 16 MHz.

Çalışmanın başında Arduino Mega Kartı kullanılmıştır. Sistem üzerine elektronik eklemeler gerçekleştikçe (Bluetooth Modül), motorların kararsız yapıda çalışma problemleri ile karşılaşılmıştır. Farklı Mega kartları ve bluetooth modülleri ile denenmesine karşın kararlı bir çalışma elde edilememiştir. Daha sonra UNO kartı üzerinde yaptığımız çalışma ile sistemin kararlı çalışması sağlanmış ve UNO üzerinden çalışmalara devam edilmiştir.

Yöntem

Çalışmada mekanik tasarım yapıldıktan sonra üretim aşamalarına geçilmiştir. Bunun için alüminyum sigma profiller kullanılmıştır ve sistemin rahat taşınabilmesi için altlarına sarhoş tekerler yerleştirilmiştir. Şekil 8'de sistemin mekanizması üzerinde yapılan çalışmalar temsili olarak verilmiştir.



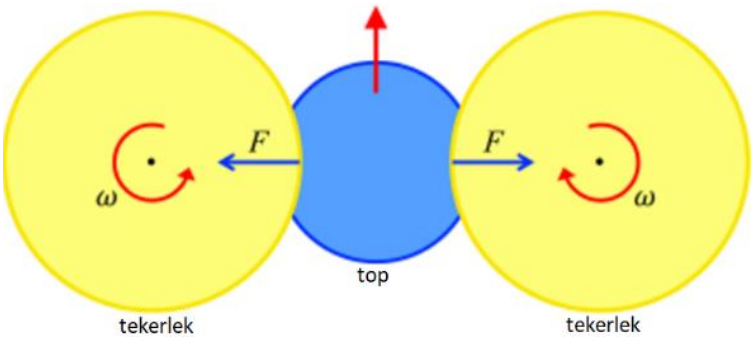
Şekil 8. Sistemin iskelet yapısının birleştirme çalışmaları

Çalışmada tenis topunu fırlatmak için üretilecek kuvvete dayanımlı malzeme seçimi ve 25 metre uzunluğundaki sahada fırlatma hızının ortalama olarak ne değerde olması gerektiğini hesaplatarak başlanılmıştır. Bunun için;

Topun fırlatma hızı, düzgün dairesel hareketin hız denklemi kullanılarak aşağıdaki gibi belirlenmiştir.

$v=\omega r$ (1)

Burada v topun fırlatma hızı, r tekerleğin yarıçapı ve ω tekerleğin açısal hızıdır. Topa uygulanan dönme kuvveti blok diyagramı Şekil 9'da verilmiştir.



Şekil 9. Topa uygulanan dönme kuvveti

Topu fırlatmak için kullanılacak motorun gücü 103Watt, torku 0.08 Nm ve hızı 12300 rpm' dir. Bu özelliklere sahip motorların seçilmesinin sebebi literatür araştırması neticesinde

benzer özelliklerde motorların tenis fırlatma makinelerinde kullanılıyor olmasıdır. Eşitlik 1'e göre 125 mm çapa sahip motor miline bağlı tekerleğin top üzerinde oluşturduğu açısal hız yaklaşık 560 radyan/saniyedir (5348 rpm). Seçilen motorların devir sayılarına bakıldığında(12300rpm) istenilen maksimum hızdan daha fazla tur elde edildiği ve çalışmada kullanılabilir olduğu hesaplanmıştır. Aynı şekilde seçilmiş motorların Eşitlik 1'e göre teorik olarak maksimum fırlatma hızları 80 m/s'dir. Mikroişlemci üzerinden üretilecek ve dc motorun kontrolünü sağlayacak sinyaller ile istenilen aralıklarda hız kontrolü gerçekleştirilmiştir. Bunların dışında, tenis topunun fırlatma tekerleri üzerinde oluşturduğu F kuvveti de sistemin mukavemeti ve stabil bir sistem tasarlamak için ayrıca hesaplanması ve bilinmesi gerekmektedir. F kuvvetini oluşturan iki büyüklük vardır bunlar; merkezkaç kuvveti (F_M) ve topun sıkışmasından kaynaklı deforme uyartım kuvvetidir(F_b). Eşitlik 2'de, F kuvvetinin nasıl hesaplanacağına dair bağıntı verilmiştir.

$$F = F_M + F_b \qquad (2)$$

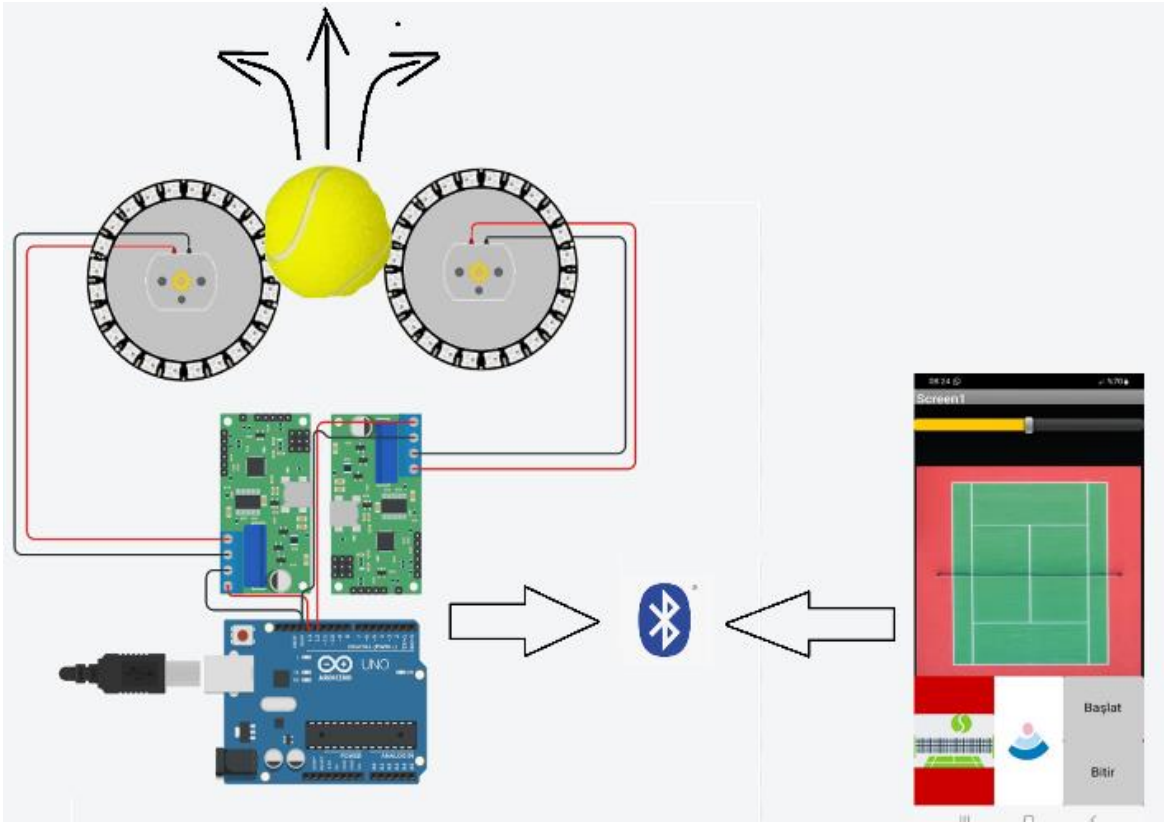
$$F = m_t r_t w^2 + k_b x_b \qquad (3)$$

m_t	Tekerleğin ağırlığı	: 0.05 kg
r_t	Tekerleğin yarıçapı	: 0.0625 m
w	Tekerleğin açısal hızı	: 1288 $rad * s^{-1}$
k_b	Topun sertlik katsayısı	: 0.02 N/m
x_b	Topun sıkıştırılma miktarı	: %10 olarak varsayılmıştır

İki tekerleğinde oluşturduğu maksimum F kuvveti Eşitlik 3'den, yaklaşık olarak 4N olarak hesaplanmıştır. Bu hesaplanan kuvvete göre en az 4N' luk kuvvete dayanım gösterecek ve yataklamada kullanılacak rulmanlar tercih edilmiştir. Topa temas eden kauçuk halkanın mekanizmaya sabitlenebilmesi için Şekil 10' da verildiği gibi solidworks katı çizim programı ile parça çizimi yapılarak 3D yazıcıdan çıktı alınmıştır. Şekil 11' de ise sistemin elektronik blok şeması verilmiştir.



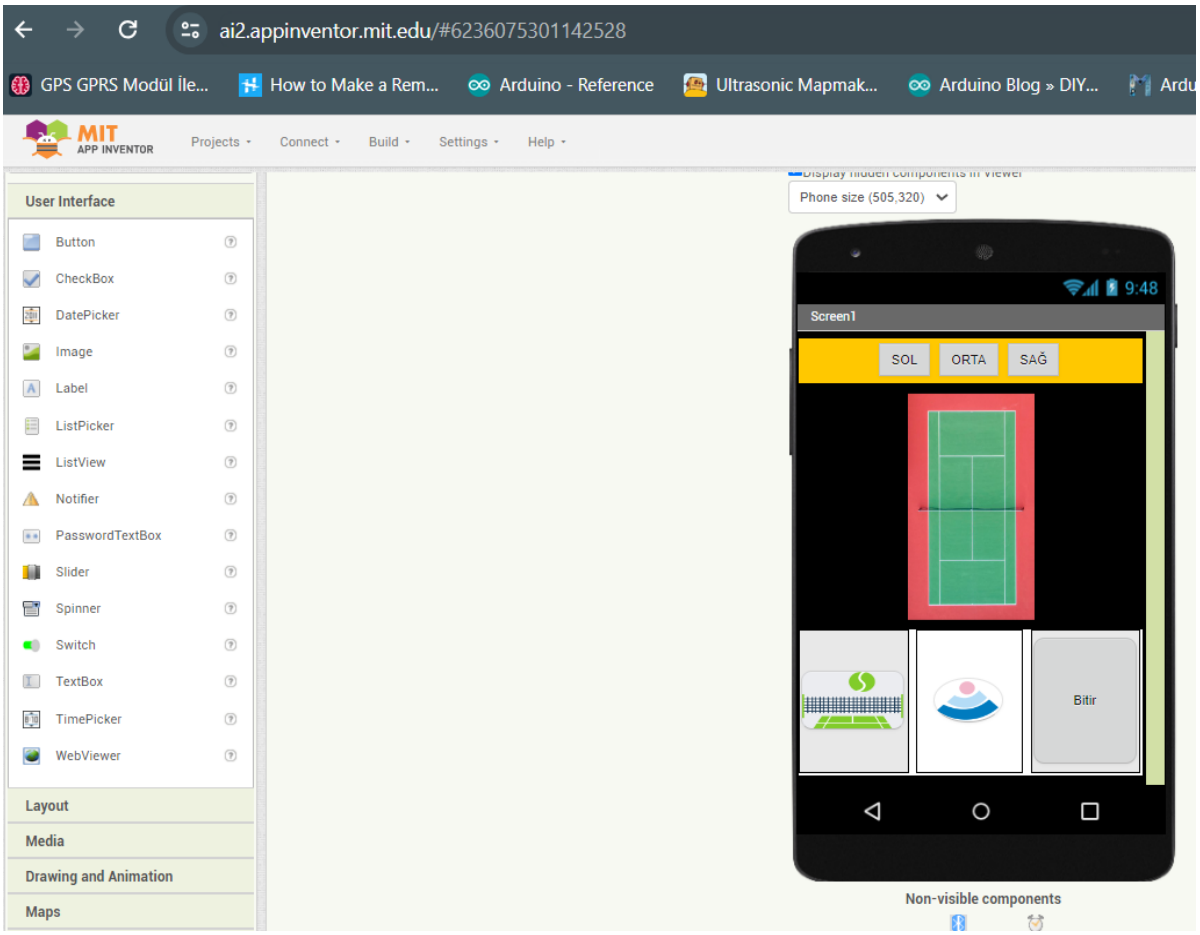
Şekil 10. Topa temas eden kauçuk halkanın mekanizmaya rulman yardımıyla sabitlenmesi.



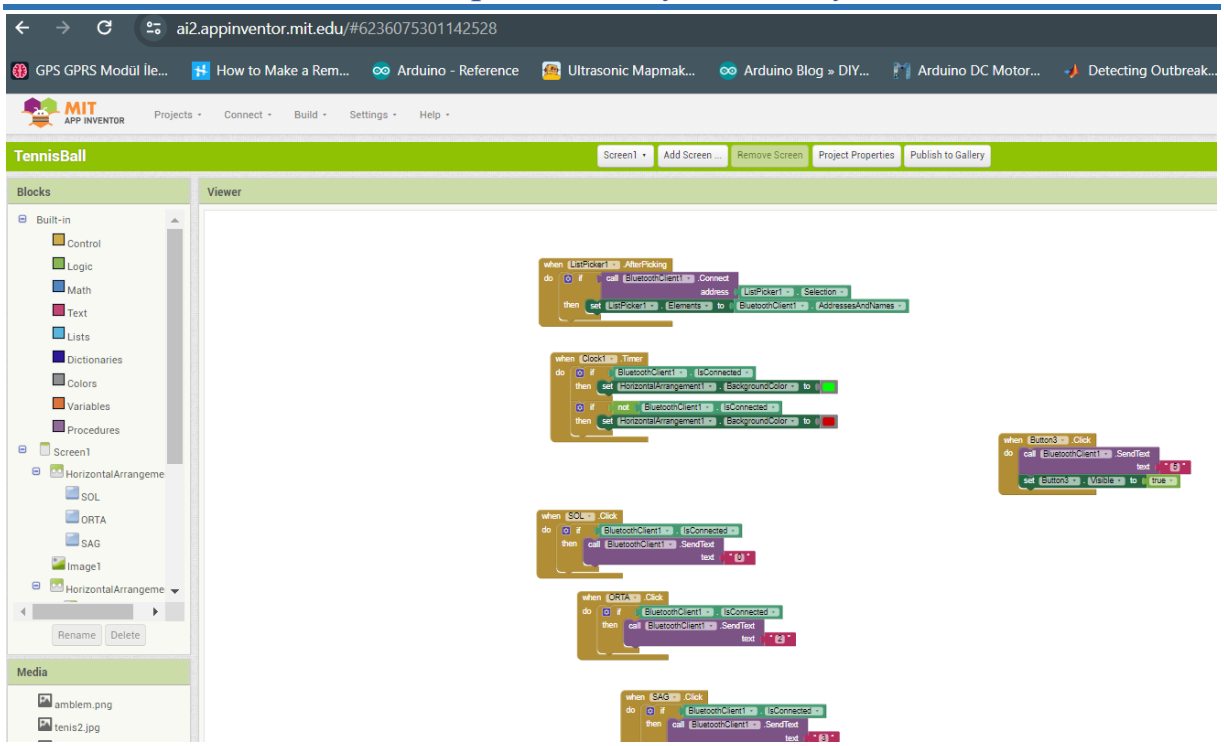
Şekil 11. Sistemin elektronik blok şeması

Sistemin ile çeşitli hızlarda ve açılarda fırlatılan tenis topları üzerinde yapılan testler, makinenin istikrarlı ve güvenilir bir performansa sahip olduğunu göstermiştir. Farklı hızlarda topları fırlatabilmek için geliştirilen sistemin çalışma mantığı şu şekildedir. Arduino kontrol kartı üzerinde yer alan RX-TX pinleri üzerinden bluetooth modülü ile haberleştirdiğimiz telefon ve telefon uygulamasında daha önce belirlediğimiz ve kablosuz seri iletişimle verileri bluetooth üzerinden aktardığımız anahtar kilit yöntemi ile çalışabilen bazı string yapılarda ifadeler iletilmiştir. Tanımlı her bir verinin arduino da karşılık gelen hareket algoritmaları tanımlanmıştır. Böylece telefon kullanıcı ara yüzünden basılan her bir buton için arduinoda karşılık gelen bir çalışma bloğu bulunmaktadır. Buna bağlı olarak

sistemimiz düz, sağ ve sol yönlerinde topu fırlatmanın dışında hızlı, yavaş olarak da kontrol edilebilmektedir. Kullanıcılar için telefondan kontrol etmelerini sağlayacak kullanıcı ara yüzleri için ise MIT APP uygulamasından yararlanılmıştır. Sürükle bırak ile kodlanan kullanıcı ara yüzünün program çıktısı ve kod bloklarının görüntüsü Şekil 12 ve 13' de verilmiştir.



Şekil 12. Kullanıcı ara yüzü tasarım uygulaması



Şekil 13. Kullanıcı ara yüzü tasarım kod blokları

ÖNERİ VE GELECEK ÇALIŞMALAR

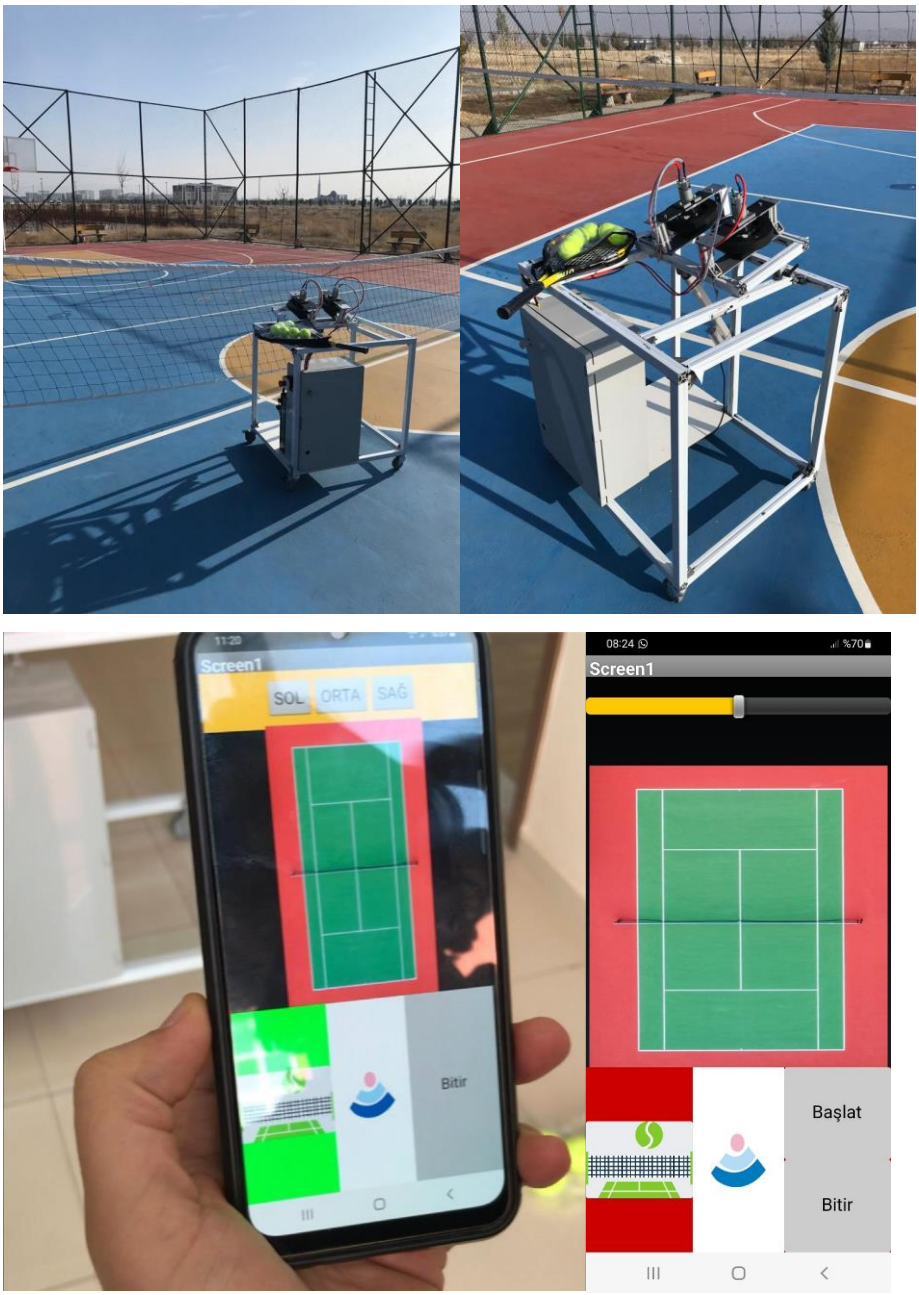
Bu çalışma, tenis topu fırlatma makinesinin başarılı bir şekilde tasarlandığını ve test edildiğini göstermektedir. Ancak, gelecekteki geliştirmeler için bazı öneriler bulunmaktadır: Teknoloji ilerlemeye devam ettikçe, Tenis Topu Atma Makinelerinin gelecekteki versiyonları uyarlanabilir antrenman programları için yapay zekayı entegre edebilir. Ek olarak, sürükleyici bir eğitim deneyimi için sanal gerçekliğin dahil edilmesini keşfetmek, daha fazla gelişme için umut verici bir yol olabilir.Hedef tespit sensörleri ile entegrasyon: Makineye, kullanıcıların hedef isabetini daha iyi değerlendirmelerine yardımcı olacak hedef tespit sensörleri eklenebilir.

Çalışmanın ilerleyen aşamalarda bu önerilere dayanarak geliştirilmesi, kullanıcı deneyimini daha da iyileştirebilir.

BULGULAR ve TARTIŞMA

Gerçekleştirilen tasarım ile tenis kortunda atış testleri yapıldı. Şekil 14' de kortta yapılan atış testlerinden bir resim ve geliştirilen mobil uygulamanın resimleri verilmiştir. Tasarım sistemin mekanik sınırlarına uygun çalışma hızında tenis topunu yaklaşık olarak 13 metre ileri fırlatabilmektedir. Yunuslama açısının aralığı 0 ile 14° arasındadır. Fırlatılan tenis topunun ortalama hızı 6,5 m/s' dir. Tasarım mekanik olarak endüstriyel bir geliştirmeden sonra ileri atış mesafesi, yunuslama açısı, atış hızı gibi parametreler geliştirilebilir. Rijit ve güvenilir bir mekanik gövde ile çalışma hızını artırmak mümkündür. Özellikle dc motorların

maksimum dönme hızı ile çalışması halinde yaklaşık 120 m/s hızda tenis topu atışı mümkün hale gelebilir.



Şekil 14. Gerçekleştirilen tenis topu fırlatma makinesi ve mobil uygulaması

SONUÇLAR

Bu çalışmanın sonunda, başarılı bir tenis topu fırlatma makinesi prototipi geliştirildi. Tasarımın performansı, güvenliği ve esnekliği, tenis oyuncularının antrenmanlarını daha etkili ve keyifli hale getirecek şekilde optimize edildi. Makine, kullanıcı güvenliği açısından detaylı güvenlik testlerinden geçirildi. Acil durumlarda kullanıcının güvenliğini sağlamak için acil durum butonu ve uygulama üzerinden durdurma butonu yerleştirilmiştir.

Yapılan testler sonucunda standart bir tenis antrenmanı için yeterli bir tenis topu fırlatma makinesi tasarımı gerçekleştirildiği ortaya çıkmıştır. Yapılacak gelişmeler ve kullanılacak hassas üretim metotları ile çalışma kapasitesinin artırılması mümkündür.

TEŞEKKÜR

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OTONOM TEKERLEKLİ SANDANYE KONTROLÜNDE GÜNCEL GELİŞMELERİN İNCELENMESİ

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ÖZET
Bu çalışmada otonom elektrikli tekerlekli sandalyelerin hareket kontrolündeki gelişmelerin bir incelemesi sunulmaktadır. Bilişsel ve motor bozukluğu olan engelli bireyler, standart bir elektrikli tekerlekli sandalyede joystick ve benzeri ekipmanları kullanmakta zorluk yaşayabilirler. Bu kişilerin hareket kabiliyetinin kısıtlanması, topluma yabancılaşmalarına ve depresyon düzeylerinin artmasına yol açabilir. Bu nedenle standart elektrikli tekerlekli sandalyelerin navigasyonunu kolaylaştırmak, engelli bireylerin etkileşimini ve hareket kabiliyetini arttırmak amacıyla tekerlekli sandalyeler üzerinde birçok çalışma yapılmıştır. Bu inceleme makalesinde bu çalışmaların ayrıntılı olarak incelenmesi ve tekerlekli sandalyelerin geleceğe yönelik bakış açıları hakkında bir değerlendirme yapılması amaçlanmaktadır. Birçok bilimsel çalışma, elektrikli tekerlekli sandalyelerin sensörlerin, kontrol uygulamalarının ve akıllı sistem teknolojilerinin uygulanabilirliğinin test edilmesi için uygun bir platform sunduğunu göstermektedir. Bu makale aynı zamanda otonom ve akıllı tekerlekli sandalyelere ilişkin geçmiş, mevcut kontrol metodolojilerini ve gelecekteki fikirleri sunmayı da amaçlamaktadır. Bu çalışmada bulanık mantık, orantısal-integral-türev (PID) ve doğrusal ikinci dereceden denetleyici (LQR) gibi tatmin edici sonuçlar veren kontrol yöntemleri analiz edilmiştir. Ayrıca bu inceleme makalesi, otonom tekerlekli sandalyenin yakınlık sensörleri, kamera, lazer tarayıcılar ve benzeri sensör seçeneklerini de ele almaktadır. Makalede sonuçlar sunulurken, kullanılan kontrol yöntemleri ve sensör seçeneklerine ilişkin karşılaştırmalı bir görüş de sunulmuş olup, otonom tekerlekli sandalye kontrolünün mevcut durumu ve gelecekteki olasılıkları ile ilgili sonuçlar ifade edilmiştir. Sonuç olarak, bu çalışmada toplanan bilgilerin, çağdaş elektrikli tekerlekli sandalye kontrol teknolojilerinin durumu hakkında farkındalığın arttırılması ve engelli bireylerin hareket kabiliyetinin arttırılması, depresyon düzeyinin azaltılması için yön verici olması amaçlanmaktadır.

Anahtar Kelimeler: Elektrikli Tekerlekli Sandalye, Kontrol Sistemleri, Yardımcı Teknolojiler, Otonom Tekerlekli Sandalye

A REVIEW OF RECENT DEVELOPMENTS IN AUTONOMOUS WHEELCHAIR CONTROL

ABSTRACT
In this study, a review of developments in motion control of autonomous electric wheelchairs is presented. Disabled people with cognitive and motor impairments have may have difficulties in using joy-stick and similar equipment in a standart electric wheelchair. Restricting the mobility of these people alienates them from society and increases their depression levels. For this reason, many studies have been conducted on wheelchairs to facilitate the navigation of standard electric wheelchairs and increase of disabled person's interaction and mobility. This review paper is aimed to examine these studies in detail and make an evaluation about the future prospects of wheelchairs. Many scientific studies show that electric wheelchairs offer a suitable platform for testing sensors, control applications and applicability of smart system technologies. This paper also aims to provide past, present control methodologies and future ideas of autonomous and intelligent wheelchairs. Control methods that yield satisfactory results including fuzzy logic, proportional-integral-derivative (PID) and linear quadratic controller (LQR) are analyzed in this study. Additionally, this review paper tackles sensor options of the autonomous wheelchair like proximity sensors, camera, laser scanners, and similar. A comparative discussion of the control methods and sensor options is also given in the results section of the paper, and conclusions relating to the present status and future possibilities of autonomous wheelchair control are noted. As a result, the information gathered in this study is intended to promote awareness of the status of contemporary electric wheelchair control technologies and provide guidance in increasing mobility, decreasing depression level of the disabled people.
Keywords: Electric Wheelchair, Control Systems, Assistive Technologies, Autonomous Wheelchair

INTRODUCTION

Persons with reduced mobility make up approximately one-third of the European population [1] The reduced mobility problem may emerge due to various reasons including old age accompanied with reduced vision and hearing, reflex disabilities, neuromuscular disabilities, lower extremity amputations, and more. Among persons reporting major mobility difficulties, 30.6% noted being frequently depressed or anxious, compared to 3.8% of people without mobility difficulties [2]. These rates show how important the movement of a disabled person is. In recent years, new technologies have emerged to increase the mobility of the disabled persons. Assistive technologies that have allowed people with disabilities to use modified computer components and software is among those technologies. These assistive technologies positively affect physical and mental health, and they are frequently used in the electric wheelchairs as detailed in Section 2 [3]. In order to adapt assistive technologies to wheelchairs, it is necessary to know the dynamics of the wheelchair motion. A study in 1985 provides a stepping-stone for wheelchair designers by incorporating analytical modeling and digital computer as valuable design tools, where wheelchair parameters, internal and external forces and detailed dynamical and kinematic analysis of a wheelchair is provided [4]. The first attempt on the intelligent wheelchair is in 1989, and its electronic components are tackle in the section 2 [5]. In 1990, after the detailed dynamical analysis of the wheelchair, an adaptable optimal controller is implemented in a microprocessor-based system. Then the system is installed in an electric wheelchair and tested [6]. Being one of the most popular control methods in industrial applications, PID control is designed and applied on an electric wheelchair propulsion system in 1991 [7]. Another well-known control method, the LQR control is designed and implemented for the electric wheelchair, and the closed loop model's sensitivity to uncertainties is demonstrated [8]. Fuzzy control method is also used for wheelchair motion control problem [9]. Overall, until the 2000s, the studies have succesfully achieved dynamical analysis and modeling of the electric wheelchair. It is also observed that there are attempts of controller design for wheelchair control problem. Nevertheless, there have been very few studies that include assistive technologies into wheelchair control systems in the past. In this paper, it is aimed to share which assistive technologies have been developed and used in wheelchair control systems on a chronological basis.

The paper organized as follows. Assistive technologies for the electric wheelchair are presented in Section 2. Section 3 presents the control methods of the wheelchairs. Results are shared in Section 4 with discussions. Lastly, conclusion is presented in Section 5.

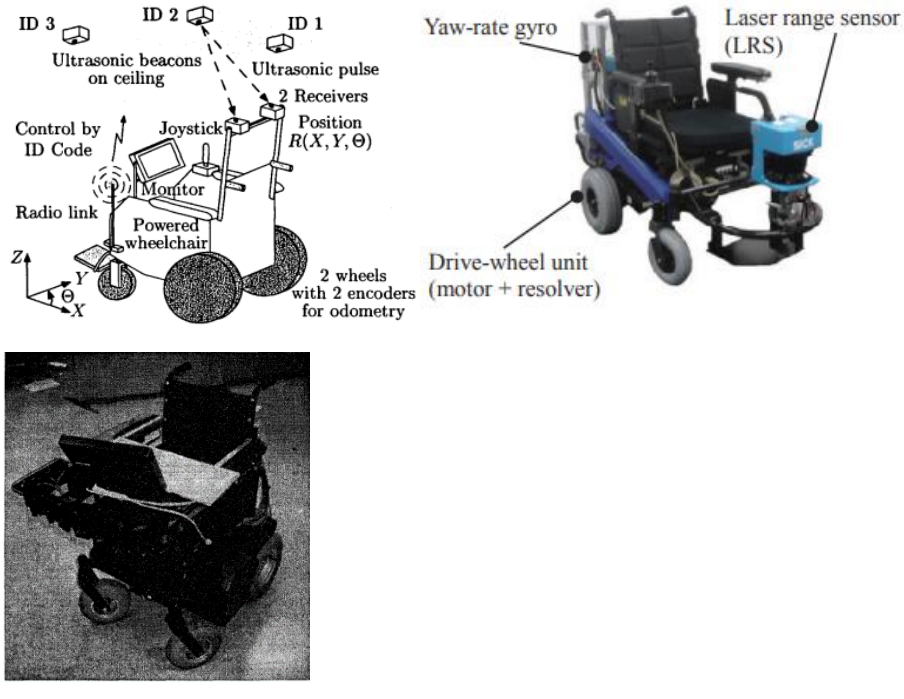
ASSISTIVE TECHNOLOGIES

Assistive technologies play an essential role in lives of the disabled individuals, aiming to make their daily routines easier. The smart wheelchairs constitute a good example of these technologies and their application areas. These wheelchairs equipped with control and instrumentation technologies increase the mobility of disabled people with the help of proximity sensors, cameras, laser scanners, global positioning system (GPS), and more. These technologies improve the disabled people's quality of life by improving the functionality of the wheelchair. In this section, sensing technologies frequently used in wheelchairs are analyzed. The literature is examined in two groups in the following sub-sections: smart wheelchairs that use cameras and smart wheelchairs that use other sensors.

Sensor Based Autonomous Wheelchairs

Autonomous wheelchairs mostly use sensors for path following and obstacle avoidance scenarios. In this sub-section, studies on sensor based autonomous wheelchairs are presented. In 1997, NavChair project [10] used voice sensors to navigate the electric wheelchair shown in Figure 2.1c. The user should train voice recognition system and then control the wheelchair by giving speech command in this system. Another voice controlled intelligent wheelchair can be found in [11]. In the year 2000, several studies that use ultrasonic range sensors are presented in literature [12-16]. An autonomous navigation system using ultrasonic beacons is shown in Figure 2.1a [12]. The study is conducted in indoor environment for the task of collision avoidance in [13]. In [14], using the ultrasonic sensor, force feedback is calculated when obstacles are detected, and the smart system moves the chair towards the safety region. The study also uses the ultrasonic range sensor, but instead of a computer, a microchip is used to decrease the cost [15]. In the year 2010, user-adapted plan recognition system is constructed with ultrasonic range sensors [16]. There are also different types of laser range sensors used for the purpose of wheelchair control, one of which can be seen in Figure 2.1b [17]. In addition to those studies, GPS (Global Positioning System) is used in 'TAO Aicle' [18] intelligent smart wheelchair Project to provide autonomous traveling. Another sensor type used in wheelchairs is the LIDAR (Light Detection and Ranging), which has the ability to measure in 3D (Dimension) [19]. In another study, instead of the aforementioned sensors placed on the wheelchair, a head joy-stick design is studied, where the head joy-stick is connected to a cap on the user's head. When the user turns his/her head, the wheelchair steers in this system [20]. Lastly, it is worth mentioning a study that uses EEG (Electroencephalogram) sensors signals, where the brain actuates the control mechanism of the intelligent wheelchair after processing the EEG [21].

Overall analysis, advantadges and disadvantadges of types of sensors are discussed in the Section 4.

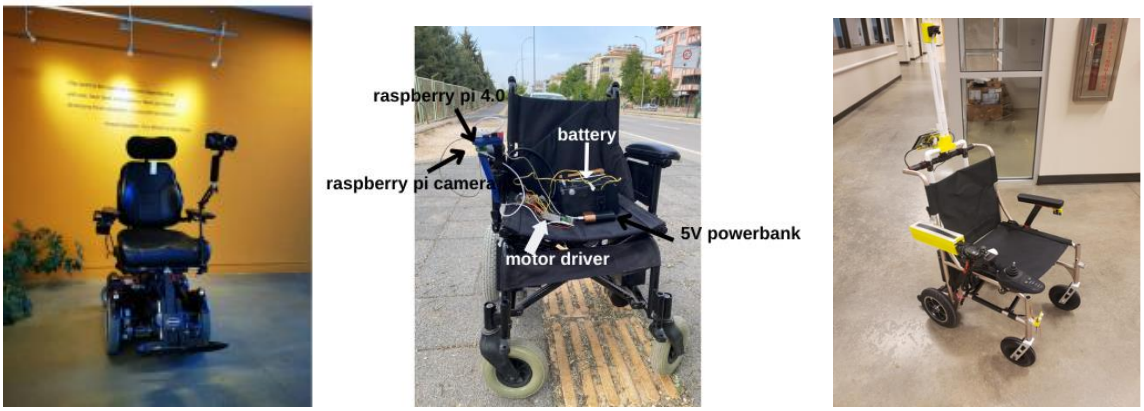


a) **b)** **c)**

Figure 2.1. Sensor technologies examples used on wheelchair a) Autonomous drive by ultrasonic beacons [12], b) Guide following control using laser range sensor for a smart wheelchair [17] ve c) NavChair [10]

Vision Based (Camera) Autonomous Wheelchairs

Vision based (camera) autonomous wheelchair systems are constructed mostly for path following and obstacle avoidance tasks. In 2010, a study proposes an autonomous wheelchair that has spherical camera system to allow detection of surrounding objects and whether or not they pose a danger for navigation [22]. In 2017, popular research topics of deep learning and internet of things (IoT) are applied to vision based smart wheelchairs [23],[24]. There is also a study that uses computer camera to find vanishing point for the path following task of the wheelchair [25]. There are examples of studies where cameras and lidar sensors are used together [26], [27] to provide impressively good results for 3D mapping. In some studies the Kinect camera is used for obstacle-object detection task, and these studies show good efficacy in achieving the pursued result in [28], [29] and[30]. Lastly, Raspberry pi camera is preferred in some intelligent wheelchair projects for its capability to output 4K video at 60 Hz and support for dual monitors enable high-quality visual feedback, which is crucial feature for advanced smart wheelchair applications [31], [32].



a) **b)** **c)**

Figure 2.2. Camera technologies examples used on wheelchair a) 3D Mapping project for autonomous wheelchair [33], b) An autonomous wheelchair that follows sidewalk using camera [34] ve c) Path planning and localization of autonomous wheelchair in indoor [32]

AUTONOMOUS CONTROL METHODS

Different types of controllers are designed for motion of the autonomous wheelchair. Fuzzy control is among the mostly used methods in wheelchair control. In 2008, development of an intelligent power assisted wheelchair using fuzzy control systems is presented [35]. Similarly, a study which is named fuzzy controller based subsumption behavior architecture for autonomous robotic wheelchair is presented in [36]. In other studies, fuzzy control is used for the task of indoor navigation of the wheelchair [37] and trajectory tracking [38]. Being one of the most popular control methods for its simplicity, flexibility and efficacy, PID control has also been used for autonomous wheelchair control problems many times. Some significant examples are presented here. In 2012, PID algorithm for dynamic control of an automatic wheelchair is studied [39]. Additionally, there are two studies for combining the fuzzy and PID control methods. These studies proposes fuzzy-PID control techniques [40], [41]. Lastly, LQR controlled wheelchair is presented in [42], and controller performances of PID and LQR are compared in a recent study in [34].

RESULTS AND DISCUSSION

The results focus on recent developments on autonomous wheelchair control in literature. Navchair project stands out as a very important study among the voice controlled smart wheelchair studies [10]. Despite its achievements, problems arise due to the user's lack of grasping and operating abilities since the wheechairs carry out the commands given unconsciously. Similar problems can be seen in the head-controlled wheelchair studies [20]. This study gives the true results when the user has capability of good head movement. On

the other hand, in brain-controlled chair studies, when users have emotional problems, there will be a disconnection in the control process of the wheelchair [21].

When the recent studies are analyzed, it can be seen that popular topics like deep learning and IoT are used with vision sensors, and these studies have proven that the vision sensor is the most capable sensing technique in robotic applications [22], [23]. It is clear that the computer vision-based methods have advantages compared to other mentioned approaches.

The review of control methods reveals that fuzzy control methods depend on designer's control experience on the system and fuzzy control table contains many parameters as well as tedious and complicated experiments for application to the wheelchair control problem [9], [34-35], [37], [39] . Presented studies show that LQR controller has advantages over PID control method [24].

CONCLUSION

In this review paper, different sensor types and control methods for autonomous wheelchair motion control in literature are presented. Autonomous wheelchair projects are designed according to the needs and situation of the disabled individual. As a result of comparing the disadvantages and advantages experienced according to some disability types and the studies in the literature, the following conclusion is reached. When the control methods are compared, it is concluded that LQR controller gives better results compared the other control methods presented. On the other hand, it is evident from the reviewed works that vision sensors are more capable of achieving good results on assistive wheelchair applications in comparison to sensor-based systems. When the publication years of the presented references are analyzed, it is observed that the camera-based smart wheelchair studies are more recent than the other sensor-based smart wheelchair studies. As a future prospect, it is anticipated that camera-based wheelchair projects will become more popular and produce better results with the integration of developing new technologies into the field of autonomous motion control of wheelchairs.

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RESPONSE OF ALL-CHARM RESONANCE $X(6900)$ TO HOT MEDIUM

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Abstract
Exploring exotic particles holds significant importance in high-energy physics research, offering insights into quark dynamics, theoretical model testing, completing the exotic hadron spectrum, probing strong interactions, and advancing experimental techniques. Additionally, the hot medium in which these particles exist can significantly alter their physical properties. By studying how particles respond to different temperature regimes, researchers can gain valuable insights into various physical phenomena. This knowledge is essential for advancing our understanding of fundamental processes in physics, such as phase transitions from quark-gluon plasma to hadrons, deconfinement, and the behavior of matter under extreme conditions. Recently, the LHCb Collaboration reported pronounced structures in the invariant mass spectrum of double-J/ψ produced in pp collisions, followed by a narrow peak around 6.9 GeV. In this work, we investigate the thermal characteristics of the newly discovered fully-charm resonance $X(6900)$ assuming it to be a $\chi_{c0}\chi_{c0}$ molecule with quantum numbers $J^{PC} = 0^{++}$ by the Thermal QCD sum rules up to dimension 4. Our analysis reveals a $\sim 7\%$ decrease in mass and nearly a substantial 80% reduction in decay constant. Our results also indicate that in the limit of $T \to 0$, the mass and decay constant of the $X(6900)$ state are consistent with data available in the literature. We expect that the findings presented in this paper will contribute to shedding light on future experiments in this field.
Keywords: Thermal QCD sum rules, Mass and decay constant, Fully-charm molecular state

PROLOGUE

Since 2003, experiments have reported numerous exotic states that differ from the conventional mesons (quark-antiquark pairs) and baryons (three-quark combinations) predicted by the standard quark model. These states emerge as the tetraquark ($qq\bar{q}\bar{q}$), molecule ($[q\bar{q}][q\bar{q}]$), glueball ($gg/ggg/gggg$), hybrid ($qq\bar{q}g/q\bar{q}g\bar{q}/qqqg\bar{q}$) and pentaquark ($qqqq\bar{q}$) states [1-3]. Among the enigmatic multiquark systems, the fully heavy four-quark states emerge as relatively pure systems. In recent years, many exotic candidates and reliably confirmed exotic structures including $[cc\bar{c}\bar{c}] - X(6900)$, LHCb 2020 [4], CMS 2022 [5], ATLAS 2022 [6] have been detected as:

$$m_{X(6900)} = 6886 \pm 16 \text{ MeV},$$

$$\Gamma_{X(6900)} = 168 \pm 80 \text{ MeV}.$$

In recent times, there have been numerous studies related to exotic mesons both in vacuum and hot/dense medium [7-26]. **In the study of the behavior of matter at extremely high temperatures, investigating fully heavy molecules offers a valuable approach to understanding how unusual particles, known as exotic particles, behave under such extreme conditions.** Motivated by the quest to understand the fundamental dynamics of strong interactions, researchers delve into the properties of these enigmatic particles to probe their response to extreme conditions, such as those encountered in the early universe or high-energy collisions. By employing theoretical frameworks like Thermal QCD Sum Rules (TQSR), scientists aim to elucidate the thermal properties of fully heavy exotic structures and their role in different phases of matter, including the transition from hadronic matter to quark-gluon plasma (QGP). Through this research, valuable insights are gained into the mechanisms governing exotic particle formation, the validity of theoretical models, and the broader implications for our understanding of particle physics. Ultimately, the study of fully heavy molecules in TQSR serves as a window into the intricate interplay between quarks, gluons, and the strong force, offering tantalizing prospects for advancing our knowledge of exotic hadrons and their significance in the cosmos.In this study, we explore the thermal properties of the all-charm $X(6900)$ resonance, considering it as a meson molecule, utilizing TQSR. In Section II, we provide a brief introduction to the theory and then present the numerical analysis in Section III. The subsequent section is dedicated to the evaluation of the results.

II. THERMAL PROPERTIES OF THE MOLECULE $\chi_{c0}\chi_{c0}$

TQSR extends traditional QCD sum rules [27] to incorporate thermal effects, allowing for the calculation of hadronic properties at finite temperatures [28]. By considering the interaction of quarks and gluons within the framework of quantum chromodynamics (QCD), TQSR enables the study of hadronic matter under extreme conditions, such as those encountered in high-energy collisions or the early universe. The transition temperature from QGP to hadron phase, known as the critical or crossover temperature (T_c), is an active area of research in heavy-ion physics. The precise determination of T_c depends on the specific conditions of the collision system and the methodology used for its measurement, such as lattice QCD simulations, experimental observables, or theoretical calculations. The transition temperature from QGP to hadron phase has been estimated to be around $150-170$ MeV. However, it is essential to note that these values can vary depending on the specificities of the collision system, such as the colliding nuclei species and their energies. We use the $T_c = 155$ MeV value in our calculations [29].

To begin the calculation, first, we introduce the usual correlation function:

$$\Pi(p,T) = i\int d^4x e^{ip\cdot x}\langle\Omega|T\{J(x)J^{\dagger}(0)\}|\Omega\rangle, \tag{1}$$

here Ω symbolizes the hot medium, T is the time-ordered operator, $J(x)$ is a local current constructed either from the quark/gluon fields or hadronic fields. The thermal average of any operator is defined as $\langle\hat{O}\rangle = \mathrm{Tr}\,(\mathrm{e}^{-\beta\mathrm{H}}\hat{O})/\,\mathrm{Tr}(\mathrm{e}^{-\beta\mathrm{H}})$. Assuming the resonance $X(6900)$ as exotic molecule $\chi_{c0}\chi_{c0}$ we chose the interpolating current as follows:

$$J(x) = \bar{c}_a(x)i\,\gamma_5\,c_a(x)\bar{c}_b(x)i\,\gamma_5\,c_b(x), \tag{2}$$

where a and b color indices, c depict charm quark fields, respectively. Henceforth, we will denote the particle $X(6900)$ with the symbol X for shortness. For the physical side of the calculation, Eq. (3) can be expressed as follows:

$$\Pi^{Phys.}(p,T) = \frac{\langle\Omega|J(0)|X(p)\rangle\langle X(p)|\bar{J}(0)|\Omega\rangle}{m_X^2(T) - p_X^2} + \cdots subtracted\ terms. \tag{3}$$

The coupling of the scalar meson with $J^{PC} = 0^{++}$, to the current, J, in Eq. (3) according to the meson decay constant f_x is:

$$\langle\Omega|J|X(p)\rangle_T = f_X(T)m_X(T). \tag{4}$$

Gathering the Eqs. (1-4), we get the correlator for the physical side reads;

$$\Pi^{Phys.}(p,T) = \frac{m_X^2(T)f_X^2(T)}{m_X^2(T)-p_X^2} + \cdots. \tag{5}$$

Then, to eliminate the specified subtractions a Borel transform is applied to Eq. (5). To continue the calculation for the $X(6900)$ meson's mass, we need to determine the OPE side.

The first step in the calculation of this side is to insert Eq. (2) into the correlator in Eq. (1). After doing some standard manipulations and contracting the quark fields, we reach an expression in terms of heavy quark propagator in the correlation function in Eq. (1), which can be written as:

$$\Pi^{\mathrm{OPE}}(p,T) = \mathrm{i}\int d^4x e^{ip\cdot x}\langle\{Tr\left[\gamma_5 S_c^{ba'}(x)\gamma_5 S_c^{a'b}(-x)\right]Tr\left[\gamma_5 S_c^{ab'}(x)\gamma_5 S_c^{b'a}(-x)\right]$$
$$-Tr\left[\gamma_5 S_c^{bb'}(x)\gamma_5 S_c^{b'a}(-x)\gamma_5 S_c^{a'b}(x)\gamma_5 S_c^{aa'}(-x)\right]$$
$$-Tr\left[S_c^{ba'}(x)\gamma_5 S_c^{a'a}(-x)\gamma_5 S_c^{ab'}(x)\gamma_5 S_c^{b'b}(-x)\right]$$
$$+Tr\left[\gamma_5 S_c^{bb'}(x)\gamma_5 S_c^{b'b}(-x)\right]Tr\left[\gamma_5 S_c^{aa'}(x)\gamma_5 S_c^{a'a}(-x)\right]\}\rangle_T. \quad (6)$$

Meanwhile, the usual heavy quark propagator in Eq. (6) is:

$$S_c^{ij}(\mathrm{x}) = i\int\frac{d^4p}{(2\pi)^4}e^{-ik\cdot x}\left(\frac{\delta_{ij}(\not{p}+m_c)}{(p^2-m_c^2)} - \frac{g_s G_{\mu\nu}^{ij}}{4}\frac{\sigma^{\mu\nu}(\not{p}+m_c)+(\not{p}+m_c)\sigma^{\mu\nu}}{(p^2-m_c^2)^2}\right.$$
$$\left. + \frac{g_s^2 G^2}{12}\delta_{ij}m_c\right.$$

$$\left.\times\frac{(p^2+m_c\not{p})}{(p^2-m_c^2)^4}\frac{g_s^3G^3}{48}\delta_{ij}\frac{(\not{p}+m_c)}{(p^2-m_c^2)^6}[\not{p}(p^2-3m_c^2)+2m_c(2k^2-m_c^2)](\not{p}+m_c)+\cdots\right), \quad (7)$$

where gluon field strength tensor $G_{\mu\nu}^{ij}$ can be defined in compact form with $G_{\mu\nu}^{ij} = G_{\mu\nu}^{A}t^{ijA}$, $A = 1,2,3\ldots,8$. Here $G_{\mu\nu}^{A}$ is the classical gluon field, $t^{ijA} = \lambda^{ij,A}/2$ and $\lambda^{ij,A}$ are the Gell-Mann matrices. Additionally, the gluon condensate associated with the gluonic component of the energy-momentum tensor $\Theta_{\mu\nu}^{g}$ is expressed through the following relation:

$$\langle Tr^c G_{\alpha\beta}G_{\lambda\sigma}\rangle_T = \left(g_{\alpha\lambda}g_{\beta\sigma}-g_{\alpha\sigma}g_{\beta\lambda}\right)C_1$$
$$-\left(u_\alpha u_\lambda g_{\beta\sigma}-u_\alpha u_\sigma g_{\beta\lambda}-u_\beta u_\lambda g_{\alpha\sigma}+u_\beta u_\sigma g_{\alpha\lambda}\right)C_2,$$
$$C_1 = \frac{1}{24}\langle G_{\alpha\beta}^{a}G^{a\alpha\beta}\rangle_T + \frac{1}{6}\langle u^\alpha\Theta_{\alpha\beta}^{g}u^\beta\rangle_T\ ,$$
$$C_2 = \frac{1}{3}\langle u^\alpha\Theta_{\alpha\beta}^{g}u^\beta\rangle_T,$$

(8)

here u_μ is the four-velocity of hot matter. Then, based on the analyticity, the correlator is related to the imaginary part by dispersion relation as:

(9)

$$\Pi^{OPE}(p,T) = \frac{1}{\pi}\int_{s_{min}}^{s_0}\frac{Im[\Pi^{OPE}(s,T)]}{s-p^2}\ ds + \cdots,$$

where, the lower limit, s_{min} is defined with $4m_c^2$, and the effective threshold s_0 represents the mass of the first excited state with the same quantum numbers as the interpolating currents selected for the considered particle. Evaluations are performed up to operator dimension four. For the sake of brevity, the detailed expressions of the QCD spectral densities are omitted in this paper. By applying the Borel transformation to the variable p^2 for the invariant amplitude $\Pi^{OPE}(p,T)$, and adopting the same structure in $B\Pi^{\text{Phys.}}(p,T)$, the thermal decay constant sum rule equality can be established by equating the terms corresponding to this structure and subtracting the continuum contribution, we get:

$$\Pi(M^2,s_0,T) = \int_{4m_c^2}^{s_0(T)} ds\,\rho(s,T) + \widetilde{\Pi}(M^2,T). \tag{10}$$

The term $\widetilde{\Pi}(M^2,T)$ stands for nonperturbative contributions directly from $\Pi^{OPE}(p,T)$. Then decay constant sum rule for the considered particle is:

$$f_X^2\,(T) = \frac{e^{m_X^2(T)/M^2}}{m_X^2(T)}\,\Pi(M^2,s_0,T). \tag{11}$$

Taking the derivative of Eq. (11) in terms of $(-1/M^2)$, we obtain the mass sum rule related to temperature:

$$m_X(T) = \sqrt{\frac{\Pi'(s_0,\ M^2,T)}{\Pi(s_0,\ M^2,T)}}. \tag{12}$$

where $\Pi'(s_0,\ M^2,T) = d\Pi(M^2,s_0,T)/d(-1/M^2)$. In this context, M^2 represents the auxiliary Borel mass parameter and the parameter s_0 serves as the cut-off in the thermal medium. The definition of s_0 and gluon condensates as functions of temperature, along with all the details, can be found in Ref. [26]. Using the standard procedures, we determine the two main parameters of the TQSR theory as in Table I.

Table I. Borel mass parameter M^2 and continuum threshold s_0 for the $X(6900)$.

Parameters	
$\boldsymbol{M^2}$	$5.5\ \text{GeV}^2 \leq \text{M}^2 \leq 7\text{GeV}^2$
$\boldsymbol{s_0}$	$54\ \text{GeV}^2 \leq \text{s}_0 \leq 55\text{GeV}^2$

To obtain the vacuum values of the exotic state $X(6900)$, we use the below input data in Table II.

Table II. Input parameters used in numerical computations.

Input Parameters	Numeric Values
m_c	1.27 ± 0.02 GeV [30]
m_0^2	(0.8 ± 0.1) GeV^2 [31]
$\left\langle 0 \left\| \frac{\alpha_s G^2}{\pi} \right\| 0 \right\rangle$	(0.0202 ± 0.0011)GeV^4 [31]

We then calculate the temperature dependence of the mass and decay constant and present the related parameter graphs versus temperature in Figures 1 and 2, respectively.

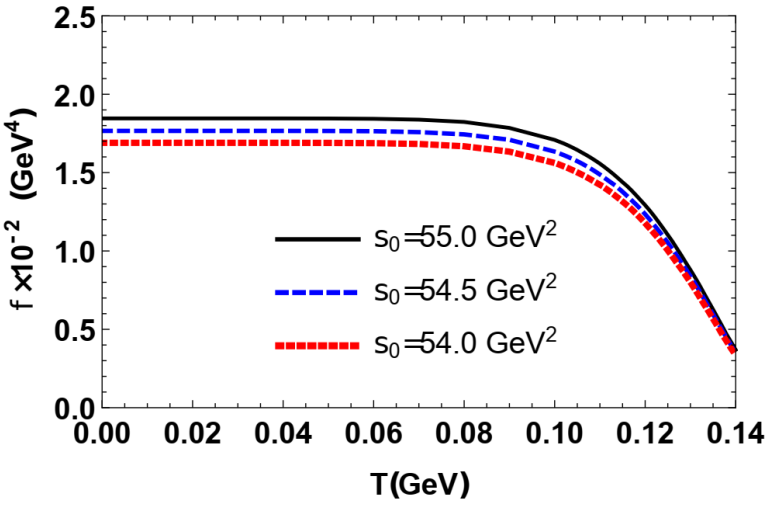


Figure 1. Variation of decay constant of $X(6900)$ in terms of temperature at the different values of continuum threshold s_0.

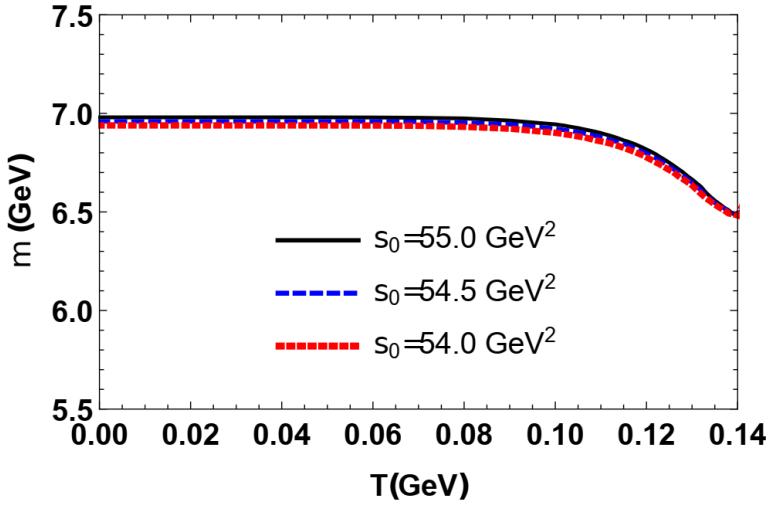


Figure 2. Change of mass of $X(6900)$ as a function of temperature at the different values of continuum threshold s_0.After numerical analyses, we get the below values for the considered resonance in Table III.

Table III. Mass and decay constant of $X(6900)$ in vacuum and at deconfinement threshold temperature.

Parameters	$T = 0$	$T = 0.14$ **(GeV)**
m(MeV)	(6957.85 ± 41.94)	(6490.46 ± 7.36)
f (GeV^4)	$(1.76 \pm 0.11) \times 10^{-2}$	$(0.35 \pm 0.02) \times 10^{-2}$

CLOSING REMARKS

The framework of TQSR provides insights into phase transitions, such as the transition from hadronic matter to QGP, and sheds light on the thermal properties of hadrons and their behavior at different temperatures. TQSR has applications in various areas of research, including the study of exotic hadrons, heavy-ion collisions, and the properties of strongly interacting matter, offering a powerful tool for advancing our understanding of the fundamental forces that govern the universe. In this manner, we calculate the mass and decay constant of the S-wave fully-heavy $X(6900)$ with $J^{PC} = 0^{++}$ tentatively, assuming it is a molecule via TQSR. Our investigation demonstrates that $X(6900)$ mass and decay constant values are decreased by approximately compared to their respective vacuum values of 93% and 20%, respectively. Also, our findings suggest that at $T = 0$, we obtain the vacuum mass and decay constant of the $X(6900)$ state aligned with existing data in the literature. We hope that this work holds promise for guiding near-future experiments.

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ANTHEMIS TINCTORIA L. (Asteraceae): GALLERIA MELLONELLA (L.) (Lepidoptera: Pyralidae)'ya KARŞI INSECTICIDAL ETKİSİ

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ÖZET
Lepidoptera ordosuna ait olan *Galleria mellonella* L., ekonomik yönden zararlı bir böcek türüdür. Büyük balmumu güvesi olarak bilinen bu türe ait larvalar, depo ürünlerine büyük zarar vermektedir. *G. mellonella*, hayat devrinin kısa olması ve yüksek verimliliğinin yanında çeşitli besinlerde iyi gelişebilmesinden dolayı biyolojik ve kimyasal mücadele çalışmaları için önemli bir böcek türü olarak kabul edilmektedir. Bu çalışmada, laboratuvar şartlarında yetiştirilen *G. mellonella*'nın larval evresinde uygulanan *Anthemis tinctoria* L. ekstraktının, böceğin katalaz, süperoksit dismutaz, glutatyon peroksidaz enzim aktivitesi ve MDA seviyesi üzerine etkileri araştırılmıştır. Çalışmada, özellikle antioksidan savunma mekanizmasında etkili olan enzim aktiviteleri ve lipit peroksidasyonunun son ürünü olan MDA ölçülmüştür. Sonuçlar incelendiğinde ekstraktın konsantrasyonundaki artışa bağlı olarak enzim aktiviteleri ve MDA seviyesinin arttığı tespit edilmiştir. Son yıllarda zararlı böceklerle mücadelede kullanılan pestisitlerin, böcek fizyolojisi ve biyokimyası üzerine etki mekanizmaları araştırılmaktadır. Bu çalışmada, Anthemis tinctoria'nın böcek metabolizmasına etkisinin incelenmesinde *G. mellonella* model bir canlı olarak kullanılmıştır.
Anahtar Kelimeler: Oksidatif Stres, Biyoinsektisit, Alternatif Kontrol Yöntemi

ANTHEMIS TINCTORIA L. (Asteraceae): INSECTICIDAL ACTIVITY AGAINST GALLERIA MELLONELLA (L.) (Lepidoptera:Pyralidae)

ABSTRACT
Galleria mellonella L., which belongs to the order Lepidoptera, is an economically harmful insect species. The larvae of this species, known as the greater wax moth, cause great damage to warehouse products. *G. mellonella* is considered an important insect species for biological and chemical control studies due to its short life cycle and high productivity, as well as its ability to grow well on various nutrients. In this study, the effects of *Anthemis tinctoria* L. extract applied to the larval stage of *G. mellonella* grown under laboratory conditions on the catalase, superoxide dismutase, glutathione peroxidase enzyme activity and MDA level of the insect were investigated. In recent years, the effect mechanisms of pesticides used to combat harmful insects on insect physiology and biochemistry have been investigated. In this study, *G. mellonella* was used as a model organism to examine the effect of *Anthemis tinctoria* on insect metabolism.
Keywords: Oxidative Stress, Bioinsecticide, Alternative Control Method

INTRODUCTION

The use of plants for many ailments is quite common in folk medicine. These plants have the potential to be a resource for the development of pharmacologically active natural products that can be used in the treatment of various diseases (Tetik et al. 2013). Today, 270 000 flowering or seed plant species are recorded in the world. It is stated that approximately 20,000 of these are suitable for medical purposes, around 4,000 herbal drugs are used extensively, and approximately 500 of them are traded for economic purposes (Baydar, 2005).Species belonging to the Anthemis genus are called "chamomile, German chamomile" in Anatolia and are traditional medicinal herbs used in the treatment of urinary inflammation, gastrointestinal disorders, high blood pressure, and wounds. *Anthemis tinctoria* is a plant belonging to the *Anthemis* genus of the Compositae (Asteraceae) family (Uysal, 1991). The main secondary metabolites of species belonging to this genus are sesquiterpene lactones and flavonoids. In addition, it has been observed that they contain comarins and simple phenolic compounds in their structures. Different *Anthemis* species are known to have cytotoxic, antimicrobial, anti-inflammatory and antioxidant effects.The number of species of the *Anthemis* genus is about 100 and 52 *Anthemis* species grow in our country. Depending on their flower status, these species are used in treatment or as dyestuffs (Davis, 1984; Baytop, 1999). With the rapidly increasing human population in the world, it is essential to maintain both the quality and efficiency of products in agricultural areas for the continuity of nutrition, which is among the most basic needs. For this reason, pesticides, also known as "agrochemicals", are widely used to protect various food, agricultural and forest products (Kalyabina et al., 2021). In many different parts of the world, various physical, chemical and biological methods are used extensively in the fight against harmful species in order to protect food resources, which are the most basic need for human beings (Eberle et al., 2022; Kusakari et al., 2023). In this way, the extent of damage from food resources to their consumption can be minimized. Insecticides are much more preferred than other methods in the fight against harmful insects in agricultural areas due to their ease of use and their ability to act in a very short time. However, some problems may arise as a result of their unconscious use during application methods, such as disruption of the natural balance, environmental pollution, negative effects on other non-target creatures, and harmful species developing resistance to these chemicals (Hafeez et al., 2022, Chen 2023). Insects may be exposed to some chemical (pesticides, insecticides, drugs, etc.), physical (temperature, radiation, etc.) and physiological factors that have different mechanisms of action throughout their lives. These factors, which are diverse and challenging, can cause oxidative stress in

insects. Oxidative stress is defined as tissue damage caused by excessive production of free radicals and the disruption of the balance between antioxidants, which have a neutralizing effect, in favor of oxidants. In some scientific studies conducted on insects, it has been found that reactive oxygen species (ROS), an oxygen-derived group of free radicals, are formed when they are exposed to various stress factors (Özbek et al. 2019, Wang et al. 2020, Hierlmeier et al. 2022). For this reason, it is an important criterion to investigate whether chemicals with various mechanisms of action have negative effects on insect parameters such as survival, development, egg production and hatching, and whether they can be used as an alternative active ingredient against the target pest (Çelik et al. 2019). For this purpose, many insect species are fed with artificial nutrients under laboratory conditions and produced various antiviral, antifungal, antiprotozoal, antibiotic and antimicrobial drugs, which may differ in their chemical structures and mechanisms of action.Studies have accelerated by adding anthelmintic substances to the artificial food of insects so that they can be used as new active ingredients alternative to the substances traditionally used today (Aslan et al. 2019, Üstündağ et al. 2020).*G. mellonella* is a known and important pest both in the world and in our country for the damage it causes to hive products that have high economic returns. It is an agricultural pest that causes significant economic losses. The life cycle of the insect consists of egg, larva (seven larval stages), pupa and adult (moth) individuals. After the adult females of the insect lay their eggs in clusters in the cracks and cracks in the beehives, the first stage larvae that hatch under suitable conditions are fed with some products in the beehives (waxes, honeycombs, honey and pollen residues) until they reach the last larval stage (7th stage). By feeding on them, they can show harmful effects by partially or completely reducing crop yield (Ellis et al. 2013, Kwadha et al. 2017). *G. mellonella* is preferred as a model organism in studies because the eggs it lays in clusters are highly productive and have a short life cycle, and it can be fed in cheap artificial food under laboratory conditions and produced in large quantities. In this study, the effects of Anthemis tinctoria L. extract applied to the larval stage of G. mellonella grown under laboratory conditions on the catalase, superoxide dismutase, glutathione peroxidase enzyme activity and MDA level of the insect were investigated.

MATERIAL AND METHOD

Chemicals, Plant Samples and Extraction

Plants were collected from Uşak province (Türkiye) in 2021 and all chemicals used were purchased from Sigma-Aldrich. The above ground parts of plant samples (flower and leaf) were cleaned and dried using the herbarium techniques of Davis (1972). For extraction, first:

4 g of dry sample was extracted with 40 ml of distilled water from 80 to 105 °C. And second: the remainder was extracted with 60 ml of distilled water from 100 to 130 °C. After cooling to 25°C, the two fractions were filtered and combined (Mai et al. 1990).

Insect Rearing, Extract Application and Tissue Collection

Different concentrations were applied to *G. mellonella* (30 mg/mL, 20 mg/mL, 15 mg/ mL, 10 mg/mL, 5 mg/mL, and 1 mg/mL). Larvae were sterilized and extract was injected into left last legs by microsyringe (Alvandial et al. 2016). After 24 hours, larvae were cooled and were cut into small pieces. After these pieces were placed in Eppendorf tubes, homogenization buffer at pH 7.4 was added to them (Büyükgüzel and Kalender, 2009). Samples were prepared with a homogenizer and centrifuged. After this step, the supernatants were taken and CAT, SOD, GPx activities and MDA levels investigated with a UV–VIS spectrophotometer.

Level of MDA was measured by Ohkawa et al.'s study [1979], activity of SOD was determined by the Marklund and Marklund's (1974) procedure, CAT activity was measured by Aebi's study [1984], GPx enzyme activitiy was specified by Paglia and Valentine's study (1987).

Data Analysis

In the experiments, ANOVA, Tukey and Probit analyzes were performed for the averages of treatments, differences between groups, and LC50 and LC99 values using the SPSS (SPSS statistical program, Ver.20.0, SPSS Inc., Chicago, IL, USA) computer program. Data are presented as mean ± standard deviation. $p<0.05$ was considered statistically significant (Apaydin et al. 2015; Abbott, 1925).

RESULTS

Insecticides, which are widely used all over the world and constitute an important group of pesticides, are known as insecticides. In addition to the current insecticides in use in the world market, the effects of active substances used in the search for new-generation chemicals on pests may vary depending on the type of pest and the types of active substances used (Şahin and Keçeci 2021; Tang et al., 2022; Alkan et al., 2023). In our study, we determined the mortalities and values of LC_{50} and LC_{99} (Table 1). As the applied doses increased, the effect against *Galleria mellonella* larvae also increased. This evaluation was associated with antioxidant enzyme activities (SOD, CAT, GPx, GST), and MDA level (Table 2). These results show that Anthemis tinctoria plant extract shows its effectiveness by creating oxidative stress at the applied dose. In insects, the preservation of the structural integrity of cells and tissues, the healthy survival of the organism and the continuity of

biological systems depend on maintaining the balance between oxidant and antioxidant systems. In some scientific studies conducted on insects, it has been found that reactive oxygen species (ROS), an oxygen-derived group of free radicals, are formed when they are exposed to various stress factors (Hauser and Koella 2020). In addition, it has been revealed that cells, tissues, systems or all functions of insects can be seriously impaired as a result of oxidative damage to proteins, lipids, nucleic acids and other biomolecules (Liu et al. 2020, Lazarević et al. 2020, Awad et al. 2022). ROS are atoms or molecules that have unshared electrons and are therefore highly reactive. Because of these properties, ROS damage cell membrane components. In the cell membrane, which is highly sensitive to ROS, lipid peroxidation begins with the removal of a hydrogen atom from the unsaturated fatty acid chain, and as a result of the reaction, toxic aldehydes such as malondialdehyde (MDA) are formed, which cause deterioration in the structural and physiological integrity of the cell (Devasagayam et al. 2003).

Table 1. LC_{50} and LC_{99} values of *Anthemis tinctoria* L. extract against *Galleria mellonella* larvae

Time (24 h)	**n**	**LC_{50}**	**LC_{99}**	**df [b]**	**sig**	**Chi-Square**
larvae	20	17,218	34,852	5	0,5119[a]	2,326

a: Since the significance level is greater than 0,150, no heterogeneity factor is used in the calculation of confidence limits; b: Statistics based on individual cases differ from statistics based on aggregated cases; n: number of the tested insects

Insects, like other organisms, have some defense systems to prevent, reduce or eliminate oxidative damage. They can be protected from the harmful and destructive effects of oxidative damage, depending on their detoxification capacity through their defense systems (Kodrík et al., 2015). Endogenous and exogenous ROS are eliminated by some antioxidant enzymes such as glutathione-S-transferase (GST), superoxide dismutase (SOD), glutathione peroxidase (GPx), catalase (CAT) and glutathione reductase (GR), which play a role in this defense system in insects. They can eliminate the oxidative stress situation created by (George and Gatehouse 2013, Karabulut and Gülay 2016b). The main cause of biological changes in insects is ROS produced by various chemicals. ROS, which can bypass the antioxidant defense system, can increase the level of oxidative stress by interacting with biomolecules, which are the basic components of the cell.

Table 2. Enzyme activities and MDA levels of *Galleria mellonella* larvae after exposure to *Anthemis tinctoria* extract for 24 h.

	control	**1 mg/ml**	**5 mg/ml**	**10 mg/ml**	**15 mg/ml**	**20 mg/ml**	**30 mg/ml**
SOD (U/mg prt)	0,062± 0,002[a]	0,059± 0,0032[a]	0,058± 0,0027[a]	0,045± 0,0016[b]	0,041± 0,0017[c]	0,035± 0,0012[d]	0,03± 0,002[e]
CAT (mmol /mgprt)	82,2± 4,02[a]	83,7± 6,18[a]	65,2± 4,25[b]	57,6± 5,57[c]	49,3± 4,61[d]	36,3± 6,11[e]	26,3± 5,72[f]
GPx (nmol/ mgprt)	0,55± 0,013[a]	0,56± 0,017[a]	0,53± 0,016[a]	0,45± 0,021[b]	0,37± 0,020[c]	0,30± 0,015[d]	0,22± 0,018[e]
MDA (nmol/ mgprt)	0,57± 0,015[a]	0,54± 0,017[a]	0,55± 0,014[a]	0,42± 0,018[b]	0,32± 0,017[c]	0,26± 0,013[d]	0,17± 0,021[e]

Values are mean ± standard deviation. Significance at $P < 0.05$. Within each row, means followed by the same letter are not significantly different.

In the study, enzyme activities, which are especially effective in the antioxidant defense mechanism, and MDA, the end product of lipid peroxidation, were measured. When the results were examined, it was determined that enzyme activities and MDA levels increased depending on the increase in the concentration of the extract.

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CENTAUREA DEPRESSA BIEB. (Asteraceae)'in LİPOKSİJENAZ, *α*-AMİLAZ, TİROZİNAZ ve KSANTİN OKSİDAZ İNHİBİTÖR AKTİVİTELERİ

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ÖZET
Bu çalışmada Türkiye'den toplanan *Centaurea depressa* su ekstraksiyonu işlemine tabi tutulmuştur. Ekstrakt, *α*-amilaz, tirozinaz, lipoksijenaz ve ksantin oksidaz enzimlerine karşı in vitro inhibitör aktiviteler açısından değerlendirilmiştir. Su ekstraktı, *α*-amilaz ve tirozinaz aktivitelerinde sırasıyla %33,92 ve %35,32 inhibisyona neden olmuştur. Ayrıca, ekstraktın lipoksijenaz ve ksantin oksidaz enzimleri üzerindeki inhibisyon oranları %42,73 ve %45,49'dir. Ksantin-ksantin oksidaz model sisteminde ekstre en yüksek inhibitör potansiyeli göstermiştir. Mevcut çalışma *Centaurea depressa* Bieb'in incelenen enzimler açısından biyolojik aktivitesi olarak yapılan ilk çalışmadır.
Anahtar Kelimeler: *Centaurea sp.,* Enzim İnhibitör Etkisi, Asteraceae

LIPOXYGENASE, *α*-AMYLASE, TYROSINASE and XANTHINE OXIDASE INHIBITORY ACTIVITIES of Centaurea depressa Bıeb. (Asteraceae)

ABSTRACT
In the present work *Centaurea depressa* collected from Türkiye was subjected to water extraction process. The extract was evaluated for *in vitro* inhibitory activities against *α*-amylase, tyrosinase, lipoxygenase and xanthine oxidase enzymes. The water extract showed 33,92% and 35,32% inhibition of *α*-amylase and tyrosinase activities, respectively. And the extracts showed 42,73% and 45,49% inhibition of lipoxygenase and xanthine oxidase enzymes. In xanthine-xanthine oxidase model system, the extracts demonstrated the highest inhibitory potency. The present study is the first study conducted on the biological activity of *Centaurea depressa* Bieb in terms of the enzymes examined.
Keywords: *Centaurea sp*., Enzyme Inhibitory Effects, Asteraceae

INTRODUCTION

Substances that prevent oxidations caused by free radicals and have the ability to capture and stabilize free radicals are called "antioxidants". Antioxidants: They are compounds that react with existing radicals and prevent them from turning into more harmful forms and the formation of new free radicals. Catalase (CAT), superoxide dismutase (SOD), and glutathione peroxidase (GSH-Px) are the primary enzymatic defense systems. Secondary antioxidants are compounds such as ascorbic acid, alphatocopherol, uric acid, bilirubin, glutathione, ubiquinone, cysteine and polyphenols that capture oxygen radicals and break radical chain reactions (Hammacıoğlu, 2017).The Asteraceae family, represented by approximately 1100 genera and 25000 species worldwide, is one of the largest families that includes many plants of high economic value. The genus *Centaurea*, represented by approximately 500 species worldwide, is the genus with the most species in the Asteraceae family (Bona, 2015). The genus *Centaurea*, which is distributed especially in Western, Southwestern and Central Anatolia in Türkiye, is represented by 200 taxa, 110 of which are endemic. The large number of species and the high rate of endemism suggest that Anatolia may be a gene center for *Centaurea* (Wagenitz, 1975; Uysal, 2012). Many *Centaurea* species, which are known by names such as cornflower, gossamer thistle, and apricot thistle in our country, are generally used internally against inflammatory diseases such as abscesses, asthma, hemorrhoids, and gastroenteritis. It has also been determined that some species are crushed and used externally in the form of poultice against skin disorders (Baytop, 1999). Essential oils obtained from different parts of *Centaurea* taxa, total extracts or secondary metabolites isolated from these extracts have been the subject of various bioactivity studies. Many studies have determined that *Centaurea* species have anti-inflammatory, antimalarial, antiprotozoal, antimicrobial, antiulcerogenic, antioxidant and cytotoxic activities (Arif et al., 2004). The main component groups obtained as a result of phytochemical studies carried out with *Centaurea* taxa, which are rich in bioactive secondary metabolites, are generally different types of sesquiterpenes, flavonoids, lignans and phenolic compounds (Karamenderes et al., 2007). Due to its large number of species, widespread use among the public and rich chemical content, the genus *Centaurea* has gained increasing importance and has been the subject of much research in terms of taxonomic, chemical and biological activity in recent years. This study was conducted to contribute to the determination of the importance of *Centaurea depressa* M. Bieb on enzyme inhibitor activities and to provide preliminary information about its usability in pharmacological fields.

MATERIAL AND METHOD

Chemicals and Plant Samples

Centaurea depressa samples were collected in Uşak province in Türkiye (2021). Collected samples were cleaned and dried according to herbarium techniques (Davis, 1972). All chemicals were obtained from Sigma–Aldrich.

Water Extraction

For water extraction first 4g dried samples were extracted for 20 min with 40 ml distilled water 40 ml at a temperature from 80 to 105 °C. Second step, the residues were extracted for 30 min with 60 ml distilled water 60 ml at a temperature from 100 to 130 ^{o}C. After cooling procedure, those fractions were filtered, then dried at 40 ^{o}C and weighed to detect the yield (Mai et al 1990).

2.3. Anti-amylase Activity

α-amylase inhibitor activity measurement was performed by iodine/potassium iodide method (Yang et al. 2012).

2.4. Anti-tyrosinase Activity

Tyrosinase inhibitory activity was determined via the procedure using L-DOPA as a substrate. Sample (25 µL), tyrosinase solution (40 µL) and of phosphate buffer at 6.8 pH (100 µL) were added. After this mixture was kept at 25 ºC for 15 minutes, 40 µL L-DOPA was added and read at 492 nm (Orhan et al., 2014).

2.5. Anti-Xanthine Oxidase Activity

Xanthine oxidase inhibitory activity was measured by Nessa's procudure [Nessa et al. 2010]. Concentrations of plant extract ranging from 0-10 mg were prepared. Xanthine oxidase enzyme (0.1 mL, 0.1 U/mL) was taken and mixed with phosphate buffer (1.9 mL, 0.1 M, pH 7.5). 1 mL of plant extract at different concentrations (0-10 mg/mL) was added to this mixture and incubated at room temperature for 5 mins. Then, xanthine (1 mL, 1.52 mg/mL) was added and incubated at 25°C for 10 mins. The reaction was terminated with 1 mL of 1 M HCl and uric acid formation was read at 295 nm.

2.6. Anti-Lipoxygenase Activity

Lipoxygenase inhibition activity of the extract was determined by Alaba et al. [2014]. Lipoxygenase enzyme was prepared to have an activity of 8460 U/mL in phosphate buffer (0.1 M pH 8.0), and linoleic acid was prepared at a concentration of 1980 µmol/L. The mixture prepared by taking lipoxygenase enzyme (50 µL), phosphate buffer (2740 µL, 0.1 M, pH 8.0) and plant extract (10 µL) varying between 0-8 mg/mL was incubated at 25°C for 5 mins, then linoleic acid (200 µL) was added and read at 234 nm.

2.7. Statistics

All analysis were carried out in triplicates. The results were expressed as mean ± SD and analyzed by 26.0 version of SPSS program by using ANOVA and Tukey tests.

RESULTS AND DISCUSSION

According to our study results, water extract of *Centaurea depressa* caused 33.92% and 35.32% inhibition in α-amylase and tyrosinase activities, respectively. Additionally, the inhibition rates of the extract on lipoxygenase and xanthine oxidase enzymes are 42.73% and 45.49%. The most inhibitory effect was seen against xanthine oxidase (Table 1).

Table 1. The biological activity of *Centaurea depressa* water extract

	Centaurea depressa	standard
Lipoxygenase, %Inh	42,73	Nodihydroguaiaretic acid, 87
α-Amylase, %Inh	33,92	Acarbose, 99
Tyrosinase, %Inh	35,32	kojic acid, 85
Xanthine Oxidase, %Inh	45,49	allopurinol, 80

Anti-inflammatory effect measurement was based on investigation of the inhibitory activity against 5-lipoxygenase enzyme (5-LOX). It is the main enzyme in arachidonic acid metabolism. The arachidonic acid is a responsible component for leukotriene formation which play a key role in inflammatory and allergic diseases pathogenesis (Mogana et al. 2013). In the present study, the inhibition potantial of water extract of Centaurea depressa was %33,92. Diabetes is an important metabolic disease. The most common symptoms of diabetes develop due to hyperglycemia. Osmotic diuresis due to glycosuria leads to polyuria and polydipsia, which can lead to orthostatic hypotension and dehydration. In addition, lipoprotein abnormalities and increased production of reactive oxygen species occur in hyperglycemia; Increased reactive oxygen species levels can cause oxidative damage to cell membranes. In diabetics, oxidative stress plays an important role in the pathogenesis of diabetes and its subsequent complications. Increased DNA, protein and lipid peroxidation products are indicative of high oxidative stress in diabetics. Therefore, decreasing high blood sugar levels is an important factor in the development of diabetes. *α*-amylase and *α*-glucosidase enzymes are involved in the hydrolysis of oligosaccharides and starch and significantly increase blood sugar levels (Exteberria et al., 2012). In our study, *Centaurea depressa* extract was evaluated for hypoglycemic activity through inhibition of α-amylase. According to Table 1, the inhibition of enzyme activity was determined as 33.92%. Skin disorders such as scarring, freckles, and facial pigmentation are associated with excessive

melanin biosynthesis. Tyrosinase is an enzyme responsible for the conversion of L-tyrosine into L-dopaquinone and Ldopachrome, especially in the first step of melanin biosynthesis. Kojic acid is the most studied inhibitor of tyrosinase and is also used as a skin whitener in the cosmetics field and as an enzymatic anti-darkening food additive in the food industry. Therefore, in recent years, natural plant extracts for cosmetic purposes have been used as a safe and alternative source of tyrosinase inhibitors (Kim and Uyama, 2005; Loizzo et al., 2012; Zengin et al., 2016). *Centaurea* extracts showed low tyrosinase (35.32%) inhibitory activity as seen in the Table 1. Xanthine oxidase has a role in reactive oxygen species formation in viral infection, inflammation, ischemia/reperfusion and cancer pathologies. Thus, Xanthine oxidase inhibitors are expected to be therapeutically useful for the treatment of these diseases. The extract demonstrated the highest inhibitory activity (%45.59).

Herbal medicines can be a solution to the negative effects generally observed in synthetic drugs used for many diseases. This study is the first report on the in vitro tyrosinase, α-amylase lipoxygenase and xanthine oxidase inhibitory effects of *Centaurea depressa*. However, further studies are needed to elucidate the mechanisms of in vivo pharmacological activities, bioavailability, and related metabolic pathways.

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BIBLIOMETRIC ANALYSIS OF STUDIES ON BRACHYTHERAPY NURSING

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Abstract
Brachytherapy is a commonly used radiotherapy method in cancer treatment. In this method, radiation sources are directly placed inside or very close to the patient's body, delivering targeted treatment by reaching cancer cells directly with radiation. The fundamental principle of brachytherapy is to provide effective treatment by bringing radiation sources as close as possible to the target. Objective: The aim of this study is to provide a comprehensive review of studies related to brachytherapy nursing conducted between 2010 and 2024. Method: A systematic literature search was conducted using specific keywords such as Gynecological/Prostate/Skin/Breast cancer brachytherapy, brachytherapy nursing, pain, anxiety in major databases including Google Scholar, PubMed, Science Direct, and Web of Science. Bibliometric analysis examined the distribution of publications by year, publication types, most cited journals, keywords, and most cited studies. Results: Among the noteworthy findings of the study, it was reported that nursing studies on gynecological cancer brachytherapy are prominent, with pain and anxiety as the most evaluated side effects. It was also observed that there has been an increase in studies on the subject in recent years. The majority of studies reported limitations due to small sample sizes and limited guidance. Discussion and Conclusion: This study serves as an important resource for understanding trends and research topics in the field by providing a bibliometric evaluation of academic research conducted in brachytherapy nursing. It can guide future studies by providing insights into the trends and priorities of research in brachytherapy nursing.
Keywords: Brachytherapy Nursing, Gynecological Cancer Brachytherapy, Prostate Cancer Brachytherapy, Pain, Anxiety

INTRODUCTION

Brachytherapy (BRT) is used as a medical treatment method and is especially common in cancer treatment. It is a type of radiotherapy used as Brachytherapy is also called "short-distance radiotherapy". This In this method, radiation sources are placed directly within or very close to the patient's body. The basic principle of brachytherapy is to place radiation sources as close to the cancer cells as possible position and provide targeted treatment. This means that healthy tissues are exposed to less radiation. remaining and applying higher doses of radiation to cancer cells in the treated area provides. The difference between BRT and external radiotherapy (RT) is that irradiation involves radioactive radiation placed inside the organ is realized through resources. In BRT, the dose increases as one moves away from radioactive sources decreases, so that when high doses are delivered to the tumor site in which the source is placed or near It is possible to protect surrounding normal tissues. BRT, resource placement in target volüme techniques (interstitial, intracavitary, intravascular, transluminal or mold), implant types (permanent or temporary), resource loading technologies (pre-loading, manual post-loading, or remote controlled-reloaded) or according to dose rates (low, medium and high dose rate) are classified (1-4).Brachytherapy treatment is applied in addition to surgery and radiotherapy in early and locally advanced stage diseases with a high probability of recurrence. Studies have shown that the incidence of vaginal cuff recurrences is higher when external radiotherapy and/or brachytherapy treatment is not administered postoperatively. Organs at risk during radiotherapy treatment include the bladder, rectum, intestines, and femoral heads. Brachytherapy is an option for patients who are not candidates for surgery. In the treatment of gynecological tumors, BRT is an indispensable treatment modality. Brachytherapy applications have been demonstrated in certain cancer types. Pain can occur during BRT application for various reasons. Applicators placed in the cervical canal and vaginal fornices are the most significant cause of pain. The degree of cervical canal dilation is directly associated with the level of pain. Pain can be prominent in patients where cervical dilation is not achieved adequately or in patients with residual disease after external radiotherapy, especially during the interstitial brachytherapy application, which is an interventional procedure (5-9).

The aim of this study is to provide a comprehensive review of studies on brachytherapy nursing between 2010 and 2024.

METHODS

A thorough search of the literature was done in several important databases, including Google Scholar, PubMed, Science Direct, and Web of Science using a set of specific

keywords such as "Gynecological/Prostate/Skin/Breast cancer brachytherapy, brachytherapy nursing, pain, anxiety". A total of English and Turkish articles published between 2010 and 2024 with full-text accessibility were analysed.

RESULTS

Randomized controlled studies on brachytherapy nursing aim to evaluate the effectiveness and patient outcomes of this special treatment method. Many of these studies emphasize that the role of nurses in the brachytherapy process is of critical importance in patient care.There have been four randomized controlled trials conducted on gynecological cancer brachytherapy, with one published in 2018, two in 2021, and one in 2024. Additionally, there are four systematic reviews and one descriptive study related to prostate cancer brachytherapy. These studies provide valuable insights into the effectiveness and safety of brachytherapy in prostate cancer treatment. Regarding bladder cancer brachytherapy, there is one systematic review available. This review systematically synthesizes research conducted in a specific area, thoroughly examining the existing evidence on this treatment method and identifying gaps in the literature. These comprehensive reviews establish a solid foundation regarding the efficacy and side effects of brachytherapy in various cancer types, serving as essential guidance for future research endeavors.The duties and responsibilities of brachytherapy nurses encompass several key areas. Firstly, patient education stands as a priority. This involves educating patients on the brachytherapy process, potential side effects, and personal care techniques. Additionally, symptom management plays a crucial role. Nurses alleviate and manage treatment-related side effects, such as pain, fatigue, nausea, and vomiting, enhancing patient comfort. During brachytherapy procedures, nurses provide procedural support. This includes procuring necessary equipment, tracking materials before and after procedures, and assisting physicians during the process. Moreover, they play a significant role in radiation safety. Nurses implement radiation safety protocols to protect both patients and healthcare personnel, ensuring radiation is controlled and managed effectively. Thus, brachytherapy nurses contribute to ensuring patient safety and comfort while facilitating the effective execution of treatment procedures.

In a study determining whether the addition of aromatherapy and foot reflexology reduces pain and anxiety in patients undergoing brachytherapy for cervical cancer, 41 women with locally advanced cervical cancer participated. Participants were randomized to either a control group receiving standard care or an intervention group receiving aromatherapy and foot reflexology. Pain and anxiety levels were measured at various time points. The results indicated that all mean pain and anxiety scores in the intervention group were equal to or

lower than those in the control group. In the intervention group, anxiety levels significantly decreased, particularly after reflexology. These findings suggest that nurses and healthcare providers could receive training in practices such as reflexology to reduce patients' pain and anxiety, ultimately enhancing overall quality of life (5).

In a study conducted to increase compliance with vaginal dilator use aimed at preventing vaginal stenosis following vaginal brachytherapy, commonly used in the treatment of endometrial cancer, 42 women with endometrial cancer ranging from stage I to IIIc after surgery were included. Despite a high level of participation, the study found low compliance with dilator use and no significant differences between groups. Therefore, new interventions need to be tested to increase compliance with dilator use. In nursing education, it is emphasized that compliance can be improved by highlighting how dilators can preserve vaginal health (6).In a study examined the effects of music on anxiety, pain, and physiological parameters in women undergoing brachytherapy. The study was conducted with a randomized controlled design, with music intervention applied to the experimental group (n=30) and no intervention given to the control group (n=25). Data were collected and analyzed using various scales and vital signs. The results indicate that music is effective in reducing pain and managing depressive symptoms, but it does not affect anxiety and physiological parameters. Therefore, the effects of music therapy may vary individually, and nurses may need to implement different strategies for different patient groups (7).In this RCT, the effectiveness of the intervention named SPARC (Sexual Rehabilitation Program After Radiotherapy for Gynecological Cancer) compared to standard care has been investigated. The results of this study may provide important evidence about the effectiveness of nurse-led sexual rehabilitation intervention in improving the sexual functions of women undergoing gynecological cancer treatment (8).In another study designed to address the deficiencies in the care of cancer patients undergoing brachytherapy in the head and neck region, it was emphasized that resources in the field are insufficient. Patients receiving brachytherapy in the head and neck region may encounter physical, nutritional, and pain management issues. Nurses need to have a deep understanding of the principles of treatment, technology, practitioner management, and acute-chronic side effects. Given that the head and neck region contains many vital organs with important anatomical functions such as breathing, eating, drinking, and speaking, it is important to disseminate expertise in nursing management during ISBT (Interstitial Brachytherapy) where applicators are in place within our community. Providing information on nursing care covering pre-treatment, brachytherapy sessions, immediately post-implantation, and long-term care after

implantation, including nutrition, airway or tracheostomy care, oral hygiene, respiratory care, and post-implantation long-term care, for patients undergoing head and neck brachytherapy is essential. This includes pain management during applicator placement and brachytherapy sessions, applicator management, and management of adverse events post-treatment. Areas presumed to be treated include the oral cavity (tongue, lips, cheeks, floor of the mouth, etc.), oropharynx (soft palate, base of the tongue, tonsils, etc.), nasopharynx, nose and paranasal sinuses, and neck lymph nodes (9).

CONCLUSION

The results of studies on brachytherapy nursing indicate the significance of nursing activities in the efficacy and patient outcomes of this particular radiotherapy method. Furthermore, research on brachytherapy nursing emphasizes the importance of patient education and support services, demonstrating their potential to positively impact health outcomes. Assessing and addressing patients' physical and emotional needs can enhance treatment effectiveness and patient satisfaction. Additionally, there is a need for numerous studies with larger samples to be conducted on this topic to provide further insights.

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KADIN GİRİŞİMCİLERİN PAZARLAMA FAALİYETLERİNDE KARŞILAŞTIKLARI SORUNLARIN BELİRLENMESİNE YÖNELİK NİTEL BİR ÇALIŞMA

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ÖZET
Girişimciler, risk alabilen, yenilikçi, etkin kaynak kullanma yeteneğine sahip, tehditleri fırsatlara çevirebilen, sabırlı, kolayca vazgeçmeyen, yetenekli gibi birçok özelikleri barındırdığı gibi aynı zamanda bulundukları yerin ekonomik, sosyal, kültürel açıdan gelişmesine de katkı sağlamaktadır. İş hayatının küreselleşmesi, sosyalleşmenin artması, endüstrileşmenin gelişmesi ile birlikte kadın girişimlerin sayısında da büyük oranda artış yaşanmıştır. Kadınların iş hayatında aktif bir şekilde bulunması kadın girişimci kavramının oluşmasını da sağlamıştır. Kadın girişimcileri hemen hemen her sektörde görmek mümkündür. Kadın girişimciler, tüm sektörlerde faaliyet gösterse de birçok zorluk ve sıkıntılar ile karşı karşıya kalmaktadır. Özellikle cinsiyet ve fırsat eşitsizliği, kültürel baskılar, tanınma eksikliği, risk alamama, finansal sıkıntılar gibi etkenler çoğu kadın girişimcilerin karşılaştıkları ortak sorunlar arasında yer almaktadır. Yapılan literatür incelemesinde kadın girişimciler ile ilgili birçok çalışmaya rastlanmıştır. Ancak kadın girişimcilerin sürdürülebilir rekabet etmede son derece önemli olan pazarlama faaliyetlerinde karşılaştıkları sorunların tespit edilmesi ve incelenmesine yönelik çok kısıtlı çalışma bulunmaktadır. Bu kapsamda çalışmanın amacını kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların belirlenmesi oluşturmaktadır. Bu amaç ile hazırlanan çalışmada ayrıca Sivas' da faaliyet gösteren kadın girişimcilerin geleneksel, yenilikçi, evcimen ve köktenci kadın girişimci türlerinden hangi sınıfa girdiği de tespit edilmeye çalışılmıştır. Sivas' da faaliyet gösteren çeşitli sektörlerdeki kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların belirlenmesi, incelenmesi ve hangi kadın girişimci türünde yer aldığının belirlenmesi için nitel araştırma yöntemi uygulanmıştır. Görüşme yöntemi ile elde edilen veriler içerik analizine tabi tutularak kategoriler şeklinde yorumlanmıştır. Görüşme yöntemi ile 17 kadın girişimciye ulaşılmıştır. Çalışma sonucunda katılımcıların faaliyet gösterdikleri işletmelerde çoğunlukta uzman bir pazarlama yöneticisinin bulunmadığı, ürün/ hizmet, fiyat, tutundurma konusunda sorun yaşadıkları bulgusu elde edilmiştir. Dağıtımda ise çoğunluğun bir sorun yaşamadığı ancak teslimatların gecikmesinden kaynaklı sıkıntılar bulunduğu bilgisi elde edilmiştir. Kadın girişimcilerin pazarlama faaliyetlerinde güvensizlik sorununu yaşadıkları anlaşılmıştır. Katılımcıların kadın girişimci olarak yorucu aile sorumlulukları hususunda sorun yaşadıkları bulgusu elde edilirken, çoğunlukla yenilikçi kadın girişimci tipi özelliği taşıdıkları tespit edilmiştir. Çalışma sonucunda kadın girişimcilere tespit edilen sorunlar ile ilgili çözüm önerileri sunulmaya çalışılmıştır. Çalışma sonucunun hem literatürdeki boşluğu doldurması hem de girişimde bulunan ve bulunmayı düşünen kadın girişimcilere katkı sağlayacağı düşünülmektedir.
Anahtar Kelimeler. Girişimci, Kadın Girişimci, Pazarlama Faaliyetleri.

A QUALITATIVE STUDY TO DETERMINE THE PROBLEMS ENCOUNTERED BY WOMAN ENTERPRISERS IN MARKETING ACTIVITIES

Abrasct
Entrepreneurs have many characteristics such as being able to take risks, being innovative, having the ability to use resources effectively, being able to turn threats into opportunities, being patient, not giving up easily and being talented, and they also contribute to the economic, social and cultural development of their place. With the globalization of business life, increased socialization and the development of industrialization, there has been a significant increase in the number of women's enterprises. The active presence of women in business life has also led to the formation of the concept of female entrepreneur. It is possible to see women entrepreneurs in almost every sector. Even though women entrepreneurs operate in all sectors, they face many difficulties and troubles. In particular, factors such as gender and opportunity inequality, cultural pressures, lack of recognition, inability to take risks and financial difficulties are among the common problems faced by most women entrepreneurs. In the literature review, many studies on women entrepreneurs were found. However there are very limited studies on identifying and examining the problems faced by women entrepreneurs in marketing activities, which are extremely important for sustainable competition. In this context, the aim of the study is to determine the problems faced by female entrepreneurs in their marketing activities. The class of female entrepreneurs working in Sivas traditional, inventive, domestic and fundamentalist was also attempted to be ascertained in the study created for this aim. The issues that female entrepreneurs in Sivas many industries confront in their marketing endeavors were identified, examined and the type of female entrepreneur that each of them belongs to was ascertained through the use of the qualitative research method. After undergoing content analysis, the interview derived data was classified into groups. The interview method reached 17 female entrepreneurs.The survey revealed that most of the participants had issues with product/service, price and promotion and that the majority of them did not have a skilled marketing manager in the companies they worked for. It was discovered that while most people had no issues with distribution, there were issues as a result of delivery delays. It is well known that insecurity issues affect female entrepreneurs when they market their products. Even while it was discovered that the participants struggled with their demanding family obligations as female business owners, it was also observed that the majority of them possessed the traits of an inventive female entrepreneur. As a result of the study, efforts were made to provide female entrepreneurs with solutions for the issues that were found. The study's findings are anticipated to close a gap in the literature and benefit female entrepreneurs who have launched or are thinking about launching a business.
Keywords. Entrepreneur, Female Entrepreneur, Marketing Activities.

GİRİŞ

Girişimcilik, toplumun ekonomik, sosyal ve kültürel refahın gelişmesinde, istihdamın artırılmasında, yeni ürün ve hizmetlerin üretilmesinde, fırsatların oluşturulmasında son derece etkili bir kavramdır. Girişimcilik faaliyetleri sayesinde toplumların birçok alanda gelişmesi ve tüketicilerin ihtiyaçlarının karşılanması sağlanmaktadır. Bilgi teknolojilerinin kullanılması, iş hayatının küreselleşmesi, eğitim düzeylerinin artması kadın girişimcilerin artmasında rol oynamaktadır. Kadın girişimcilerin iş hayatında olması özellikle cinsiyet rolleri farklılığından zorlaştırılsa da fırsatları değerlendirebilen, risk alan, lider vasfının ön plana çıkaran kadınlar sayesinde kadın girişimciliği kavramının oluşmasını sağlamıştır. Girişimciliğin başarılı olmasında pazarlama faaliyetleri kilit öneme sahiptir. Pazarlama bir ürün ya da hizmetin oluşturulması, fiyatlandırılması, dağıtımın yapılması ve tutundurma unsurlarının uygulanması olarak bilinmektedir. Tüm bu süreçlerin başarılı bir şekilde organize edilmesi ise pazarlama yöneticilerin ve girişimcilerin sorumluluğundadır. Girişimcilerin, faaliyetlerini yürütürken başarı elde edebilmeleri için pazarlama faaliyetlerinde etkin olmaları gerekmektedir (Mucuk, 1999). Günümüz rekabet koşullarında kaynakların etkin ve verimli kullanılması pazar koşullarına hakim olmak, fırsatları yakalamak gibi birçok unsur etkin pazarlama faaliyetleri ile mümkündür (Eru, 2019:807).

Girişimcilik faaliyetleri içerisinde başarı elde etmenin yan sıra kadın olan girişimcilerin, cinsiyet rolleri, ev hayatındaki sorumlulukları, sosyal yaşamdaki varlıkları, kültürel baskılar, risk alamama, fırsat eşitsizliği gibi birçok etken karşısına çıkmaktadır. Bu unsurlar da pazarlama faaliyetlerinde kadın girişimcilerin başarılarına etki etmektedir. Yapılan literatür taramasında kadın girişimciler ile ilgili birçok çalışmaya rastlamak mümkündür. Bu çalışmalar; kadın girişimcilerin demografik özelliklerinin ortaya konulması, dijitalleşme ve kadın girişimcilerin durumlarının belirlenmesi, sosyal medya kullanımı ve kadın girişimciler, kadın girişimcileri yönelik verilen krediler, kadın girişimcilerin iş kurma nedenlerini belirlemeye, kadın girişimcilerin karşılaştıkları genel sorunların ortaya konulmasına yöneliktir (Bakay vd, 2019; Filizöz ve Yaraş, 2020; Öztürk, 2020;Yıldırım ve Yüksekbilgili, 2021; Turhan, 2023). Ancak kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların ortaya konulmasına yönelik çok kısıtlı çalışmaya rastlanmıştır. Araştırmaya en yakın çalışma ise kadın girişimcilerin pazar farkındalık düzeylerinin belirlenmesine yöneliktir (Eru, 2019). İlgili çalışmada Bolu' da faaliyet gösteren kadın girişimcilerin pazarlama konusunda kafa karışıklığı yaşadıkları ve farkındalık düzeylerinin yeterli olmadığı sonucuna ulaşılmıştır. Dolayısıyla yapılan literatür taramasında kadın girişimcilerin pazarlama faaliyetlerinde (ürün, fiyat, dağıtım ve tutundurma) karşılaştıkları

sorunların belirlenmesine yönelik bir çalışmaya rastlanmadığından literatürdeki bu boşluğun doldurulması amaçlanmaktadır.

KAVRAMSAL ÇERÇEVE

Kavramsal çerçevede girişimci, kadın girişimci ve pazarlama faaliyetleri konularına yer verilmiştir.

Girişimci

Literatürde ilk kez 1253 yılında kullanılan girişimci, işletmeci anlamında kullanılmıştır (Filion, 2008). 1980'lerden itibaren ekonomik, sosyal ve psikoloji araştırmalarının ilgi odağı haline gelen girişimcilik ise en basit tanımla yeni iş kurma olarak açıklanmaktadır (Chepurenko, 2015:45). Yeni iş kuran eylemini gerçekleştiren olarak tanımlanan girişimciyi günümüzde üretim faktörlerini bir araya getirerek risk üstlenen kişi olarak da ifade etmek mümkündür. Girişimci kavramının farklı özelliklerini ortaya çıkaran birçok tanım ile karşılamak mümkündür. Geçmişten günümüze bu farklı özellikler: yenilikçi (Schumpeter,1947; Drucker, 1985), risk alabilen (Cantillon, 1755; Rosenberg,1983), üretim ve yönetim kaynaklarını organize eden (Ely & Hess, 1983; Pearce, 1981; Casson, 1982), değer yaratan (Say, 1996; Fayolle, 2008), vizyoner düşenceye sahip (Fillion, 2004), fırsatları yakalayan (Smith, 1967; Dana, 1995; Timmons & Spinelli,2004), değişimci (Shapero,1975) olarak sıralamak mümkündür. Buradan hareketle en geniş anlamıyla girişimci, yenilikçi, risk alabilen, üretim ve yönetim kaynaklarını organize eden, değer yaratan, vizyoner düşenceye sahip, değişimci, kaynakları etkin ve verimli kullanan, yeni iş kuran kişi olarak tanımlanabilir. Bağlı olduğu sektöre, yapan kişiye, oluşturduğu potansiyel ve unsura göre, mülkiyet yapısına göre çok çeşit girişimcilik türleri bulunmaktadır. Bunlardan ilki genç girişimcilik kavramıdır. Genç girişimcilik, 35 yaş altında bulunan genelde yüksek eğitim sırasında yeni girişimlerde bulunan kişilerin oluşturduğu bir türdür. Genç girişimciler, özellikle üniversitelerde fikir yarışmalarına katılarak ya da firmaların açtığın gençlere yönelik yeni düşüncelerin fonlanmasına yönelik etkinlikler sonucunda faaliyetlerine başlamaktadır (Aracıoğlu vd. 2016). Bir diğer girişimcilik türü ise yeşil girişimciliktir. Yeşil girişimcilik, sürdürülebilir dünyaya katkı sağlayan, sosyal sorumluk içerisinde değer sunan, yeşil proje fikirleri ile oluşan yeni iş modeli olarak tanımlanmaktadır (Tekin, 2023:219). İşletmelerin sosyal sorumluluklarını yerine getirmek, daha yeşil bir toplum elde etmek ve çevreye zarar vermeyen faaliyetleri gerçekleştirme istemeleri sonucu yeşil girişimcilik yapılmaktadır. Kamu girişimciliği ise istihdamı artırmak, kamu hizmetleri yürütmek, kamu politikasını tamamlamak için kamunun kaynaklarını kullanarak devletin ya da devlet aracılığıyla tüzel kişilerin girişimi olarak tanımlamak mümkündür (Baklacıoğlu, 1976;

Choski, 1979). Bir diğer girişimcilik türü olan dijital girişimcilik ise elektronik ortamda fırsatların aranması olarak ifade edilmektedir (Davidson&Vaast, 2010). Günümüz teknoloji çağında bilgi teknolojilerinin kullanımın artması, internetin yaygınlaşması dijital girişimciliğin de gelişmesine katkı sağlamıştır. Ekonomik, sosyal ve kültürel açıdan toplumların gelişmesini sağlayan girişimcilik ile ilgi son dönemlerde teknoloji, sosyal sorumluluk, kadın girişimciliği unsurlarına daha çok dikkat çekilmektedir. Çalışmanın konusu olan kadın girişimciliği ise bir diğer girişimcilik türüdür. Kadın girişimciliği konusuna aşağıda detaylı olarak değinilecektir.

Kadın Girişimciliği

Kadın girişimciliği, bir iş yeri açılmasında sorumlulukları üstlenen, yenilikçi, risk üstlenen ve üretim faaliyetlerini bir araya getiren kadınların faaliyet göstermesi olarak tanımlamak mümkündür. Ayrıca pazar şartlarında tüm kaynakları etkin ve verimli bir şekilde yürüten kadınların faaliyet göstermesi olarak da tanımlanmaktadır (Yıldırım ve Çıkmaz, 2016:978). Kadın girişimcilerin sayısında artış söz konusu olsa da günümüzde halen özellikle erkek egemenliğinde olan, gelişmemiş ya da gelişmekte olan ülkelerde kadın girişimci sayısı azınlıktadır. Bu durumu kadınların daha az risk alması (Bedük vd. 2016:6), kadın girişimcilik faaliyetlerinin desteklenmemesi (Soysal, 2010:77), cinsiyet rolleri ile kadınların evlerindeki daha fazla sorumlulukları ve iş hayatındaki farklılıklardan (Filizöz & Yaraş,2020:181) ve sektörel sınırlamaların varlığından (Turhan, 2023:977) kaynaklandığı ifade edilmektedir. Bu durumun yanı sıra özellikle gelişmiş ülkelerde ve eğitim düzeyi yüksek olan ülkelerde her geçen gün kadın girişimci sayısı artmaktadır.Kadın girişimciliğin farklı türleri olmasına karşın birçok çalışmada sıklıkla belirtilen tipler ise geleneksel, yenilikçi, evcimen ve girişimci (köktenci) kadındır (Goffe & Scase, 1985). Bunlardan geleneksel kadın girişimci, cinsiyet rollerinin farkında olan ve üstlenen, girişimcilik ideallerinin yerine getirmeye çalışan ancak erkeklerin astı olmayı da kabul eden türdür. Yenilikçi kadın girişimciliği ise geleneksel kadın girişimciliğin tam aksi olan cinsiyet rolünden ziyade işini daha ön plana çıkaran girişimciliktir. Bu kadın girişimcilerin, işletmelerinin büyümelerini, yenilik yapmayı amaçlamaktadır. Evcimen kadın girişimciliği de yapmış olduğu işi yan bir iş olarak değerlendiren ve cinsiyet rolünün ve evdeki sorumluluklarının her şeyin üzerinde tutun girişimcilik türüdür. Son olarak girişimci kadın ise kadınların daha ön planda olması gerekliliğine inanan ailedeki sorumluluklarını işten daha ön planda tutmayan girişimciliktir. Bu girişimcilik tipi köktenci girişimci olarak da ifade edilmektedir (Soysal, 2010:92). Yapılan araştırmalarda kadın girişimcilerin daha çok kadın cinsiyeti rollerine uygun eğitim, sağlık, danışmanlık gibi hizmet sektöründe

girişimcilik yaptıkları anlaşılmaktadır (Delmar, 2003; Soysal, 2010). Ayrıca daha az sermaye gereksinimi ve daha kolay girişim yapabilme olanağı sunan hazır giyim, temizlik ve sigortacılık işlerinde de kadın girişimcilerin faaliyet gösterdikleri bilinmektedir (Çelik & Özdevecioğlu, 2001; Nayır, 2008).Kadın girişimciliğine iten nedenlere bakıldığında ise ülkelerde görünen ekonomik sorunlar, bağımsızlık isteği (Çakıcı, 2003; Soysal, 2010), aile ve iş hayatında bir denge kurma arzusu, kendi işinin patronu olma isteği (Hisrich & Brush, 1986; Hatten, 1997; Yetim, 2008), kadın girişimciliğini özendiren ve kolaylaştıran hükümet politikaları ve ev ekonomisine katkı sunma (Tan, 2006) isteği olarak açıklanmaktadır.

Pazarlama Faaliyetleri

Sürdürülebilir rekabet etme, kâr maksimizasyonu, pazar payına sahip olma gibi birçok avantajı elde etmek isteyen girişimciler için pazarlama faaliyetleri hayati önem taşımaktadır. Bir ürünün, malın ya da hizmetin oluşturulması, fiyatlandırılması, tutundurma unsurlarından en uygun olanına karar verilmesi ve dağıtım kanallarının oluşturulması faaliyetleri pazarlama olarak bilinmektedir. Girişimciler bir iş fikrinin hayata geçirilmesinde ve sürdürülmesinde pazarlama faaliyetlerinde ne kadar başarılı olurlarsa o ölçüde piyasada kalabilmektedir. Aynı zamanda girişimcilerin üretim kaynaklarını bir araya getirerek ve fırsatları değerlendirerek oluşturdukları yeni ürün ya da hizmetler ile üretim artışı sağlamakta (TÜSİAD, 2002), bu ürünler ile tüketici ihtiyaçlarını karşılayarak milli gelirin de artışına neden olmaktadır (Yeniçeri & İnce, 2005). Pazarlama faaliyetleri içerisinde yer alan ürün, fiyat, dağıtım ve tutundurma pazarlama karması olarak bilinmektedir. Ayrıca hizmet sektörü söz konusu olduğunda ise bu dört pazarlama karması elemanlarına insan, süreç ve fiziksel kanıt da eklenmektedir. Pazarlama karması unsurlarından ürün, hedef pazara uygun malın hazırlanması ile ilgili kavramdır. İşletmenin hedef pazarlara sürmeyi düşündüğü ürün seçimi, üretimi, ürün dizisindeki bazı kalemlerin çıkarılması ya da eklenmesi, markalama, gibi ürün ya da hizmetler ile ilgili her türlü süreç ile ilgilidir (Tek, 1997:67). Fiyat ise işletmelerin pazarlama stratejilerinde en önemli etkenlerden olan, kontrol edilebilen bir pazarlama karması unsurudur (Cebeci, 2012:5). İşletmelerin belirleyeceği fiyat pazarlama karmasının diğer unsurları olan ürün, dağıtım ve tutundurma ile ilgili olduğundan pazarlama karışımını tamamlayacak çekici yönü olan bir etkendir. Bir diğer pazarlama karması unsuru olan dağıtım ise üretim ile tüketim arasındaki gerçekleşen ürünlerin tüketicilere ulaştırılması ile ilgilidir (Mucuk, 2010). Girişimcilerin müşterilerin memnuniyetini kazanmada ve başarı elde etmede karar verdikleri dağıtım kanalı hayati öneme sahiptir. Dağıtım kanalları iki sınıfta incelenmektedir. Bunlar dolaylı ve doğrudan dağıtım kanalları olarak bilinmektedir. Tüketici ile doğrudan ilişki kurmak isteyen, tüm

pazarlama faaliyetlerini kendi kontrol etmek isteyen, aracı ile çalışmanın zor olacağını düşünen ve pazarlama karmasını hızlı bir şekilde organize etmek isteyen işletmeler doğrudan dağıtım kanallarını tercih etmektedir. Dağıtım kanalı sistemi kurma gücünde olmayan, alanında uzman tecrübeli dağıtım firmaları ile çalışmak isteyen ve tasarruf etmek isteyen işletmeler ise dolaylı dağıtım kanalı sistemini kullanmaktadır. Son pazarlama karması unsuru ise tutundurmadır. Tutundurma işletme ya da ürün/hizmet hakkında tüketiciyi bilgilendirme, haber verme, ikna etme çabaları olarak tanımlanabilir. Tutundurma hem mevcut müşterileri hem de potansiyel müşterileri etkilemeyi amaçlamaktadır (Cebeci, 2012:12). Hizmet pazarlaması, pazarlandığında fayda ve tatmin sağlayan, maddi olmayan unsurları içeren faaliyetlerin gerçekleştirilmesi olarak tanımlanmaktadır (Akdoğan, 1983:125). Hizmet pazarlamasının özellikleri ise hizmetlerin maddi olmayan unsurları içermesi, üretim kaynağından ayrı olmayışı, heterojen olması ve dayanıksız oluşlarıdır. Hizmet pazarlaması karması unsurlarından insan ise katılımcılar olarak da bilinmektedir. Hizmet pazarlamasında insan unsurundan kasıt, müşteriler ve çalışanları da kapsayan hizmette rol oynayan herkestir (Çıtak, 2014:24). Hizmet pazarlamasında hem hizmeti veren hem de hizmeti alanların tatmin olması önemlidir. Hizmeti sunanlar için tatmin ve memnun olan bir çalışan hem daha iyi bir hizmet sağlayacak hem de iş yerinde daha uzun süre kalabilecektir. Müşteriler açısından da iyi hizmet alan bir kişi ilgili işletmeyi tercih edecektir (Schlesinger ve Heskett, 1991: 71-81). Bir diğer hizmet pazarlaması karması unsuru ise süreçtir. Hizmetin ulaşmasını sağlayan faaliyetler, prosedürler, mekanizmalar süreci oluşturan unsurlardır (Çıtak, 2014:25). Hizmet pazarlamasında yer alan fiziksel kanıtlar ise ortam koşulları ilişkileri, düzen, fonksiyonel olma durumları, işaretler, semboller ve maddelerden oluşmaktadır (Üner, 1994).

Literatür Taraması

Konuyla ilgili olarak ilk önce kadın girişimciler üzerine yapılan çalışmalar incelenmiştir. Literatür incelemesi Google scholar da yerli ve yabancı yazındaki çalışmaları kapsamaktadır. Kadın girişimciliği üzerine yapılan ilk çalışma Eleanor Schwartz tarafından 1976 yılında yapılmıştır. Kadın girişimciliği ile ilgili çalışmaları kadın ve erkek girişimciler arasındaki farklılıkların ortaya konulduğu, kadın girişimcilerin karşılaştıkları sorunların belirlenmesine yönelik yapılan ve tanımlayıcı / betimleyici bilgilerin yer verildiği çalışmalar olarak sınıflandırma yapmak mümkündür. Bu sınıflandırmalardan kadın-erkek girişimciler arasındaki farklılıkların tespiti için yapılan çalışmalarda kadın girişimcilerin erkek girişimcilere benzemesi gerekliliği sonucunun verildiği (Birley, 1989), kadınların işlerinin toplum, aile ve kişisel ilişkilerin işbirliği içerisinde yapılması gerekliliğinden (Brush, 1992),

cinsiyet odaklı çalışmaların daha fazla yapılmasının gerekliliğinden (Mirchandani, 1999), kadın girişimcilerin erkek girişimcilerden daha fazla olmasının ekonomik ve toplum açısından daha iyi olacağı görüşlerinin (Gundry, 2002) açıklandığı tespit edilmiştir. Kadın girişimcilerin karşılaştığı sorunların belirlenmesine yönelik çalışmalarda ise kadın girişimcilerin işletme kurmada sermaye sorunu ile karşı karşıya kaldıklarına (Yetim, 2002; Aşkın & Barış, 2012; Turan & Hepkul, 2016; Akyol, 2017; Çelik, 2018; Gül & Gül, 2018; Demir & Sezgin, 2020;Uzun & Çakmak, 2020; Morkoç vd., 2021) yönelik çalışmalara rastlanmıştır. Yine aynı sınıflandırmada, kadın girişimcilerin sorunlarının kavramsal ve teorik incelendiği (Soysal, 2010), kadın girişimcilerin profillerinin belirlenmesi ve en çok borç ödeme (Güleç, 2011; Tahtalı, 2018; Filizöz & Yaraş, 2020), cinsiyet eşitsizliği (Sullivan &Meek, 2012;Henry vd., 2015; Filizöz & Yaraş, 2020) finansal sorunlar ile karşı karşıya kaldıkları ifade edilmiştir. Bir diğer sınıflandırmada ise kadın girişimciliği ile ilgili betimsel/teorik bilgilerin verildiği çalışmalar bulunmaktadır. Bu çalışmalarda kadın girişimciliği kavramı, türleri ve kadın girişimcilerin karşılaştıkları sorunlar ikincil verilerden faydalanarak hazırlanmıştır (Bowen & Hisrich, 1986; De Bruin vd., 2007;Goyal & Yadav, 2014;Henry vd., 2015; Aksay, 2019; Şenel & Sevim, 2022). Yapılan literatür taramasında kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların ürün, fiyat, tutundurma ve dağıtım unsurları üzerinden inceleyen bir çalışmaya rastlanmamıştır. Yine de kırsal alanda kadın girişimciliği üzerine yapılan çalışmada girişimcilerin pazarlama konusunda zayıf olduğu, müşteriler ile pazarlama konusunda yetersiz kaldıkları sonucu elde edilmiştir (Bozacı & Gökdeniz). Bir diğer çalışma konusuna yakın araştırmada ise kadın girişimcilerin pazarlama bilgi düzeyleri araştırılmıştır. Çalışma sonucunda kadın girişimcilerin pazar bilgi düzeylerinde kafa karışıklığı yaşadıkları, yeterli düzeyde farkındalığa ulaşmadıkları ve kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların belirlenmesi gerekliliği ortaya konulmuştur (Eru, 2019). Çalışmaya yakın son araştırma ise kadın girişimcilerin pazarlamanın aracı olan sosyal medya kullanımlarının tespiti üzerine yapılan nitel araştırmadır (Öztürk, 2020). Çalışma sonucunda kadın girişimcilerin pazarlama aracı olan sosyal medya kullanımında en çok güven sorunuyla karşı karşıya kaldıkları bulgusu elde edilmiştir. Dolayısıyla literatürde kadın girişimcilerin karşılaştıkları sorunların genel bir çerçevede incelendiği anlaşılıp olup sorunların pazarlama faaliyetleri (ürün, fiyat, dağıtım ve tutundurma) açısından irdelenmesinin literatürdeki boşluğu dolduracağı düşünülmektedir.

YÖNTEM

Kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların belirlenmesi ve Sivas ilindeki kadın işletmecilerin hangi kadın girişimci tipinde olduğunun belirlenmesi araştırmanın amacını oluşturmaktadır. Ayrıca çalışma sonucunda belirlenen sorunların çözümü konusunda öneriler getirilmiştir. Bu amaçlar doğrultusunda çalışmada şu sorulara yanıt aranmıştır.

- İşletmenizde pazar bilgisi eksikliği yaşanıyor mu?
- İşletmenizde pazarlama faaliyetleri açısından hangi sorunlar ile karşılaşıyorsunuz?
- Müşterileriniz acısından hangi sorunlar ile karşılaşıyorsunuz?
- Hangi tür kadın girişimci tipine sahipsiniz?

Araştırma kapsamında Sivas ilinde bulunan kadın girişimcilerin pazarlama faaliyetlerinde ne tür sorunlar ile karşılaştıkları tespit edilmiştir. Bunun için çalışmada görüşme yöntemi için oluşturulan sorularda ürün, fiyat, dağıtım ve tutundurma ile ilgili sorunları belirlemek için kadın girişimcilere sorular yöneltilmiştir. Ayrıca kadın girişimci tipini, pazar bilgilerini tespiti için sorular da sorulmuştur. Hali hazırda konuyla ilgili yapılan literatür incelemesinde bu çalışmanın amacına uygun araştırma sayısı yeterli görülmemektedir. Bu anlamda kadın girişimcilerin pazarlama faaliyetleri ve karşılaştıkları sorunların belirlenmesine yönelik gelecekteki çalışmalara kavramsal açıdan yön verilmesi, mevcut ve potansiyel kadın girişimcilere katkı sağlaması düşünülmektedir. Araştırmanın evrenini Sivas ilinde bulunan kadın girişimciler oluşturmaktadır. Bu anlamda Sivas ilinde yaklaşık olarak 250 kadın girişimci bulunmaktadır. Zaman ve maliyet kısıtından dolayı kadın girişimcilerin hepsine ulaşmak mümkün olamayacağından nitel araştırma yönteminde en sık kullanılan amaçlı örneklemden benzeşik örneklem tekniği kullanılmıştır. Bu örneklem tekniğinin tercih edilmesinde belirli alt gurubun derinlemesine tanımlamak ve anlamlı karşılaştırmaları sağlamaktır (Yağar & Dökme, 2018:5). Bu anlamda 17 kadın girişimci araştırmanın örneklemini oluşturmaktadır. Çalışmada durumların ve olayların kendi ortamında gerçekçi ve tam olarak ortaya konulmasını sağlamak için nitel araştırma yöntemi tercih edilmiştir. Nitel araştırma yönteminde sıklıkla tercih edilen görüşme tekniği verilerin elde edilmesinde kullanılmıştır. Görüşme yöntemi, araştırmaya dahil edilen katılımcıların belirlenen konu üzerindeki duygu, tutum, düşünce, görüş ve tecrübelerinin anlaşılmasında etkili bir yöntemdir (Dömbekci & Erişen, 2022:143). Görüşme yönteminde kadın girişimcilerden oluşan katılımcıların görüşlerini derinlemesine incelemek için yarı yapılandırılmış görüşme formu kullanılmıştır. Yarı yapılandırılmış görüşme formundaki bazı sorular

standartlaştırılmış, bazı sorular ise katılımcıların görüşlerinin derinlemesine belirlenmesi için açık uçlu sorular şeklindedir. Araştırmada sorulan sorular literatür incelemesinde karşılaşılan ve uzman pazarlama hocalarının görüşleri doğrultusunda geliştirilmiştir. Daha sonra veriler bilgisayar ortamına aktarılarak içerik analizi yöntemi ile analiz edilmiştir. Nitel araştırmalarda içerik analizi sayesinde betimleyici olarak nasıl, nedir vb. sorular ve açıklayıcı olarak da neden, niçin vb. sorular sorulmaktadır. Bu sayede katılımcıların yüzeysel görüşleri yerine görünmeyen düşüncelerine ulaşılması sağlanır (Metin & Ünal, 2022:277). İçerik analizinde katılımcıların verdikleri yanıtların benzer olanların belirli temalar doğrultusunda kategorileştirerek okuyucunun anlayacağı şekilde yorumlanmaktadır. Katılımcı kadın girişimciler, 1. katılımcı, 2. Katılımcı, 3. Katılımcı,….. olarak kodlanmıştır.

Bulgular

Katılımcıların demografik özelliklerine ait bilgiler tablo 1'de gösterilmektedir. Buna göre katılımcıların eğitimlerine bakıldığında %71 gibi bir çoğunluğun lisans eğitimi aldığı, 3 kişinin de lisansüstü eğitim aldıkları anlaşılmaktadır. Katılımcıların yaş değişkenine göre en fazla yoğunluğun 42 ve üstü yaş aralığında olduğu görülmektedir. Katılımcıların en fazla 1-10 yıldır faaliyet gösterdiği, kadın girişimci tiplerinden de en çok yenilikçi kadın girişimci oldukları bulgusuna ulaşılmıştır. Son olarak kadın girişimcilerin en çok sağlık sektöründe faaliyet gösterdikleri sonucuna ulaşılmıştır.

Tablo 1. Kadın Girişimcilerin Demografik Özellikleri

Eğitim	**f**	**%**	**İşletmenizde Çalışan Sayısı**	**f**	**%**	**İşletmenizin Faaliyet Yılı**	**f**	**%**
İlk ve Orta	-	-	1– 5 çalışan	9	52,9	1-10 Yıl	15	88,2
Lise	2	11,8	6 – 10 çalışan	4	23,5	11- 20 yıl	-	-
Lisans	12	70,6	11 -14 çalışan	-	-	21- 30 yıl	2	11,8
Lisansüstü	3	17,6	15 – +	4	23,5	31- 40 yıl	-	-
Toplam	**17**	**100**	**Toplam**	**17**	**100**	Toplam	**17**	**100**
Yaşınız	**f**	**%**	**İşletmenizin faaliyet gösterdiği sektör**	f	%	**Kadın Girişimci Tipi Toplam**	**f**	**%**
			Güzellik ve Kişisel Bakım	2	11,8			
25- 30 Yaş Aralığı2	7	41,2	Sağlık	5	29,4	Geleneksel	**6**	**35,3**
			İnşaat	1	5,9			
31 – 35 Yaş Aralığı	4	23,5	Aksesuar	2	11,8	Yenilikçi	**9**	**52,9**
			Yeme içme	3	17,6			
36 – 41 Yaş Aralığı	1	5,9	Mobilya	1	5,9	Evcimen	-	-
			Giyim	1	5,9			
42 - +	5	29,4	Üretim	2	11,8	Köktenci	**2**	**11,8**
Toplam	**17**	**100**	**Toplam**			Toplam	**17**	**100**

Sivas ilinde bulunan kadın girişimcilere İşletmenizde Uzman Pazarlama Yöneticisi / Sorumlusu var mı? Sorusuna var ve yok şeklinde yanıt vermeleri istenmiştir. Katılımcıların bu soruya verdikleri yanıtlar Tablo 2 de verilmektedir. 6 kadın girişimci işletmelerinde pazarlama yöneticisinin bulunduğunu ifade ederken geriye kalan katılımcılar yok cevabını vermiş ve işletme yöneticisi olarak pazarlamadan kendilerinin sorumlu olduklarını belirtmişlerdir.

Tablo 2. Katılımcıların İşletmelerinde Uzman Pazarlama Yönetici Varlığı Durumu

İşletmenizde Uzman Pazarlama Yöneticisi / Sorumlusu var mı?		**Durum**
1.	Katılımcı	**Var**
2.	Katılımcı	**Var**
3.	Katılımcı	**Yok**
4.	Katılımcı	**Yok**
5.	Katılımcı	**Var**
6.	Katılımcı	**Yok**
7.	Katılımcı	**Yok**
8.	Katılımcı	**Var**
9.	Katılımcı	**Yok**
10.	Katılımcı	**Yok**
11.	Katılımcı	**Yok**
12.	Katılımcı	**Yok**
13.	Katılımcı	**Yok**
14.	Katılımcı	**Yok**
15.	Katılımcı	**Var**
16.	Katılımcı	**Var**
17.	Katılımcı	**Yok**

Tablo 3 de ise katılımcıların pazar bilgisi konusunda yaşadıkları sorunlar kategorileştirilmiştir. Katılımcılara işletmenizin bulunduğu pazar ile ilgili eksiklik ve sorun yaşıyor musunuz şeklinde yöneltilen soruya 3 kadın girişimci (2. Katılımcı, 3. Katılımcı, 13. Katılımcı) bir eksiklik ve sorun yaşamıyoruz cevabını vermiştir. 5 katılımcı fiyat konusunda, 4 katılımcı yönetmelikler, prosedürler konusunda ve son olarak 5 kadın girişimci genel pazarlama faaliyetleri konusunda bilgi eksikliği yaşadıklarını belirtmişlerdir. Bu kapsamda katılımcıların bazılarının bu soruya verdikleri cevaplar ise şu şekildedir:

"…….bizim sektörde piyasada sektör oturmamıştır hala. Fiyatlar ile alakalı karmaşa yaşanmaktadır *(5. Katılımcı)*

"……*Yönetmelikler ve prosedürler sık değiştiği için bir bilgi eksikliği vardır."(4. Katılımcı)*

"…….Muhakkak ki hangi pazarın daha iyi olduğu hangi pazarın daha cazip olduğunu öğrenme konusunda bilgi eksikliği yaşıyoruz. Önemli olan üretmek değil pazarlamaktır.

Dolayısıyla genel anlamda pazarlama faaliyetlerinde bilgisizlik ve sorun yaşıyoruz."(8. Katılımcı)

Tablo 3. Katılımcıların İşletmelerinin Bulunduğu Pazar İle İlgili Bilgi Eksikliği/Sorunlar İle İlgili Görüşleri

İşletmenizin bulunduğu pazar ile ilgili bilgi eksikliği yaşanıyor mu? Nelerdir?	**f**	**%**
Fiyat Konusu	5	29,4
Yönetmelikler, prosedürler konusu	4	23,5
Genel pazarlama faaliyetleri bilgisizliği	5	29,4
Herhangi bir eksiklik ve sorun yaşamıyoruz.	3	17,6

İşletmenizde ürün konusunda sorunlar yaşıyor musunuz? Nelerdir? Sorusuna verilen yanıtlar Tablo 4 de kategorileştirilmiştir. Kadın girişimcilerin ürün konusunda ne tür sorunlar yaşıyorsunuz sorusuna verdikleri yanıtlar incelendiğinde en çok tedarik (hammadde, yarı mamül, nihai ürün) etmede yaşadıklarını daha sonra ise defolu ürünler (5 katılımcı) konusunda sorun yaşandığı bulgusu elde edilmiştir. Ürün anlamında sorun yaşamadığını belirten kadın girişimci sayısı ise altıdır.

Katılımcıların ürün konusunda yaşadıkları sorunları belirten yanıtların bazıları şu şekildedir:

"……..Şehir gereği ürün temini sağlamakta yani tedarik konusunda zorluk çekiyoruz. Özellikler özel günlerde hizmet sektöründe olduğumuz için şehir dışından tedarik ettiğimiz nihai ürünler bizlere stres yaşatıyor. Zamanında gelememe durumu "tarzında. (5. Katılımcı)

"……Ürünlerimizin fabrika çıkışında ürünlerin defolu çıkışında sıkıntı yaşıyoruz. Defoları ayıklıyoruz. Bazı ürün gruplarımız kendine has özelliğinden kaynaklı kimyasal ile temas ettiğinde yapısını kaybediyor. Fakat bu sorunu çözmeyi altı ay içerisinde başaracağımızı düşünüyoruz." (1. Katılımcı)

"…….Ürün konusunda yazılım hataları, programlamadan kaynaklı defolu olarak ifade ettiğimiz ürünlerde sorun yaşamaktayız." (11. Katılımcı)

Tablo 4. Katılımcıların Ürün Konusunda Ne Gibi Sorunlar Yaşıyorsunuz Sorusu İle İlgili Yanıtları

İşletmenizde ürün konusunda sorunlar yaşıyor musunuz? Nelerdir?	**f**	**%**
Tedarik Sorunu (hammadde, ara ürün, nihai ürün)	6	35,3
Defolu ürünler	5	29,4
Ürün konusunda sorun yaşamıyoruz.	6	35,3
Toplam	17	100

Katılımcılara yöneltilen fiyat konusunda ne gibi sorunlar yaşıyorsunuz şeklindeki soruya verilen yanıtlar incelendiğinde en çok müşterilerin fiyatları beğenmedikleri (yüksek bulma,

gelir seviyesi düşüklüğü, pazarlık yapma isteği) için sorun yaşadıklarını (%52,9) belirtmektedirler. 5 kadın girişimci ise rakip işletmelerin fiyatlandırmalarından kaynaklı sorunlar yaşadıklarını ifade etmişlerdir. 9. ve 10. katılımcılar ise müşterilerinin gelir seviyelerine uygun fiyatlar belirledikleri için sorun yaşamadıklarını belirtmişlerdir. Katılımcıların ürün konusunda yaşadıkları sorunlarını belirttikleri cevaplardan bazıları ise şu şekildedir:"……Fiyat belirleme konusunda ciddi sıkıntı yaşıyorum. Bizim malzemelerimiz döviz üzerinden belirleniyor. Malzeme bittikten sonra sipariş veriyorum ancak verdiğim ürünün fiyatı artmış oluyor. Bu da büyük bir sorun halini alıyor." (12. Katılımcı)"……Fiyatları biz belirlemiyoruz. Çünkü bayilik sistemi üzerinden faaliyet yapıyoruz. Ama müşteri çok pahalı buluyor. Pahalılık algısını yitiren kesim de var. Onlar da düşük fiyatlı olan kalitesizdir diye düşünerek ucuz ürünleri almıyor. Müşteri farklılığı bizi yoruyor. İki farklı kesim (fiyatları çok yüksek ve çok düşük bulan) var çünkü."(13. Katılımcı)"……..Personel maaşları yüksek olduğu için ürünleri belli bir fiyattan satmak zorunda kaldık. Dolayısıyla hizmet sektöründe olduğumuz için eleman sayısını fazla tutuyoruz. Bu durum da fiyatlarımıza yansıdı. Piyasadaki diğer rakip işletmelerin fiyatlarından yüksek olması bizleri zorluyor.

Tablo 5. Katılımcıların Fiyat Konusunda Ne Gibi Sorunlar Yaşıyorsunuz? Sorusu İle İlgili Yanıtları

İşletmenizde fiyat konusunda sorunlar yaşıyor musunuz? Nelerdir?	**f**	**%**
Rakip işletmelerin Fiyatları	5	29,4
Müşterinin fiyatı beğenmemesi	9	52,9
Döviz	1	5,9
Fiyat konusunda sorun yaşamıyoruz.	2	11,8
Toplam	17	100

Katılımcılara iletilen tutundurma konusunda ne gibi sorunlar yaşıyorsunuz? Sorusuna verilen cevaplar incelendiğinde çoğunluğunun sektörlerinden (sağlık) kaynaklı reklam verememe ve bunun da tanınmama gibi sorunları oluşturduğunu ifade etmişlerdir. Dört kadın girişimci tutundurma konusunda sorun yaşamadıklarını belirtmiştir (7. Katılımcı, 4. Katılımcı, 15. Katılımcı, 16. Katılımcı). Bir kadın girişimci kişisel satışta sorun yaşadığını (2. Katılımcı), bir katılımcı sosyal medyada sorun yaşadığını (14. Katılımcı) son olarak da yine bir kadın girişimci tutundurma ücretlerinin yüksek olduğu için sorun yaşadığını belirtmiştir (1. Katılımcı). Bu soruya verilen yanıtların bazıları ise şu şekildedir:

"……En büyük sorunumuz reklam. Yeni firma olmak herkesin kafasında soru işaretine neden oluyor. Yeni reklamcı ile tanıştık ama tabii zaman gerekiyor. Bizim için en etkili reklam ağızdan ağıza pazarlama diyebiliriz. Sosyal medyadan da reklam yapıyoruz. Üniversite ile iş birliği içinde birkaç projemiz oldu. Hocalarımız yerli firma olduğumuz için bize destek olmakta." (8. Katılımcı).

"…….Sağlık sektöründe olduğumuz için reklam yapamıyoruz. En büyük sıkıntımız bu yönde." (3. Katılımcı).

"……..Kişisel satış kısmında bazı sorunlar yaşıyoruz. Çoğunda elamanlarımızda özgüven eksikliği yaşıyoruz." (2. Katılımcı).

"…….Sosyal medyayı tanıtımda tercih ediyoruz. Çünkü kitlemiz sosyal medyayı çok kullanıyor. Sosyal medyada fotoğraflama çok önemli. İstediğimiz gibi bir fotoğrafçı bulamadık. Yeni biri ile anlaştık, bakalım isteklerimizi karşılayacak mı? Özellikle instagrama ağırlık verdik." (14. Katılımcı).

"……..Bizim meslekte tutundurmaya gerek olmadığından sorunumuz da bulunmamakta." (4. Katılımcı).

Tablo 6. Kadın Girişimcilerin İşletmenizde Tutundurma Konusunda Ne Gibi Sorunlar Yaşamaktasınız? Sorusuna Verdikleri Yanıtlar

İşletmenizde Tutundurma (reklam, halkla ilişkiler, kişisel satış, satış özendirme vb.) konusunda sorunlar yaşıyor musunuz? Nelerdir?	**f**	**%**
Reklam	10	59
Sosyal medya	1	5,8
Tutundurma ücretlerinin yüksek oluşu	1	5,8
Kişisel satış	1	5,8
Tutundurma konusunda sorun yaşamıyoruz.	4	23,5
Toplam	17	100

Kadın girişimcilere yöneltilen dağıtım konusunda nasıl sorunlar ile karşılıyorsunuz sorusuna çoğunluğun (%59) herhangi bir sorun ile karşılaşmıyoruz şeklinde yanıt verdikleri anlaşılmaktadır. Kadın girişimcilerin teslimat (3.,5. ve 8. Katılımcı) dağıtım ücretinin yüksek oluşu (1. ve 13. Katılımcı) ve son olarak dağıtım sırasında ürün hasarından (15. ve 17. Katılımcı) kaynaklanan sorunlar yaşadıkları bulgusu elde edilmiştir. Bu soruya alınan yanıtların bazıları ise şu şekildedir:

"……..Satmış olduğum ürünleri kargoya verdiğimde ürünlerin gecikmesinden dolayı hasara uğradığını biliyorum. Ayrıca sipariş verdiğim bazı ürünlerinde dağıtımda gerçekleşen gecikmelerden dolayı bozulduğu durumlar oluyor." (17. Katılımcı).

"…….Ürünlerin teslimatında gecikmeler oluyor. Bu da bize müşteri kaybı olarak geri dönüyor." (3. Katılımcı)."……..Kadın girişimci olarak dağıtım konusunda herhangi bir sorun ile karşılaşmıyorum. Müşterilerimin de genelde kadın olmasından dolayı bir problem yaşamıyorum."(6. Katılımcı)"…….. Dağıtım konusunda kapıdan ödemede ücret konusunda sorun yaşamaktayız. Onun dışında kargoladığım ürünlerin dağıtımında bir sorun yaşamıyorum." (13. Katılımcı).

Tablo 7. Kadın Girişimcilerin İşletmenizde Dağıtım Konusunda Ne Gibi Sorunlar Yaşıyorsunuz? Sorusuna Verdikleri Yanıtlar

İşletmenizde Dağıtım Konusunda Ne Gibi Sorunlar Yaşıyorsunuz?	**f**	**%**
Dağıtım ücreti	2	11,7
Teslimat	3	17,6
Ürün Hasarı	2	11,7
Herhangi bir sorun yaşamıyoruz.	10	59
Toplam	17	100

Tablo 8 de katılımcıların kadın girişimci olarak pazarlama faaliyetlerinde en sık karşılaştıkları sorunlara yönelik yapılan kategorileştirme verilmektedir. Bu bilgilere göre katılımcıların %59 pazarlama faaliyetleri konusunda bir sorun ile karşılaşmadıklarını belirtmiştir. Diğer katılımcılar ise pazarlama faaliyetlerinde ürün tedariki sırasında diğer firmalara karşı çekingen olmaları (kendilerine güvenmeme), sosyal medyada reklam vermede yanlış anlaşılma duygusu, yapılan iş için tecrübesiz ve genç olmadan kaynaklı güven duyulmama, geç saatlere kadar çalışmadan kaynaklı güvende hissetmeme gibi sorunlar ile karşılaştıklarını ifade etmişlerdir (4. Katılımcı, 15. Katılımcı, 17. Katılımcı, 14. Katılımcı, 5. Katılımcı, 16. Katılımcı, 13. Katılımcı).

Tablo 8. Kadın Girişimcilerin Pazarlama Faaliyetlerinde Karşılaştıkların Sorunlar Hakkındaki Görüşleri

Kadın Girişimcilerin Pazarlama Faaliyetlerinde Karşılaştıkların Sorunlar Hakkındaki Görüşleri	**f**	**%**
Güven Sorunu	7	41
Herhangi bir sorun yaşamıyoruz.	10	59
Toplam	17	100

Kadın girişimcilere yöneltilen müşterileriniz ile ne gibi sorunlar yaşıyorsunuz? Sorusuna verilen cevaplar Tablo 9 da ürün/hizmet, fiyat, dağıtım ve herhangi bir sorun yaşamıyoruz şeklinde kategorileştirerek verilmiştir. Tablo 9'a göre iki katılımcı bir sorun yaşamadığını belirtmiştir. Katılımcılardan bazılarının verdiği yanıtlar ise şu şekildedir:

"……Olmayacak işi yapmamızı bekliyorlar. Üretimden anlamayan müşteriler bizi çok zorluyor. Ürünleri hızlı teslim etmemizi bekliyorlar. Onun dışında sıkıntı yaşamadım." (15. Katılımcı).

"…….Karmaşık buketlere yani ürünler kalabalık kağıtlara alışmış insan toplumu var. Müşteriler yeni ürünlere, yeniliklere çok açık değiller. Alışılmışın dışına çok çıkmak istemiyorlar. Aranjmanlarımı çok sade ve özensiz buluyorlar. Dolayısıyla he ne kadar direnseme de müşteri isteklerini yapmak zorunda kaldım. Bu da benim yapmak istediğimin çok önüne geçti." (17. Katılımcı)."…….Müşterilerim/danışanlarım tek seansta iyileşmek istiyorlar. Esneme, ısınma ve kuvvet zamanla olan şeylerdir. Tek seansta verdiğimiz hizmetten sonuç alamayız. En çok bu konuda sıkıntı yaşıyoruz." (7. Katılımcı)."……Ödeme konusunda sıkıntı yaşıyoruz. Nakit ödemeli anlaşıyoruz. Fakat daha sonra fiyatı ödemeyeceklerini, çek ve vadeli ödemek istiyorlar. Hem de nakit fiyatına. Maalesef diğeri de 100 ürün için anlaşıyoruz sonra 20 ürüne düşürüyor (fiyattan dolayı). Yaptığımız iskontoyu 20'ye de yapmamızı istiyor. Yani yine fiyattan kaynaklı ödeme sorunu." (16. Katılımcı).

Tablo 9. Katılımcıların Müşterileriniz İle Ne Gibi Sorunlar Yaşıyorsunuz? Soruna Verdikleri Yanıtlar

Müşterileriniz ile Ne Gibi Sorunlar Yaşıyorsunuz?	**f**	**%**
Ürün/ Hizmet	9	53
Fiyat	5	29,4
Dağıtım	1	5,8
Herhangi bir sorun yaşamıyoruz.	2	11,7
Toplam	17	100

Tablo 10 da ise katılımcılara kadın girişimci olarak karşılaştıkları sorunlara yönelik kapalı uçlu soru yönlendirilmiştir. Kadın girişimcilerin yarısından fazlası yorucu aile sorumlulukları olduğunu belirtmiştir. 1 katılımcı, fırsat eşitsizliği, 1'i yetenek eksikliği, 3 kişi de cinsiyet ayrımcılığı olarak yanıt vermiştir.

Tablo 10. Katılımcıların İşletmenizde Kadın Girişimci Olarak Karşılaştığınız Sorunlar Nelerdir? Sorusuna Verdikleri Yanıtlar

Kadın Girişimci Olarak Karşılaştığınız Sorunlar Nelerdir?	f	%
Fırsat Eşitsizliği	1	
Güvenirlilik Eşitsizliği	-	
Tanınma Eksikliği	-	
Yorucu Aile Sorumlulukları	11	
Yetenek Eksikliği	1	
Cinsiyet Ayrımcılığı	3	
Risk Alamama	-	
Toplam	17	100

SONUÇ ve ÖNERİLER

İş hayatının değişmesi, eğitim düzeyinin artması kadınların aile içi sorumlulukları dışında sosyal hayatta olup ekonomiye katkı sağlama düşüncesi kadın girişimciliğinde artışa neden olmuştur. Bu çalışmanın amacı ise kadın girişimciliği ve pazarlama faaliyetleri konusunda teorik bilgilerin yanında kadın girişimcilerin pazarlama faaliyetlerinde karşılaştıkları sorunların belirlenmesidir. Ayrıca Sivas ilinde bulunan kadın girişimcilerin girişimci tipinin de belirlenmesidir. Bu amaçla yapılan çalışma sonucunda Sivas'da faaliyet gösteren kadın girişimcilerin çoğunlukla lisans eğitimi aldığı, 36- 41 yaş aralığında olduğu, 1-10 yıl arasında faaliyet gösterdiği, sağlık sektöründe bulunduğu, 1- 5 çalışanı olduğu belirlenmiştir. Kadın girişimci türlerinden büyük bir çoğunlukta girişimcilik faaliyetlerini, cinsiyet rollerine ait sorumluklarından daha ön planda tutan yenilikçi kadın girişimci oldukları anlaşılmıştır. Yine çalışma sonucunda katılımcıların faaliyet gösterdikleri işletmelerde çoğunlukta uzman bir pazarlama yöneticisinin bulunmadığı, pazarlama işlemlerini yönetici olarak kendilerinin üstlendiği sonucuna ulaşılmıştır. Pazar ile bilgi eksikliği konusunda katılımların çoğunluğunun fiyat ve genel pazarlama faaliyetlerinde sorunları olduğu anlaşılmıştır. Katılımcıların ürün konusunda hammadde, ara ürün ve nihai ürünlerin tedarikinde sorunlar yaşadıkları sonucuna ulaşılmıştır. Fiyat konusunda en çok müşterilerin fiyatları çok yüksek ya da düşük bulmasından kaynaklı sorunlar yaşadıkları bulgusu elde edilmiştir. Tutundurma anlamında sektöre bağlı olarak reklam veremedikleri ve bunun da tanınmamalarına neden olduğu anlaşılmaktadır. Dağıtım konusunda da çoğunluğun bir sorun yaşamadığı ancak teslimatların gecikmesinden kaynaklı sıkıntılar bulunduğu bilgisi elde edilmiştir. Kadın girişimcilerin pazarlama faaliyetlerinde ürün tedariki pazarlığında, tecrübesizlikten kaynaklı

ve çevreden gelebilecek olumsuz durumlardan güvensizlik sorununu yaşadıkları anlaşılmıştır. Sivas ilinde faaliyet gösteren kadın girişimciler müşteriler ile en çok ürün ya da hizmet konusunda sorun yaşadıklarını belirtmişlerdir. Katılımcıların kadın girişimci olarak yorucu aile sorumlulukları hususunda sorun yaşadıkları bulgusu elde edilmiştir. Tüm bu sonuçlar yapılan literatür ile değerlendirildiğinde pazarlama faaliyetleri açısından ürün konusunda ve güven konusunda sorun yaşamaları bakımından Öztürk'ün (2020) ve Çelik ve Özdevecioğlu (2001) çalışmalarını desteklemektedir. Kadın girişimcilerin daha çok sağlık, hizmet ve danışmanlık tarzı sektörler de faaliyet göstermeleri bakımından Delmar'ın (2003) ve Tahtalı (2022) araştırmalarına benzerlik göstermektedir. Kadın girişimcilerin fiyat belirlemede müşterilerin fiyatları çok yüksek ya da düşük bulmalarının ve prosedürler ve genel konularda bilgi eksikliğinden kaynakladığının düşünülmesi bakımından Tan'ın (2006), Soysal (2010) ve Özyılmaz (2016) çalışmaları ile benzerlik göstermektedir. Yine katılımcıların en çok yenilikçi kadın girişimci tiplerinde olmaları bakımından Soysal'ın (2010) çalışmalarını desteklemektedir. Katılımcıların uzman pazarlama yöneticisi bulundurma durumları, tutundurma ve dağıtımda karşılaştıkları sorunlar, pazarlama faaliyetlerini ürün, fiyat, dağıtım ve tutundurma unsurları üzerinden ayrı ayrı değerlendirme, müşteriler ile karşılaşılan sorunların incelenmesi bakımından literatürde benzer bir çalışmaya rastlanmaması karşılaştırmayı zorlaştırsa da literatürdeki boşluğu doldurması açısından önemli olduğu düşünülmektedir. Kadın girişimcilerin her ne kadar yenilikçi bir özelliği olması bakımından literatürde bilgi olmasına karşın dört kadın girişimci türünün (geleneksel, yenilikçi, evcimen ve köktenci) tanımının verilip katılımcıların ait olduğu kadın girişimci tipinin belirlenmesine yönelik ilgili yazında bir araştırmaya da rastlanmamıştır.Çalışmanın kısıtları incelendiğinde ise örneklemin Sivas ilinde bulunan kadın girişimcilerden oluşması, araştırmanın uygulamasının 02.12.2023 ve 10.04.2024 tarihleri arasında olmasıdır. Çalışmanın sonuçları incelendiğinde kadın girişimcilerin özellikle pazarlama faaliyetlerinde ürün, fiyat ve tutundurma konusunda eğitim, seminer almalarının faydalı olacağı düşünülmektedir. Yine müşteri ilişkileri, çalışan ve satış teknikleri konusunda da destek almaları faydalı olacaktır.Toplumların, ekonomik, sosyal ve kültürel açıdan gelişmesine katkı sağlayan kadın girişimcilerin başarılı ve sürdürülebilir rekabet edebilmeleri için pazarlama faaliyetleri kilit öneme sahiptir. Bu anlamda kadın girişimciliği ile ilgili farklı yönlerden yapılacak araştırmalar (Nicel araştırma, nicel ve nitel araştırma yöntemlerinin karşılaştırılması, farklı örneklemlerin karşılaştırılması vb.) literatüre katkı sağlayacaktır.

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GÜNEŞ ENERJİ SANTRALİNİN KURULUMU, İŞLETMESİ, VERİMLİLİĞİ VE FOTOVOLTAİK SİSTEMİN PVSYST PROGRAMI İLE SİMÜLASYONU

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ÖZET
Son yıllarda Dünyada enerji ihtiyacının yenilenebilir kaynaklardan enerji elde edinimi giderek yaygınlaşmaktadır. Bu yenilenebilir enerji kaynaklarının önemli bir kısmını Güneş Enerji Santralleri oluşturmaktadır. Güneş enerjisi diğer enerji kaynakları ile kıyaslandığında her zaman ulaşılabilir durumdadır. Üretim maliyetlerinin diğer enerji kaynaklarına göre daha düşük olması da tercih edilme sebebidir.Bu çalışmada bir fotovoltaik sistemi meydana getiren temel bileşenler açıklanmıştır. Bu bileşenlerin fotovoltaik sistemdeki görevleri belirtilmiş ve çalışmasına etki eden faktörler açıklanmıştır. Bir fotovoltaik sistem kurulumunda yapılan hesaplamalar ve formüller açıklanmıştır. Ayrıca bir fotovoltaik sistemin verileri similasyon programı yardımıyla oluşturulmuş modelinin üretim verileri analiz edilmiştir.
Anahtar Kelimeler: Fotovoltaik, verim, similasyon

INSTALLATION, OPERATION, EFFICIENCY OF SOLAR POWER PLANT AND SIMULATION OF PHOTOVOLTAIC SYSTEM WITH PVSYST PROGRAM

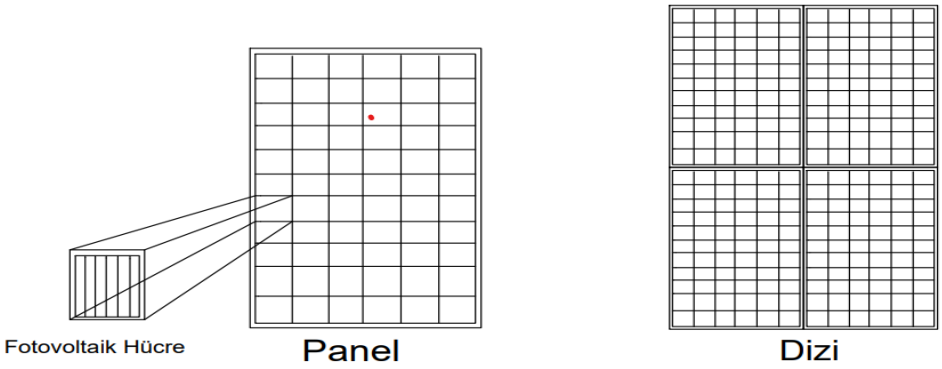
ABSTRACT:

In recent years, obtaining energy from renewable sources has become increasingly common in the world. Solar Power Plants constitute a significant part of these renewable energy resources. Solar energy is always accessible compared to other energy sources. The fact that production costs are lower than other energy sources is also why it is preferred.In this study, the basic components that make up a photovoltaic system are explained. The functions of these components in the photovoltaic system are stated and the factors affecting their operation are explained. Calculations and formulas made in the installation of a photovoltaic system are explained. In addition, the production data of a model of a photovoltaic system whose data was created with the help of a utility program were analyzed.

Keywords: Photovoltaic, efficiency, simulation

GİRİŞ

Güneş enerjisi, yenilenebilir enerji kaynaklarından biridir ve uzun bir geçmişe sahiptir. Tarih boyunca ısıtma ve sıcak su elde etmek amacıyla birçok uygulamada kullanılmıştır. Ancak, güneş enerjisini doğrudan elektrik enerjisine dönüştüren sistemler ise daha yeni teknolojiler arasındadır. Güneş enerjisini elektrik enerjisine dönüştüren sistemlere fotovoltaik sistemler denilmektedir. Son yıllarda yapılan araştırmalar, Türkiye'de her yıl metrekare başına 1100 kWh'lik güneş enerjisi potansiyelinin bulunduğunu göstermektedir (Altın, 2004). Bu potansiyele bağlı olarak günümüzde ise ülkemizde lisanslı ve lisanssız fotovoltaik sistemlerin sayısı sürekli artmaktadır. Fotovoltaik sistem çeşitleri çalışma ilkelerine göre üç ana gruba ayrılır:Şebekeye bağlı (On-Grid) sistemler, fotovoltaik (pv) modülleri kullanarak elektrik üreten ve ürettiği elektriği şebekeye veren sistemlerdir. Şebekeye bağlı bir sistemde, gündüz saatlerinde üretilen güneş enerjisi, herhangi bir depolama işlemi yapılmadan şebekeye iletilir.Şebekeden bağımsız (Off-Grid) sistemler, solar pv modülleri tarafından üretilen elektrik enerjisini akülerde depolar. Akülerde depolanan enerji, elektrik enerjisine talep olması durumunda veya gece saatlerinde kullanılır. Bu sistemler elektriğin olmadığı, enerji sıkıntısı olan veya şebekeye erişimin uzak olduğu yerlerde kullanılır.On Grid ve Off Grid sistemler, şebekeye bağlı olup aynı zamanda aküleri de bulunan fotovoltaik sistem olarak ifade edilebilir.Güneş enerjisinden elektrik üretiminde faydalanılan fotovoltaik güneş enerji sistemleri sadece güneş panelinden ibaret değildir. Sistem türüne bağlı olarak akü, evirici, kablolar, koruma devreleri, panolar gibi diğer sistem elemanları bulunmaktadır.Güneş Panelleri (Fotovoltaik Paneller), yüzeylerine gelen güneş ışığını direk olarak elektrik enerjisine çeviren yarıiletken malzemelerdir. Fotovoltaik panellerin üzerlerine ışık düşmesi durumunda uçlarında elektriksel potansiyel oluşur. Panelin yüzeyine gelen güneş enerjisi ile elektrik üretilmiş olur. Güneş enerjisi, fotovoltaik panellerin yapısına bağlı olarak %5 ile %30 arasında bir verimle elektrik enerjisine dönüştürülebilir.



Şekil.1. Güneş hücresi, güneş paneli ve dizi

Güneş panellerinin bir araya gelmesi ile dizeler fotovoltaik hücrelerin bir araya gelmesi ile paneller oluşmaktadır. Piyasada çok farklı fotovoltaik panel çeşitleri bulunmaktadır. Fakat uygulamalarda en yaygın olan üç fotovoltaik panel çeşidi bulunmaktadır: monokristal paneller, polikristal paneller ve ince film paneller.

Monokristal paneller; Temel malzeme olarak silikondan yapılırlar. Diğer güneş panellerine göre daha verimlidirler, % 19-%21 seviyelerinde verimliliğe sahiplerdir. Üretim maliyetleri yüksektir ve bu durum fiyatlarına yansır.Polikristal paneller; Monokristal panellerin üretimi oldukça yüksek maliyetli ve zor bir yöntem olması sebebiyle, imalatta maliyetinin düşürülmesi için geliştirilen polikristal panel çeşididir. Verimleri ise çoğunlukla %12-%15 seviyelerindedir.İnce film panellerde; bir kaplama malzemesi üzerine bir veya birden fazla ince film katmanı yerleştirilir. Ne yazık ki, bu panel tipinin verimi hala istenilen düzeylerin altında kalmaktadır.Güneş enerji santrallerinin elektriksel hesaplamaları, piyasada bulunan hazır programların yanı sıra manuel olarak da yapılabilmektedir. İlk olarak, santralde kullanılacak panel sayısı belirlenmelidir. Panel sayısı, kurulu güç ile bir panelin gücü arasındaki oran ile hesaplanır. Kurulu güç; elektrik üretimi için gereken DC gücü temsil eder ve pratikte üretilecek enerjinin yaklaşık %12 fazlasına karşılık gelir. Ayrıca, bir panelin dizi bağlantısı için maksimum ve minimum çalışma voltajı sınırları belirlenmelidir ve bu amaçla formüller kullanılır (Güneş, 2021).İnvertörler yani eviriciler güneş paneli ile birlikte sistemin ana omurgasını oluşturmaktadır. Güneş panelleri yarı iletken hücrelerden oluşmaktadır ve güneşten aldığı enerjiyi elektrik enerjisi olarak vermektedir ve DC akım olarak eviriciye iletmektedir. Evirici DC akımı alır ve çıkışından AC akıma dönüştür ve çıkışından verir.

Fotovoltaik sistemlerde mikro, dizi ve merkezi eviriciler adı ile üç tür evirici kullanılmaktadır.Fotovoltaik sistemlerde kullanılacak evirici sayısı aşağıdaki formüle göre bulunabilir.N(inv.) = Maksimum çıkış gücü / Evirici çıkış gücü

Fotovoltaik güneş enerjisi santrallerinde kullanılan dört farklı kablo türü vardır: DC kablolar, AC kablolar, topraklama ve haberleşme kontrol kabloları.Trafolar, AC sistemlerde, frekansı sabit tutarak akım ve gerilim değerlerini istenilen dönüşüm oranlarında düşüren veya yükselten elektrik makineleridir. Trafolar genellikle prefabrik beton yapı veya galvanizli saçtan oluşan ve köşk adı verilen bir yapı içinde bulunur. Piyasada yağlı tip ve kuru tip olmak üzere iki farklı trafo çeşidi bulunmaktadır.Ayrıca bir fotovoltaik santralde sistemde meydana gelebilecek elektriksel bir hatanın tüm sistemi etkileyebileceği ve sistemde yer alan bütün ekipmanların zarar görebileceği düşünüldüğü zaman bu sistemin ne kadar korunması gerektiği anlaşılacaktır. Bu sebepten dolayı enerji üreten sistemlerde bazı koruma

elemanlarının varlığı söz konusudur. Bu elemanlar sistemi tehlikeli olabilecek akımlardan korumaktadır. Güneş panellerinden alınabilecek olan maksimum gücü almak için bölgesel iklimsel özelliklerinin iyi araştırılıp buna göre önlemler alınması gerekmektedir. Güneş panellerinde sistem verimliliğini etkileyen en önemli iklimsel değişkenler; hava sıcaklığı, rüzgâr hızı, güneş radyasyonu, hava kirliliği ve toz olarak değerlendirilmiştir.Güneş enerjisinin her zaman ulaşılabilir olması, üretim maliyetlerinin diğer enerji kaynaklarına göre daha düşük olması ve veriminin her geçen gün artması yenilenebilir enerji kaynakları arasından en çok tercih edilmesine neden olmaktadır (EPDK, 2024).Literatürde Güneş enerji santrallerinin temel özellikleri, verimliliğini etkileyen faktörler ve verimlerinin artırılması için yapılan çok sayıda çalışmalar mevcuttur (Dal, 2021; Yılmaz, 2017; Yücel, Kılıçarslan, Yıldırım, 2018; Demirtaş, 2006; Boyacı ve Kocaman, 2018; Artan, 2020; Tamoor ve ark., 2022). Bunlara ilaveten diğer bazı örneklerden; Beyoğlu yaptığı çalışmada Balıkesir ilinde maksimum güç takip sistemine sahip sabit fotovoltaik sistem ile iki eksenli fotovoltaik sistemin karşılaştırmasını yapmıştır (Beyoğlu, 2011). Atalay yaptığı çalışmada iki eksenli güneş takip mekanizmasına sahip olan 1 Kw güç değerine sahip bir fotovoltaik sistemi bilgisayar ortamında modellemiş ve İzmir ili koşulları için simüle etmiştir (Atalay, 2016). Zengin ve arkadaşları Gaziantep, Konya ve Hatay'ın güneş enerjisi potansiyellerinin karşılaştırmalı analizini çalışmışlardır. Verimlilikle ilgili yine benzer çalışmalar yapılmıştır (Zengin ve ark., 2024; Fernández-Ahumada, Casares, Ramírez-Faz, López-Luque, 2017; Abdelghani-Idrissi ve ark., 2017; Sidek ve ark., 2017; Eldin, Abd-Elhady, Kandil, 2016). Benzer şekilde Çınaroğlu ve Önal, PVsyst yazılımı kullanılarak performans analizi ile ilgili çalışma yapmışlardır (Çınaroğlu ve Önal, 2022). Bu çalışmada da gerçek üretim verileri ile simülasyon sonucu elde edilen üretim verileri karşılaştırılmıştır.

2. MATERYAL VE METOT

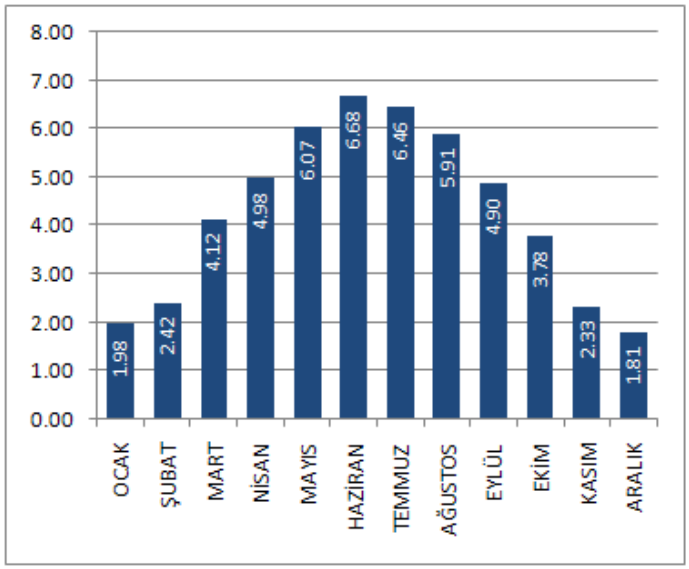
Güneş enerjisi santrali kurulumu için geliştirilmiş olan ve kullanıma sunulan bir çok uygulamadan biri olan Cenevre Üniversitesi tarafından geliştirilmiş olan PVsyst 7.4 (trial) uygulaması bu çalışmada kullanılmıştır.

3. BULGULAR

Gerçek üretim verileri ile simülasyon sonucu elde edilen üretim verilerinin karşılaştırıldığı santral Adana ilinde bulunmaktadır. Adana ili Anadolu yarım adasının güneyinde Akdeniz'in Kıyısında 36-38 Kuzey Enlemleri ve 34-36 Doğu Boylamları arasında bulunmaktadır. Akdeniz iklim kuşağında bulunur. Yazları sıcak ve kurak kışları ılık ve yağışlı geçer. Yıl içi sıcaklıkları 5 ile 35 santigrat derece arasındadır. Santralin verimliliğini

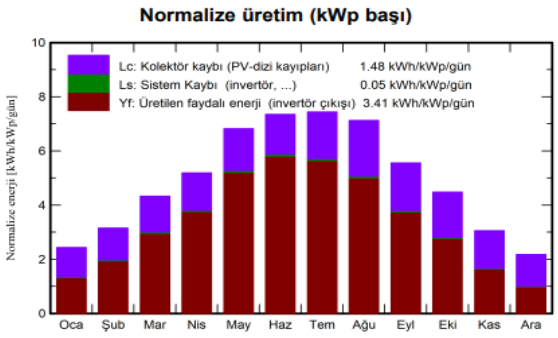
ve performansı üzerinde etkili olan birçok değişken bulunmaktadır ve santralin tasarımı yapılırken bu faktörler göz önünde bulundurulmalıdır.

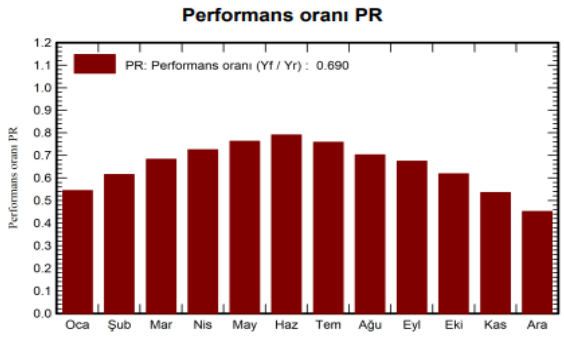
Adana'nın ortalama günlük global radyasyon değeri 4,8 kWh/m^2 olduğu ve Türkiye'nin yıllık ortalama global radyasyon değeri 4,18 kWh/m^2 olduğu bilinmektedir (GEPA, 2024). Buradan Adana ilinin Türkiye ortalamasının üstünde olduğu anlaşılmaktadır. Mayıs ayında güneşlenme süresi 10 saate çok yakın, Haziran, Temmuz, Ağustos aylarında 11 saat üzerinde olmaktadır. En düşük güneşlenme süresi Aralık ayındadır ve 4,21 saat olarak belirtilmiştir.Santralin verimliliği ve performansı üzerinde etkili olan birçok değişken bulunmaktadır ve santralin tasarımı yapılırken bu faktörler göz önünde bulundurulmalıdır.



Şekil 2. Adana ili Global Radyasyon Değerleri (KWh/m^2-gün) (GEPA, 2024)

PVSYST programı yardımı ile Adana ilinde bir fotovoltaik sistemin tasarımı gerçekleştirilmiştir. 4120 adet 320 W gücünde panel, 12 adet 100 kW gücünde invertör kullanılmış ve simülasyon sonucunda aşağıdaki sonuçlar alınmıştır.





Bilanço ve genel sonuçlar

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray kWh	E_Grid kWh	PR oran
Ocak	76.4	33.59	7.37	75.4	42.9	55337	54074	0.544
Şubat	89.1	36.80	8.95	88.3	56.8	72919	71614	0.615
Mart	135.2	59.46	13.13	134.2	97.4	122857	120972	0.683
Nisan	156.3	67.92	16.12	155.6	121.1	150733	148730	0.725
Mayıs	211.9	74.96	20.52	211.4	177.2	215613	212753	0.763
Haziran	220.8	81.78	23.45	220.6	192.7	232813	229917	0.790
Temmuz	231.0	71.17	28.49	230.7	198.4	233581	230639	0.758
Ağustos	221.7	60.22	29.07	221.0	176.5	207462	204818	0.703
Eylül	167.6	50.92	24.04	166.6	124.7	150235	148141	0.674
Ekim	140.2	41.07	18.47	138.9	92.9	114959	113219	0.618
Kasım	92.8	32.91	16.82	91.6	52.9	65934	64682	0.535
Aralık	68.5	26.73	8.98	67.5	32.4	41347	40200	0.452
Yıl	1811.5	637.53	18.00	1801.9	1365.9	1663789	1639760	0.690

Şekil 3. PVsyst uygulamasından alınan simülasyon sonucu oluşan değerler

SONUÇLAR

PVsyst 7.4 programı simülasyonunda yapılan analizler sonucu ortaya çıkan üretim miktarı 1639,760 MWh'dır. Bolat ve arkadaşlarının yaptığı çalışmadan da görüldüğü gibi simülasyon değeri gerçek üretilen enerji miktarına göre daha fazla enerji üretmektedir (Bolat, Arifoğlu, Demiryürek, 2020). Gerçek üretim değerleri ile PVsyst simülasyonunda elde edilen üretim değerleri genellikle birbirine oldukça yakın olabilir. Ancak, kayıpların azaltılması ve üretimin artırılması için kullanılan panellerin dış ortam sıcaklığına daha dayanıklı olması, daha yüksek verimlilik sağlayan invertörlerin tercih edilmesi ve tarım alanlarına yakın kurulan sistemlerin modül temizliğinin daha sık yapılması gibi önlemler alınabilir.Pvsyst simülasyon programı meteoroloji verilerinden, piyasada bulunan evirici ve panel verilerine kadar birçok bilgiye erişebilmesine rağmen santralde kullanılan AC, DC kablolar, toplama panoları ve trafolara ait veriler ile ilgili ayrıntılı bilgiler sunmamaktadır. İletkenlerin akım taşıma kapasitesi üzerinde etkili olan döşeme yolları, sıcaklığı ve mesafenin etkili olduğu göz önünde bulundurulduğunda gerçek veriler ile simülasyon sonucunda alınan veriler arasında bir farkın bulunabilmesi olağandır.

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MİHALIÇCIK KİLİ VE BENTONİTLE SULU ÇÖZELTİLERDE METİLEN MAVİSİ GİDERİMİ

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ÖZET
Tekstil endüstrisinde kullanılan boyar maddeler herhangi bir işlem görmeden sulara bırakıldığı takdirde kanserojen ve toksik etkilere sebebiyet vererek ciddi oranda çevre kirliliğine yol açmaktadır. Kirliliği gidermede en önemli alternatif yöntemlerden biri de adsorpsiyon metodudur. Bu çalışmada Mihalıççık kili ve bentonit kullanılmıştır. pH, sıcaklık, karıştırma hızı, boyar madde konsantrasyonu ve adsorban miktarının metilen mavisi adsorpsiyonu üzerine etkisi incelenmiştir. Farklı sıcaklıklarda izoterm çalışmaları yapılmıştır. Adsorpsiyon davranışı üç ana izoterm modeli yardımıyla incelenmiştir. En yüksek adsorpsiyon verimlilik değeri Mihalıççık kili ile %99,19 iken bentonit ile %94,32 olarak tespit edilmiştir. Kinetik hesaplamalara ve çizilen grafiklere göre adsorpsiyon verilerinin yalancı ikinci mertebe kinetiğe uyduğu görülmüştür. Adsorpsiyon termodinamiği incelenmiştir. Denge sabiti, Gibbs serbest enerjisi, entalpi ve entropi değişim değerleri hesaplanmıştır.
Anahtar Kelimeler: Mihalıççık kili, Bentonit, Metilen mavisi, Adsorpsiyon

METHYLENE BLUE REMOVAL IN AQUEOUS SOLUTIONS WITH MIHALIÇCIK CLAY AND BENTONITE

ABSTRACT
The use of dyestuffs in the textile industry can lead to significant environmental contamination, carcinogenic consequences, and toxicity if they are discharged into the water untreated. The adsorption method is one of the most significant alternative techniques for eliminating pollution. In this investigation, bentonite and Mihalıççık clay were utilised. We looked at how methylene blue adsorption was affected by pH, temperature, stirring speed, dye concentration, and amount of adsorbent. Studies using isotherms were conducted at various temperatures. The behaviour of adsorption was examined using the three primary isotherm models. The results showed that bentonite had the highest adsorption efficiency value at 94,32% and Mihalıççık clay at 99.19%. According to kinetic calculations and drawn graphs, it was seen that the adsorption data conformed to pseudo second order kinetics. Adsorption thermodynamics was studied. Equilibrium constant, Gibbs free energy, enthalpy and entropy change values were calculated.
Keywords: Mihalıççık clay, Bentonite, Methylene blue, Adsorption

GİRİŞ

Endüstriyel boyalar, suyu içmeye uygun olmayan hale getiren en önemli kimyasallardandır. Bu boyalar arasında metilen mavisi toksik, kanserojenik ve biyolojik olarak parçalanamayan bir madde olup, insan sağlığı ve çevre güvenliği açısından ciddi bir tehdit oluşturabilmektedir. Genellikle doğal su kaynaklarından salınır ve insan ve canlı organizmalar için sağlık tehdidi haline gelir. Bu nedenle metilen mavisinin atık sudan uzaklaştırılması için çevre dostu ve verimli bir teknolojinin geliştirilmesine ihtiyaç vardır (Khan ve ark, 2022). Adsorpsiyon teknikleri, atık su arıtım proseslerinde belli türdeki kirleticilerin uzaklaştırılmasında yaygın biçimde kullanılmaktadır. Bu çalışmada alternatif, çevre dostu ve ekonomik olması sebebiyle Mihalıççık kili ve bentonit ile denemeler yapılmıştır.

2. MATERYAL VE YÖNTEM

Bu çalışmada Mihalıççık kili ve bentonit adsorban, metilen mavisi adsorbat olarak kullanılmıştır. Metilen mavisi için öncelikle 2,5 mg L^{-1}'lik stok çözeltisi hazırlanmıştır. Denemelerde kullanılan çözeltiler stok çözeltiden seyreltme yapılarak hazırlanmıştır. Boya giderim verimi çalışmaları 100-1000 mg 100 ml^{-1} derişim, 25°C-55°C sıcaklık ve 4-9 pH aralığında gerçekleştirilmiştir. Santrifüjle ayrılan çözeltilerde adsorplanmadan kalan madde miktarı UV-VIS spektrofotometresi ile tespit edilmiştir.

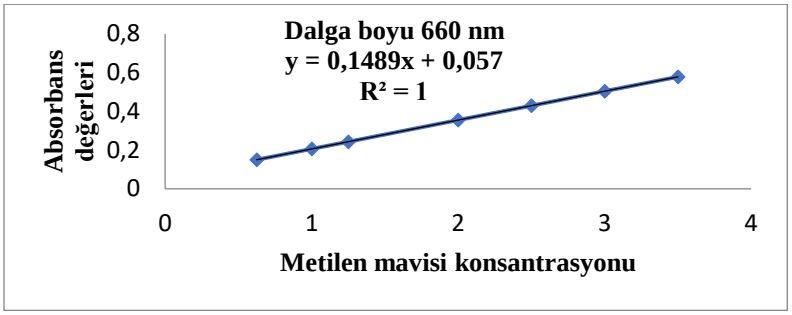
3. BULGULAR VE TARTIŞMA

3.1. Adsorpsiyon Çalışmaları

660 nm dalga boyunda absorbans bandı bulunmuştur. Tüm ölçümler 660 nm'de yapılmıştır.

Tablo 3.1. Farklı konsantrasyonlardaki metilen mavisinin 660nm'de ölçülen absorbans değerleri

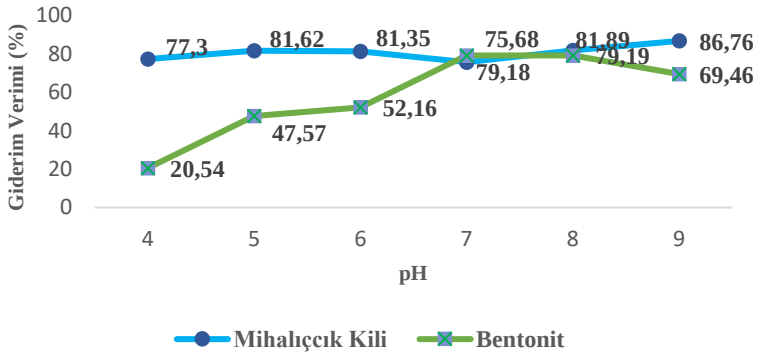
Metilen Mavisi Konsantrasyonu (mg/L)	**660 nm**
0	0
0,625	0,150
1,0	0,206
1,25	0,243
2,0	0,355
2,5	0,429
3,0	0,504
3,5	0,578



Şekil 3.1. Metilen mavisine ait standart eğri

3.2. Başlangıç Çözelti pH'sının Etkisi

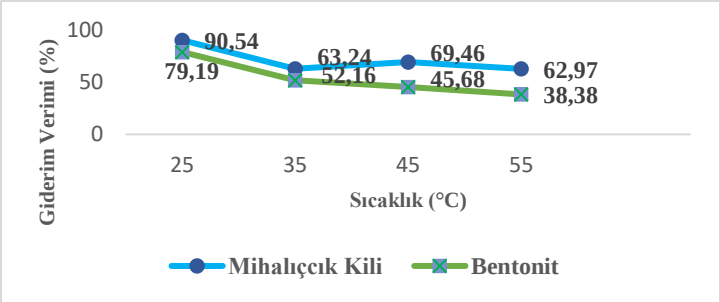
Adsorpsiyon sırasında, adsorpsiyon kapasitesi çözeltinin pH değişikliklerinden yüksek oranda etkilenir (Alkaim ve ark, 2014). pH'nın etkisi belirlenirken 400 mg 100 mL^{-1} Mihalıççık kili ile bentonit 2,5 mg 100mL^{-1} metilen mavisi üzerine kullanılmıştır. Bekleme sürelerinin sonunda 60 saniye askıda kalan kilin çökmesi için santrifüj işlemi uygulanmıştır. pH'nın artmasıyla killerin yüzeyi daha negatif yüklü hale gelip pozitif yüklü boya anyonları ile negatif yüklü adsorpsiyon bölgeleri arasındaki elektrostatik çekim kuvvetlerinin artışına ve bu da boya adsorpsiyonunda yükselmeye neden olmuştur. Mihalıççık kili pH 9'da, bentonit ise pH 8'de maksimum absorbans göstermiştir.



Şekil 3.2. Adsorpsiyon üzerine başlangıç çözelti pH'sının etkisi

Sıcaklık Etkisi

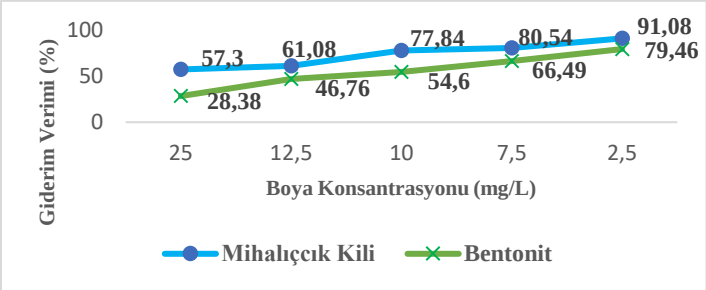
Adsorpsiyon denemeleri 25°C-55°C aralığında farklı sıcaklıklarda gerçekleştirilerek adsorpsiyon verimi açısından uygun sıcaklık değeri tespit edilmeye çalışılmıştır. Sıcaklık artışı durumunda boya giderim veriminin düşük olması nedeni ile her iki kil için de 25°C optimum sıcaklık olarak belirlenmiştir.



Şekil 3.3. Adsorpsiyon üzerine sıcaklığın etkisi

Başlangıç Boya Konsantrasyonunun Etkisi

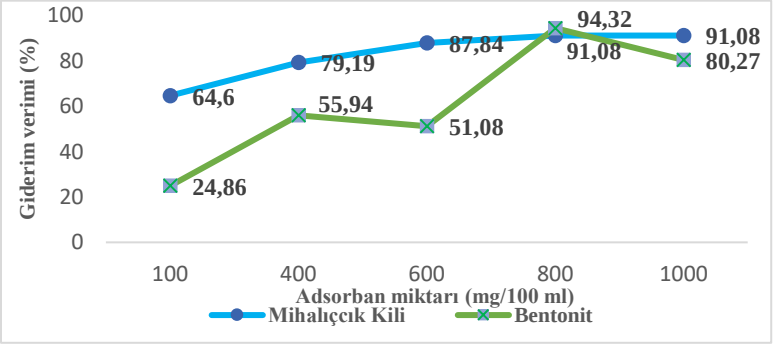
2,5-25 mg L^{-1} aralığında beş farklı konsantrasyonda metilen mavisi çözeltisi için Mihalıççık kili ve bentonit ile oda koşullarında adsorpsiyon denemeleri yapılarak % giderim verimleri hesaplanmıştır. Her iki kilin de yüzeyindeki aktif bölgelerin doygunluğa ulaşmasından dolayı boya konsantrasyonu arttıkça giderim verimi azalmaktadır.



Adsorpsiyon üzerine boya konsantrasyonunun etkisi

Adsorban Miktarının Etkisi

Doğal kil minerallerinin süspansiyon içerisindeki miktarlarının adsorpsiyon verimine etkisi 100-1000 mg 100 ml^{-1} aralığında değişen katı sıvı oranlarında incelenmiştir. Adsorban dozajı 800 mg 100 ml^{-1}'e çıkarıldığında metilen mavisi giderim verimi Mihalıççık kili için %64,6'dan %91,08'e; bentonit için ise %24,86'dan %94,32'ye yükselmiştir.

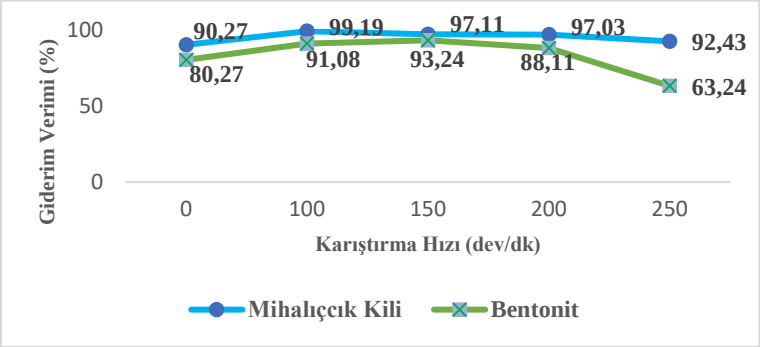


Şekil 3.5. Adsorpsiyon üzerine adsorban miktarının etkisi

Karıştırma Hızının Etkisi

Karıştırma hızı, dış sınır tabakanın yapısını etkilediğinden dolayı adsorpsiyon prosesi için önemli bir değişkendir. Denemeler 0-250 dev dk^{-1} aralığındaki karıştırma hızlarında

gerçekleştirilmiştir. Bu sonuç artan karıştırma hızıyla kil çevresindeki akışkan film kalınlığının azalması ve buna bağlı olarak adsorpsiyon veriminin artması şeklinde açıklanabilir (Bayar, 2018).



Adsorpsiyon üzerine karıştırma hızının etkisi

Adsorpsiyon İzotermleri

Adsorpsiyon izotermleri, sabit sıcaklık ve pH'da adsorban üzerine adsorplanan madde miktarı (q_e, mg g^{-1}) ile çözeltide adsorplanmadan kalan madde konsantrasyonu (C_e, mg L^{-1}) arasındaki denge durumunu ifade eden grafiklerdir (Çelik ve Doğan, 2019). Bu çalışmada yaygın olarak kullanılan Langmuir, Freundlich ve Temkin izoterm modellerinden yararlanılmıştır.

Langmuir İzotermi

Langmuir izoterm modeli (Eşitlik 1), adsorpsiyon dengesiyle ilgili olayları açıklamak için kullanılan bir denklemdir.

Eşitlik 1 $$\frac{Ce}{qe} = \frac{Ce}{qm} + \frac{1}{KL.qm}$$

Bu denklemde, q_e dengede birim adsorplayıcı ağırlığı başına adsorplanan madde miktarını (mg g^{-1}), q_m maksimum adsorpsiyon kapasitesini (mg g^{-1}), C_e dengede adsorplanmadan çözeltide kalan çözünen derişimini (mg L^{-1}), K_L ise Langmuir sabitini (L mg^{-1}) göstermektedir.

Eşitlik 2 $$R_L = \frac{1}{1+KL.C0}$$

Burada C_0 başlangıçtaki boyar madde derişimidir (mg L^{-1}). Bu eşitlikte, Langmuir izoterminden hesaplanan K_L değeri Eşitlik 2' de yerine konularak R_L değeri hesaplanabilir. R_L boyutsuz faktörü olarak isimlendirilir ve adsorbanın elverişliliğini belirlemek için kullanılır. R_L değeri; R_L=1 ise izotermin doğrusal, R_L=0 ise izotermin tersinmez, 0<R_L<1 ise izotermin uygun ve R_L>1 ise izotermin elverişli olmadığını gösterir (Sarısoylu, 2024). Burada, C_e'ye karşı C_e/q_e değerleri doğrusal olarak grafik edilmiş, bu grafiğin eğimi ve kaymasından q_m ve K_L değerleri hesaplanmıştır.

Freundlich İzotermi

İzotermin doğrusal ifadesi Eşitlik 3'te verilmiştir.

Eşitlik 3 $\ln(q_e) = \ln(K_F) + \frac{1}{n}(\ln C_e)$

Burada K_F Freundlich sabiti (L mg^{-1}), C_e dengede adsorplanmadan çözeltide kalan çözünen derişimini (mg L^{-1}), q_e dengede birim adsorplayıcı ağırlığı başına adsorplanan madde miktarını (mg g^{-1}), n ise adsorpsiyon yoğunluğunu ifade etmektedir. n değerinin 1'den büyük olması adsorpsiyonun bu izoterme uyduğunun göstergesi olarak kabul edilir. 0-1 arasındaki n değerleri de genellikle bu izoterm için uygun değer olarak kabul edilebilir. Burada, $\ln C_e$'ye karşı $\ln q_e$ doğrusal olarak grafik edilmiş, bu grafiğin eğimi ve kaymasından K_F ve n değerleri hesaplanmıştır.

Temkin İzotermi

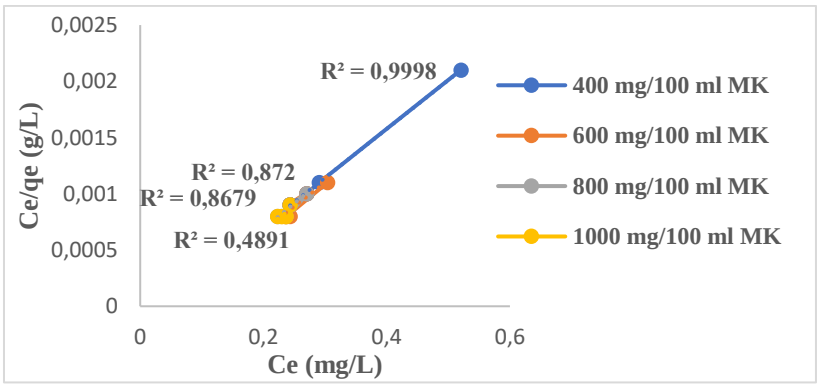
Temkin izoterm modeli (Eşitlik 4), adsorpsiyon prosesinin derecesinin adsorpsiyon ısısının doğrusal olarak azaldığını varsayar (Kocabıyık, 2023).

Eşitlik 4 $q_e = \frac{RT}{b} X \ln(K_T) + \frac{RT}{b} X \ln(C_e)$

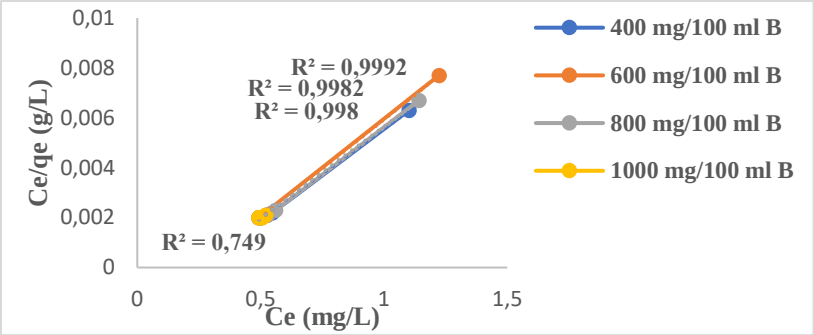
Eşitlik 5 $q_e = B_T.\ln(K_T) + B_T.\ln(C_e)$

Burada, B_T adsorpsiyon ısısı ile ilgili Temkin izoterm sabiti (j mol^{-1}), K_T Temkin izoterm sabitidir (L mg^{-1}). q_e değerleri ln C_e'ye karşı grafiğe geçirildiğinde elde edilen doğrunun y eksenini kesim noktası ln K_T'yi eğimi ise B_T'yi vermektedir

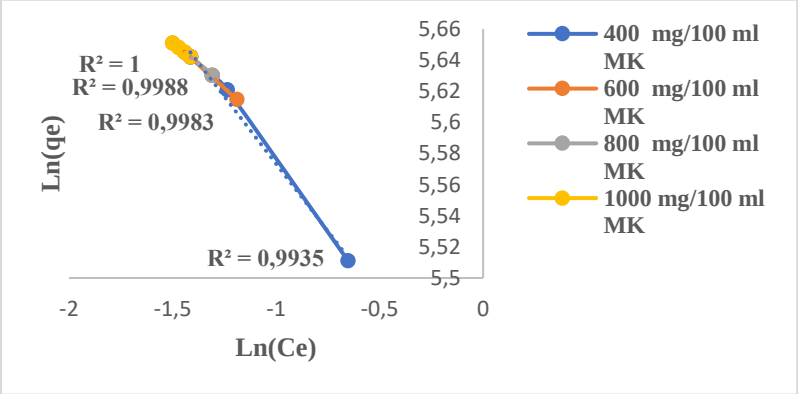
Bu eşitlikler yardımıyla Mihalıççık kili ve bentonite ait izoterm modelleri grafik edilmiştir.



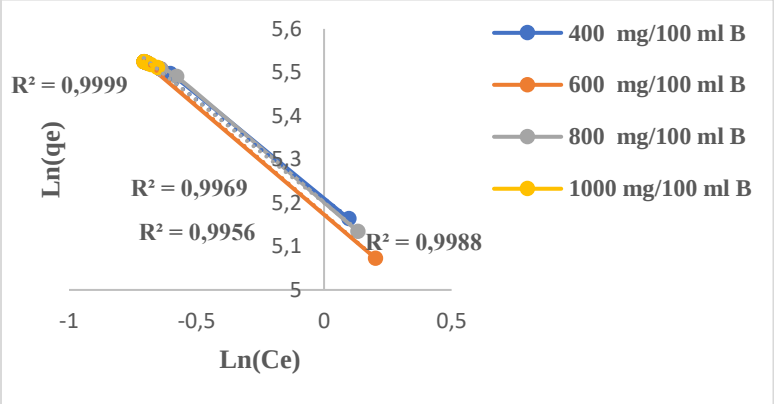
Şekil 3.7.1. Mihalıççık kiline ait Langmuir izoterm grafiği



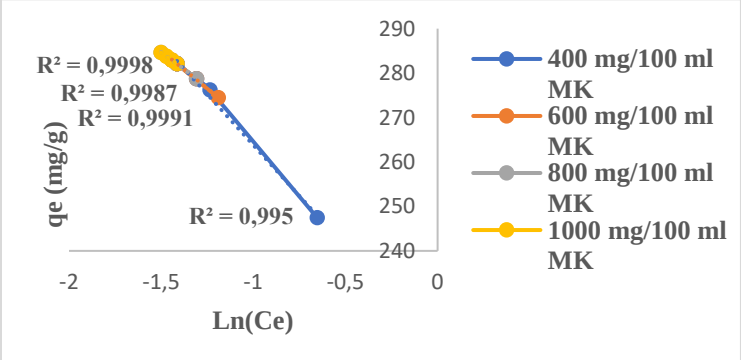
Şekil 3.7.2. Bentonite ait Langmuir izoterm grafiği



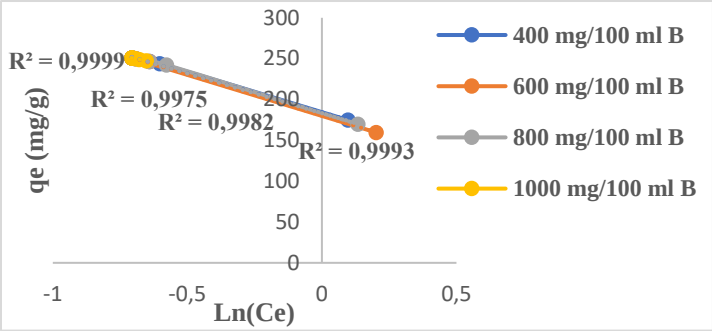
Şekil 3.7.3. Mihalıççık kiline ait Freundlich izoterm grafiği



Şekil 3.7.4. Bentonite ait Freundlich izoterm grafiği



Şekil 3.7.5. Mihalıççık kiline ait Temkin izoterm grafiği



Şekil 3.7.6. Bentonite ait Temkin izoterm grafiği

Bu grafiklerden yararlanılarak Mihalıççık kili ve bentonit için her bir izoterme ait sabitler belirlenmiş ve bu sabitler **Tablo 3.7.1.**'te verilmiştir.

Tablo 3.7.1. Mihalıççık kili ve bentonite ait izoterm sabitleri

İzoterm Modeli	*Mihalıççık Kiline Ait Parametreler*				*Bentonite Ait Parametreler*			
Langmuir	***qm (mg/g)***	***K_L (L/mg)***	***R_L***	***R^2***	***qm (mg/g)***	***K_L (L/mg)***	***R_L***	***R^2***
400 mg/100 ml	*232,5581*	*21,5*	*0,0183*	*0,9998*	*138,8889*	*4,5*	*0,0816*	*0,998*
600 mg/100 ml	*238,0952*	*21,0*	*0,0187*	*0,872*	*126,5823*	*4,1579*	*0,0878*	*0,9992*
800 mg/100 ml	*217,3913*	*23,0*	*0,0171*	*0,8679*	*136,9863*	*4,2941*	*0,0852*	*0,9982*
1000 mg/100 ml	*250,0*	*40,0*	*0,0099*	*0,4891*	*303,0303*	*8,25*	*0,0462*	*0,749*
Freundlich	***n***	***K_F (L/mg)***		***R^2***	***n***	***K_F (L/mg)***		***R^2***
400 mg/100 ml	*5,78*	*0,2215*		*0,9935*	*2,2*	*0,1831*		*0,9969*
600 mg/100 ml	*8,3*	*0,2379*		*0,9983*	*2,0*	*0,1767*		*0,9988*
800 mg/100 ml	*9,22*	*0,2419*		*0,9988*	*2,12*	*0,1813*		*0,9956*
1000 mg/100 ml	*9,74*	*0,2440*		*1*	*3,94*	*0,2097*		*0,9999*
Temkin	**B_T (j/mol)**	**K_T (L/mg)**		**R^2**	**B_T (j/mol)**	**K_T (L/mg)**		**R^2**
400 mg/100 ml	45,743	0,0085		0,9950	95,541	0,1451		0,9982
600 mg/100 ml	33,62	0,0009		0,9991	100,93	0,1679		0,9993
800 mg/100 ml	30,861	0,0004		0,9987	97,5	0,1528		0,9975
1000 mg/100 ml	29,115	0,0003		0,9998	63,222	0,0384		0,9999

Adsorpsiyon Kinetiği

Deneysel verileri farklı kinetik modellere uydurmak, adsorpsiyon hızını, prosesin modelini ve adsorban/adsorbat arasındaki etkileşimin fiziksel mi yoksa kimyasal mı olduğu hakkında tahmini bilgileri incelememizi sağlar. Bu çalışmada yalancı birinci mertebe ve yalancı ikinci mertebe olmak üzere iki farklı kinetik model kullanılmıştır (Çelik ve Doğan, 2019).

Yalancı Birinci Mertebe Hız Eşitliği

Eşitlik 6 $\log(qe - qt) = \log qe - \frac{k1}{2,303} t$

Burada, q_e (mg g^{-1}) dengedeki adsorpsiyon kapasitesi, q_t (mg g^{-1}) herhangi bir t süresindeki adsorpsiyon kapasitesi, k_1 (dk^{-1}) yalancı birinci mertebe hız sabitidir.

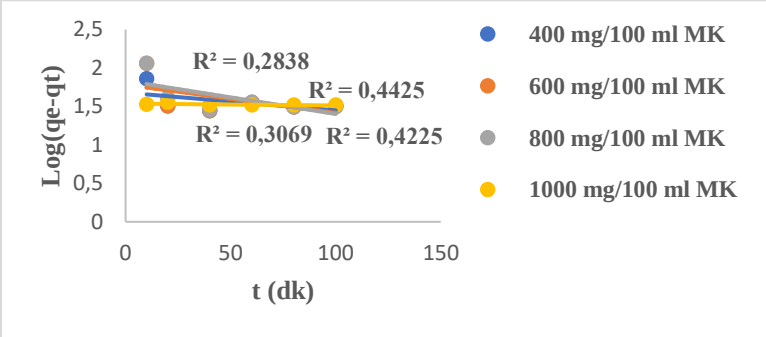
Burada, t'ye karşı log (q_e-q_t) değerleri dört farklı konsantrasyon için grafik edilmiş, doğrunun eğimi ve kaymasından k_1 ve q_e değerleri hesaplanmıştır.

Yalancı İkinci Mertebe Hız Eşitliği

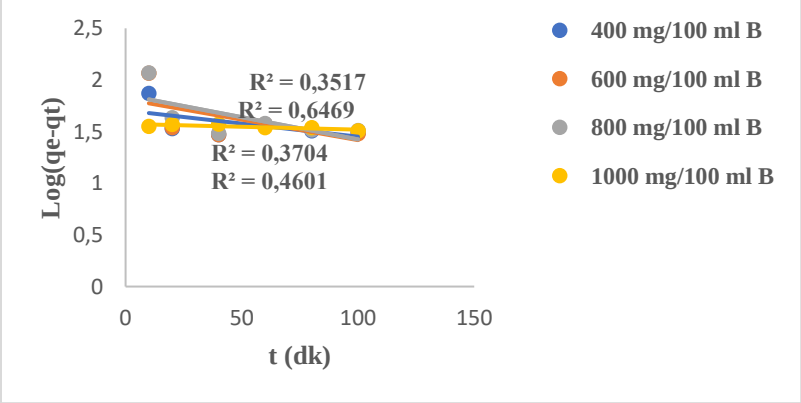
Eşitlik 7 $\frac{t}{qt} = \frac{1}{(k2qe^2)} + \frac{1}{qe} X\, t$

Burada, q_e (mg g^{-1}) dengedeki adsorpsiyon kapasitesi, q_t (mg g^{-1}) herhangi bir t süresindeki adsorpsiyon kapasitesi, k_2 (g mg^{-1} dk^{-1}) yalancı ikinci mertebe hız sabitidir.

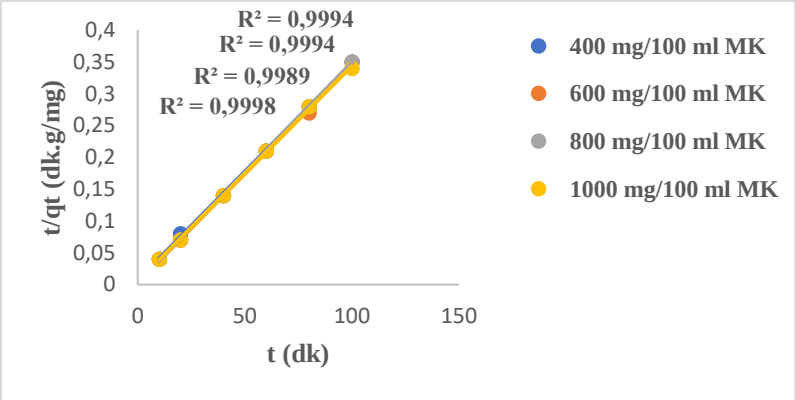
Burada, t'ye karşı, t/q_t değerleri dört farklı konsantrasyon için grafik edilmiş, doğrunun eğimi ve kaymasından k_2 ve q_e değerleri hesaplanmıştır. Mihalıççık kili ve bentonite ait kinetik parametreleri **Tablo 3.8.1** 'te sunulmuştur.



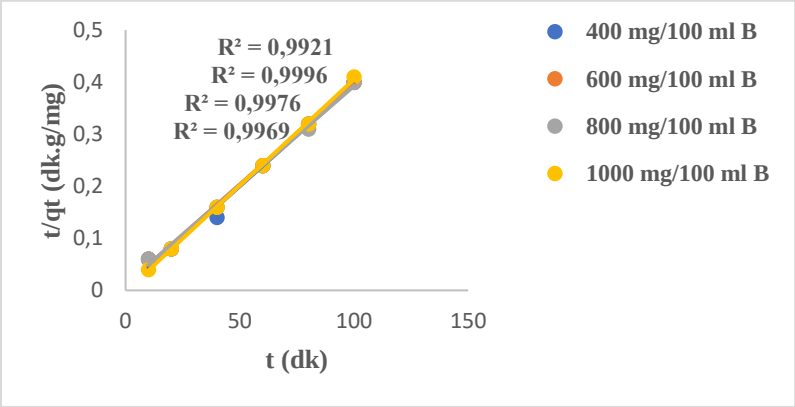
Şekil 3.8.1. Mihalıççık kiline ait yalancı birinci mertebe kinetik model



Şekil 3.8.2. Bentonite ait yalancı birinci mertebe kinetik model



Şekil 3.8.3. Mihalıççık kiline ait yalancı ikinci mertebe kinetik model



Şekil 3.8.4. Bentonite ait yalancı ikinci mertebe kinetik model

Tablo 3.8.1. Mihalıççık kili ve bentonite ait birinci ve ikinci mertebe kinetik parametreleri

	Yalancı Birinci Mertebe Kinetik Model				Yalancı İkinci Mertebe Kinetik Model			
Mihalıççık kili	**k_1 (dk^{-1})**	**$q_{e\ hesap.}$**	**$q_{e\ deney.}$**	**R^2**	**k_2 ($mg.g^{-1}.dk^{-1}$)**	**$q_{e\ hesap}$**	**$q_{e\ deney}$**	**R^2**
400 mg/100 ml	0,0023	1,6798	247,4625	0,2838	0,0034	0,007	247,4625	0,9994
600 mg/100 ml	0,0037	1,7833	274,4875	0,3069	0,0034	0,0033	274,4875	0,9989
800 mg/100 ml	0,0043	1,8339	284,625	0,4425	0,0035	0,0026	284,625	0,9998
1000 mg/100 ml	0,0002	1,5374	284,625	0,4225	0,0034	0,005	284,625	0,9994
Bentonit	**k_1 (dk^{-1})**	**$q_{e\ hesap.}$**	**$q_{e\ deney.}$**	**R^2**	**k_2 ($mg.g^{-1}.dk^{-1}$)**	**$q_{e\ hesap}$**	**$q_{e\ deney}$**	**R^2**
400 mg/100 ml	0,0025	1,7051	174,825	0,3517	0,0039	0,0051	174,825	0,9921
600 mg/100 ml	0,004	1,8137	159,625	0,3704	0,0039	0,0104	159,625	0,9976
800 mg/100 ml	0,0043	1,8548	169,7625	0,4601	0,0038	0,0112	169,7625	0,9969
1000 mg/100 ml	0,0006	1,5744	250,85	0,6469	0,0041	0,0024	250,85	0,9996

Burada Mihalıççık kili ve bentonite ait birinci ve ikinci mertebe korelasyon katsayıları incelendiğinde, ikinci mertebe kinetik model korelasyon katsayılarının yüksek olması dolayısı ile metilen mavisinin Mihalıççık kili ve bentonit üzerine adsorpsiyonunun yalancı ikinci mertebeden kinetik modele uygun olduğu gözlenmiştir. Deneysel olarak elde edilen qe değerlerinin hesaplanan qe değerleriyle uyumsuz olduğu saptanmıştır.

Termodinamik Analizler

Termodinamik analizler 25°C, 35°C, 45°C ve 55°C olmak üzere dört farklı sıcaklıkta gerçekleştirilmiştir. Standart serbest entalpi değişimi (ΔG°), entalpi değişimi (ΔH°) ve entropi değişimi (ΔS°) gibi termodinamik değişkenler, aşağıdaki eşitlikler yardımıyla hesaplanmıştır.

Eşitlik 8 $KD = \frac{qe}{Ce}$

Burada K_D (dağılım katsayısı), adsorban yüzeyinin ilgisini ortaya koyar. Gibbs serbest enerjisi Eşitlik 9 kullanılarak bulunmuş ve Tablo 3.9.1'de sunulmuştur.

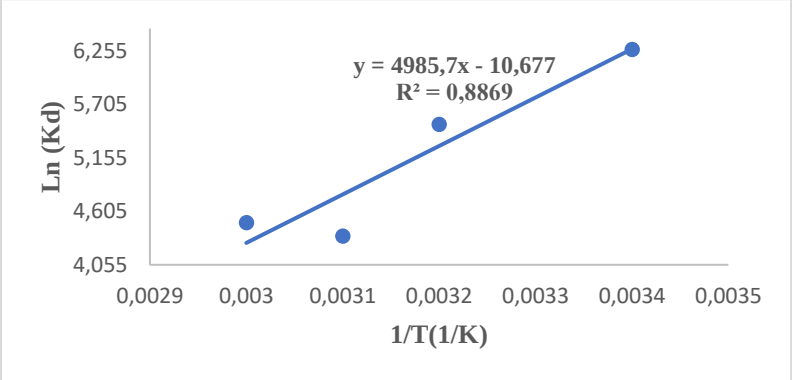
Eşitlik 9 $\Delta G° = -RTlnKD$

ΔH° ve ΔS° değerleri Eşitlik 10 (Van't Hoff eşitliği) kullanılarak bulunmuştur.

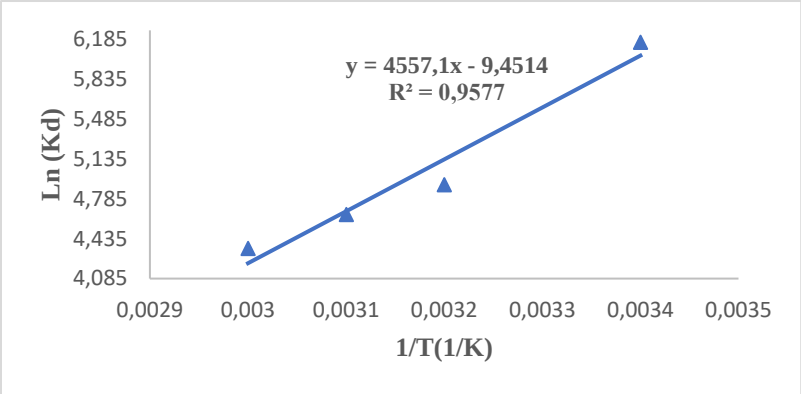
Eşitlik 10 $lnKD = \frac{\Delta S°}{R} - \frac{\Delta H°}{RT}$

Burada, R (8,314 j mol^{-1} K^{-1}), gaz sabiti ve T (K), mutlak sıcaklıktır.

Burada 1/T'ye karşı lnK_D doğrusal olarak grafik edilmiş (**Şekil 3.9.1 ve Şekil 3.9.2**), elde edilen doğrunun eğimi ve kaymasından ise ΔH° ve ΔS° değerleri bulunmuştur (**Tablo 3.9.1**).



Şekil 3.9.1. Mihalıççık kiline ait Van't Hoff eşitliği grafiği



Şekil 3.9.2. Bentonite ait Van't Hoff eşitliği grafiği

Tablo 3.9.1. Mihalıççık kili ve bentonite ait termodinamik parametreler

Mihalıççık kili	**T (°C)**	**ΔH° (kj/mol)**	**ΔS° (kj/mol.K)**	**ΔG° (kj/mol)**
	25	-41,45	-0,0888	-15,53
	35	-41,45	-0,0888	-14,08
	45	-41,45	-0,0888	-11,5
	55	-41,45	-0,0888	-12,24
Bentonit	**T (°C)**	**ΔH° (kj/mol)**	**ΔS° (kj/mol.K)**	**ΔG° (kj/mol)**
	25	-37,89	-0,0786	-15,26
	35	-37,89	-0,0786	-12,57
	45	-37,89	-0,0786	-12,29
	55	-37,89	-0,0786	-11,86

Tablo 3.9.1 'deki değişkenleri incelediğimizde;

ΔH° (kj/mol) < 0 olması, prosesin ekzotermik olduğunu ve düşük sıcaklıkların adsorpsiyonun lehine olduğunu, ΔG° (kj/mol) değerlerinin negatif olması adsorpsiyonun kendiliğinden gerçekleştiğini göstermektedir. Literatürde adsorpsiyon işlemi ΔG° (kj/mol) değeri -80 ile -400 kj/mol arasında ise kimyasal adsorpsiyon, -20 ile 0 kj/mol arasında ise fiziksel adsorpsiyon olarak tanımlanır. Bu çalışmada ΔG° (kj/mol) değerinin her iki kil için de -20 ile 0 arasında olması, prosesin fiziksel adsorpsiyon olarak gerçekleştiğini göstermektedir. Negatif ΔS° (kj/mol.K) değerleri ise adsorpsiyon işlemi sırasında entropinin

azaldığını, mihalıççık kili ve bentonit ile metilen mavisi arasındaki hızlı bir etkileşimi ve sıcaklığın artışıyla spontan eğilimin azaldığını göstermektedir.

SONUÇ

Yapılan çalışmada Mihalıççık kili ve bentonit kullanılarak metilen mavisi boyar maddesinin adsorpsiyonu incelenmiştir. Mihalıççık kili için pH 9, 25°C sıcaklık, 100 dev dk^{-1} karıştırma hızı, 2,5 mg L^{-1} boya konsantrasyonu, 800 mg 100 ml^{-1} adsorban ile en optimum koşullar için adsorpsiyon prosesi maksimum giderim veriminin %99,19 olduğu, maksimum adsorpsiyon kapasitesinin 250 mg g^{-1} olduğu belirlenmiştir. Bentonit için ise pH 8, 25°C sıcaklık, 150 dev dk^{-1} karıştırma hızı, 2,5 mg L^{-1} boya konsantrasyonu, 800 mg 100 ml^{-1} adsorban ile en optimum koşullar için adsorpsiyon prosesi maksimum giderim veriminin %94,32 olduğu, maksimum adsorpsiyon kapasitesinin 303,0303 mg g^{-1} olduğu tespit edilmiştir. Deneysel verilere Langmuir, Freundlich ve Temkin izoterm modelleri uygulanmıştır. Metilen mavisinin Mihalıççık kili ve bentonit üzerindeki adsorpsiyon kinetiğinin Yalancı ikinci mertbebe kinetik model ile ifade edildiği görülmüştür. Termodinamik analizler, prosesin ekzotermik olduğunu, kendiliğinden gerçekleştiğini ve fiziksel adsorpsiyon olduğunu göstermiştir. Elde edilen deney sonuçlarına göre hem Mihalıççık kili hem de bentonitin metilen mavisi boyar maddesinin adsorpsiyonu için verimli olduğu, boya giderim çalışmalarındaki etkinliği, çevrecil ve ekonomik olması sebebiyle tercih edilebileceği söylenebilir.

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TOZ AKTİF KARBON VE BENTONİTLE SULU ÇÖZELTİLERDE METİLEN MAVİSİ GİDERİMİ

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ÖZET
Tekstil sanayisi atık sularının içermiş olduğu yoğun kirlilik ciddi bir tehlike arz etmiştir. Özellikle içeriğinde selüloz bulunan malzemelerin boyanması işleminde kullanılan metilen mavisinin atık sulardan giderimi üzerinde önemle durulması gereken bir konudur. Bu çalışmada toz aktif karbon ve bentonit kullanılmıştır. pH, sıcaklık, karıştırma hızı, boyar madde konsantrasyonu ve adsorban miktarının metilen mavisi adsorpsiyonu üzerine etkisi incelenmiştir. Farklı sıcaklıklarda izoterm çalışmaları yapılmıştır. Adsorpsiyon davranışı üç ana izoterm modeli yardımıyla incelenmiştir. En yüksek adsorpsiyon verimlilik değeri toz aktif karbon ile %99,73 iken bentonit ile %94,32 olarak tespit edilmiştir. Adsorpsiyon kinetiği ve termodinamik analizler gerçekleştirilmiştir. Hesaplanan verilere ve elde edilen grafiklere göre adsorpsiyon reaksiyon mertebesinin yalancı ikinci mertebeden olduğu tespit edilmiştir. Adsorpsiyon verilerinin termodinamik analizi incelenmiştir. Denge sabiti, Gibbs serbest enerjisi, entalpi ve entropi değişim değerleri hesaplanmıştır.
Anahtar Kelimeler: Toz aktif karbon, Bentonit, Metilen mavisi, Adsorpsiyon

METHYLENE BLUE REMOVAL IN AQUEOUS SOLUTIONS WITH POWDERED ACTIVATED CARBON AND BENTONITE

ABSTRACT
Wastewater from the textile sector is extremely polluted, which is extremely dangerous. Important attention needs to be paid in particular to the removal of methylene blue from wastewater, which is used to dye products made of cellulose. In this study, bentonite and powdered activated carbon were utilised. We looked at how methylene blue adsorption was affected by pH, temperature, stirring speed, dye concentration and amount of adsorbent. Studies using isotherms were conducted at various temperatures. The three primary isotherm models were used to study adsorption behaviour. The highest values of adsorption efficiency were found to be 94.32% with bentonite and 99.73% with powdered activated carbon.Adsorption kinetics and thermodynamic analyzes were carried out. According to the calculated data and the obtained graphs, it was determined that the adsorption reaction order was pseudo second order. Thermodynamic analysis of adsorption data was examined. Equilibrium constant, Gibbs free energy, enthalpy and entropy change values were calculated.
Keywords: Powder activated carbon, Bentonite, Methylene blue, Adsorption

GİRİŞ

Endüstriyel gelişmenin ve sanayileşmenin hızlı olması dünyada pek çok ülkede çevre ile ilgili ciddi sorunları beraberinde getirmiştir. Artan çevresel kirlilikler çevrenin özümseme kapasitesinden daha fazla yük oluşmasına sebep olmaktadır. Kentleşme ve sanayileşmenin bir sonucu olarak gelişmekte olan ülkelerde su kirliliği, su kaynaklarının sürdürülebilirliği (Afroz, 2017) ve insan sağlığı (Akhtar ve ark, 2021) üzerinde etkili olan ciddi bir sorun haline gelmiştir. Bu çalışmada tekstil atık sularının çevreye salınmadan önce boyar maddelerin uzaklaştırılmasında kullanılan metotlardan biri olan adsorpsiyon tekniği toz aktif karbon ve bentonit ile metilen mavisi giderimi üzerine gerçekleştirilmiştir.

MATERYAL VE YÖNTEM

Bu çalışmada adsorban olarak toz aktif karbon ve bentonit, adsorbat olarak metilen mavisi kullanılmıştır. Çözeltiler stok çözelti üzerinden seyreltilerek kullanılmıştır. Metilen mavisi stok çözeltisi için 2,5 mgL^{-1}'lik çözelti hazırlanmıştır. Adsorpsiyon çalışmaları 100; 400; 600; 800 ve 1000 mg $100ml^{-1}$ konsantrasyon, 25°C; 35°C; 45°C; 55°C sıcaklık, 4; 5; 6; 7; 8 ve 9 pH değerlerinde yürütülmüştür. Santrifüj işlemi ile ayırma gerçekleştirilen çözeltilerde adsorplanmadan kalan madde miktarı UV-VIS spektrofotometresi ile belirlenmiştir.

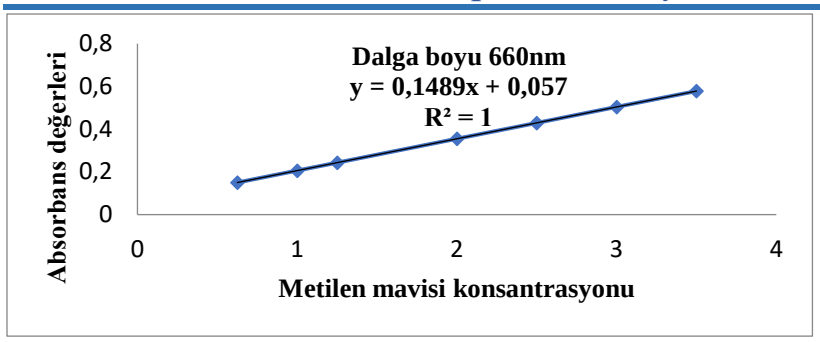
BULGULAR VE TARTIŞMA

Adsorpsiyon Çalışmaları

660 nm dalga boyunda absorbans bandı bulunmuştur. Tüm ölçümler 660 nm'de yapılmıştır.

Tablo 3.1. Farklı konsantrasyonlardaki metilen mavisinin 660 nm'de ölçülen absorbans değerleri

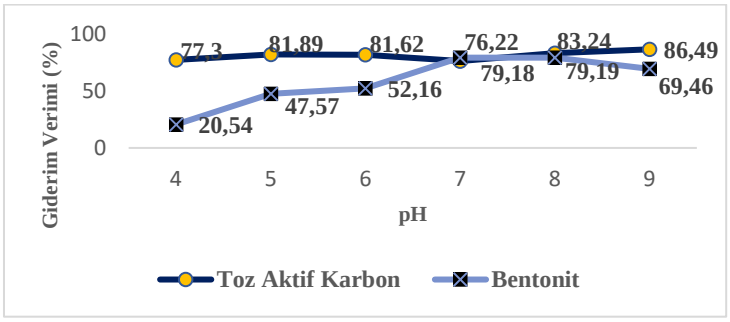
Metilen Mavisi Konsantrasyonu (mg/L)	660 nm
0	0
0,625	0,150
1,0	0,206
1,25	0,243
2,0	0,355
2,5	0,429
3,0	0,504
3,5	0,578



Şekil 3.1. Metilen mavisine ait standart eğri

Başlangıç Çözelti pH'sının Etkisi

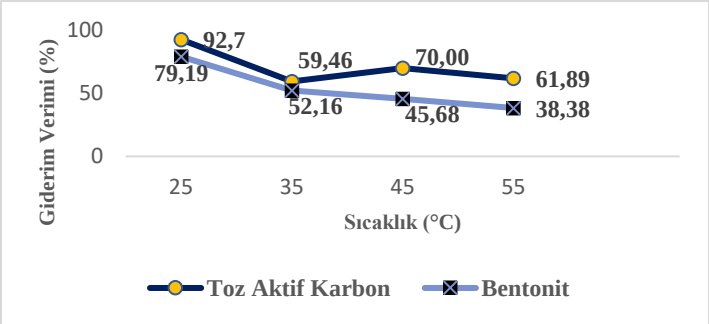
Asidite ve alkalinite değişkenleri endüstriyel bazlı atık suların kirliliğini gidermede arıtım verimini etkileyen önemli parametreler arasında yer almaktadır. pH değeri adsorpsiyon prosesinde önemli bir göstergedir. Bu çalışmada pH aralığı 4-9 olarak seçilmiş ve denemeler bu değişken aralıkta gerçekleştirilmiştir. pH'nın etkisi belirlenirken 400 mg 100 mL^{-1} Mihalıççık kili ile bentonit 2,5 mg 100 mL^{-1} metilen mavisi üzerine kullanılmıştır. Bekleme sürelerinin sonunda 60 saniye askıda kalan toz aktif karbon ve kilin çökmesi için santrifüj işlemi uygulanmıştır. pH'nın artmasıyla adsorbanların yüzeyi daha negatif yüklü hale gelip pozitif yüklü boya anyonları ile negatif yüklü adsorpsiyon bölgeleri arasındaki elektrostatik çekim kuvvetlerinin artışına ve bu da boya adsorpsiyonunda artışa yol açmıştır. Maksimum absorbansın gerçekleştiği pH değerleri toz aktif karbon için pH 9, bentonit için pH 8 olarak belirlenmiştir.



Şekil 3.2. Adsorpsiyon üzerine başlangıç çözelti pH'sının etkisi

Sıcaklık Etkisi

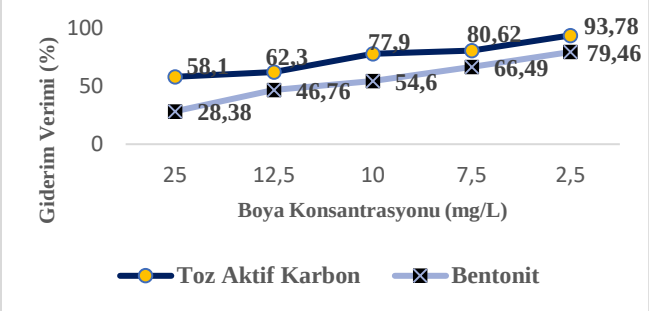
25°C; 35°C; 45°C ve 55°C'de gerçekleştirilen denemeler ile boya giderimi açısından verimliliğin en etkin olduğu sıcaklık belirlenmeye çalışılmıştır. Hem toz aktif karbon hem de bentonit için uygun sıcaklık 25°C olarak tespit edilmiştir.



Şekil 3.3. Adsorpsiyon üzerine sıcaklığın etkisi

Başlangıç Boya Konsantrasyonunun Etkisi

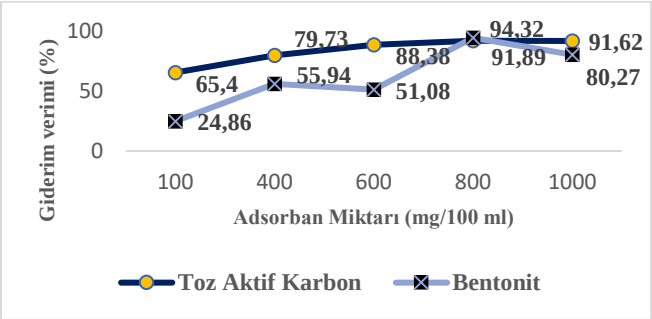
Metilen mavisi çözeltilerinin 2,5-25 mg L^{-1} değer aralığındaki derişimlerinde denemeler yapılarak giderim verimleri hesaplanmıştır. Hem aktif karbonun hem de bentonitin yüzey aktif bölgelerinin doygunluğa ulaşması dolayısıyla metilen mavisi konsantrasyonu artttıkça giderim veriminde düşüş gözlenmiştir.



Şekil 3.4. Adsorpsiyon üzerine boya konsantrasyonunun etkisi

Adsorban Miktarının Etkisi

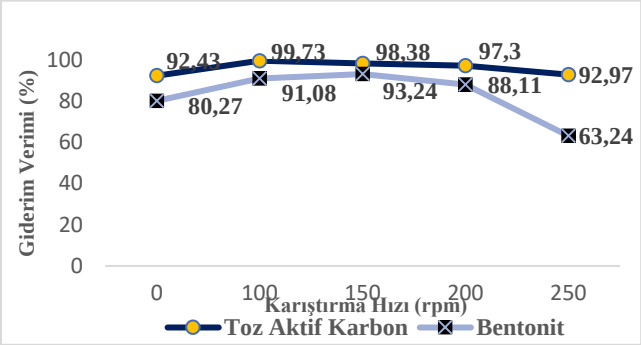
100-1000 mg 100 ml^{-1} aralığında değişen konsantrasyonlara sahip toz aktif karbon ve bentonit çözeltilerinde adsorban miktarının değişiminin giderim verimi üzerine etkisi incelenmiştir. Adsorban dozajı 800 mg 100 ml^{-1}'e çıkarıldığında metilen mavisi giderim verimi toz aktif karbonda %91,89'a bentonitte ise %94,32'ye yükselmiştir.



Şekil 3.5. Adsorpsiyon üzerine adsorban miktarının etkisi

Karıştırma Hızının Etkisi

Adsorpsiyon denemeleri 0-250 dev dk^{-1} aralığında beş farklı değer kullanılarak gerçekleştirilmiştir. Deneme sonuçları incelendiğinde, karıştırma hızının artış göstermesi ile boya giderim veriminde önemli bir artışın meydana gelmediği tespit edilmiştir.



Şekil 3.6. Adsorpsiyon üzerine karıştırma hızının etkisi

Adsorpsiyon İzotermleri

Adsorpsiyon izotermleri, sabit sıcaklık ve pH'da adsorban üzerine adsorplanan madde miktarı (q_e, mg g^{-1}) ile çözeltide adsorplanmadan kalan madde konsantrasyonu (C_e, mg L^{-1}) arasındaki denge durumunu ifade eden grafiklerdir (Çelik and Doğan,2019). Bu çalışmada yaygın olarak kullanılan Langmuir, Freundlich ve Temkin izoterm modellerinden yararlanılmıştır.

Langmuir İzotermi

Langmuir izoterm modeli (Eşitlik 1), adsorpsiyon dengesiyle ilgili olayları açıklamak için kullanılan bir denklemdir.

Eşitlik 1 $$\frac{Ce}{qe} = \frac{Ce}{qm} + \frac{1}{KL.qm}$$

Bu denklemde, q_e dengede birim adsorplayıcı ağırlığı başına adsorplanan madde miktarını (mg g^{-1}), q_m maksimum adsorpsiyon kapasitesini (mg g^{-1}), C_e dengede adsorplanmadan çözeltide kalan çözünen derişimini (mg L^{-1}), K_L ise Langmuir sabitini (L mg^{-1}) göstermektedir.

Eşitlik 2 $$R_L = \frac{1}{1+KL.C0}$$

Burada C_0 başlangıçtaki boyar madde derişimidir (mg L^{-1}). Bu eşitlikte, Langmuir izoterminden hesaplanan K_L değeri Eşitlik 2' de yerine konularak R_L değeri hesaplanabilir. R_L boyutsuz faktörü olarak isimlendirilir ve adsorbanın elverişliliğini belirlemek için kullanılır. R_L değeri; R_L=1 ise izotermin doğrusal, R_L=0 ise izotermin tersinmez, 0<R_L<1 ise izotermin uygun ve R_L>1 ise izotermin elverişli olmadığını gösterir (Sarısoylu, 2024).

Burada, C_e'ye karşı C_e/q_e değerleri doğrusal olarak grafik edilmiş, bu grafiğin eğimi ve kaymasından qm ve K_L değerleri hesaplanmıştır.

Freundlich İzotermi

İzotermin doğrusal ifadesi Eşitlik 3'te verilmiştir.

Eşitlik 3 $\ln(q_e) = \ln(K_F) + \frac{1}{n}(\ln C_e)$

Burada K_F Freundlich sabiti (L mg^{-1}), C_e dengede adsorplanmadan çözeltide kalan çözünen derişimini (mg L^{-1}), q_e dengede birim adsorplayıcı ağırlığı başına adsorplanan madde miktarını (mg g^{-1}), n ise adsorpsiyon yoğunluğunu ifade etmektedir. n değerinin 1'den büyük olması adsorpsiyonun bu izoterme uyduğunun göstergesi olarak kabul edilir. 0-1 arasındaki n değerleri de genellikle bu izoterm için uygun değer olarak kabul edilebilir. Burada, $\ln C_e$'ye karşı lnqe doğrusal olarak grafik edilmiş, bu grafiğin eğimi ve kaymasından K_F ve n değerleri hesaplanmıştır.

Temkin İzotermi

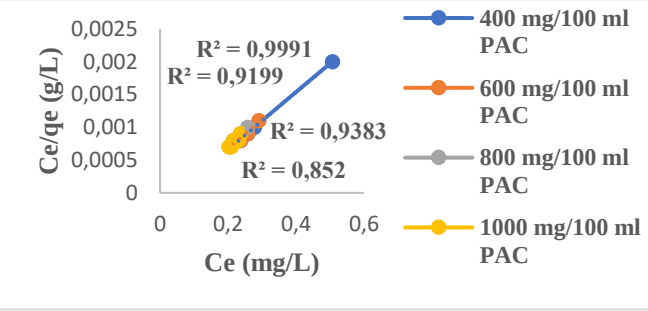
Temkin izoterm modeli (Eşitlik 4), adsorpsiyon prosesinin derecesinin adsorpsiyon ısısının doğrusal olarak azaldığını varsayar (Kocabıyık, 2023).

Eşitlik 4 $q_e = \frac{RT}{b} X \ln(K_T) + \frac{RT}{b} X \ln(C_e)$

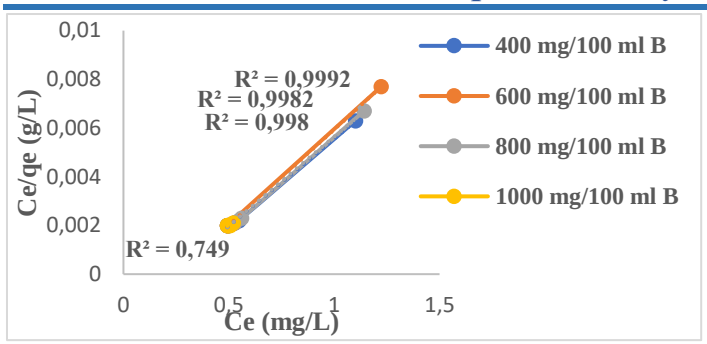
Eşitlik 5 $q_e = B_T.\ln(K_T) + B_T.\ln(C_e)$

Burada, B_T adsorpsiyon ısısı ile ilgili Temkin izoterm sabiti (j mol^{-1}), K_T Temkin izoterm sabitidir (L mg^{-1}). q_e değerleri ln C_e'ye karşı grafiğe geçirildiğinde elde edilen doğrunun y eksenini kesim noktası $\ln K_T$'yi eğimi ise B_T'yi vermektedir

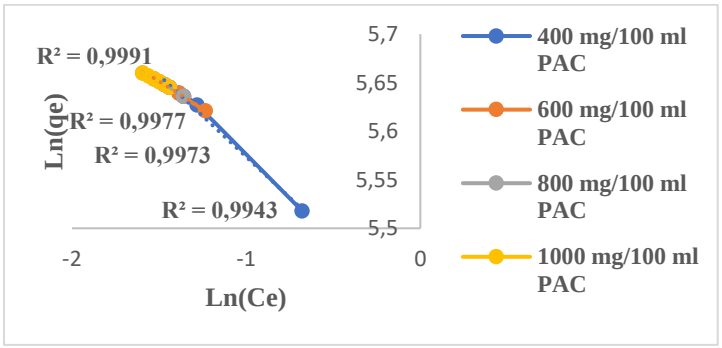
Bu eşitlikler yardımıyla toz aktif karbon ve bentonite ait izoterm modelleri grafik edilmiştir.



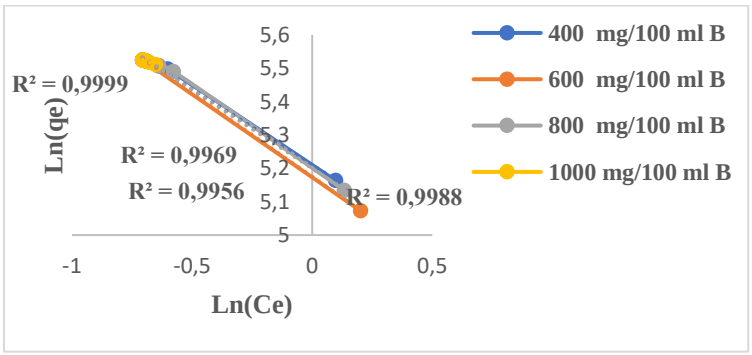
Şekil 3.7.1. Toz aktif karbona ait Langmuir izoterm grafiği



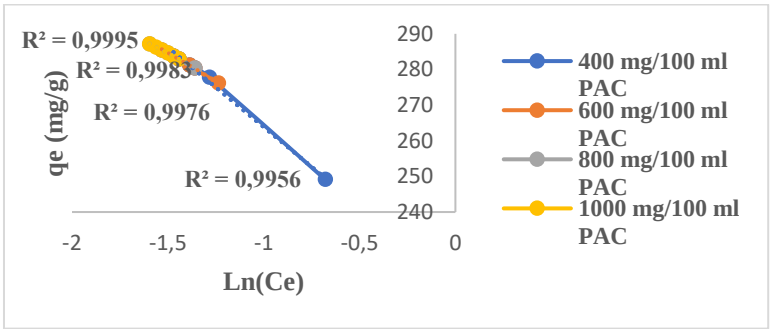
Şekil 3.7.2. Bentonite ait Langmuir izoterm grafiği



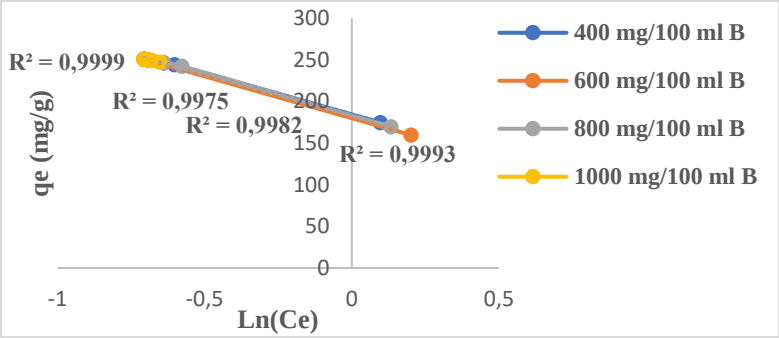
Şekil 3.7.3. Toz aktif karbona ait Freundlich izoterm grafiği



Şekil 3.7.4. Bentonite ait Freundlich izoterm grafiği



Şekil 3.7.5. Toz aktif karbona ait Temkin izoterm grafiği



Şekil 3.7.6. Bentonite ait Temkin izoterm grafiği

Bu grafiklerden yararlanılarak toz aktif karbon ve bentonit için her bir izoterme ait sabitler belirlenmiş ve bu sabitler **Tablo** 3.7.1.'te verilmiştir.

Tablo 3.7.1. **Toz aktif karbon ve bentonite ait izoterm sabitleri**

İzoterm Modeli	*Toz Aktif Karbona Ait Parametreler*				*Bentonite Ait Parametreler*			
Langmuir	***qm (mg/g)***	***K_L (L/mg)***	***R_L***	***R^2***	***qm (mg/g)***	***K_L (L/mg)***	***R_L***	***R^2***
400 mg/100 ml	*227,2727*	*22,0*	*0,0179*	*0,9991*	*138,8889*	*4,5*	*0,0816*	*0,998*
600 mg/100 ml	*232,5581*	*21,5*	*0,0183*	*0,9199*	*126,5823*	*4,1579*	*0,0878*	*0,9992*
800 mg/100 ml	*185,1852*	*13,5*	*0,0288*	*0,9383*	*136,9863*	*4,2941*	*0,0852*	*0,9982*
1000 mg/100 ml	*181,8182*	*13,75*	*0,0283*	*0,852*	*303,0303*	*8,25*	*0,0462*	*0,749*
Freundlich	***n***	***K_F (L/mg)***		***R^2***	***n***	***K_F (L/mg)***		***R^2***
400 mg/100 ml	*5,95*	*0,2226*		*0,9943*	*2,2*	*0,1831*		*0,9969*
600 mg/100 ml	*8,90*	*0,2406*		*0,9973*	*2,0*	*0,1767*		*0,9988*
800 mg/100 ml	*9,92*	*0,2446*		*0,9977*	*2,12*	*0,1813*		*0,9956*
1000 mg/100 ml	*10,41*	*0,2464*		*0,9991*	*3,94*	*0,2097*		*0,9999*
Temkin	**B_T (j/mol)**	**K_T (L/mg)**		**R^2**	**B_T (j/mol)**	**K_T (L/mg)**		**R^2**
400 mg/100 ml	44,614	0,0073		0,9956	95,541	0,1451		0,9982
600 mg/100 ml	31,514	0,0005		0,9976	100,93	0,1679		0,9993
800 mg/100 ml	28,611	0,0002		0,9983	97,5	0,1528		0,9975
1000 mg/100 ml	27,398	0,0001		0,9995	63,222	0,0384		0,9999

Adsorpsiyon Kinetiği

Adsorpsiyon veriminin değerlendirilmesi amacıyla toz aktif karbon ve bentonit kullanılarak metilen mavisi gideriminin kinetik olarak incelemesi için yalancı birinci mertebe kinetik

model ve yalancı ikinci mertebe kinetik modellerinin hız eşitliklerinden yararlanılmıştır (Kaykıoğlu, 2016).

Yalancı Birinci Mertebe Hız Eşitliği.

Eşitlik 6 $\log(qe - qt) = \log qe - \frac{k1}{2{,}303} t$

Burada, q_e (mg g^{-1}) dengedeki adsorpsiyon kapasitesi, q_t (mg g^{-1}) herhangi bir t süresindeki adsorpsiyon kapasitesi, k_1 (dk^{-1}) yalancı birinci mertebe hız sabitidir.

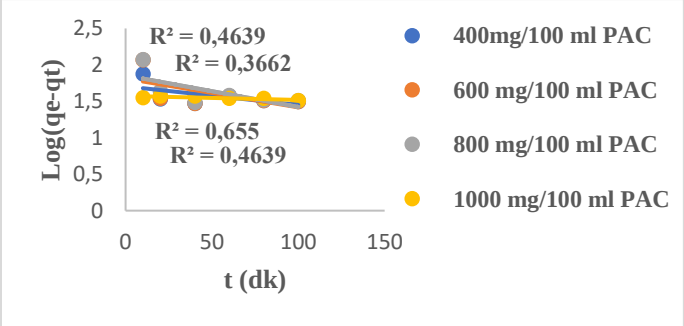
Burada, t'ye karşı log (q_e-q_t) değerleri dört farklı konsantrasyon için grafik edilmiş, doğrunun eğimi ve kaymasından k_1 ve q_e değerleri hesaplanmıştır.

Yalancı İkinci Mertebe Hız Eşitliği.

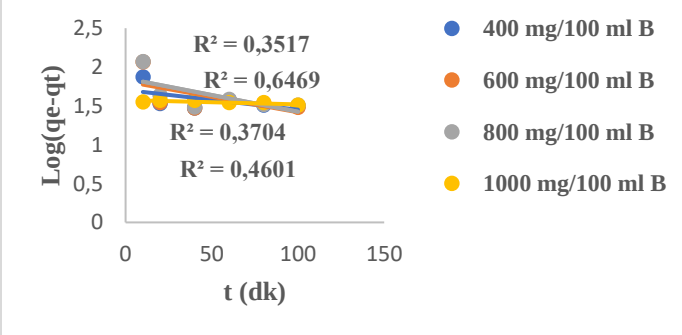
Eşitlik 7 $\frac{t}{qt} = \frac{1}{(k2qe^2)} + \frac{1}{qe} X\, t$

Burada, q_e (mg g^{-1}) dengedeki adsorpsiyon kapasitesi, q_t (mg g^{-1}) herhangi bir t süresindeki adsorpsiyon kapasitesi, k_2 (g mg^{-1} dk^{-1}) yalancı ikinci mertebe hız sabitidir.

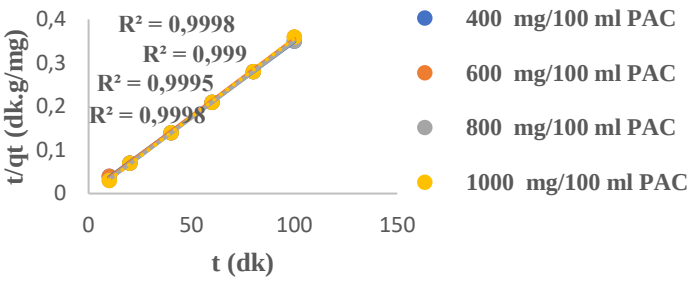
Burada, t'ye karşı, t/q_t değerleri dört farklı konsantrasyon için grafik edilmiş, doğrunun eğimi ve kaymasından k_2 ve q_e değerleri hesaplanmıştır. Toz aktif karbon ve bentonite ait yalancı birinci mertebe ve yalancı ikinci mertebe kinetik parametreleri **Tablo 3.8.1**'de sunulmuştur.



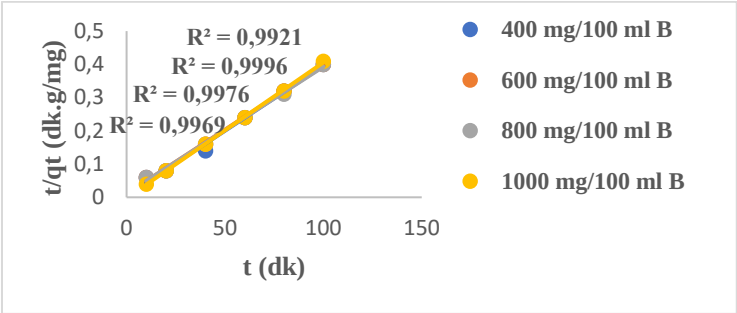
Şekil 3.8.1. **Toz aktif karbona ait yalancı birinci mertebe kinetik model**



Şekil 3.8.2. **Bentonite ait yalancı birinci mertebe kinetik model**



Şekil 3.8.3. **Toz aktif karbona ait yalancı ikinci mertebe kinetik model**



Şekil 3.8.4. **Bentonite ait yalancı ikinci mertebe kinetik model**

Tablo 3.8.1. Toz aktif karbon ve bentonite ait birinci ve ikinci mertebe kinetik parametreleri

	Yalancı Birinci Mertebe Kinetik Model				Yalancı İkinci Mertebe Kinetik Model			
Toz Aktif Karbon	**k_1 (dk^{-1})**	**q_e hesap.**	**$q_{e\ deney.}$**	**R^2**	**k_2 ($mg.g^{-1}.dk^{-1}$)**	**q_e hesap**	**$q_{e\ deney}$**	**R^2**
400 mg/100 ml	0,0026	1,70554	249,15	0,3538	0,0035	0,0026	249,15	0,9998
600 mg/100 ml	0,0039	1,81188	276,1875	0,3662	0,0035	0,0002	276,1875	0,999
800 mg/100 ml	0,0043	1,85553	287,1625	0,4639	0,0035	0,0026	287,1625	0,9998
1000 mg/100 ml	0,0006	1,57444	286,3125	0,655	0,0036	0,005	286,3125	0,9995
Bentonit	**k_1 (dk^{-1})**	**q_e hesap.**	**$q_{e\ deney.}$**	**R^2**	**k_2 ($mg.g^{-1}.dk^{-1}$)**	**q_e hesap**	**$q_{e\ deney}$**	**R^2**
400 mg/100 ml	0,0025	1,70511	174,825	0,3517	0,0039	0,0051	174,825	0,9921
600 mg/100 ml	0,004	1,81137	159,625	0,3704	0,0039	0,0104	159,625	0,9976
800 mg/100 ml	0,0043	1,85548	169,7625	0,4601	0,0038	0,0112	169,7625	0,9969
1000 mg/100 ml	0,0006	1,57444	250,85	0,6469	0,0041	0,0024	250,85	0,9996

Burada toz aktif karbon ve bentonite ait birinci ve ikinci mertebe korelasyon katsayıları incelendiğinde, ikinci mertebe kinetik model korelasyon katsayılarının yüksek olması dolayısı ile metilen mavisinin toz aktif karbon ve bentonit üzerine adsorpsiyonunun yalancı ikinci mertebeden kinetik modele uygun olduğu gözlenmiştir. Deneysel olarak elde edilen qe değerlerinin hesaplanan qe değerleriyle uyumsuz olduğu saptanmıştır.

3.9. Termodinamik Analizler

Termodinamik analizler 25°C, 35°C, 45°C ve 55°C olmak üzere dört farklı sıcaklıkta gerçekleştirilmiştir. Standart serbest entalpi değişimi (ΔG°), entalpi değişimi (ΔH°) ve entropi değişimi (ΔS°) gibi termodinamik değişkenler, aşağıdaki eşitlikler yardımıyla hesaplanmıştır.

Eşitlik 8 $$KD = \frac{qe}{Ce}$$

Burada K_D (dağılım katsayısı), adsorban yüzeyinin ilgisini ortaya koyar. Gibbs serbest enerjisi Eşitlik 9 kullanılarak bulunmuş ve Tablo 3.9.1'de sunulmuştur.

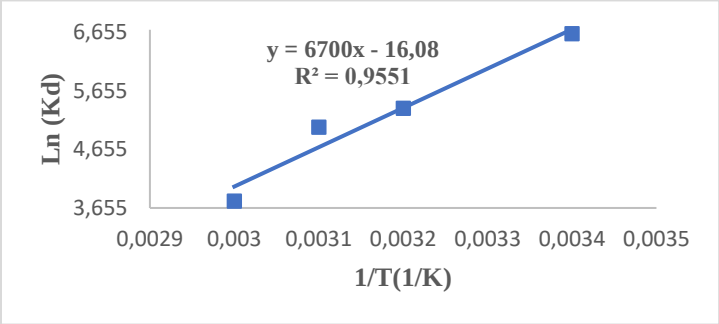
Eşitlik 9 $\Delta G° = -RTlnKD$

ΔH° ve ΔS° değerleri Eşitlik 10 (Van't Hoff eşitliği) kullanılarak bulunmuştur.

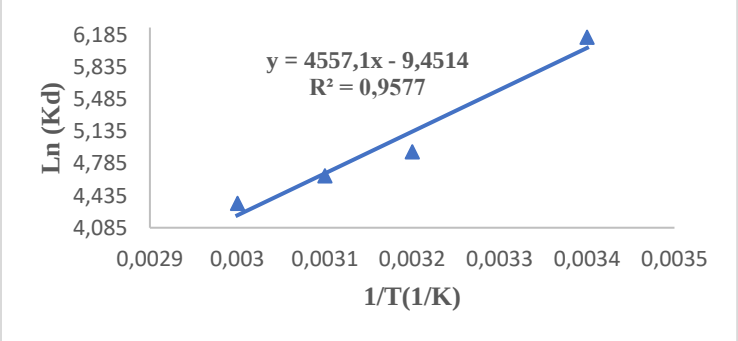
Eşitlik 10 $lnKD = \frac{\Delta S°}{R} - \frac{\Delta H°}{RT}$

Burada, R (8,314 j mol^{-1} K^{-1}), gaz sabiti ve T (K), mutlak sıcaklıktır.

Burada 1/T'ye karşı lnK_D doğrusal olarak grafik edilmiş (**Şekil** 3.9.1 **ve Şekil** 3.9.2), elde edilen doğrunun eğimi ve kaymasından ise ΔH° ve ΔS° değerleri bulunmuştur (**Tablo 3.9.1**).



Şekil 3.9.1. **Toz aktif karbona ait Van't Hoff eşitliği grafiği**



Şekil 3.9.2**. Bentonite ait Van't Hoff eşitliği grafiği**

Tablo 3.9.1. Toz aktif karbon ve bentonite ait termodinamik parametreler

Toz aktif karbon	**T (°C)**	**ΔH° (kj/mol)**	**ΔS° (kj/mol.K)**	**ΔG° (kj/mol)**
	25	-55,70	-0,1337	-16,4
	35	-55,70	-0,1337	-13,7
	45	-55,70	-0,1337	-13,3
	55	-55,70	-0,1337	-10,28
Bentonit	**T (°C)**	**ΔH° (kj/mol)**	**ΔS° (kj/mol.K)**	**ΔG° (kj/mol)**
	25	-37,89	-0,0786	-15,26
	35	-37,89	-0,0786	-12,57
	45	-37,89	-0,0786	-12,29
	55	-37,89	-0,0786	-11,86

Tablo 3.9.1 'deki parametreleri incelersek negatif ΔH° (kj/mol) değerleri bize adsorpsiyonun doğasının ekzotermik olduğunu gösterir. Toz aktif karbon ve bentonite ait ΔS° (kj/mol.K)

değerleri sırasıyla -0, 1337 ve -0, 0786 olarak bulunmuştur. Negatif ΔS° (kj/mol.K) değerleri adsorpsiyon sırasında katı/çözelti ara yüzeyinde düzensizliğin azaldığını göstermektedir (Erşan ve Düğenci, 2024). Negatif ΔG° (kj/mol) değerleri çalışmanın yürütüldüğü sıcaklıklarda adsorpsiyonun kendiliğinden gerçekleşebileceğini ve sıcaklık arttıkça bu eğilimin de arttığını ortaya koymaktadır.

SONUÇ

Yapılan çalışmada katyonik bir boyar madde olan metilen mavisinin atık sulardan uzaklaştırılması amacıyla toz aktif karbon ve bentonit kullanımı ile adsorpsiyon prosesinin verimi incelenmiştir. Toz aktif karbon için pH 9, 25°C sıcaklık, 100 dev dk^{-1} karıştırma hızı, 2,5 mg L^{-1} boya konsantrasyonu, 800 mg 100 ml^{-1} adsorban ile en optimum şartlar için adsorpsiyon prosesi giderim veriminin %99,73 olduğu, maksimum adsorpsiyon kapasitesinin ise 227,2727 mg g^{-1} olduğu belirlenmiştir. Bentonit için pH 8, 25°C sıcaklık, 150 dev dk^{-1} karıştırma hızı, 2,5 mg L^{-1} boya konsantrasyonu, 800 mg 100 ml^{-1} adsorban ile en optimum şartlar için adsorpsiyon prosesi giderim veriminin %94,32 olduğu, maksimum adsorpsiyon kapasitesinin 303,0303 mg g^{-1} olduğu tespit edilmiştir. Metilen mavisinin adsorpsiyon kinetiği toz aktif karbon kullanıldığında da bentonit kullanıldığında da ikinci mertebe kinetik model ile iyi bir şekilde tanımlanmıştır. Termodinamik incelemeler neticesinde, aktif karbon ve bentonit üzerindeki metilen mavisi adsorpsiyonunun spontane ve ekzotermik olduğu gözlenmiştir. Tüm bu veriler ışığında, sulu çözeltilerde metilen mavisi boyar maddesinin giderilmesinde toz aktif karbon ve bentonitin etkili bir adsorban olarak kullanılabileceği, atık sulardan kirleticileri yüksek performansla uzaklaştırabileceği söylenebilir.

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GRAPHENE-BASED ACOUSTIC AND OPTICAL SENSORS FOR ALCOHOL DETECTION

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ABSTRACT
This study investigates the sensing capabilities of graphene synthesized through chemical vapor deposition (CVD) to detect a spectrum of volatile organic compounds (VOCs) with a specific focus on alcohols using the conventional surface plasmon resonance (SPR) and quartz crystal microbalance (QCM) technique. Two custom sensing devices were engineered, each tailored for QCM and SPR transducing mechanisms, utilizing CVD-graphene as the sensing element. Raman spectroscopy was employed to characterize the CVD-graphene film, revealing predominantly single-layer graphene composition with minimal defects. Consistent and reproducible responses were observed from the sensor across various concentrations of ethanol, methanol, propanol, and acetone. Significantly, both sensors display a slightly higher sensitivity to acetone, featuring a sensitivity value of 460×10^{-3} ppm^{-1} and a limit of detection (LOD) of 6.52 ppm. Results suggest that the adsorption of tested molecules on the CVD-graphene surface correlates with their increasing dipole moments and vapor pressure values. Overall, the utilization of CVD-graphene in the SPR and QCM approach showcases good reproducibility for detecting ultralow alcohol concentrations at room temperature. The precise detection of alcohol molecules holds significant importance in various fields such as healthcare, safety, and environmental monitoring. Graphene's remarkable properties make it an ideal candidate for enhancing sensor performance and advancing applications in these critical domains.
Keywords: CVD-Graphene, VOC sensor, surface plasmon resonance (SPR), quartz crystal microbalance (QCM)

Introduction

Exposure to volatile organic compounds (VOCs) poses health risks, highlighting the need for their detection and monitoring in both industrial and domestic settings [1]. Additionally, precise and rapid detection of alcohol is crucial in law enforcement, forensics, chemical industries and health sector.

Traditionally, two main methods are used for alcohol detection: gas chromatography [2,3], mass spectrometry and solid-state sensors, including metal-oxide semiconductors [4,5], electrochemical methods [6], and photoionization detection [7]. While GC-MS offers accurate analysis, its bulky equipment limits its practicality for real-time applications. Solid-state sensors, though portable, lack sufficient selectivity among VOCs. In response to this challenge, researchers have explored alternative transducing principles, including capacitive [8], electrochemical [9], surface acoustic wave [10], optical [11], and gravimetric [12] methods. These methodologies leverage innovative materials such as nanostructured metal oxides, carbon-based nanomaterials, and hybrid nanostructures to improve both selectivity and sensitivity of VOC detection systems.Among the range nanomaterials applicable for gas sensing applications, graphene has garnered significant attention due to its remarkable sensitivity, versatile transduction properties, and easily modifiable chemical and physical characteristics [13,14]. The large surface area and π-electron system of graphene contribute to its strong affinity for VOCs, while defect sites and functional groups further enhance this affinity. Interactions between graphene and VOCs involve hydrogen bonding, Van der Waals forces, and charge transfer mechanisms, collectively influencing its suitability for VOC detection across diverse environments[15,16].In this study, CVD-graphene is integrated onto appropriate substrates using conventional Quartz Crystal Microbalance (QCM) and Surface Plasmon Resonance (SPR) sensing approaches to investigate its sensing performance against VOCs, with a specific focus on alcohols (ethanol, methanol, and propanol) and a ketone (acetone), utilizing two distinct transducing principles.

Sensor fabrication

Commercially purchased CVD-graphene was utilized to construct two types of sensors: one featuring a graphene-coated QCM and the other with graphene-coated SPR on a glass substrate coated with a thin layer of gold (50 nm thick).The fabrication process, outlined in Fig. 1, commences by applying a layer of poly-methyl-methacrylate (PMMA) onto a monolayer of CVD graphene on a copper foil using spin-coating. This approximately 400 nm thick PMMA layer acts as a supportive medium, facilitating the transfer of the graphene film onto the target substrates. Prior the transfer, however, the graphene on the opposite side

of the foils is eliminated using a mild O_2/Ar plasma etch.Afterward, the copper foil with the PMMA support layer is immersed in a solution of ammonium persulfate (25 g/L), which dissolves the copper foil, freeing the graphene attached to the support layer. The floating graphene/PMMA membrane is then transferred onto a silicon/silicon dioxide (Si/SiO_2) substrate and subsequently onto a water surface to rinse off any copper and etchant residues. Following the rinsing process, the membrane is moved onto the final substrate (QCM or SPR) and allowed to air-dry. To enhance the graphene's adhesion to the substrates, the substrate with the PMMA/graphene membrane is subjected to baking at 130 °C for 10 minutes. The PMMA film is then removed from the substrates by soaking them in an acetone bath for two hours. Finally, the substrates are rinsed in isopropyl alcohol (IPA) and gently dried using a nitrogen gun.

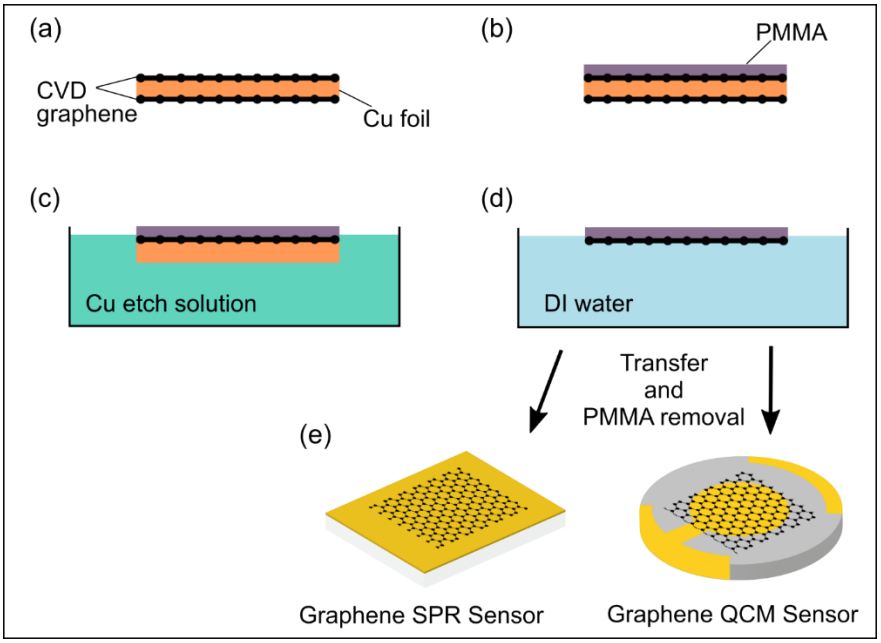


Fig.1 Fabrication process flow of the graphene sensors

Assessing the structural and electronic attributes of CVD-graphene on copper foil was conducted through Raman spectroscopy using a 532 nm laser excitation on the Renishaw inVia system. The evaluation of the graphene's structural attributes, such as layer numbers and the film's integrity, are derived from the shapes, intensities, and positions of the characteristic Raman peaks—D, G, and 2D bands [17]. The Raman spectrum of graphene, as shown in Fig. 2, displays a minimal D peak and a single Lorentzian 2D peak with a full width at half maximum (FWHM) below 40 cm^{-1}. This observation indicates that the graphene films predominantly consist of single-layer graphene with few defects, as confirmed by Raman spectroscopy.

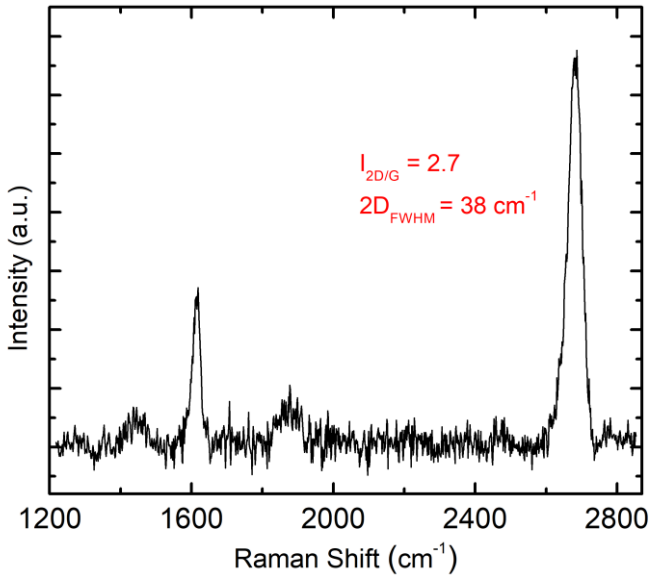


Fig.2 Raman spectrum of graphene on copper foil

Two distinct sensing devices were fabricated, both utilizing CVD-graphene as the main sensing element, and their responses to different volatile compounds were extensively studied. A meticulous preparation of different concentrations of volatile compounds, focusing particularly on alcohols such as ethanol, methanol, and propanol, along with a ketone, acetone. Subsequently, the sensor devices were subjected to detailed examination using Quartz Crystal Microbalance (QCM) measurements and Surface Plasmon Resonance (SPR) systems. This approach allowed for a comprehensive understanding of the sensor responses to these volatile compounds.

Results and Discussions

In QCM sensors, the increase in mass resulting from adsorption demonstrates a linear relationship with the oscillation frequency change (Δf), as quantified by the established Sauerbrey Equation [18].

In contrast, SPR sensing relies on changes in refractive index to achieve label-free detection and real-time monitoring of molecular interactions [19]. Unlike QCM sensing, which primarily detects mass changes near the sensor surface, SPR excels in its sensitivity to alterations in refractive index at the interface between the sensing material and the surrounding medium [20].The data presented in Fig. 3a and Fig. 3b capture the reactions of QCM and SPR sensors, both coated with graphene, to saturated vapor concentrations. In the initial 120 seconds, the gas cell is filled with fresh air, during which both sensors exhibit a steady baseline resonance frequency. The introduction of organic vapor molecules into the gas cell triggers an immediate and pronounced increase in both sensors, a change that represents the adsorption of these molecules onto the graphene layer. At the 240-second

mark, fresh air is reintroduced, causing the baseline resonance frequency to revert to its original state. This demonstrates the sensors' capacity to respond reversibly to various vapor types.

Defect sites in graphene play a pivotal role in gas detection. These imperfections, which include oxidation defect sites and free bonds, are scattered both along the edges and throughout the basal plane of the graphene [21]. These defects, often created during the synthesis of CVD graphene or transfer process, encompass (C=O), (CO), (OC=O), and (OH) [22]. Defect sites interact with vapors, predominantly through weak forces such as hydrogen bonds or Van der Waals interactions [23,24].

The data in Fig. 3 reveals a reversible and relatively swift response, suggesting that the primary mode of vapor adsorption on the graphene structure is physical. This includes interactions such as Van der Waals forces, charge-transfer, and the formation of hydrogen bonds via functional groups on the graphene surface, like oxygen-containing groups [24].Interestingly, acetone was the compound to which both sensor types were most sensitive, even more so than to the alcohol groups. The sensitivity in descending order, is: acetone > ethanol > methanol > propanol.

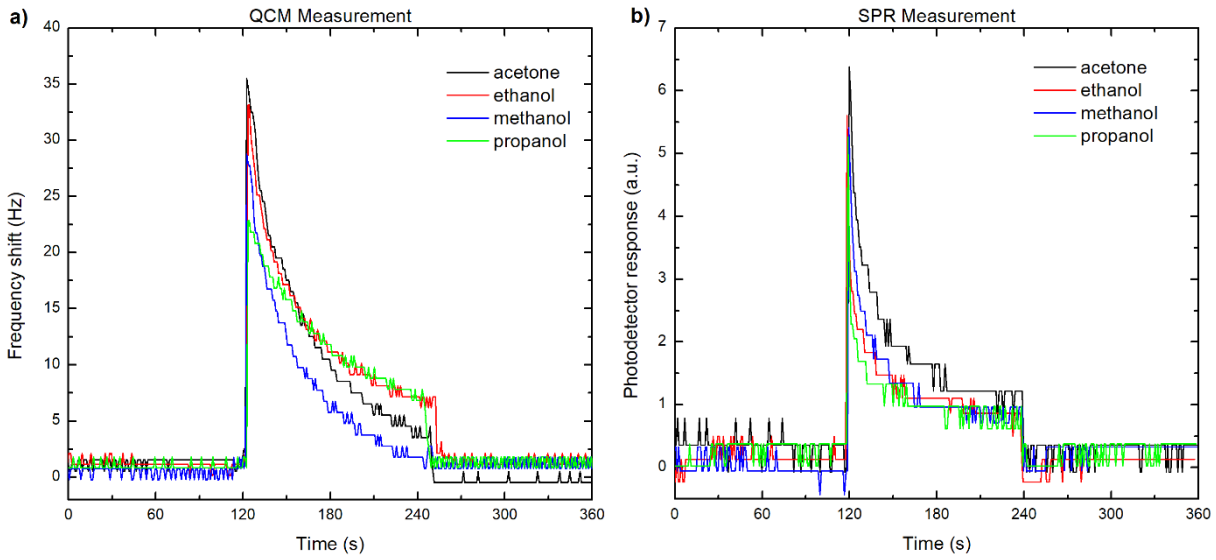


Fig. 3 Reversible response of graphene-coated QCM and SPR sensors to saturated vapor concentrations. a) Kinetic results of the graphene-coated QCM sensor, b) Kinetic results of the graphene-coated SPR sensor.The sensitivity of the graphene-coated sensors to the tested vapors may be primarily affected by two factors: the dipole moment and the vapor pressure of the molecules. The dipole moment, which is the more influential of the two, results from the molecule's polar nature, allowing for dipole-induced dipole interactions with the

graphene. This interaction is particularly strong in the case of acetone, which possesses a substantial dipole moment that enhances its adsorption onto the graphene surface. Additionally, higher vapor pressure may lead to a stronger sensor response. The vapor pressures of the tested molecules, listed from highest to lowest, are: acetone > methanol > ethanol > propanol.Fig. 4 captures the time-resolved behavior of the graphene-coated QCM sensor under increasing methanol concentrations. The graph demonstrates a direct correlation between the vapor concentration and the frequency shift. As vapor concentrations increase, there is a corresponding greater mass loading on the sensor surface. Consequently, this leads to an elevated change in the resonance frequency of the QCM sensor. The inset of the graph on the other hand highlights the sensor's consistent response to repeated exposures to the same concentration of methanol vapor. To ensure the reliability of these findings, the same procedure was applied to other VOCs, confirming the sensor's consistent response across different substances.

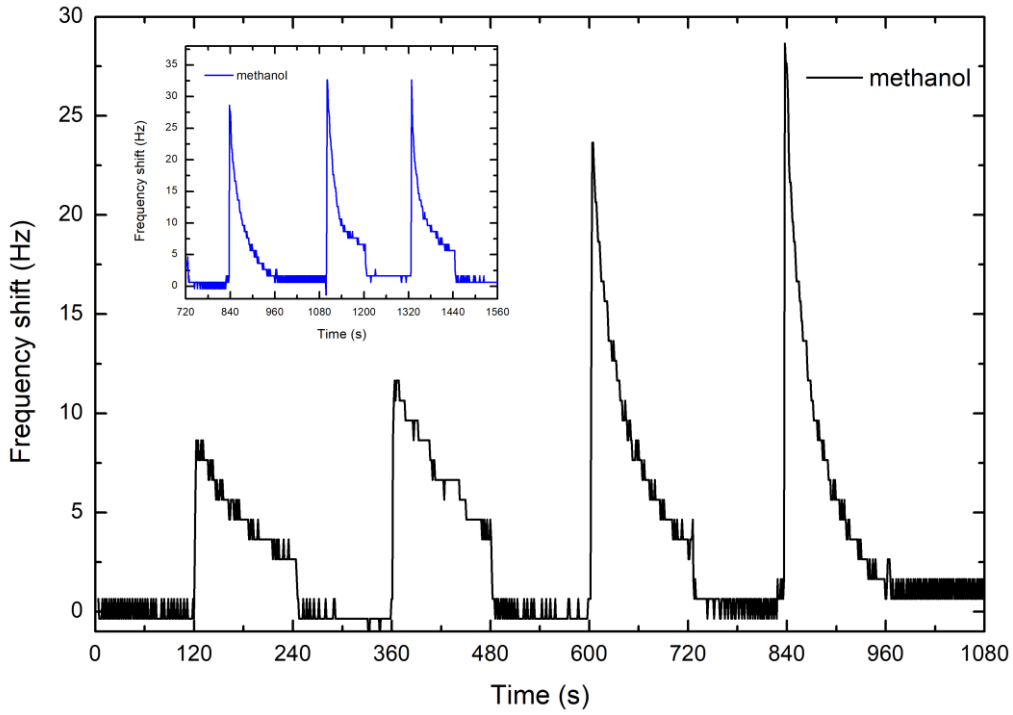


Fig. 4 The graphene-coated SPR sensor was continuously monitored as it exhibited linearity in response to varying concentrations of methanol vapor: 25%, 50%, 75%, and 100%. The inset displays the transient response curve of the sensor to the saturated concentration of methanol, highlighting its repeatability.

For the graphene-coated Surface Plasmon Resonance (SPR) sensor, the limit of detection (LOD), is calculated as the ratio of the standard deviation (σ), which is 0.001, to the sensitivity (S) [25]. The sensor's sensitivity was determined by analyzing the slope of the

calibration curve presented in Fig. 5, which illustrates the SPR sensor's response to varying concentrations of acetone vapor.

To determine the vapor concentration, the formula

$$c = \frac{24.055\ \rho\ V}{M\ V_0} x10^6$$

is employed, where ρ represents the density of acetone vapor, V denotes the injected vapor volume into the gas cell, M stands for the molecular weight of the vapor, and V_0 represents the volume of the gas cell. Similarly, the sensitivity of the CVD-graphene-coated SPR sensor to other VOCs was computed. The findings are outlined in Table 1.

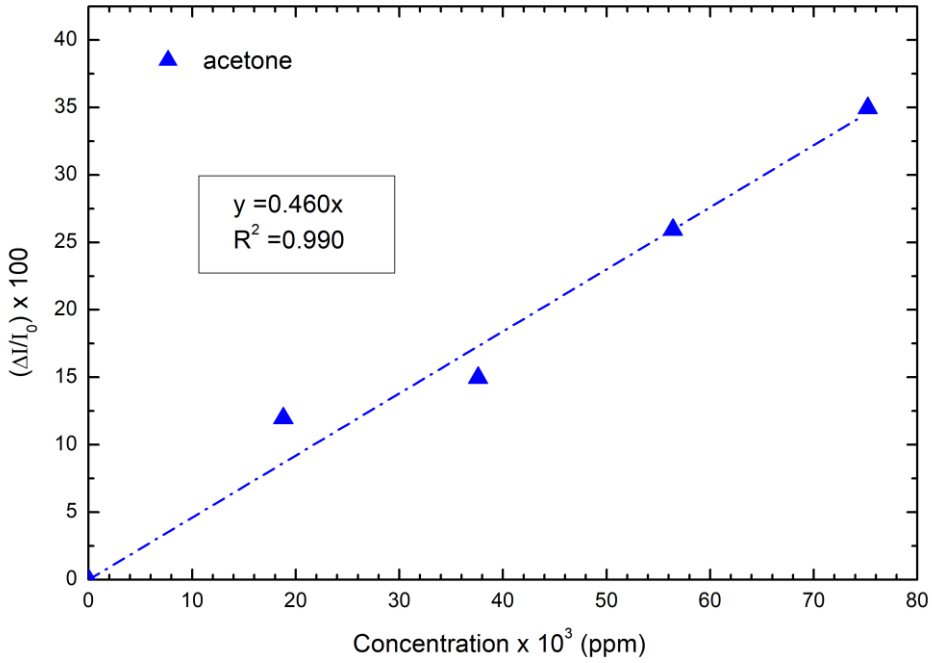


Fig. 5 Graphene-SPR sensor's calibration curve for various concentrations of acetone vapor

Because of its elevated dipole moment, acetone demonstrated superior sensitivity ($0.460x10^{-3}$ ppm^{-1}) and the lowest limit of detection (LOD) value (6.52 ppm) on the graphene-coated SPR sensor compared to the vapors of the alcohol groups, which exhibited sensitivity and LOD values that were closely aligned.

Table 1. The sensitivity and LOD values for the vapors tested on the graphene-coated SPR sensor

Organic vapor	**Sensitivity (x 10^{-3} ppm^{-1})**	**LOD (ppm)**
Acetone	0.460	6.52
Ethanol	0.315	9.50
Methanol	0.271	11.05
Propanol	0.278	10.76

1. Conclusion

In this study, two separate sensing methodologies, QCM and SPR, were utilized to conduct a comprehensive analysis of the detection capabilities of CVD-graphene for various alcohol vapors and acetone. Tailored sensor devices were developed for each detection technique, integrating CVD-graphene as the sensing material. These graphene-based sensors demonstrated reliable and repeatable performance across different vapor concentrations.

Particularly, acetone was identified as the vapor to which both sensor types were most responsive, with the graphene-coated SPR sensor showing a sensitivity of 0.460×10^{-3} ppm^{-1}, with a LOD value of 6.52 ppm.

Overall, our research highlights the superior sensing abilities of CVD-graphene for alcohols, underscoring its suitability for accurate and reliable gas detection systems. Given graphene's exceptional electronic attributes, including high carrier mobility and a superior signal-to-noise ratio, it is expected to become an integral component in electrochemical sensors for alcohol detection.

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CERRAHİ HEMŞİRELERİNİN POSTOPERATİF ÜRİNER RETANSİYONU ÖNLEMEYE YÖNELİK UYGULADIĞI YÖNTEMLER

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ÖZET

Postoperatif üriner retansiyon (PÜR), cerrahi sonrası mesanenin dolu olmasına rağmen spontan idrarın yapılamaması durumudur. Cerrahi sonrası hastada bir komplikasyon olarak ortaya çıkan PÜR'ün gelişiminde birçok faktör rol oynamaktadır. Literatürde bu faktörlerin hasta (ileri yaş, erkek, anatomik sorunlar, komorbidite, sinirsel iletim bozuklukları) ve cerrahi (anestezi tipi, preoperatif mesane doluluğu, 2 saatten fazla süren cerrahi, opioid-NSAİD-atropin kullanımı, alınan sıvı miktarı) kaynaklı olduğu belirtilmektedir. Cerrahi uygulamalarda sıklıkla karşılaşılan PÜR postoperatif 2-6. saatlerde meydana gelmektedir. Bu sürede idrar drenajı gerçekleşmeyen hastalarda aşırı idrar basıncı ve mesane distansiyonuna bağlı PÜR gelişmektedir. Literatürde PÜR prevalansının %5-70 olduğu bildirilirken; ortopedik cerrahilerde bu oranın %9-60, torasik ve vasküler cerrahilerde %18-28, jinekolojik cerrahilerde %2.5-43, genel cerrahide %4-29 ve omurga cerrahisinde ise %5-30 olduğu görülmektedir.Sağlık profesyonelleri arasında rol ve sorumluluklar açısından önemli olan cerrahi hemşireleri, postoperatif dönemde gelişebilecek herhangi bir olumsuzluğa karşı gerekli önlemleri alarak sağlık hizmetini yerine getirmektedir. Hemşireler özellikle postoperatif dönemde meydana gelebilecek komplikasyonların yönetiminde aktif rol almaktadırlar. Bu komplikasyonlardan biri olan PÜR; uzayan yatış, yaşam kalitesini bozma, sağlık hizmeti maliyetini artırma gibi olumsuz sonuçları nedeniyle hemşireler tarafından yönetilmesi gereken bir konudur. Literatür hemşirelerin PÜR yönetimine yönelik uyguladığı yöntemlerden bahsetmektedir. Bu yöntemler, mesaneye sıcak-soğuk uygulama, masaj, sürgü-ördek-komot kullanımı, mobilizasyon, bol sıvı tüketimi, pelvik kas egzersizi, akupunktur, eli sıcak suya sokma, bel altı duşun yanında sıklıkla mesane kateterizasyonudur. Bu uygulamalar ile cerrahi hemşireler postoperatif dönemde PÜR'e yönelik mevcut risk faktörlerini gözden geçirmeli, bütüncül hasta takibini yerine getirmeli, hastaları emosyonel açıdan desteklemeli, ilk olarak non-invaziv, sonrasında invaziv yöntemleri tercih etmelidirler.Sonuç olarak, PÜR cerrahi hemşirelerinin sıklıkla karşılaştığı bir komplikasyondur. Bu nedenle özellikle cerrahi hemşirelerinin postoperatif dönemdeki hasta konforunu sağlama ve en kısa sürede başarılı idrar drenajının gerçekleştirilmesine yardımcı olmalarının etkili sağlık hizmetinin sürdürülmesine önemli katkılar sağlayacağı öngörülmektedir.

Anahtar kelimeler: Cerrahi, hemşirelik, postoperatif üriner retansiyon.

TO PREVENT POSTOPERATIVE URINARY RETENTION OF SURGICAL NURSES THE METHODS HE APPLIED TOWARDS

ABSTRACT
Postoperative urinary retention (PUR) is a condition in which spontaneous urine cannot be produced despite the fact that the bladder is full after surgery. Many factors play a role in the development of PUR, which occurs as a complication in the patient after surgery. It is stated in the literature that these factors are caused by the patient (advanced age, male, anatomical problems, comorbidity, neural conduction disorders) and surgery (type of anesthesia, preoperative bladder fullness, surgery lasting more than 2 hours, opioid-NSAID-atropine use, amount of fluid taken). PURE postoperative 2-6, which are often encountered in surgical applications. it occurs during the hours. During this time, PUR develops due to excessive urinary pressure and bladder distension in patients who do not undergo urine drainage. While the prevalence of PUR is reported to be 5-70% in the literature, it is observed that this rate is 9-60% in orthopedic surgeries, 18-28% in thoracic and vascular surgeries, 2.5-43% in gynecological surgeries, 4-29% in general surgery and 5-30% in spinal surgery.Surgical nurses, who are important in terms of roles and responsibilities among health professionals, perform health services by taking the necessary measures against any negative Decencies that may develop in the postoperative period. Nurses take an active role in the management of complications that may occur, especially in the postoperative period. PUR, which is one of these complications, is an issue that needs to be managed by nurses due to its negative consequences such as prolonged hospitalization, deterioration of quality of life, and increasing the cost of health care. The literature mentions the methods applied by nurses for the management of PUR. These methods are hot-cold application to the bladder, massage, slider-duck-November, mobilization, plenty of fluid consumption, pelvic muscle exercise, acupuncture, putting the hand in hot water, bladder catheterization often next to the shower under the waist. With these applications, surgical nurses should review the existing risk factors for PUR in the postoperative period, perform holistic patient follow-up, support patients emotionally, first choose non-invasive methods, then invasive methods. As a result of, PUR is a complication that surgical nurses often encounter. For this reason, surgical nurses in particular are expected to make significant contributions to maintaining effective health care by providing patient comfort in the postoperative period and helping to perform successful urine drainage as soon as possible.
Keywords: Surgery, nursing, postoperative urinary retention.

Giriş

Postoperatif üriner retansiyon (PÜR), cerrahi sonrası mesanenin dolu olmasına rağmen spontan idrarın yapılamaması durumudur (Pomajzl & Siref, 2022). Cerrahi sonrası hastada bir komplikasyon olarak ortaya çıkan PÜR'ün gelişiminde birçok faktör rol oynamaktadır (Pomajzl & Siref, 2022; Çakmak vd., 2020). Bu faktörler; hasta (ileri yaş, erkek cinsiyet, anatomik sorunlar, komorbidite, sinirsel iletim bozuklukları) ve cerrahi uygulama (genel/spinal anestezi, preoperatif dönemde mesanenin boşaltılmaması, cerrahinin 2 saatten uzun sürmesi, acil cerrahi, opioid-NSAİD-atropin kullanımı, alınan sıvı miktarı) kaynaklı olduğu belirtilmektedir (Verhamme et al., 2008; Baldini et al, 2009; Hansen et al., 2011; Dreijer et al., 2011; Choi et al., 2012; David et al., 2015; Sung et al., 2015, Brouwer et al., 2021; Agrawal et al., 2019; Çakmak vd., 2020). Cerrahi uygulamalarda özellikle spinal anestezi sonrası sıklıkla karşılaşılan PÜR postoperatif 2-6. saatlerde meydana gelmektedir (Song et al., 2016; Oelke et al., 2017). Bu sürede idrar drenajı gerçekleşmeyen hastalarda aşırı idrar basıncı ve mesane distansiyonuna bağlı PÜR gelişmektedir (Serlin et al., 2018; Pomajzl & Siref, 2022). PÜR'ün klinik tanılamasında mesanenin fizik muayenesi, mesane kateterizasyonu ve ultrasonografik (USG) görüntüleme yöntemleri kullanılmaktadır (Song et al., 2016; Oelke et al., 2017; Serlin et al., 2018; Pomajzl & Siref, 2022).PÜR prevalansı literatürde yaklaşık %5-70 (Baldini et al., 2009) olduğu bildirilirken; ortopedik cerrahilerde bu oran %9-60 (Abdul-Muhsin et al, 2020; Scholten et al., 2018; Kort et al., 2018; Fernandez et al, 2014; David et al., 2015), torasik ve vasküler cerrahilerde %18-28 (Merlo et al., 2020; Boitano et al., 2020), jinekolojik cerrahilerde %2.5-43 (Temtanakitpaisan et al., 2012; Priyatini & Sari, 2015; Alas et al., 2018), genel cerrahide %4-29 (Kin et al., 2013; Qi-Ming et al., 2015; Scott et al.,2018; Jeong et al., 2022; Croghan et al., 2023; Prayoonchan et al., 2023), omurga (spinal) cerrahisinde ise %5-30 (Altschul et al., 2017; Golubovsky et al., 2018; Strickland et al., 2021) olduğu görülmektedir. PÜR gelişmesi durumunda ise yatış süresinde artış, yaşam kalitesinde bozulma, sağlık hizmeti maliyetinin artması gibi sonuçlara neden olduğu belirtilmektedir (Verhamme et al., 2008; Dreijer et al., 2011; Hansen et al., 2011; Choi et al., 2012; David et al., 2015; Sung et al., 2015; Agrawal et al., 2019; Çakmak vd., 2020). Bu sonuçların azaltılması için sağlık profesyonellerinin PÜR gelişme oranını en aza indirecek uygulamaları tercih etmesi çok önemlidir (Çakmak vd., 2020). Bu nedenle öncelikle hastaların emosyonel açıdan desteklenmesi, ardından non-invaziv yöntemler ile PÜR yönetiminin sağlanması gerekmektedir (Wu et al., 2012; Meska et al., 2016). Bununla birlikte postoperatif dönemde oral beslenmenin başlaması sonrasında bol su tüketimi, PÜR riskine karşı bireyin bilgilendirilmesi ile idrar çıkışının sorgulanması sürecin etkin yönetimi

açısından önemli diğer bir konudur (Uslu ve Yavuz, 2016; Pomajzl & Siref, 2022). Literatürde PÜR'ün gelişmesi sonucunda hastaların konforunu artırmak amacıyla invaziv ve non-invaziv yöntemlerin kullanılması önerilmektedir (Wu et al., 2012; Dal vd., 2013; Verghese et al., 2016; Meska et al., 2016; Hoke & Bradway, 2016). Bunlar; mesaneye sıcak-soğuk uygulama, masaj, hastanın sürgü-ördek kullanımı, mobilize olması, postoperatif dönemde sıvı tüketimi, pelvik kas egzersizi, akupunktur, bel altı duş ile sıklıkla mesane kateterizasyonunun uygulamasıdır (Afazel et al, 2014; Wu et al., 2012; Dal vd., 2013; Verghese et al., 2016; Meska et al., 2016; Hoke & Bradway, 2016; Prayoonchan et al., 2023). Sağlık profesyonelleri arasında rol ve sorumluluklar açısından önemli bir konumda yer alan hemşireler postoperatif dönemde oluşabilecek herhangi bir olumsuzluğa karşı gerekli önlemleri alarak kaliteli sağlık hizmetinin sunumunda aktif görev almaktadır (Vaismoradi et al., 2017; ANA, 2016). Hemşireler diğer disiplinlerle işbirliği sağlayarak postoperatif dönemde meydana gelebilecek komplikasyonların yönetiminde hasta konforunun sağlanması ve sürdürülmesine yardımcı olmaktadırlar (Akhtar et al., 2013; Malley et al., 2015). Bunun için hemşirelerin mevcut risk faktörlerini gözden geçirerek bütüncül hasta yönetimini yerine getirmeleri gerekmektedir (Meska et al., 2016). Ayrıca hemşireler hastaları emosyonel açıdan destekleyerek, öncelikle non-invaziv yöntemleri tercih etmelidirler (Wu et al., 2012; Meska et al., 2016). Literatürde hemşirelerin PÜR yönetimine yönelik farklı yöntemleri kullanıldığı bildirilmektedir (Wu et al., 2012; Dal vd., 2013; Verghese et al., 2016; Meska et al., 2016; Hoke & Bradway, 2016; Mirzaei et al., 2024). Aşağıda bu yöntemler invaziv ve non-invaziv olarak ayrıntılı şekilde açıklanmıştır.

Non-İnvaziv Yaklaşımlar

- Mesaneye sıcak-soğuk uygulama: Bu uygulama mesane detrüsor kaslarının kasılıp gevşemesine yardımcı olmak amacıyla kompres, termofor veya ısı paketlerinin belirli sürelerde kullanımına dayanmaktadır (Toney-Butler et al., 2024). Bu konudaki çalışmalarda hemşirelerin mesane yaptıkları sıcak uygulama sonrası hastaların %59.5'inde PÜR gelişiminde azalma görülürken, ılık uygulama sonrası ise %71.4'inde azalma olduğu bildirilmiştir (Afazel et al, 2014). Yaşlı hastalarda sıcak ve soğuk kompreslerin ameliyat sonrası idrar retansiyonuna etkisini inceleyen bir araştırmada ise sıcak kompres grubundaki hastaların %46.2'sinde, soğuk kompres grubundakilerin ise %53.8'inde idrar retansiyonunun giderildiği belirtilmiştir (Mirzaei et al., 2024).
- Masaj: Masaj, sağlığı ve konforu artırmak için yumuşak vücut dokularının manuel olarak manipülasyonu olarak tanımlanmaktadır. Ülkemizde Dal ve arkadaşlarının (2013) çalışmasında sezaryen doğum sonrası hastalara uyguladıkları sakral bölge masajı sonrası

postoperatif ilk idrar çıkış süresinin kısaldığı bildirilmiştir (Dal vd., 2013). Yine hemşirelerin doğum sonrası üriner retansiyonu önlemek için akupresürün etkisini inceleyen bir başka çalışmada ise müdahale grubunun idrar retansiyonu insidansının daha düşük, ilk idrara çıkma süresinin daha erken olduğu belirtilmiştir (Geng et al., 2022).

- Sürgü-ördek-komot kullanımı: Yataklı tedavi hizmeti veren sağlık kurumlarında hastaların boşaltım ihtiyacını gidermek için sürgü, ördek veya komot kullanımı ile idrarın non-invaziv drenajı sağlanmaktadır (Toney-Butler et al., 2024). Üriner katater kullanımına yönelik rehberlerde ise bu materyallerin tercihen kullanılması ve hastaların idrar drenajına yardımcı olunması gerektiği belirtilmektedir (CDC, 2015). Hemşireler tarafından doğum sırasında sürgü ve kateter kullanımıyla ilgili deneyimleri ve kadınların işeme konusunda başarılı olmalarına yardımcı olmayı amaçlayan bir çalışmada sürgü kullanımının %5.5'ten %19'a yükseldiği, hastaların %38'si sürgü kullanımıyla desteklendiklerinde %64 oranında başarılı idrar drenajının sağlandığı bildirilmiştir (McLain, 2019).
- Sıvı tüketimi: Cerrahi sonrası hastalara oral alımın başlamasının ardından bol sıvı tüketiminin artırılması gerektiği belirtilmektedir (Wu et al., 2021). Doğum sonrası idrar retansiyonu olan hastalarda erken içme suyu tedavisinin etkisini değerlendiren bir çalışmada hastaların ilk idrara çıkma zamanları arasında bir farklılığın olmadığı, ancak müdahale grubunda %5.67 olan üriner retansiyon sıklığının kontrol grubunda %14.67 olduğu sonucuna varılmıştır (Cui et al., 2022).
- Mobilizasyon: Cerrahi dönemde anestezi nedeniyle detrüsor kas kasılması baskılandığından mesane oluşan basıncı azaltmak amacıyla hastanın mobilize edilmesi gerekmektedir (Yaban Şimşek, 2020). Cerrahi sonrası derlenme odasında hastaların tuvalete mobilizasyonun sağlanarak idrar deşarjını kolaylaştırmayı ve üriner kateter kullanımının azaltılmasını inceleyen bir çalışmada hastaların sadece %19'unda üriner kateter kullanımının gerektiği ve idrar yapma süresinin kısaldığı anlaşılmıştır (Hansen and Olsen, 2015).
- Pelvik kas egzersizi: Pelvik kas egzersizi diğer adıyla kegel egzersizi, pelvik tabandaki kasların 3 saniye kasılıp gevşemesini, 3 saniye ara verip tekrar aynı işlemin uygulanmasını içeren hareketler bütünü olarak tanımlanmaktadır (Cho et al., 2021). Pelvik kaslar mesane, bağırsaklar ve vajina gibi pelvisteki organları desteklenmesine yardımcı olmaktadır. Zong ve ark. kegel pelvik taban kas egzersizi eğitiminin idrar retansiyonuna etkisini inceleyen çalışmalarında müdahale grubunda idrar retansiyonu, dizüri ve mesanede kalan idrar hacmi görülme sıklığı kontrol grubuna göre anlamlı derecede düşük olduğu belirlenmiştir (Zong et al., 2022).

- Akupunktur: Akupunktur tedavisi alternatif tıp yöntemi olarak literatürde yer almakla birlikte birçok alanda uygulanmaktadır. Belirlenen akupunktur noktalarına iğne batırma işlemi uygulanması ile gerçekleştirilmektedir (Li et al., 2021). Akupunkturun üriner retansiyondaki etkinliği inceleyen bir meta-analiz çalışmasında hastaların spontan idrara çıkmalarını etkili bir şekilde desteklediği ve anksiyeteyi azalttığı sonucuna varılmıştır (Zheng et al., 2021)
- Bel altı duş: Sıcak uygulamalar arasında yer alan bel altı duş tedavisi birçok alanda kullanılmaktadır. Anorektal cerrahi sonrası postoperatif idrar retansiyonunda işemeyi uyarmada bel altı duşun etkisi inceleyen bir çalışmada hastaların yaklaşık %90'ında spontan idrar drenajının sağlandığı belirtilmiştir (Shafik, 1993).
- Diğer: Literatürdeki diğer uygulamalarda ise hemşirelerin algoritma eşliğindeki PÜR yönetiminde mesane kateterizasyon oranının %45'den %15'e gerilediği (Hoke & Bradway, 2016); simülasyon eğitimi sonrası hemşirelerin PÜR gelişen hastalara verilen hemşirelik bakımına ilişkin görüşlerinde anlamlı bir artış olduğu (Meska et al., 2016); cerrahi bakımı iyileştirme projesi uygulanan hastalarda PÜR'ün %2.1'e gerilediği görülmektedir (Wu et al., 2012).

İnvaziv Yöntemler

- Mesane kateterizasyonu: Diğer adıyla üriner kateterizasyon mesanenin aşırı dolumunu önlemek veya idrar drenaj takibini yapmak için foley sonda aracılığıyla yetkin sağlık profesyoneli tarafından uygulanabilen invaziv bir tedavi seçeneğidir. Öte yandan üretral travmadan idrar yolu enfeksiyonuna, mesanenin aşırı genişlemesi nedeniyle mesanede geçici veya kalıcı hasara yol açabilen bir uygulamadır (Pomajzl & Siref, 2022). PÜR gelişen hastalara uygulanan mesane kateterizasyon süresini inceleyen bir çalışmada kateterizasyonun çıkarılması sonrası spontan işemenin yaklaşık 4 saat sonra gerçekleştiği bildirilmiştir (Brouwe et al., 2019), sezaryen ile doğum yapan hastalarda 6, 12 ve 24 saat sonra çıkarılan idrar sondalarının postoperatif sonuçlarını ve üriner retansiyon oranlarını karşılaştırmayı amaçlayan bir çalışmada ise postoperatif 6. saatte kateteri çıkarılan grupta üriner retansiyonu oranının (13.9%) daha yüksek olduğu, ilk ambulasyona kadar geçen sürenin kateterin kalma süresinden etkilendiği ve 24. saat sonrasında kateteri çıkarılan grupta dizüri ve idrar yolu enfeksiyon oranının daha yüksek olduğu elde edilmiştir (Ersak vd., 2022).

Sonuç

Sonuç olarak PÜR cerrahi sonrası sık karşılaşılan bir komplikasyon olduğu için özellikle cerrahi hemşirelerin hastalara yönelik risk faktörlerini gözden geçirerek bütüncül hasta

bakım sürecini gerçekleştirmelidirler. Ayrıca hemşirelerin PÜR açısından hastaların emosyonel açıdan desteklenmesi, PÜR gelişme durumunda multidisipliner iş birliğinin sağlanması, hastaya en uygun non-invaziv veya invaziv yöntemin seçilmesinin önem arz ettiği düşünülmektedir.

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ÖZET
İş sağlığı ve güvenliği kapsamında çalışanların güvenli su temini hem sağlık ve temizlik hem de günlük yaşamını sürdürebilmesi için temel hakkıdır. Çalışan sağlığı için bunlara dikkat etmek işveren, işveren vekili, iş sağlığı ve güvenliği uzmanının sorumluluğundadır. Suyun çıkartılması, kullanımı için çeşitli testler ve uygulamalar bulunmaktadır. Çalışma sahalarında kullanılan su temini çeşitli başlıklar altında toplanabilir. Şebeke bağlantıları, açık kaynaklardan su temini, yeraltı su kaynaklarının kullanımı bunlara birer örnektir. En kolay, kullanışlı ve maliyeti düşük olan şebeke hattı kullanımı olduğu için genellikle bu yöntem kullanılmaktadır. Bu yöntemlerle çıkartılan sular çeşitli kimyasallar kullanılarak (klor, krominler, ozon gibi…) içmeye ve kullanmaya hazır hale getirilmeye çalışılmaktadır. Mikroorganizmalara uygulama kolaylığı, maliyeti ve etkisi bakımından, içme suyu dezenfeksiyonu için en uygun dezenfektan maddeler ozon, klor ve klordioksit'tir. Hazır hale getirilen sulardan örnekler alınarak İl Umumi Hıfzıssıhha laboratuvarlarına teste gönderilip onayı alınır. Ayda bir kez düzenli olarak kontrolleri devam eder. Temiz su kullanımı için boruların insan sağlığına zarar vermeyen Türk Standartları Enstitüsü standartlarında malzemelerden yapılmalıdır. Ayrıca suyun depolanmasını istiyorsak paslanmaz çelik depolar kullanmalıyız. Uygun sıcaklığı 8-12 derece olup, kaynak ve içme kullanma sularına göre ph değeri sırasıyla 6,5-8,5 ve 6,5-9,2 olmalı, toplam sertliği 10 ve 50 Fransız derecesini geçmemelidir. Bu çalışmada saha da, iş yerlerinde kullanılan suların dezenfektasyonu, kullanım şartları ve çıkarılma yöntemlerini açıklamaya çalışacağız.
Anahtar kelimeler: İçme suyu, İş güvenliği, Su çıkarma yöntemleri, İş Sağlığı ve İş Güvenliği için sağlıklı su, Su standartları

SAFE WATER WITHIN THE SCOPE OF OCCUPATIONAL HEALTH AND SAFETY IN WORKPLACES

Abstract
Within the scope of occupational health and safety, safe water supply is a fundamental right of employees fot both health and cleanliness and daily life. It ıs the responsibility of the employer , employer's representative, occupational health and safety specialist to pay attention to these for employee health. There are various tests and applications for the extraction and use of water. Water supply used in the study areas can be categorized under various headings. Network connections, water supply from open sources, use of underground water resources are examples of these. This method is generally used because it is the easiest, most convenient and cost-effective way to use mains line. The water extracted by these methods are tried to be made ready for drinking and use by using various chemicals.(chlorine, chromins, ozone like this…) In terms of its effect on microorganisms, cost and ease of application, the most suittable disinfection are chlorine, ozone, chlorine dioxide. Samples are taken from the prepared water and sent to The Provincial Public Hygiene laboratories for testing and approval is obtained. Regular checks continue once a month. To use clean water, pipes must be made of materials that meet the standards of the Turkish Standards Institute and do not harm human health. Also, if we want to store water, we should use stainless steel tanks. The appropriate temperature is 8-12 degrees the ph value should be 6,5-8,5 and 6,5-9,2 respectively according to spring and drinking water and the total hardness should not exceed 10 and 50 French degrees. In this study, we will try to explain the disinfection of water used in the field, workplaces, conditions of use and extraction methods.
Keywords: Drinking water, Work safety, Water extraction methods, Healthy water for occupational health and safety, Water standards

GİRİŞ

Su insan yaşamı için çok önemlidir. Su, vücudumuzdaki tüm hücrelere ve beynimize oksijen besleyen besinleri taşır. İlk çağlardan itibaren toplum yaşamı için en önemli ihtiyaçlar içerisinde su en baştadır. Devletlerin kurulması bile su kaynaklarına yakınlık derecesine göre belirlenmiştir.

Suyun getirilmesi ve su kaynaklarının düzenlenmesi ve planlanması büyük önem taşımaktadır. Suyun temini için kurulacak tesisler, çevreye en az zarar verecek şekilde kurulması, hizmete sunulması önemlidir. Bu tesislerin kurulması, planlanması olmadan toplumun kalkınmasından bahsedilemez. Çeşitli şekillerde kullanılmış olan bu suların çevreye ve doğaya zarar vermeyecek şekilde uzaklaştırılması önemli bir diğer konudur.

Suyun, üretim ve kullanımı için çeşitli kaynaklar vardır. Bunlar şebeke hattı(isale hattı), açık su kaynakları, yeraltı su kaynakları ayrıca hiç suyun bulunmadığı durumlarda taşıma suyu kullanılır.

GELİŞME

Su isale hatları “su üretim kaynaklarında üretilen suyu kullanım mahalline aktaran büyük çaplı ve taşıyıcı özellikteki boru hatları” olarak tanımlanmaktadır. İçme suyu şebekesi ise “isale hatları ile haznelerden getirilen suları sarfiyat yerlerine dağıtan boru sistemi” olarak tanımlanmaktadır. Bu şebeke binalarda yeterli basınçlı suyu sağlayacak şekilde planlanır. Şebeke hatları devamlı su dolu ve basınçlı olmalıdır. Aksi durumda suyun kirlenme ihtimali artmaktadır. Ayrıca su temini tesisinde, su miktarının ihtiyacı karşılayacak kadar emniyetli, bol, kaliteli, tat ve kokunun standartlara uygun olması gerekir.Dünya nüfusunun artması sebebiyle yerüstü su kaynakları hızlıca tükenmekte yeraltı sularının önemi artmaktadır. Avrupa’daki su kaynaklarının %65’i yeraltı suları oluşturmaktadır. Avrupa Birliği sınırları içerisindeki içme suyunun büyük bir kısmı yeraltı sularından temin edilmektedir. Yer altındaki boşluk veya gözeneklerde tutulan suya “yer altı suyu” denmektedir. Yer altı suyu dünyanın tatlı su rezervinin yaklaşık %22'sini sağlar. Yer altı Suları; Türkiye, çakıllı, kumlu ve alüvyal sahalar ile başta karstik alanlar olmak üzere, geçirimli kayaçlara bağlı olarak yer altı suları bakımından oldukça zengin özellikle, delta ve ova, yer altı suyu bakımından en zengin alanları oluşturur. Yeraltı suları ile ilgili faaliyetler Devlet Su İşleri Müdürlüğü tarafından yürütülmektedir. Söz konusu kanun, yeraltı sularının araştırılması, kullanılması, korunması ve tescili ile ilgili hükümleri içermektedir.Dünya üzerinde bulunan göller, nehirler, akarsular, denizler, okyanuslar açık su kaynakları olarak adlandırılır. Türkiye açık su kaynakları bakımından zengin bir ülkedir. Başlıca akarsuları Dicle, Fırat, Kızılırmak, Sakarya ve Yeşilırmak'tır. Türkiye'de 2022 yılında, içme ve kullanma suyu şebekesi için

çekilen suyun 43%'ü barajlardan, 3,7%'si göl-gölet/denizlerden ve 7,7%'si akarsulardan çekilmiştir.Hiçbir şekilde suya ulaşamadığımız noktalarda su tankerleri yardımımıza ulaşır. Su tankerleri, TSE standartlarında ve özenli bir şekilde imal edilmelidir. İçme suyu için kullanılan su tankerlerin bazı özellikleri vardır. Tanker ile dolum ve boşaltım sırasında kullanılan bağlantı araç ve gereçleri suyun fiziksel, mikrobiyolojik ve kimyasal özelliklerini bozmayan malzemeden yapılır. Tanker gerektiğinde kolayca yıkanıp temizlenebilecek şekilde yapılır, ayda bir defa temizlenir ve dezenfekte edilir. Tankerin su girişi su birikmesine izin vermeyecek, tankere yapılacak dolum sırasında tankerin içi ile dışı arasındaki teması tamamen kesecek, çevresel ortamdan kontaminasyon riskini en aza indirecek ve kapalı devre sistemine sahip olacak şekilde düzenlenir. Tankerde su numunesi alma musluğu bulundurulur ve gerekli görüldüğü durumlarda Halk Sağlığı Müdürlüğünce su numunesi alınır. Su dolum işlemi yapıldıktan sonra, su işletmecisi tarafından tankere su girişini sağlayan tüm kapak veya benzeri aksam mühürlenir. Bu mühür bir sonraki su dolum işlemi öncesinde su işletmecisi tarafından sökülür. Tanker sahipleri, aylık olarak su miktarlarını ve teslim tarihlerini gösterir listeyi Halk Sağlığı Müdürlüğüne ilgili ayın ilk 10 günü içerisinde bildirim yapmakla yükümlüdür.İçme suyu, insan fizyoloji için öneminin yanı sıra, sağlıklı (hijyenik) yaşamı için önemlidir. Su kokusuz, berrak ve içimi hoş olmalıdır. Uygun su sıcaklığı 8-12 derece olup, kaynak ve içme kullanma sularına göre ph değeri sırasıyla 6,5-8,5 ve 6,5-9,2 olmalı, toplam sertliği 10 ve 50 Fransız derecesini geçmemelidir.Çeşitli yöntemler kullanılarak çıkarılan sular, kimyasallar kullanılarak (klor, krominler, ozon, klor dioksit gibi) içmeye ve kullanılmaya hazır hale getirilmeye çalışılmaktadır. Mikroorganizmalara etkisi, maliyeti ve uygulama kolaylığı bakımından, içme suyu dezenfeksiyonu için en uygun dezenfektan maddeler ozon, klor ve klordioksit'tir.Ozon, açık mavi gaz halindedir. Organik ve inorganik bileşiklerle hızlıca reaksiyona giren kuvvetli bir oksitleyicidir. Suyun durumuna göre 0,1 ila 0,5 mg/lt ozon verilmesi, bakterileri %99,99 oranında öldürülmesi için yeterlidir. Ozon özellikle ortamda su bulunduğunda biyosid etki göstermektedir. Ozonun bu biyosid etkisinden, yaygın olarak içme sularının dezenfeksiyonunda yararlanılmaktadır.Klor dioksit, çok etkili bir bakteriyel dezenfektandır. Virüs içeren suların dezenfeksiyonu için klor ile karşılaştırıldığında daha etkilidir. Suya girdiğinde hidrolize olmaz ve çözelti içinde çözünmüş bir gaz olarak kalır. İçme suyu dağıtım şebekesinde bakteri üremesini engeller.Klor krominler, oda sıcaklığında yeşil – sarı renkli gaz halinde olan klor, kuvvetli oksitleyici bir dezenfektandır. İçme suyu dezenfeksiyonu için 70 yıldır kullanılmaktadır.İçme suyu üretimi sürecinde, özellikle yüzey suları için önemli olan ön arıtma işlemleri uygulanır. Bu işlemler, suyun kalitesini iyileştirir

ve daha sonraki arıtma süreçleri için hazırlar. Ön arıtma işlemleri arasında ızgara ve kaba ızgara, kum yakalama, ön çöktürme ve ön oksidasyon yer alır. Bu işlemler, büyük parçacıkların ve kaba kirleticilerin sudan uzaklaştırılmasına yardımcı olur. Suyun fiziksel ve kimyasal arıtılması, daha ince kirleticilerin ve partiküllerin sudan uzaklaştırılması için uygulanır. Bu süreçte, koagülasyon, flokulasyon, çöktürme, filtrasyon ve dezenfeksiyon işlemleri gerçekleştirilir. Koagülasyon ve flokulasyon, suyun renk, koku ve bulanıklığını azaltırken, çöktürme ve filtrasyon işlemleri ile partiküller sudan ayrılır. Dezenfeksiyon, suyun mikrobiyolojik güvenliğini sağlamak için gerçekleştirilir ve patojenlerin etkisiz hale getirilmesine yardımcı olur.Gelişmiş içme suyu arıtma teknolojileri arasında membran filtrasyonu ve ters ozmoz yöntemleri bulunur. Bu yöntemler, suyun daha yüksek kalitede arıtılmasını sağlar ve klasik arıtma işlemlerinin yetersiz kaldığı durumlarda tercih edilir. Membran filtrasyonu, partiküllerin ve mikroorganizmaların suyun içinden geçmekte zorlandığı ince gözenekli membranlar kullanarak gerçekleştirilir. Ters ozmoz ise, yüksek basınç altında suyun yarı geçirgen bir membran üzerinden itilerek, tuz ve diğer çözünmüş maddelerin sudan uzaklaştırılması işlemidir. Bu yöntemlerle elde edilen içme suyu, daha düşük tuzluluk ve partikül içeriğine sahip olup, yüksek kalitede olması nedeniyle özellikle endüstriyel ve sağlık sektörlerinde tercih edilir.Hazır hale getirilen sulardan örnekler alınarak İl Umumi Hıfzıssıhha laboratuvarlarına teste gönderilip onayı alınır. Ayda bir kez düzenli olarak kontrolleri devam eder. Temiz su kullanımı için boruların insan sağlığına zarar vermeyen Türk Standartları Enstitüsü standartlarında malzemelerden yapılmalıdır. Ayrıca suyun depolanmasını istiyorsak paslanmaz çelik depolar kullanamayız.İnşaat sahalarında kullanılan sular içme suyu özellikleri taşımalıdır. Çalışanların sağlığı, hijyen ve salgın hastalıkların yayılmaması açısından bu suların dezenfektasyonu önemli bir faktördür. İçme ve genel kullanım sularının dezenfektasyonu sağlanmazsa kolera, ishal, tifo, paratifo, dizanteri, basili dizanteri, epidemik sarılık, çocuk felci gibi hastalıkların yayılmasına neden olduğu gibi bağırsak solucanı ve kurtları gibi parazitlerin yumurtalarını taşıyabilmektedir. Bu yüzden su insan için hayati önem taşımaktadır.

SONUÇ

İçme ve kullanma suyunun dezenfekte edilmesin amacı, su ile geçen hastalıklara sebep olan patojen mikroorganizmaları öldürmektir. Çalışanlarımız için; sahanın büyüklüğüne göre bir veya daha fazla yerden alınan su numuneleri her ay bakteriyolojik, yılda 2 defa bir kimyasal analiz yaptırılmalıdır. İçme kullanma suyunun kaynaktan tüketiciye kadar uygun şekilde gereğince klorla dezenfekte edilmiş temiz, güvenilir nitelikte taşınmasının sağlanması konusunda gereken özen gösterilmelidir. Sağlıklı bir toplum ve içme sularının denetimi için

halkın bilgilendirilmesi ve bu konuda eğitim verilmesi konularına yoğunlaşılmalıdır. Tüketilen suyun özellikleri; kokusu, tadı, içeriği bilinmeli ve gerekirse farklı yöntemler kullanılarak içilen su sağlık kurallarına uygun hale getirilmesi sağlanmalıdır. Halkın bu konuda bilinçlendirilmesi için sağlık personelleri çalışmalar gerçekleştirmelidir.

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Özet
Göç, bireylerin bir yerden başka bir yere taşınması veya yer değiştirmesi sürecini ifade eder. Bu süreç kırsal alanlar ile şehirler arasında veya ülkeler ya da şehirler arasında gerçekleşebilir. Ekonomik fırsatlar aramak, iş bulmak, eğitim almak veya siyasi ya da çevresel faktörler gibi çeşitli nedenler göçlere yol açabilir. Göçler, yerleşim alanlarının nüfusunu, sosyal yapısını ve peyzajını etkileyerek demografik, kültürel ve ekonomik değişimlere katkıda bulunur. Bu durum, göç eden bireylerin yeni yaşam alanlarına adaptasyonu ve mevcut topluluklarla etkileşimi ile birleştiğinde kentsel peyzajlarda çeşitlilik ve dönüşüme de katkıda bulunabilmektedir. Çağdaş göçler kentsel peyzajları çeşitli şekillerde etkilemektedir. Öncelikle, kentlerin nüfusunu artırarak kentsel alanlarda yoğunlaşmaya yol açmakta, bu da yeni konut alanlarının oluşturulmasını ve kent sınırlarının genişletilmesini gerektirebilmektedir. Bu artan yoğunluk, yüksek binaların inşası ve yoğunlaşan trafik gibi yapısal değişikliklerle de sonuçlanabilir. Ayrıca, göçler kültürel çeşitliliği artırmakta ve şehirlerde farklı mimari tarzların varlığına katkıda bulunmaktadır. Farklı kültürlerden gelen göçmenler kentsel peyzajın çeşitlenmesine katkıda bulunmakta ve mimari zenginliği desteklemektedir. Ayrıca, göçler altyapı ve kamu hizmetleri üzerinde baskı oluşturabilir; artan nüfus su, elektrik ve ulaşım gibi temel hizmetlerin genişletilmesini ve iyileştirilmesini gerektirebilir. Son olarak, göçler sosyal etkileşimi teşvik eder; farklı kültürlerden gelen bireyler arasındaki etkileşimler ve kültürel alışverişler kentlerde daha çeşitli bir sosyal yaşamın oluşmasına neden olur. Göçün kentsel peyzaj üzerindeki etkisi karmaşık ve çok yönlüdür ve bu etkiler göçün niteliğine, kentin büyüklüğüne ve gidilen ülkenin sosyo-ekonomik yapısına bağlı olarak değişmektedir. Bu çalışma, göçler ve kentsel sorunlar arasındaki ilişkinin yanı sıra göçlerin kentler üzerindeki etkisini ve kentsel peyzaj kavramı ile ilişkisini tartışmaktadır. Ayrıca, göçler ve kentsel peyzaj kavramlarının kentin sosyo-ekonomik ve sosyo-kültürel çerçevesi içindeki önemi vurgulanmaktadır.
Anahtar Kelimeler: Göç, Peyzaj, Kentsel Peyzaj.

THE IMPACT OF MIGRATION ON THE URBAN LANDSCAPE

Abstract
Migration refers to the process of individuals moving or relocating from one place to another. This process can occur between rural areas and cities, or between countries or cities. Various reasons may lead to migrations, including seeking economic opportunities, finding employment, pursuing education, or due to political or environmental factors. By affecting the population, social structure, and landscape of settlement areas, migrations contribute to demographic, cultural, and economic changes. This situation, coupled with the adaptation of migrating individuals to new living spaces and their interaction with existing communities, can also contribute to diversity and transformation in urban landscapes. Contemporary migrations affect urban landscapes in various ways. Primarily, they increase the population of cities, leading to densification in urban areas, which may necessitate the creation of new housing areas and the expansion of city limits. This increased density can also result in structural changes such as the construction of high-rise buildings and intensified traffic. Additionally, migrations enhance cultural diversity and contribute to the presence of different architectural styles in cities. Migrants from different cultures contribute to the diversification of urban landscapes and support architectural richness. Moreover, migrations can exert pressure on infrastructure and public services; the growing population may require the expansion and improvement of basic services such as water, electricity, and transportation. Lastly, migrations foster social interaction; interactions and cultural exchanges among individuals from different cultures lead to a more diverse social life in cities. The impact of migration on urban landscape is complex and multifaceted, and these effects vary depending on the nature of migration, the size of the city, and the socio-economic structure of the destination country.This study discusses the relationship between migrations and urban problems, as well as their impact on cities and their relationship with the concept of urban landscape. Furthermore, it emphasizes the importance of migrations and urban landscape concepts within the socio-economic and socio-cultural framework of the city.
Keywords: Migration, Landscape, Urban Landscape.

GİRİŞ

Kentler, insan eliyle yapılmış, bazen planlı bazen de plansız şekilde gelişen, yüksek nüfus yoğunluğuna sahip yaşam merkezleridir. Günümüzde, kent yaşamı, ekonomik fırsatlar, sağlık hizmetleri ve sosyal etkileşim gibi çeşitli avantajlar sunması nedeniyle tercih edilmektedir. Kentler, farklı sosyal statülere ve kimliklere sahip birçok insanın kullandığı, büyüme şekli ve formu üstünde sadece kısmi kontrollerin yapılabildiği, birçok yaratıcı etkenin rol oynadığı karmaşık alanlardır. Kentteki barınma, iş, eğitim ve sağlık gibi faaliyetlerin kaliteli olarak gerçekleştirilebilmesi için birçok faktörün bir araya gelmesi gerekmektedir. Kentlerde bulunan fiziki yapıların kalitesi, bu yapıların bulunduğu sokakların, caddelerin ve meydanların kalitesini etkiler. Sokakların, caddelerin ve meydanların kalitesi, bulundukları bölgenin ve genellikle tüm kentin kalitesini belirler. Kent kalitesi, sadece kullanım kolaylığı ve konforu değil, aynı zamanda kültürel değerleri de içerir. Çünkü insanlar, kent yaşamına geçmeden önce kentin kültürel unsurlarını inceleyip algılamaktadır (Çetinkaya Karafakı, 2023).Kentlere göç eden nüfusun, kentin alt ve üst yapısının taşıma kapasitesini aşması durumu, çöküntü alanlarının oluşmasına ve bu durumun ilgili bölgelerde insan yaşam koşullarının kötüleşmesine yol açmaktadır. Kentteki artan nüfusun etkisi sadece ekolojik, sosyolojik ve ekonomik değil, aynı zamanda kentin fiziki yapısını da etkilemektedir. Kentte yaşayan nüfus, yoğunlukla yerleşim bölgelerinde etkisi görülse de kent içinde kısa süreli de olsa kullandığı tüm alanlarda değişime neden olabilmektedir. Göç, Uluslararası Göç Örgütü tarafından yapılan tanıma göre, insanların uluslararası sınırları geçerek veya bir devlet sınırları içinde yer değiştirme eylemidir. Göç, çeşitli sebeplerle insanların yerleştikleri yerleri geçici veya kalıcı olarak terk etmesini içermektedir (Çetinkaya Karafakı, 2023).Bu çalışmada temel yaklaşım, göçün kent peyzajına olan fiziksel ve sosyal çevresine etkilerini anlamak ve değerlendirmektir. Çalışmada, göçün kentsel peyzaja nasıl bir etki yarattığı incelenerek, kentlerdeki demografik değişimlerin çevresel, sosyal ve ekonomik boyutları ele alınamaya çalışılmıştır. Ayrıca, göçün kentsel altyapıya, yeşil alanlara, konut piyasasına ve kamu hizmetlerine olan etkileri de irdelenmiştir. Bu çalışmanın amacı, göçün kent yaşamına ve çevresine olan etkilerini anlamak ve kentsel planlama süreçlerinde bu faktörleri dikkate alarak daha sürdürülebilir kentlerin oluşturulmasına katkıda bulunmaktır.

2.MATERYAL VE YÖNTEM

Bu çalışmada öncelikle günümüz kentlerinin genel görünümünü oluşturan temel bileşenler ortaya konulmaya çalışılmıştır. Bu bileşenlerin tespiti ve çeşitli kentsel peyzaj, göç kavramlarının tanımlanması için detaylı bir literatür taraması yapılmıştır. Daha sonra göç

hareketinin Göçün Kentsel Peyzaj Üzerine Etkisi kentlerin görünüşü üzerindeki etkisini ortaya koyabilmek amacıyla göçlerin kentler üzerindeki etkileri sıralanmıştır. Bu etkiler sırasıyla;

- Nüfus Yoğunluğu
- Çevresel Etkiler
- Ekonomik Canlılık
- Kültürel Çeşitliliktir.

Sonuç bölümünde bu etkilerin kent peyzajı üzerine olumlu ya da olumsuz etkilerinin ortaya konulması için bir tablo oluşturulmuştur. Bu tablo ile göçün kent peyzajı üzerindeki etkilerinin analitik olarak ortaya konulması amaçlanmıştır. Çalışmanın akış diyagramı Şekil 1'de verilmiştir.

KENT KAVRAMININ AÇIKLANMASI	GÖÇ KAVRAMININ AÇIKLANMASI	GÖÇÜN KENTLER ÜZERİNDEKİ ETKİLERİNİN AÇIKLANMASI

Şekil 1. Çalışmanın akış diyagramı,

3.BULGULAR

Göç olgusu her ülkede benzer şekillerde oluşmamakla birlikte, genellikle benzer kavramsal çerçevede değerlendirilir. Göç, yer, zaman ve mekân gibi temel kavramlar etrafında incelenir. Göç olgusu, genellikle iç ve dış göç olmak üzere iki ana kategoriye ayrılır. İç göçler, kendi ülke sınırları içinde gerçekleşen hareketlerdir ve mevsimlik, gönüllü, zorunlu, işgücü temelli ve sürekli göçler gibi alt kategorilere ayrılabilir. Dış göçler ise bir ülke sınırlarını aşarak gerçekleşen hareketlerdir ve beyin göçü, nüfus mübadelesi ve işçi göçleri gibi çeşitli alt kategorilere sahiptir. Bu sınıflandırmalar, göç olgusunun farklı yönlerini anlamak ve analiz etmek için akademik literatürde yaygın olarak kullanılmaktadır (Bozkurt, ve Ayfer,2018).Türkiye'de göç tarihi, özellikle 1940'lı yıllardan sonra önemli değişimlere sahne olmuştur. İkinci Dünya Savaşı'nın sona ermesiyle birlikte, Türkiye'de ekonomik, siyasi ve sosyal yapıda önemli değişimler yaşandı ve bu değişimler göç hareketlerini etkilemiştir (Şekil 2).

950'ler ve 1960'lar: Bu dönemde Türkiye'de kırsal kesimdeki nüfusun kentlere yönelik göçü hız kazandı. Özellikle tarımdaki teknolojik gelişmeler, köylülerin kentlere yönelik göç etmelerine neden oldu. Bu dönemde kentlerde sanayileşme ve endüstrileşme süreçleri hızlandı ve bu da kentlerde iş imkânlarının artmasına yol açmıştır.
1970'ler ve 1980'ler: Bu dönemde ekonomik ve siyasi istikrarsızlık nedeniyle Türkiye'den Avrupa ülkelerine işçi göçü yaşanmıştır. Özellikle Almanya, Fransa ve Hollanda gibi ülkelere Türk işçilerin göç etmesi önemli bir trend haline gelmiştir. Bu dönemde Türkiye'den Avrupa'ya göç, ekonomik kalkınmaya katkı sağladı ancak aynı zamanda Türkiye'deki işgücü piyasasında da boşluklar yaratmıştır.
1990'lar ve 2000'ler: Bu dönemde Türkiye'de ekonomik reformların ve küreselleşmenin etkisiyle göç hareketleri artmaya devam etmiştir. Ayrıca, Türkiye'de iç göçler de önemli bir yer tuttu. Özellikle büyük şehirlerdeki ekonomik fırsatlar, kırsal kesimden kente yönelik göçü artırmıştır.
2010'lar ve Sonrası: Son yıllarda, Suriye'deki iç savaşın etkisiyle Türkiye'ye yönelik sığınmacı akını artmıştır. Bu dönemde milyonlarca Suriyeli Türkiye'ye sığınarak geçici olarak veya kalıcı olarak yerleşmiştir. Bu durum, Türkiye'deki göç tarihinde önemli bir dönemeç oluşturdu ve Türkiye'nin göç politikalarını şekillendirmiştir.

Şekil 2. Akyıldız, 2022. Dış ve iç göçler bağlamında Türkiye'nin dinamik göç yapısının değerlendirilmesi.

Kırsal bölgelerden kentsel alanlara gerçekleşen göçler, Türkiye'nin kentleşme sürecinde önemli bir faktör olmuştur. Ancak, bu göçler beraberinde bazı olumsuzlukları da getirmiştir. Özellikle kentlerde yeterli konut ve iş alanlarının bulunmaması, zaman içinde kentlerin sorunlarla karşılaşmasına neden olmuştur. Bu durum, Türkiye'de kentleşme hızının artmasına rağmen, kent çevresindeki sanayi sektörlerinin kentlerle aynı hızda gelişememesiyle birleşince, kentleşmeyi olumsuz etkilemiştir. Göçler, kentleşme hızını etkileyen en temel faktörlerden biri olmakla birlikte, kentleşmenin getirdiği olumsuzlukları da beraberinde getirmektedir (Bozkurt, ve Ayfer,2018).Göç edilen yerden ayrılan nüfusun çoğunlukla aktif çalışan kesim olması, göç eden kişinin ekonomik kaynaklarını da yanında götürmesiyle sonuçlanır. Bu durum, göç edilen yerde üretimin azalmasına ve bölgenin tüketici haline gelmesine neden olur. Zamanla, göç veren yerlerde üretim azaldığı için ekonomik olarak gerileme yaşanır ve bölge daha az gelişmiş hale gelir. Bir diğer sorun ise göç edenlerin genellikle genç ve eğitimli bireyler olmasıdır, bu da göç veren yerlerde demografik yapının bozulmasına ve yaşlı nüfusun artmasına yol açar. Bu durum da gelişmişlik açısından diğer bölgelerden geri kalmaya ve daha az gelişmeye neden olmaktadır (Bozkurt, ve Ayfer,2018).

Göçlerin Nüfus Yoğunluğu ve Konut Problemi ile Kent Peyzajına Olan Etkisi

Göç edilen bölgelerdeki konut sıkıntısı ve yüksek konut fiyatları, insanları kaçak yapılaşma ve gecekondu gibi alternatif konut seçeneklerine yönlendirmiştir. Ancak, bu tür yapılar genellikle kentsel peyzajı olumsuz etkilemektedir. Özellikle kaçak yapılaşmanın artmasıyla birlikte kentlerin doğal ve kentsel peyzajı tahrip olmakta, yeşil alanlar yok olmakta ve doğal yaşam alanları zarar görmektedir. Bu durum, kentlerin estetik değerlerinin azalmasına ve çevresel dengeye zarar vermesine yol açmaktadır (Bozkurt, ve Ayfer,2018). Ayrıca, kaçak yapılaşma ve plansız kentleşme, altyapı hizmetlerinin yetersiz kalmasına ve altyapı sorunlarının artmasına neden olmaktadır. Örneğin, yağmur suyu tahliye sistemlerinin eksikliği sel veya heyelan gibi doğal afetlere zemin hazırlayabilir ve elektrik ve su kesintileri gibi altyapı sorunları yaşanabilir. Bu durumlar, kentsel peyzajın sürdürülebilirliğini ve yaşanabilirliğini olumsuz etkilemektedir.

Kentsel peyzajın korunması ve geliştirilmesi için etkili kentsel planlama ve altyapı geliştirme stratejileri geliştirilmelidir. Ayrıca, kentsel dönüşüm projelerinin kentsel peyzajı koruyacak şekilde uygulanması ve yeşil alanların artırılması önemlidir. Bu şekilde, kentlerin doğal ve kentsel peyzajı korunabilir ve sürdürülebilir bir kentsel çevre sağlanabilmektedir.

Göçlerin Çevresel Etkiler ile Kent Peyzajına Olan Etkisi

Göçün kentlerdeki nüfus artışını ve çevre kirliliğini artırması genellikle kaynakların azalması, plansız kentleşme, alt yapı eksiklikleri, işsizlik, trafik sorunları, cinsiyet eşitsizlikleri ve sosyal uyumsuzlukların çevresel etkileriyle ilişkilendirilmektedir. Toplumun çevre ve doğa bilincini desteklemek için çaba gösteren birçok aktif çevre ve doğa koruma kuruluşu bulunmaktadır. Bu kuruluşların çoğu, kirliliği önleme üzerine odaklanmaktadır. Bu bağlamda, göç kaynaklı fiziksel sorunların belirlenmesi öncelikli öneme sahiptir. Ülke genelinde nüfus dağılımındaki farklılıklar gözlemlenebilir ve bu, iç ve dış göçlerin öncelikli olarak sanayi bölgeleri gibi iş imkanlarının bol olduğu metropollere veya tarım yapılabilir alanlara yönelmesine neden olabilir. Bu durum, metropollere yönelen nüfus artışından kaynaklanacak sorunların azaltılması için daha fazla altyapı yatırımının yapılmasını gerektirecektir. Bu da kırsal kesimdeki yatırımların azalmasına yol açabilmektedir (Bardakçı Tosun, 2016).Çevre kirliliği, genellikle hava, su, toprak, gürültü ve görüntü olmak üzere çeşitli türlerde sınıflandırılır. Göçle birlikte artan nüfus ve göçmenlerin yerel kültürleri ve tüketim alışkanlıklarını sürdürmeleri, zaman zaman bu kirlilik türlerinin derinleşmesine neden olmaktadır. Sanayileşme ve hızlı kentleşme süreçlerinin ardından, çöp miktarı artmış ve çöplerin türü ve zararlı etkileri de artmıştır. Bu durum, çevre ve insan sağlığını tehdit eden

çöp yığınları veya dağları karşısında çözüm arayışlarının yerel yönetimlerin gündemine girmesine neden olmuştur (Bardakçı Tosun, 2016).

Göçlerin Ekonomik Canlılık ile Kent Peyzajına Olan Etkisi

Mültecilerin ekonomik etkileri, göçün başladığı dönemden bu yana belirgin bir şekilde gözlemlenmiştir. Göçün yol açtığı hızlı nüfus artışı, imalat ve perakende sektörlerinde canlanmaya neden olmuştur. Devletin mültecilere sağladığı hizmetler için yerel tedarikçilerden mal ve hizmet temin etmesi, yerel ekonomiyi desteklemiştir. Ancak, bu olumlu etkilerin süresi sınırlı olmuştur. Başlangıçta, göç eden mültecilerin yanlarında getirdikleri nakit paraları hızla harcamaları, piyasayı canlandırmış ve satışları artırmış olsa da, mal ve hizmet fiyatlarında artışlar yaşanmıştır. Özellikle şehir merkezlerinde kalan mültecilerin ev kiralaması veya satın alması, konut satış fiyatlarını ve kiraları artırmış ve düşük gelirli ailelerin zor durumda kalmasına yol açmıştır (Kaypak ve Bimay, 2016).

Niteliksiz iş gücü piyasasında düşük ücretlerle kaçak işçi olarak çalışmaya başlamaları, işverenler açısından önemli bir kazanç kaynağı olmuştur. Bununla birlikte, bu durum yerel iş gücünün daha düşük ücretlerle rekabet etmesini zorlaştırmıştır. Dolayısıyla, yerel işçiler arasında memnuniyetsizlik oluşmuş ve ülke genelinde istihdam politikaları üzerinde baskı oluşturmuştur. Düşük ücretlere razı olan veya bu durumu reddedip işlerinden ayrılan işçiler, ülkenin genel ekonomik dengesinde önemli bir rol oynamaktadır (Kaypak ve Bimay, 2016)

Göçlerin Kültürel Çeşitlilik ile Kent Peyzajına Olan Etkisi

Günümüzde Avrupa'da göç olgusunun paradoksal bir şekilde tersine işlediği ve yerel halk için bir tehdit olarak algılandığı gözlemlenmektedir. Göçmenlerle yerel nüfus arasındaki sosyo-kültürel farklılıkların varlığı, uyum ve kimlik konularında endişelere neden olmuştur. Kimlik tanımları konusunda tam bir uzlaşının sağlanamamasının temel nedenlerine bakıldığında, toplumun sosyal, politik ve kültürel bütünlüğünü koruyabilecek ve destekleyebilecek, bu hedefe ulaşmak için girişilen eylemleri yönlendirebilecek ve meşruiyet kazandıracak değerler ve referanslar konusunda farklı görüşlerin olduğu görülmektedir. Bu farklılıklara ek olarak, ortak bir vizyon oluşturulması sürecinde çeşitli katkılarda bulunulması gerektiği de belirgin hale gelmektedir (Bardakçı Tosun, 2016).

SONUÇ

Göç, kentlerin demografik, sosyal ve ekonomik yapısını önemli ölçüde etkileyen karmaşık bir olgudur. Göçün nedenleri arasında ekonomik fırsatlar, iş bulma olanakları, eğitim ve çevresel faktörler bulunmaktadır. Göçler, yerleşim alanlarının nüfusunu artırarak kentsel yoğunluğa ve yapısal değişimlere yol açmaktadır. Bu değişimler, kent sınırlarının genişlemesi, yeni konut alanlarının oluşturulması ve altyapı hizmetlerinin geliştirilmesi gibi

sonuçları beraberinde getirebilir. Ayrıca, göçler kentsel peyzajda kültürel çeşitliliği artırarak mimari zenginliği desteklemekte ve sosyal etkileşimi teşvik etmektedir. Ancak, göçlerin kentsel peyzaja olan etkileri sadece olumlu değildir. Özellikle konut sıkıntısı, kaçak yapılaşma ve plansız kentleşme gibi sorunlar, kentsel peyzajın tahribine ve çevresel dengenin bozulmasına yol açabilir.

GÖÇ + **KENTSEL PEYZAJ**

	ÇOK ETKİLİ	ETKİLİ	ETKİSİZ
İşsizlik Artışı	✓		
Kira Arsa Fiyat Artışı	✓		
Dilencilik Artışı	✓		
Sağlık Sorunlarının Artışı			✓
Suç Oranlarının Yükselmesi			✓
Halkın Gelir Seviyesinin Düşüş Durumu		✓	
Nüfusun Demografik Yapısının Bozulması			✓
Sınırlarının Genişlemesi ve Tarım Alanlarının Yok Edilmesi	✓		

Ekonomik canlılık ve kültürel çeşitlilik getirisiyle birlikte işsizlik, ücretlerdeki düşüş ve yerel halk ile göçmenler arasındaki uyum sorunları gibi zorluklar da yaşanmaktadır. Bu bağlamda, kentsel planlama süreçlerinde göçün etkileri dikkate alınmalı ve sürdürülebilir kentlerin oluşturulması için stratejiler geliştirilmelidir. Altyapı ve kamu hizmetlerinin geliştirilmesi, konut piyasasının düzenlenmesi ve kültürel entegrasyonu destekleyici politikaların uygulanması, göçün kentsel peyzaj üzerindeki olumsuz etkilerini azaltabilir ve kentlerin daha yaşanabilir ve sürdürülebilir hale gelmesine katkıda bulunabilmektedir. Sonuç olarak, göçlerin kentsel peyzaj üzerinde karmaşık ve çeşitli etkileri bulunmaktadır. Bu etkilerin yönetilmesi ve en iyi şekilde değerlendirilmesi için çoklu paydaşların katılımını sağlayacak politika ve stratejilerin belirlenmesi gerekmektedir. Bu sayede, göçün kentsel peyzaj üzerindeki olumlu etkileri maksimize edilirken, olumsuz etkileri ise minimize edilebilmektedir.

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DÜŞÜK ETKİLİ GELİŞME VE PEYZAJ ŞEHİRCİLİĞİNİN BİRLİKTE İNCELENMESİ

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Özet
Günümüzde su yönetimi, küresel iklim değişikliği, hızlı kentleşme ve artan nüfus gibi faktörlerin etkisiyle giderek daha büyük bir sorun haline gelmektedir. Bu durum, su kaynaklarının sürdürülebilir bir şekilde kullanılması ve yönetilmesi gerekliliğini ortaya koymaktadır. Düşük etkili geliştirme (LID), yağmur suyunu doğal sistemlerin kontrolünde tutmayı hedeflemektedir. Bu yaklaşım, doğal özelliklerden yararlanarak yeşil çatılar, biyolojik koruma bahçeleri ve geçirgen kaldırımlar gibi doğal süreçleri taklit eden sistemlerin kullanımını içermektedir. Geçmişte yağmur suyu yönetimi, yağmur suyunun bertaraf edilmesi anlamına gelmekteydi. LID ile yağmur suyu bertaraftan ziyade bir kaynak olarak yönetilmektedir. LID'in amacı, bir alanın yağmur suyunu doğal kapasitesine uygun şekilde kontrol etmek için, sızan, filtreleyen, depolayan, buharlaştıran ve suyun akışını yavaşlatan tasarım tekniklerini kullanmaktır. Bu yaklaşım, yağmur suyu yönetiminde doğal süreçlere dayalı ve çevresel olarak sürdürülebilir bir çözüm sunar. Peyzaj şehirciliği ise, doğal ve yapay peyzaj ögelerini kentleşme süreçlerine entegre ederek ekonomik ve ekolojik sürdürülebilirlik üzerine odaklanmaktadır. Geleneksel kent modellerinin eksikliklerine karşı bir tepki olarak ortaya çıkan bu yaklaşım, kent planlamasında ve tasarımında doğal sistemlerin kullanımını vurgulayarak yaşanabilir kentlerin oluşturulmasını amaçlamaktadır. Düşük etkili gelişme (DEG) ve peyzaj şehirciliği kavramlarına odaklanarak, günümüz su yönetiminde yenilikçi ve sürdürülebilir çözümler sunulmaktadır. Özellikle iklim değişikliği, düzensiz kentleşme ve ekolojik endişelerin artmasıyla yeni yağmur suyu yönetimi stratejilerine olan ihtiyaç daha da belirgin hale gelmiştir. Bu bağlamda, düşük etkili gelişme ve peyzaj şehirciliği gibi yaklaşımlar, su yönetiminde ve kent planlamasında önemli birer araç olarak değerlendirilmektedir. Düşük etkili gelişme ve peyzaj şehirciliği kavramları, günümüzdeki kentsel sorunlar, sosyo-ekonomik ve ekolojik sorunlar ile başa çıkmak için çeşitli stratejiler arasında önemli bir bağlantı oluşturmaktadır. Bu stratejiler, sürdürülebilir kentlerin oluşturulması için mavi-yeşil altyapılarını kapsamakta ve bu su kaynaklarının etkili yönetimi için önemli birer çerçeve sunmaktadır. Bu araştırmada günümüz kentsel sorunlarına ithafen peyzaj şehirciliğinin etkisi ve düşük etkili gelişme kavramıyla olan ilişkisi kurulmuş olup farkları ele alınarak, kentin sürdürülebilirliği için önemli unsurları vurgulamaktadır.
Anahtar kelimeler: Düşük Etkili Gelişme, Peyzaj Şehirciliği, Kentleşme, Yağmur Suyu Yönetimi

A JOINT EXAMINATION OF LOW IMPACT DEVELOPMENT AND LANDSCAPE URBANISM

Abstract
In today's world, water management is becoming an increasingly significant issue due to factors such as global climate change, rapid urbanization, and population growth. This situation underscores the necessity for sustainable use and management of water resources.Low Impact Development (LID) aims to control rainwater within natural systems. This approach involves utilizing natural features and implementing systems that mimic natural processes such as green roofs, bioretention gardens, and permeable pavements. Historically, rainwater management focused on disposal; however, with LID, rainwater is managed as a resource rather than just being disposed of. The objective of LID is to mimic the natural capacity of an area to manage rainwater by utilizing design techniques that allow infiltration, filtration, storage, evaporation, and slowing down of water flow. This approach offers a sustainable solution for rainwater management based on natural processes. On the other hand, landscape urbanism focuses on integrating natural and artificial landscape elements into urban development processes, with an emphasis on economic and ecological sustainability. Emerging as a response to the shortcomings of traditional urban models, landscape urbanism aims to create livable cities by emphasizing the use of natural systems in urban planning and design.By focusing on the concepts of Low Impact Development and landscape urbanism, innovative and sustainable solutions are being proposed for contemporary water management. Particularly, with the increasing challenges posed by climate change, unplanned urbanization, and ecological concerns, the need for new strategies in rainwater management has become more pronounced. In this context, approaches such as Low Impact Development and landscape urbanism are being regarded as significant tools in water management and urban planning. These concepts form an important connection among various strategies to address contemporary urban issues, socio-economic, and ecological challenges. They encompass blue-green infrastructures for creating sustainable cities and provide a crucial framework for the effective management of water resources. This research establishes the impact of landscape urbanism and its relationship with the concept of Low Impact Development concerning contemporary urban issues, highlighting the essential elements for urban sustainability.
Keywords: Low Impact Development, Landscape Urbanism, Urbanization, Storm Water Management

GİRİŞ

Su kaynaklarının sınırlı miktarları ve giderek azalan kaliteleri, artan nüfus, hızla gelişen sanayi ve tarım sektörü gibi faktörlerle birlikte, arazi kullanımında meydana gelen değişimlerle önemli sorunlara yol açmaktadır. Özellikle ormanlık alanların ve sulak alanların azalması, kontrolsüz ve hızlı bir şekilde yayılan tarım, yerleşim ve endüstriyel faaliyetler, su kaynaklarının geleceği için ciddi riskler oluşturmaktadır. Bu bağlamda, su kaynaklarının etkili bir şekilde yönetilmesi kaçınılmaz hale gelmektedir.Su kaynaklarının korunması için havza yönetimi büyük önem taşımaktadır. Havza yönetimi, erozyonun önlenmesi, sel ve taşkınların kontrol altına alınması, su kirliliğinin engellenmesi ve havzanın su potansiyelinin değerlendirilmesi gibi amaçlar doğrultusunda gerçekleştirilmektedir. Bu sayede, toplumun su ihtiyaçları karşılanırken, çevresel sürdürülebilirlik de sağlanmış olur. Özellikle, kentsel alanlarda yağmur suyunun etkili bir şekilde yönetilmesi ve kirliliğin önlenmesi için çeşitli çalışmalar yürütülmektedir.Yağmur suyu yönetimine yönelik uygulamalar, dünya genelinde uzun bir geçmişe sahiptir. Ancak, bu uygulamalar genellikle büyük ölçekli havzalarda ve taşkın kontrolüne odaklanmıştır. Son yıllarda ise özellikle kentleşmenin artmasıyla birlikte, küçük ölçekli bölgelerde yağış sonucu oluşan yüzeyel akışın kontrol edilmesi ve su kaynaklarına karışan kirliliğin azaltılması için çeşitli çalışmalar yapılmaktadır. Bu çalışmaların amacı, su miktarını kontrol altına almak, taşkın gibi olumsuz etkileri azaltmak ve su kirliliğini önlemektir (Gülbaz ve Kazezyılmaz-Alhan, 2017).Kentleşme sürecinde artan yüzeysel akışın neden olduğu taşkın ve sel gibi afetlerle başa çıkabilmek için doğru ve zamanında müdahale gerekmektedir. Bu müdahalenin sadece taşkın yataklarının korunması ve altyapının güçlendirilmesi ile sınırlı olmadığı unutulmamalıdır. Özellikle kentsel bölgelerde, suyun sızmasını kolaylaştıracak ve suyu tutabilecek yapıların inşası büyük önem taşımaktadır. Bu sayede, taşkın ve sel olaylarının etkileri minimize edilerek, kentsel alanlardaki su yönetimi daha etkili bir şekilde gerçekleştirilebilir (Gülbaz ve Kazezyılmaz-Alhan, 2017).Peyzaj şehirciliği kuramı, genişleyen kentleri anlamak ve analiz etmek için peyzaj mimarlarının geleneksel araçlarını kullanmasını önerir. Bu yaklaşım, kent dinamiklerini mimari odaklı yaklaşımlara kıyasla daha etkili bir şekilde anlamamıza ve değişen peyzaj ve kentsel tasarım programlarına esnek bir şekilde yanıt vermemize olanak tanır. Bu bakış açısı, postmodern şehircilik tarafından belirli kurallar ve kalıpların kente uygulanmasına eleştirel bir yaklaşım sunar. Peyzaj şehirciliği kuramı, "belirsizlik, açık uçluluk, akış, esneklik, komplekslik ve açık sistemler" gibi anahtar kavramları vurgulayarak peyzajı kentsel programların değişen ihtiyaçlarına uyum sağlayabilen stratejik bir araç olarak konumlandırır (Gümüşsoy Kısar, N., 2017). Bu yaklaşım, kentlerin sürekli değişen

ihtiyaçlarına cevap verebilecek dinamik ve esnek tasarım stratejilerinin geliştirilmesine olanak tanır. Ayrıca, peyzaj şehirciliği kuramı, kentlerin karmaşıklığını ve sürekli değişen doğasını göz önünde bulundurarak, kentsel tasarımın ve planlamanın daha geniş bir perspektiften ele alınmasını teşvik eder. Bu da kentsel alanların daha sürdürülebilir ve yaşanabilir hale getirilmesine katkı sağlar.Bu çalışmanın amacı, Düşük Etkili Gelişme (DEG) ve Peyzaj Şehirciliği kavramlarını inceleyerek, bu kavramların kentsel su yönetimi üzerindeki etkilerini değerlendirmektir. Yazarlar, mevcut literatürü derleyerek analiz etmiş ve DEG ile Peyzaj Şehirciliği arasındaki bağlantıyı ortaya koymuşlardır. Ayrıca, bu çalışmada kullanılan materyal ve yöntemler detaylı bir şekilde açıklanmıştır. Bu çalışmanın akademik amaçları arasında şunlar yer alabilir:

- DEG ve Peyzaj Şehirciliği kavramlarını kapsamlı bir şekilde açıklamak ve bu kavramların kentsel su yönetimi üzerindeki etkilerini anlamak.
- Kentsel alanlardaki su yönetimi, kentsel planlama ve sürdürülebilirlik alanlarında yeni bakış açıları ve stratejiler geliştirmek.
- DEK uygulamalarının ve Peyzaj Şehirciliği prensiplerinin daha geniş çapta benimsenmesi ve kentsel çevrenin dönüşümünde etkili bir şekilde kullanılması için bilimsel ve pratik bir temel oluşturmak.
- Kentsel alanların daha sürdürülebilir, yaşanabilir ve çekici hale gelmesine katkıda bulunmak için politika yapıcıları, şehir planlamacıları ve tasarımcılar için rehberlik sağlamaktır.

MATERYAL VE YÖNTEM

Bu araştırma, mevcut literatürün derlenmesi ve analizi üzerine odaklanmıştır. Düşük Etkili Gelişim ve Peyzaj Şehirciliği kavramlarının incelenmesi ve bu kavramların kentsel su yönetimi üzerindeki etkilerinin değerlendirilmesi amaçlanmıştır. Araştırma kapsamında kullanılan veriler, akademik makaleler, kitaplar, konferans bildirileri ve çevrimiçi kaynaklar gibi çeşitli bilgi kaynaklarından elde edilmiştir. Veri toplama sürecinde, "Low Impact Development", "Landscape Urbanism", "Urbanization" ve "Stormwater Management" gibi anahtar kelimeler kullanılarak PubMed, Google Scholar, Web of Science ve Scopus gibi bilimsel veri tabanları taranmıştır.Literatür taraması, Düşük Etkili Gelişim ve Peyzaj Şehirciliği ile ilgili mevcut çalışmaların ve bulguların belirlenmesi için gerçekleştirilmiştir. İlgili bilgi kaynaklarından elde edilen makaleler ve diğer kaynaklar, araştırmanın odak noktalarına uygun olarak titizlikle seçilmiştir. Toplanan veriler, karşılaştırmalı olarak incelenmiştir. Bu karşılaştırma, Düşük Etkili Gelişim ve Peyzaj Şehirciliği kavramlarının su yönetimi, kentsel planlama ve sürdürülebilirlik bağlamında nasıl uygulandığını ve etkilerini

değerlendirmeyi amaçlamıştır. Elde edilen veriler, temalar ve benzerlikler açısından karşılaştırmalı olarak değerlendirilmiştir.Araştırmanın sınırlılıkları, yalnızca İngilizce dilindeki kaynaklara odaklanması, belirli bir coğrafi bölgeye odaklanmaması ve literatür taramasına dayalı olması olarak belirlenmiştir. Ayrıca, belirli bir dönemdeki en güncel bilgileri içermeyebilir. Araştırmanın kapsamı, seçilen anahtar kelimeler ve veri tabanlarına bağlı olarak sınırlı olabilir. Çalışmanın akış diyagramı Şekil 1'de verilmiştir.

PEYZAJ ŞEHİRCİLİĞİ KAVRAMININ AÇIKLANMASI	DÜŞÜK ETKİLİ GELİŞME KAVRAMININ AÇIKLANMASI	DÜŞÜK ETKİLİ GELİŞME VE PEYZAJ ŞEHİRCİLİĞİNİN BİRLİKTE İNCELENMESİ

Şekil 1. Çalışmanın akış diyagramı,

BULGULAR

DEG (Düşük Etkili Gelişme) uygulamaları, yağmur suyu yönetiminde küçük ölçekli teknikler kullanarak hidrolojik dengenin korunmasını, yağmur suyu akışının olumsuz etkilerini azaltmayı ve yayılı kirlilik kaynaklarının etkilerini hafifletmeyi amaçlar. Bu teknikler arasında biyotutma, bitkisel kanallar, geçirgen kaldırımlar, yeşil çatılar ve yağmur tankları gibi çözümler bulunmaktadır. DEG uygulamaları, öncelikle kentleşme süreciyle artan geçirimsiz alanların azaltılmasını hedefler. Bu durum, kentlerde yüzeyel akışın artmasına ve sızmanın azalmasına neden olur. Sonuç olarak, sel ve taşkın gibi olumsuz olaylar artar ve su kalitesi olumsuz etkilenir. Ancak, DEG uygulamaları yüzeyel akış hacmi, pik debi, akış frekansı ve süresi gibi faktörler üzerinde etkili olarak su kalitesini iyileştirebilir (Gülbaz ve Kazezyılmaz-Alhan, 2017).

Peyzaj şehirciliğinin kurucularından biri olarak kabul edilen Waldheim, peyzaj şehirciliğini modern kentsel tasarım paradigmasını değiştiren bir disiplin olarak tanımlar. Ona göre, peyzaj şehirciliği, mimarinin yerini alarak kentsel alanların çok boyutlu bir şekilde ele alınmasını sağlar ve yeni kent temsilleri üretir (Duran Akansel, 2012). Peyzaj şehirciliği, yeni şehircilik gibi akımlara eleştirel bir yaklaşım sergiler. Yeni şehircilik, kentin sosyal ve insan odaklı olduğunu iddia etmesine rağmen, genellikle kalıplaşmış mimari yapılarla dolu bir kent modeli önerir ve bu da kentin ekosisteminin sadece arka bahçelerle sınırlı kaldığına işaret eder. Bu duruma karşı çıkan peyzaj şehirciliği ise atıl alanların peyzajının öncelikli olarak yeniden değerlendirilmesini savunur ve böylece doğal unsurların kente dahil edilmesini mümkün kılar. Yeni şehircilik, peyzaj şehirciliğinin vurguladığı belirsizlik ve

açık uçluluk kavramlarının tam tersi olan basitlik ve netlik ilkesini benimseyerek, kentin çevreyle birlikte şekillenmesi gerektiğini savunur (Gümüşsoy Kısar, N., 2017).Bu iki kavram arasındaki bağlantı daha da derinleşirken, DEG uygulamaları peyzaj şehirciliği prensipleriyle uyumlu bir şekilde kentsel çevrenin dönüşümünü destekler. Özellikle, DEG teknikleri kentlerde yeşil altyapının geliştirilmesine odaklanarak peyzajın kente entegrasyonunu güçlendirir. Örneğin, bitkisel kanallar ve biyotutma sistemleri gibi DEG çözümleri, kentsel alanlarda yağmur suyunun doğal yollarla tutulmasını ve arıtılmasını sağlayarak kentin yeşil dokusunu güçlendirir ve biyoçeşitliliği artırır. Bu sayede, kent sakinlerine doğal yaşam alanları ve dinlenme alanları sunulurken, aynı zamanda su kaynaklarının korunması ve kentsel sel riskinin azaltılması gibi önemli çevresel faydalar elde edilir.DEG uygulamaları kentsel sürdürülebilirlik ve yaşanabilirlik açısından da kritik bir rol oynar. Örneğin, geçirgen kaldırımlar ve yeşil çatılar gibi DEG teknikleri, kent mikro iklimini iyileştirir, hava kalitesini artırır ve enerji tüketimini azaltarak kent sakinlerinin yaşam kalitesini yükseltir. Bu uygulamalar aynı zamanda kentsel ısı adalarının etkilerini azaltarak şehirlerdeki sıcaklık artışıyla mücadele eder ve böylece kentsel yaşamı daha konforlu hale getirir. Sonuç olarak, DEG uygulamaları peyzaj şehirciliği ilkeleriyle birleşerek kentsel çevrenin dönüşümünde önemli bir rol oynar ve kentlerin daha sürdürülebilir, yaşanabilir ve çekici hale gelmesine katkıda bulunur. Bu nedenle, DEG tekniklerinin daha geniş çapta benimsenmesi ve uygulanması, kentsel alanların gelecek nesiller için daha sağlıklı ve dayanıklı bir şekilde gelişmesine olanak tanımaktadır (Gümüşsoy Kısar, N., 2017).

Bu çalışmanın ana bulguları şunlardır:

- DEG uygulamaları, kentsel alanlardaki su yönetimi üzerinde önemli etkilere sahiptir. Özellikle, DEG teknikleri yüzeyel akışın kontrol altına alınmasını ve su kaynaklarının korunmasını sağlar. Bu teknikler, sel ve taşkın gibi olumsuz etkileri azaltarak su kalitesini iyileştirir.
- Peyzaj şehirciliği, kentsel alanların tasarımı ve yönetiminde doğal ve kültürel peyzaj ögelerinin entegrasyonunu vurgular. Bu yaklaşım, kent yaşamının kalitesini artırırken, doğal su sistemlerinin restore edilmesini ve yeşil altyapının geliştirilmesini teşvik eder.
- Sürdürülebilirlik ve doğal kaynakların korunması, kentsel alanların uzun vadeli sağlığı için temel bir gerekliliktir. DEG ve Peyzaj Şehirciliği yaklaşımları, su ve enerji verimliliği, atık yönetimi ve biyoçeşitliliğin korunması gibi önlemleri içerir ve kentsel alanların sürdürülebilirlik hedeflerine ulaşmasına yardımcı olur.

Düşük Etkili Gelişme Yaklaşımının Şehir Planlamasına Etkisi

Düşük etkili gelişme yaklaşımı, şehir planlamasında giderek artan bir öneme sahip olup, kentsel alanların sürdürülebilirliği ve yaşanabilirliği açısından çeşitli avantajlar sunmaktadır. Bu yaklaşım, yoğunlaşmış kentsel büyüme yerine, mevcut doğal kaynakları koruyan ve insan etkisini azaltan bir gelişme modeli olarak tanımlanabilir. Örneğin, düşük etkili gelişme stratejileri, kentsel alanlardaki yeşil alanları koruyarak biyoçeşitliliği destekler ve kent sakinlerinin doğal ortamlarla etkileşimini artırır. Ayrıca, altyapı yatırımlarında verimliliği artırarak kaynakların daha etkin kullanılmasını sağlar ve kentsel alanların çevresel ayak izini azaltmaktadır.

Peyzaj Şehirciliği ve Kentsel Çevre Arasındaki Etkileşim

Peyzaj şehirciliği, kentsel çevre üzerinde önemli bir etkiye sahip olan multidisipliner bir yaklaşımdır. Bu yaklaşım, kentsel alanların tasarımı ve yönetiminde doğal ve kültürel peyzaj ögelerinin entegrasyonunu vurgular ve böylece kent yaşamının kalitesini artırır. Örneğin, peyzaj şehirciliği prensipleri doğal su sistemlerinin restore edilmesini ve kentsel alanlardaki yeşil altyapının geliştirilmesini teşvik ederek kentsel su döngüsünü iyileştirebilir. Ayrıca, doğal peyzaj ögelerinin kullanımı, kentsel ısık kirliliğini azaltarak gece gökyüzünün görünürlüğünü artırabilir ve kent sakinlerinin görsel çevre deneyimini zenginleştirebilir.

Sürdürülebilirlik ve Doğal Kaynakların Korunması:

Sürdürülebilirlik ve doğal kaynakların korunması, düşük etkili gelişme ve peyzaj şehirciliği kavramlarının merkezinde yer alır ve kentsel alanların uzun vadeli sağlığı için temel bir gerekliliktir. Bu bağlamda, su ve enerji verimliliği, atık yönetimi ve biyoçeşitliliğin korunması gibi önlemler, kentsel alanlardaki sürdürülebilirlik hedeflerine ulaşmada kritik bir rol oynar. Örneğin, yeşil altyapının geliştirilmesi ve doğal su kaynaklarının korunması, kentsel alanlardaki su döngüsünün iyileştirilmesine ve su kalitesinin artırılmasına katkıda bulunabilir. Ayrıca, enerji verimli binaların inşası ve yenilenebilir enerji kaynaklarının kullanımı, kentsel alanların karbon ayak izini azaltarak iklim değişikliğiyle mücadelede önemli bir rol oynamaktadır.

SONUÇ

Bu çalışma, Düşük Etkili Gelişme (DEG) ve Peyzaj Şehirciliği kavramlarının kentsel su yönetimi ve şehir planlaması üzerindeki etkilerini incelemiştir. Elde edilen bulgulara göre, DEG uygulamaları kentsel alanlardaki su yönetimi üzerinde önemli etkilere sahiptir. Özellikle, DEG teknikleri yüzeyel akışın kontrol altına alınmasını ve su kaynaklarının korunmasını sağlar, bu da sel ve taşkın gibi olumsuz etkileri azaltarak su kalitesini iyileştirir.

Peyzaj şehirciliği ise kentsel alanların tasarımı ve yönetiminde doğal ve kültürel peyzaj ögelerinin entegrasyonunu vurgular, bu da kent yaşamının kalitesini artırırken, doğal su sistemlerinin restore edilmesini ve yeşil altyapının geliştirilmesini teşvik etmektedir.

DEG ve Peyzaj Şehirciliği kavramları, sürdürülebilirlik ve doğal kaynakların korunması açısından kentsel alanların uzun vadeli sağlığı için temel bir gereklilik olarak ortaya çıkmaktadır. Bu bağlamda, su ve enerji verimliliği, atık yönetimi ve biyoçeşitliliğin korunması gibi önlemler, kentsel alanlardaki sürdürülebilirlik hedeflerine ulaşmada kritik bir rol oynamaktadır. DEG tekniklerinin ve peyzaj şehirciliği prensiplerinin daha geniş çapta benimsenmesi ve uygulanması, kentsel alanların gelecek nesiller için daha sağlıklı ve dayanıklı bir şekilde gelişmesine olanak tanır. Sonuç olarak, bu çalışma DEG ve Peyzaj Şehirciliği kavramlarının kentsel su yönetimi ve şehir planlaması alanında önemli birer araç olarak değerlendirilmesini sağlamıştır. Bu kavramlar, günümüzün kentsel sorunlarına çözüm sunarken, aynı zamanda sürdürülebilir ve yaşanabilir kentlerin oluşturulmasına katkıda bulunmaktadır.

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TÜRKİYE'DE SU KRİZİ ve EKONOMİK ETKİLERİ

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ÖZET
Su kaynağı, kıt kaynak olma özelliği dolayısıyla çoğu zaman potansiyel olarak bir çatışma zeminine hazırdır. Su kaynakları, günümüzde küresel ölçekte önemli sorunlarla karşı karşıyadır. Dünyanın birçok bölgesinde sel felaketleri yaşanmakta, su kalitesi neredeyse her ülkede süratle bozulmaktadır. Bu sorunlar da gerek ekonomik gerek sosyal açıdan pek çok sorunu da beraberinde getirmektedir. Ekosistemlerdeki yaşamın varlığının devamının tehdit altında bulunması bunun en önemlileri arasında yer almaktadır. Türkiye'deki duruma gelince ise su kaynaklar nüfusun hızlı artışı, endüstriyel gelişim, tarımsal üretimdeki artış ve son olarak kirlilik unsurlarının baskıları ile karşı karşıyadır. Türkiye'deki hızlı nüfus artışının yol açtığı gıda gereksinimi ve bunun sonucu olarak tarımsal sulama ihtiyacındaki artışın yanında, sosyo- ekonomik açıdan kalkınmanın bir gerçekliği olan hızlı kentleşme ve sanayileşmenin suya olan ihtiyaca yönelik olarak getirdiği talep zamanla artmaktadır. İklim değişikliği senaryolarının tartışıldığı günümüzde, su krizinin ekonomik etkileri ve su yönetimi hususunda ulusal çıkarlarımız ve toplumsal gerçeklerimiz ışığında uluslararası politikaların değerlendirmeye alınarak tartışılmasına ihtiyaç bulunmaktadır.
Anahtar Kelimeler: Su krizi, ekonomik kalkınma, su kaynakları yönetimi

WATER CRISIS IN TURKEY AND ITS ECONOMIC EFFECTS

ABSTRACT
Water resources are often a potential source of conflict due to their nature as a scarce resource. Today, water resources face important problems on a global scale. Floods occur many places in the world, and water quality is rapidly deteriorating in almost every country. These problems bring about many problems both economically and socially. The most important of these is that the existence of life in ecosystems is under threat. As for the situation in Turkey, water resources are faced with the pressures of rapid population growth, industrial development, increase in agricultural production and finally pollution elements. In addition to the food requirement caused by the rapid population growth in Turkey and the increasing need agricultural irrigation, demand for water brought about by rapid urbanization and industrialization, which is a reality of socio-economic development, is increasing over time. Today, when climate change scenarios are being discussed, there is a need to evaluate and discuss international policies regarding the economic effects of the water crisis and water management in the light of our national interests and social realities.
Keywords: Water crisis, economic development, water resources management

GİRİŞ

Türkiye kişisel olarak dikkate alınan miktar bazlı suda, ülkeler kategorisinde su anlamında sıkıntı çeken grupta yer almaktadır. Türkiye İstatistik Kurumu var olan nüfus bilimsel kriterlerdeki yönelimler sürdüğünde minvalde 2017 yılı adrese dayalı nüfus kayıt sistemi neticeleri bazında 2023 yılında Türkiye nüfusunun 86 milyon 907 bin 367 kişiye, 2040 yılında da 100 milyon 331 bin 233 kişiye ulaşacağı tahmin edilmektedir. (Tuik.gov.tr, 2018). 2030 yılına gelindiğinde ise kişi başına düşen su miktarının daha da azalması sonucunda 1.120 m^3/yıla düşmesi tahmin edilmektedir. Türkiye bir anlamda hızlı nüfus artışı büyüyen ekonomisi ve yükselen kentleşme ile su fakiri ülke olma konumunda hızla ilerlemektedir (Öktem ve Aksoy, 2014:14).Yenilenebilir su potansiyeli, Türkiye'nin 234 milyar m3'tür. Bunun 41 milyar m3'ü yer altı, 193 milyar metreküpü yerüstü sularından ibarettir. Tüketime konu yerüstü ve yer altı su miktarının iktisadi ve teknik anlamda 110 milyar m3 olarak tayin edilmiştir. (Atalık, 2006-2008, www.zmo.org.tr). Bu açıdan bakıldığında Türkiye'nin su kaynaklarını verimli yönetmesi ve iktisadi kullanması gerekmekte olup, ileride karşılaşabilmesi olağan su krizinin üstesinden gelmesi açısından önemlidir.2018 ylı DSİ verilerine göre su kullanımını sektörel bazda incelendiğinde yüzde 12.9'u (7 milyar m3) sanayide, yüzde 12.9'u (7 milyar m3) içme suyu olarak ve yüzde 74'ü de (40 milyar m3) tarım sektöründe sulamada kullanılmaktadır (DSİ faaliyet raporu, 2018).Suyun bir doğal kaynak oluşu dolayısıyla ekonomik kalkınmaya olan etkisi sektörler bazında yadsınamaz. Bu doğal kaynak enerjiden tarıma endüstriye varıncaya kadar birçok sektörde kullanılmaktadır. Türkiye'de meydana çıkacak olan su krizi dolayısıyla birçok sektörü etkileyecek ve bu da Türkiye'nin ekonomik kalkınmasına olumsuz yönde etki edecektir.Doğal kaynakların etkin kullanılması dolayısıyla yapılan üretimin, Günümüz dünyasında, ülkeler tarafından, başta milli hasılaya, sanayi, ticaret, enerji alanlarına dış ticarete, turizme, yatırım alanlarına ve istihdam temelinde pekala azımsanmayacak miktarda artıları vardır. (MTA, 2000:1) Bahse konu söz konusu katkıların nazara alınması sonucunda su kaynağının sürdürülebilir yeterli üretim olanağı ve kullanım fikri sağlanması Türkiye'de ekonomik manada kalkınmaya katkı sağlayacaktır.Türkiye, kalkınmakta olan bir ülke konumun olduğundan; su, Türkiye'de refah seviyesini yükseltici kaynak görülmekle birlikte kamusal kurum ve kuruluşlar, geçmişten bugüne su kaynaklarının yönetiminde önemli bir rol oynamaktadır. Bölgelerin İktisadi ve sosyal ilerleme bakımından aralarındaki farklılıklarının azaltılması, tarıma dayalı üretim, kırsal kesimin suya talebini karşılama, şehirlerin suya talebini karşılama, sanayi kesiminin suya talebini karşılama dahası enerjide dış kaynaklara bağımlılığı düşürmek benzeri bu minvalde Türkiye'ye ait su politikası

şekillenmiştir (Öktem ve Aksoy, 2014:20).Su kaynağının 2012 yılında yapılan Dünya Ekonomik Forumunda baskıya maruz kaldığına vurgu yapılmış ve suyun yönetimi konusunun hem sosyal hem de devamlılık ve çevre temelinde üstesinden gelinmesi gereken sorunların başında geldiğinin altı çizilmiştir. Türkiye benzeri gelişmekte olan ülkeler kategorisindeki ülkenin suyun yönetimi temelindeki çerçeve politikasında iktisadi kalkınma temelinde suyun kendini konumlandırdığı yeri kati suretle bilmesi olmalıdır. Ekonomik açıdan ilerlemenin devamlılığı, aynı zamanda finansal, çevrebilim ve sosyal sürdürülebilirlikle ilişkilidir. Bu sürdürülebilirlik konularından birinde ortaya çıkacak sorun, ülke kalkınmasını negatif yönde etkileyecektir (Öktem ve Aksoy, 2014:23)Yüzyıllarca zamandır; tarımda önemli bir girdidir su. Gelişmekte olan ülke kategorisinde olan birçok ülke örneğinden de anlaşılacağı üzere, hemen her yıl Türkiye'de tarım sektöründe su miktarının %73'ü kullanılmaktadır. Gelecekte de tarım sektörü suyun en çok kullanılacağı alan olma konumunu koruyacaktır. (Öktem ve Aksoy, 2014:32).

1. Türkiye'de Tarımsal Üretim ve Hızlı Nüfus Artışının Su Kaynakları Üzerindeki Etkileri

Tarımsal üretime katkısı suyu ekonomilerde en önemli etki haline getirmiştir. Tarımsal sulama ve aynı zamanda gıda üretimi alanlarında kaynak olarak tatlı su kullanılmaktadır. Bu oran gelişmiş ülkelerde ülkemizdeki orana kıyasen çok daha fazladır. Alan olarak tarım alanı, Türkiye'de suyun sektör bazlı dağılımında dünyada en fazla kullanım alanı olan sektördür. (www.ekodialog.com , 2011).Tarım sektörünün, Su temelli risklerle karşı karşıya kalmasının nedeni; tarıma dayalı faaliyetlerin su kaynaklarıyla olan bağlantısı ve iklim temelli değişikliklere olan hassasiyetinden gelmektedir.Milli gelir içindeki paya bakıldığında Tarım sektörünün 2000'li yılların başında %12 olan payı 2003 yılından itibaren giderek düşmeye başlamıştır (www.tzob.org.tr, 2007-2010).Türkiye'de 2007 yılında yaşanan kuraklığın etkileri tarım sektöründe kendini göstermiş olup, bu örneklerden biri olarak gösterilebilir. Türkiye Ziraat Odaları Birliği'nin 2007-2010 iktisadi raporuna göre, o yıl yaşanan kuraklığın çiftçiye maliyeti TZOB hesaplarına göre 5 Milyar TL olarak hesaplanmış, Ege, Marmara ve İç Anadolu bölgesel bazda en fazla hasar alan yerlerdir.2007 yılında olan bu kuraklık neticesinde tarımda yaşanan bu afet TÜİK rakamlarına %7 oranında küçülme olarak yansımıştır. Tarım sektörü 2007'de yaşanan bu acığı ancak 2009 yılı sonunda kapatabilmiştir (TZOB Zirai ve İktisadi Rapor, 2007-2010:3).

2. Hızlı Nüfus Artışının Su Kaynakları Üzerindeki Etkileri

Türkiye'de artışı görülen nüfusun su kaynaklarına iki farklı etkisi bulunmaktadır; nüfustaki artış ile birlikte gıdaya olan talebin ve netice itibariyle suya olan talebin artması; bunun

sonucunda da kişi başı su miktarında düşüş olmasıdır (dkm.org.tr).Değişik açılardan birçok bölgesel ve uluslararası kuruluşların gündeminde su konusu yerini korumaktadır. Bu konuların başında, suyun ülke ekonomileri için arz ettiği önem gelmektedir. Ülkelerin ekonomisinde birden fazla iktisadi alanda kullanılan ana girdi olması dolayısıyla su bambaşka bir iktisadi değere sahiptir. Bu da suyu salt iktisadi unsur olarak nazara alınıp alınmayacağı ya da fiyatlandırma politikasının nasıl cereyan edeceği meselesinin ötesine taşımaktadır. (www.makaleler.com, 2011) .Türkiye su kıtlığı çeken ülkeler kategorisinde, su kaynakları bakımından dünya ekseninde yapılan değerlendirme ışığında yer almasa da Türkiye'deki şehirleşme ve endüstrileşme verisi nüfusun hızlı yükselişi beraberinde kişi bazında suyun tüketim atışı temelli süratli bir iniş gözlemlenmektedir. 2000 m^3 su miktarı kişisel bazda yıllık su miktarıdır. Bu standardın bir yaşam için ideal olduğunu araştırmalar söylemektedir. Eğer bu oran 1700 m3 'ün altına inerse su sıkıntısı, 1000 m^3 'ün altın indiğinde su kıtlığı, 500 m^3 ün altına indiğinde de yaşamın sınırlanmasına sebep olan ana sebebin su olacağı açıklanmıştır. 1990 yılı oranlarında kişi bazında isabet eden miktarsal olarak tatlı su 1950 m^3'ken, bu oranın 2000 yılına gelindiğinde 1580 m^3 e ineceği öngörülmüş takip eden yıllarda gelecekte su sıkıntısının ortaya çıkacağı ve gündemi meşgul edeceği kanaati oluşmaktadır. (DPT, 2001).Şehirleşme, sanayileşme ve hızlı nüfus artışı olgularıyla su tüketimi Türkiye'de yükselmektedir. Böyle olunca da miktar ve kalite olarak yenilenebilir durumda ki su kaynakları azalmaktadır (Durmuş, 2013:20). Böyle olmasına rağmen şayet Türkiye'deki suyun kalitesi ve boyutu, şebekelerin ıslahıyla elbette düzeltilebilecektir.

3. Türkiye'de Su Krizinin Ekonomik Kalkınmaya Olan Etkileri

Tarihsel süreçte doğal kaynaklar ülkeler tarafından sürekli olarak kullanımda kalmış ve böylelikle belli periyotlarda süratle gelişme göstererek zenginlik kazanmışlardır. Günümüze bakıldığında doğal kaynaklarını kullanıma dahil eden ülkeler sanayi devrimini yapmış ve seviye olarak bu noktaya gelmişlerdir (MTA, 2000:1).Doğal kaynaklar tükenme özelliğine sahiptir. Buna Petrol ve kömürü örnek verebiliriz fakat; su benzeri kaynaklar da tükenmeden ziyade vasfının bozulması durumuyla karşı karşıyadır (Kuyucuklu,1998:15).Türkiye'de su kaynaklarının durumu ve yönetimi yeterince hassasiyet ihtiva eden önemli bir konu olma vasfını korumaktadır.Su kaynaklarının yönetimi konusu, toplumu ve ekonomiyi sağlık, gıda yönetimi ve güvenliği, evsel su sağlanması, enerji, sanayi ve çevresel sürdürülebilirlik açısından etkilemektedir (Wwap, 2009). Bu kapsamda tüm bu suyu farklı kullanım şekilleri, sektörler ve bunlar arasında yer alan ilişkilerin birlikte düşünülmesini gerektirmektedir.Su yönetimi, Türkiye'de merkezden yapılmaktadır. Merkezi otorite önemli karar ve planları

alır. Bakanlıklara bağlı uygulayıcı birimler ve yerel yönetim birimleri karar ve planları uygular İdari teşkilat Türkiye'de üç seviyelidir; Ulusal, il ve yerel (belediye ve köy) (www.sutema.org).Su yönetimi konusunda Türkiye'de en önemli aktör olan iki kurum (DSİ) Devlet Su işleri Genel Müdürlüğü ve kuruluşu 2011 yılında gerçekleşen Su yönetimi Genel Müdürlüğü'dür (SYGM).Kullanılabilir durumdaki su kaynaklarının değişik etmenler sebebiyle azalması, konunun ne kadar önemli olduğunun göstergesidir.Suyun iktisadi bir meta olarak değerlendirilmesi ve yönetilmesi gerekliliği fikri ortaya ilk defa Dublin'de yapılan Su ve Çevre Uluslararası Konferansı'nda atılmıştır.Adı geçen konferansta ikrar edilen Dublin kriterlerine göre; su, iktisadi organizasyonlara katkı sağlayan ve bu minvalde her seviye kullanım alanında iktisadi önemi olan bir meta olduğu ikrar edilmiştir.

2000 yılı başlangıcından başlamak üzere Su hizmetlerinin yönetim anlayışında kamusal hizmet anlayışından uzaklaşılarak, pazara dayalı bir ekonomi temelinde bir anlayış değişikliğine gidilmeye başlamıştır. Nüfusun süratle artması, iklim değişikliği, kentleşme, toprakta bozulma, çölleşen ülke toprakları, ormanların yok olması, kalitesiz hava ve farklı bütün çevreye bağlı meseleler ile beraber kalite ve miktar temelinde suya devinimin bozulması neticesinde suları korumak maksadıyla Pazar ekseninde düzenlemelerin yapılması fikri ortaya çıkmıştır. (Supolitikalaridernegiblog.files.wordpress.com, 2016).

Birçok politikaya kendini gösterdiği gibi Su politikalarında da 1990'ların yeni liberalizm anlayışı kendini göstermiş kıt kaynak olarak kabul edilmeye başlayan suyun iktisadi bir mala evirilmesine yol açmış bu da suyun fiyatlandırma politikalarına zemin hazırlamıştır. Birçok toplum/topluluk esasından su, kültürel manada taşıdığı değerle beraber, aynı zamanda insanlar için mülkiyetin de zeminini hazırlamaktadır. Bu mülkiyet bedeni, çevreyi temizleme mülkiyeti olabilir bu direk mülkiyettir. Gıda üretimi, gıda tüketimi ve barınmada olduğu gibi dolaylı mülkiyette olabilir. Ayrıca en tepede enerji yer şekilde pek çok teknolojik, sanayi ve ticaret amaçlı kullanmanın ana başlığını meydana getirebilir. Kapitalizm açısından bu özellikler suyun iktisadi mala evirilmesi demektir (Supolitikalaridernegiblog.files.wordpress.com, 2016).Giderleri, şirketlerin üretime kanalize edebilmeleri temelinde küresel ısınma su kaynaklarını sınırlayan günümüzde en güncel ve en önem ihtiva eden etmendir. Küresel ölçekte dünyamız bir su krizi ile gündeme gelecektir. Bundan dolayıdır ki krize çözüm üretmeye yönelik arayışlara girilecektir (Tutar, Kılıç ve Aytekin, 2012:235).Devam ettirilebilir su kaynakları yönetimi yeterli mali kaynakları bulma temeline dayanır. Yeterli ve ekonomik bütçe bulunması ile sağlık, insansal ihtiyaçlar için su arzı ve doğal denge maksadıyla suda niteliğin korunması ve daha iyi olmasına yönelik önlemlerin alınması var olan yapıların su ile ilgili, çalıştırılması imkânı

sağlayacaktır. (www.tarimorman.gov.tr, 2019-2023).Suya bağlı sektörlerde ihtiyaç duyulan yatırımlar (alt yapı vs) ve diğer bütün yatırım ihtiyacı olan sahalar değerlendirildiği zaman yüksek mali kaynaklar gerektirmektedir. Uçes 2016 yılı raporunda ,2016-2023 yılları arası 16,9 milyar avro yatırım gereksinimi olarak bildirilmiştir (Uçes, 2016:149).Türkiye'nin bu yatırım gereksinimi dikkate alındığında, ciddi bir sınavdan geçeceği ortadadır. Ortaya çıkması muhtemel ilave maliyetleri düşürmek yatırımlarda hedeflenmelidir. Yapılacak yatırımların kesinlikle su, enerji, gıda ve ekosistem ilintili yapılması gerekmektedir (www.tarimorman.gov.tr, 2019-2023).

3.SONUÇ

Günümüz dünyasında, temel insan haklarının gerçekleştirilebilmesi amacıyla suya olan ihtiyaç konusu artık tartışmasız olup; sağlık, hayat ve hayat standardına sahip olma hakları benzeri temel hakların su kaynaklarına ulaşılarak vücut bulacağı genel olarak ikrar edilmiştir; fakat, Su henüz bir insan hakkı olarak, uluslararası anlaşmalar ve kararnamelerde hala tanımlanmamış bulunmaktadır. Ortak kullanım konusunda çok önemli sorunları olan su meselesi iktisadi ve siyasi çıkarlardan külliyen arındırılmış da değildir. (Duyar, 2021:16).Su kıtlığı ve su kaynaklarının azalması 21. Yüzyılın en önemli meselelerindedir. Alternatifsiz bir doğal kaynak olan suyun idaresinde en ana hedef suyun ekonomik bir sistem dahilinde kullanılması su kaynaklarına zarar veren sorunların ortaya konulması ve bertaraf edilmesi ve devamlılığı olan su kaynakları idaresinin ortaya konulmasıdır. Suyun ve kaynaklarının İdaresinde meydana çıkan meseleler sorunlar, yanlış karar ve sorunlu uygulamalar neticesinde çok esaslı derecelere varmış aynı zamanda geleceği zora sokar hale gelmiştir. Böylesi bir hal de, suyu ve kaynaklarını sistemli ve etkili kullanmayı mecbur bırakmaktadır (Tarım Bilimleri Araştırma Dergisi, 2010, 67-74:7) UNEP, FAO, ve WHO benzeri BM kuruluşları ile Dünya su Forumu ve Dünya Bankası benzeri uluslararası kurumlar ve suyla ilintili kişi ve kuruluşların dediği üzere Bundan böyle su 21'inci yüzyılda en önemli ve stratejik kaynak olarak karşımıza çıkmaktadır. (www.tuba.gov.tr , 2014).Türkiye'de de önemli su havzaları olan Fırat ve Dicle Nehirlerine sahip bir ülke konumundadır. Bu konumuyla Türkiye önemli stratejik su havzalarına sahip olduğu için suyun yönetimi her zaman önemli olmaya devam edecektir. Türkiye coğrafi konumu açısından her zaman her türlü oluşabilecek su krizi olasılıklarına karşı hazırlıklı olmak ve kriz yönetimini çok iyi planlamak durumundadır.

Devlet Su İşleri Türkiye'de tam manasıyla kullanım potansiyeli olan toplam su miktarının 112 milyar m3 olarak bildirmektedir. Bunun 40,1 m3'ü 2003 yılından itibaren kullanımdadır. 40,1 milyar m3 suyun%74'ü sulamada, %15'i içmede ve %11'i de sanayi

sektöründe kullanılmaktadır. Devlet Su İşleri'nin 2030 stratejisinde ise 112 milyar m3'ün tümünün genel olarak sulama gayesiyle kullanılması planlanmaktadır. Diğer taraftan, 2005'te 45,3 milyar kilovatsaat olan hidroelektrik enerjisi üretiminin 2030'da 127,3 milyar kilovatsaate artırılması hedeflenmektedir. DSİ'nin amaçlarına erişmek amacıyla toplamda 71,5 milyar USD lüzumlu olduğunu açıklanmaktadır (www.dsi.gov.tr).Yapılacak planlamalarda sudan tasarruf etmek ve nesillere yeterli su temini ve niteliği amacıyla suyun arz yanının değil talep yanının yönetilmesi daha elzemdir. Su yatırımlarının yüksek kapasitede kullanımını sağlamak için talebin ilk sıralarda ele alınmasını gerektirir. Kriter olarak arzın yönetimi yatırımların karlı olup olmadığını öncesinde garantileyemediğinden beklenti ve kapasiteyi dikkate almaması dolayısıyla sonuç olarak arz talebi aşarsa ülke ekonomilerine zarara yol açacaktır. (www.cekulvakfi.org.tr, 2006).Geldiğimiz yüzyılda, Su küresel ısınmanın ve iklim değişikliğinin etkisiyle birlikte her geçen gün daha da önemini artırarak su sorunu olabilecek ülkeler bağlamında çok iyi yönetilmesi gereken iktisadi bir kaynak olma konumuna gelmiştir.

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EPOKSİ-AMİN KÜRLENMESİNDE NANO PARTİKÜL ETKİSİNİN İNCELEMESİ

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ÖZET
Polimer matrisli kompozit malzemelerin (PMK) endüstriyel uygulamalarda yaygın olarak kullanımı, bu malzemelerden beklenen özellikleri artırmıştır. Kullanılacak malzeme ve nano partiküllerin doğru seçilmesinin yanında kompozit üretim basamaklarının tasarlanması da nihai ürün özeliklerine ulaşmada vazgeçilmez bir zorunluluk haline gelmiştir. Kompozit üretim basamaklarının tasarlanmasında kullanılan önemli değişkenler; malzeme türü, optimum nano dolgu miktarı ve uygun kürlenme sıcaklığıdır. Bu değişkenlerin seçimi, kürlenme sürecinin optimize edilmesi ve kürlenme kinetik parametrelerinin tespiti ile doğrudan ilişkilidir. PMK' ların imalatında nano partikül katkısı kullanımı ile epoksi malzemelerin mekanik ve termal özelliklerinin iyileştirilmesine yönelik çalışmalar yapılmaktadır. Nano partikül katkısı ile üstün özelliklere sahip düşük ağırlıklı kompozit yapıların üretilmesi amaçlanmaktadır. Bu çalışmada, ticari olarak temin edilen epoksi içerisine kütlece farklı oranlarda TiO_2 (%0.1-0.5), Al_2O_3 (%1.0-1.5) ve GNP-grafen nanoplatelet (%0.25-0.75) nanopartiküllari eklenerek polimer kompozit malzemeler üretilmesi ve kürlenme süreçlerinin optimize edilmesi amaçlanmıştır. Kürlenme kinetik parametrelerinin tespiti için 80 ve 110 °C sıcaklıklarda izotermal diferansiyel taramalı kalorimetre (DSC) ölçümleri gerçekleştirilmiştir. DSC analizlerinde elde edilen veriler Kamal-Sourour kinetik modeline uygun olarak Matlab-R2019b programında analiz edilmiştir. Bu model, epoksi-nano partikül sisteminin kürlenme kinetiğini en doğru açıklayan model olarak ifade edilmektedir. TiO_2, Al_2O_3 ve GNP nano katkıları için Matlab-R2019b çıktıları, parametrik bir modelleme yaklaşımı sunan Arrhenius denklemleri kullanılarak aktivasyon enerjisi değerlerine dönüştürülmüştür. Elde edilen sonuçlar maksimum kürlenme hızının, nano partikül türünden ve katkı oranından bağımsız olarak kürleme sıcaklığına paralel olarak arttığını göstermektedir. Ek olarak nano partikül katkılı numunelerde aktivasyon enerjisinin saf epoksiye göre düşüş gösterdiği gözlenmiştir. Bu düşüş nano partikül katkı oranı paralel olarak artış eğilimi sergilemiştir. Bu durum kürlenme reaksiyonlarının daha kısa sürede başlamasının sağlanacağını göstermektedir. Buna bağlı olarak kürlenme sürelerinin ve imalat için gerekli işçilik maliyetlerinin azaltılabileceği ön görülmektedir. Yapılan çalışma ile PMK yapıların imalat süreçlerinin optimizasyonuna yeni bir bakış açısı kazandırılmıştır.
Anahtar Kelimeler: Epoksi, kompozit malzeme, nano partikül, kürlenme kinetiği, DSC.

INVESTIGATION OF NANO PARTICLE EFFECT ON EPOXY-AMINE CURING

ABSTRACT

The widespread use of polymer matrix composite materials (PMCs) in industrial applications has increased the expected properties of these materials. In addition to the correct selection of materials and nano particles to be used, the design of composite production steps has become an indispensable necessity to achieve the desired product properties. Important variables used in the design of composite production steps include the type of material, the optimum nano filler amount, and the appropriate curing temperature. The selection of these variables is directly related to the optimization of the curing process and the determination of curing kinetic parameters. Studies are being conducted to improve the mechanical and thermal properties of epoxy materials with the use of nano particle additives in the manufacturing of PMCs. The aim is to produce lightweight composite structures with superior properties using nano particle additives. In this study, polymer composite materials were produced by adding TiO_2 (0.1-0.5%), Al_2O_3 (1.0-1.5%), and GNP-graphene nanoplate (0.25-0.75%) nano particles at different mass ratios to commercially available epoxy, and the curing processes were optimized. Isothermal differential scanning calorimetry (DSC) measurements were performed at 80 and 110°C to determine the curing kinetic parameters. The data obtained from the DSC analyses were analysed using the Kamal-Sourour kinetic model in Matlab-R2019b program, which is expressed as the most accurate model describing the curing kinetics of the epoxy-nano particle system. Matlab-R2019b outputs for TiO_2, Al_2O_3, and GNP nano additives were converted to activation energy values using Arrhenius equations, which offer a parametric modelling approach. The results obtained show that the maximum curing rate increases parallel to the curing temperature regardless of the nano particle type and additive ratio. Additionally, a decrease in activation energy was observed in nano particle-doped samples compared to pure epoxy, and this decrease exhibited an increasing trend parallel to the nano particle additive ratio. This indicates that the curing reactions will start in a shorter time, potentially reducing curing times and labour costs required for manufacturing. The study provides a new perspective on the optimization of PMC manufacturing processes.

Keywords: epoxy, composite material, nano particle, curing kinetics, DSC.

GİRİŞ

Farklı kimyasal yapı formada en az iki malzemenin bir araya getirilmesi ile oluşan ve yapı elemanlarından daha üstün özelliklere sahip olan malzemelere kompozit malzeme adı verilmektedir. Kompozit malzemeler matris ve takviye fazı olarak iki bileşenden oluşmaktadır. Polimer matris grubunda yer alan epoksi reçineler; hafiflik, yüksek mekanik dayanım ve korozyon direnci, imalat esnekliği ile çok sayıda takviye fazı ile üstün uyum sağlaması gibi özellikleri sayesinde kompozit malzeme imalatında yaygın kullanıma sahiptir [1].Isı etkisi ile sertleşen reçine sistemlerinde kürlenme mekanizmaları nihai ürünlerin mekanik özellikleri üzerinde önemli bir etkiye sahiptir [2]. Ekzotermik bir reaksiyon modeli gösteren kürlenme sürecinde, sıcaklık ve kürlenme derecesi arasında önemli bir bağıntı vardır [3], [4]. Kürlenme sıcaklığının yüksek seçilmesi malzeme iç yapısında karmaşık gerilmelerin oluşmasına sebep olarak mukavemetinin düşmesine ve dolaylı olarak mekanik performansın azalmasına sebep olmaktadır [5], [6]. Bu yüzden kürlenme sıcaklığının ve sürecinin doğru tanımlanması kompozit imalat süreçlerinin tasarım ve değerlendirilmesinde önemli bir basamak olarak görülmektedir [7], [8].Kürlenme kinetik modellerini geliştirilmesi reçine esaslı kompozit malzemelerin simülasyon ve üretim aşamalarında önemli kriterlerdendir. Kürlenme kinetik modellerinin analizinde yaygın olarak kullanılan analiz yöntemi diferansiyel tarama kalorimetrisi (DSC)'dir. DSC analizleri dinamik ve izotermal koşullar altında gerçekleştirilebilmektedir.Epoksinin kürlenme süreci ekzotermik olarak gerçekleşmektedir. DSC analizi ile epoksi reçinenin kürlenmesi sırasında sisteme verilen ısı ile sitemden salınan ısı arasındaki fark ölçülmekte ve kompozit yapının kürlenme derecesi (α) tespit edilmektedir. Aynı zamanda ekzotermi eğrileri kullanılarak kürlenme hızı (dα/dt) değerlerine ulaşılabilmektedir. Bu özellikleri ile DSC analizleri kürlenme kinetiğini değerlendirmede yaygın kullanılan analitik bir yaklaşımdır [9].Kürlenme derecesi α; Denklem (1)'de ifade edildiği gibi reaksiyon sırasında t anında açığa çıkan ısının (H_t), kürlenme süreci boyunca açığa çıkan toplam ısıya (H_T) oranı ile açıklanmaktadır. Aynı zamanda kürlenme sürecinde t anında, reaksiyona giren epoksit gruplarının karışımda var olan tüm epoksit gruplarına oranlanması ile de hesaplanabilmektedir. α %0'dan %100'e çıktığında epoksi kürlenme reaksiyonu tamamlanmaktadır [8].

$$\propto = \frac{H_t}{H_T} \qquad (1)$$

H_T, kürlenme derecesi-zaman eğrisinin altında kalan alan olarak açıklanmaktadır. Kürlenme reaksiyonunun hızının ise Denklem (2)'de verilen hız yasasına uyması beklenmektedir.

$$\frac{d\alpha}{dt} = k(T)f(\alpha) \quad (2)$$

Burada, reaksiyon modeli f(α) ile açıklanmaktadır. Epoksi esaslı kompozit yapıların kürlenme kinetik parametrelerinin değerlendirilmesinde n'inci mertebe veya otokatalitik reaksiyon türleri etkin sonuçlar vermektedir [10].

Bu çalışmada Denklem (3)'de yer alan, otokatalitik ve n'inci dereceden modellerini aynı anda kullanan ampirik Kamal-Sourour modeli epoksi reçinenin reo-kinetiğini açıklamak için kullanılmıştır. Burada m ve n, sırasıyla kürlemenin başlangıç ve yayılma aşamalarını tanımlayan ampirik reaksiyon sabitleridir

$$\frac{d\alpha}{dt} = (k\,\alpha^m)(1-\alpha)^n \quad (3)$$

Bu çalışmada, değişik oranlarda GNP, Al_2O_3 ve TiO_2 nano partikül katkısının epoksi reçinenin tam katılaşma (kürlenme) sürecine etkisinin değerlendirilmesi ve kür süresinin kısaltılması amaçlanmıştır. Bu doğrultuda optimum kürlenme sıcaklığının seçilmesi, nano partiküllerin kompozit yapıların aktivasyon enerjisi üzerine etkisinin değerlendirilmesi için farklı kürlenme sıcaklıklarında izotermal DSC analizleri gerçekleştirilmiş ve sonuçlar değerlendirilmiştir.

MATERYAL METOD

Materyal

Yapılan çalışmada Hexion marka MGS-LR285 laminasyon reçinesi ve sertleştirici olarak da sıvı MGS-LH285 kullanılmıştır. Reçine ve sertleştiricinin teknik verileri Çizelge 1'de yer almaktadır.

Çizelge 1. Reçine ve sertleştiriciye ait teknik veriler.

Reçine		**Sertleştirici**	
Yoğunluk (g/cm³)	1.18-1.23	**Yoğunluk** (gr/cm³)	0.94-0.97
Vizkosite (mPas)	600-900	**Vizkosite** (mPas)	80-120
Epoksi değeri (Eşdeğer/100gr)	0.59-0.65	**Amin Değeri** (mgr KOH/gr)	480-550
Refraktör indeksi	1.525-1.530	**Refraktör indeksi**	1.4950-1.4990

Nano partiküllerin epoksi reçine ile birlikte kullanılması hakkında yapılan araştırmalarda

Al_2O_3, TiO_2 ve GNP partikülleri aktif ve olumlu sonuçlar göstermeleri ile yaygın kullanılmaktadırlar [11]-[13]. Analizlerde kullanılan nano partiküllere ait teknik veriler Çizelge 2'de yer almaktadır.

Çizelge 2. Nano partiküllere ait teknik özellikler.

	TiO_2	**Al_2O_3**	**GNP**
Saflık	% 99.55	% 99.9	% 99.9
Renk	Beyaz	Gri	Beyaz
Parça Ölçüsü	13 nm	5 nm	8 nm
Spesifik Yüzey Alanı	60 m^2/g	135 m^2/g	30 m^2/g
Yoğunluk	4.1 g /cm^3	-	1 g /cm^3
PH	5.5-6.5	-	7
Elektriksel İletkenlik	-	1100-1600 s/m	-

Analiz numuneleri, reçine içerisine kütlece değişken miktarlarda TiO_2 (%0.1-0.5), Al_2O_3 (%1.0-1.5) ve GNP (%0.25-0.75) nano partikülleri içermektedir. Numuneler, nano partiküllerin matris içerisine homojen dağılımının sağlanabilmesi için oda ısısında sırası ile 15 dk mekanik, 5 dk manyetik karıştırmaya tabi tutulmuştur. Karıştırma esnasında oluşan hava kabarcıklarının minimum seviyeye indirilmesi için ve 15 dk ultrasonik banyoda bekletilen numuneler, yine oda sıcaklığında stokiyometrik oranda (100: 40±1) sertleştirici ile karıştırılarak teste hazır hale getirilmiştir.

Metod

Kürlenme kinetik parametrelerinin tespiti için 80 ve 110 °C sıcaklıklarda izotermal DSC ölçümleri gerçekleştirilmiştir. DSC analizleri bir intracooler ile döşenmiş, yüksek saflıkta indiyum ve çinko standartlarıyla kalibre edilmiş bir Mettler-Toledo DSC1 modülünde gerçekleştirilmiştir. Analizler, kuru atmosferde, sabit akışlı 50 ml/dk'lık nitrojen altında, 2.5-3.5 mg numunelerin cihaz bekleme sıcaklığından (~30 °C) istenen izotermal sıcaklıklara (80-110 °C) 2dk gibi hızlı bir sürede ısıtılması bu sıcaklıkta 30 dk kürlenmesi ile gerçekleştirilmiştir.

Her analiz öncesi numunelere sürüntü testleri yapılarak aglomerasyon oluşumu kontrol edilmiştir. Yapılan kontrollerde aglomerasyon oluşumu gözlenmemiştir.

BULGULAR VE TARTIŞMA

DSC analizlerinden elde edilen ısıl aktarım verileri MATLAB-R2019b kullanılarak analiz edilmiş ve kürlenme derecesinin (α) değerleri hesaplanmıştır. Hesaplamalarda model denklem olarak Kamal-Sourour modeli kullanılmıştır.

Kürlenme derecesi epoksi-nano partikül karışımlarının viskozitelerindeki değişimlere bağlı olarak artış göstermiş ve bir birim değere çıkıldığında sabit bir eğri çizmiştir [14], [15]. Grafiklerde yer alan eğriler Kamal-Sourour modeline uygun olarak oluşturulan eğrilerdir.

Yapılan araştırmalarda, epoksinin sabit sıcaklık altında kürlenme sürecinin başlangıç evresinde kürlenme derecesinin hızlı bir artış sergilerken ilerleme aşamasında sabit bir eğri çizdiği gözlenmiştir [16], [17]. Bu eğilim reçinenin polimerizasyon sırasında gerçekleştirdiği zincir dallanması ve uzaması ile çapraz bağlanmalardan kaynaklandığı düşünülmektedir. Bu çapraz bağlar moleküler bağlanmaları artırarak vizkoziteyi yükseltmiş ve moleküler hareketliliği azaltmış ve dönüşüm oranı düşüş sergilemiştir [18], [19]. Tüm nano partikül katkılarında benzer eğilimler gözlenmiş, katkı oranı arttıkça karışımların sergilediği farklı tepkiselliklere bağlı olarak kürlenme oranları değişmiştir.

Epoksi-Al_2O_3 karışımlarının 80,110 °C'de gerçekleştirilen kürlenme işleminde kürlenme hızı- kürlenme derecesi eğrilerini gösteren grafikler Şekil 1'de yer almaktadır.

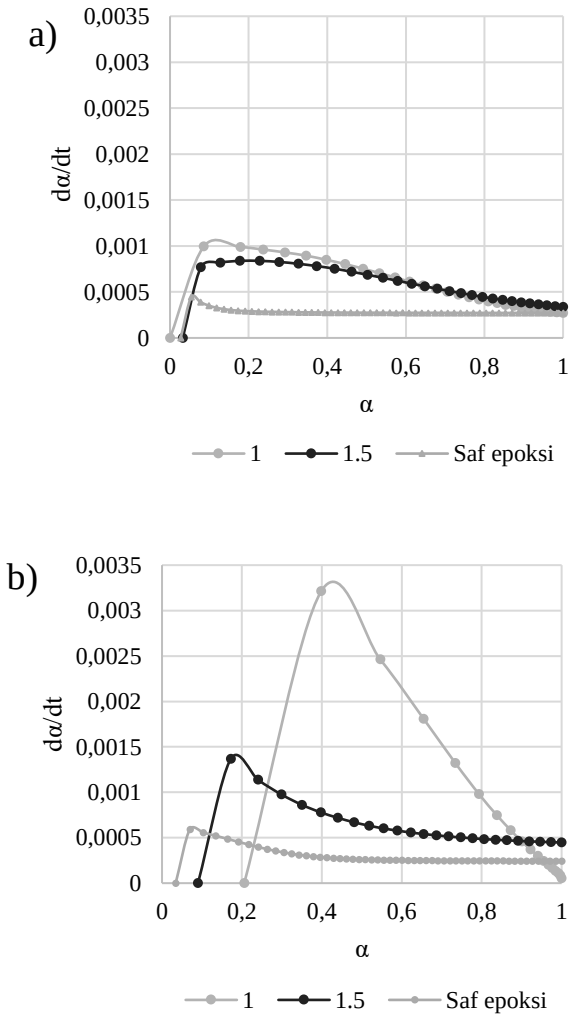
Şekil 1'de görüldüğü gibi,

- Tüm sıcaklık değerlerinde Al_2O_3 katkısı ile maksimum kürlenme hızı saf epoksiye kıyasla artış göstermiştir.

- 80 °C sıcaklıkta %1.0 Al_2O_3 katkısı maksimum kürlenme hızını saf epoksiye göre 2.58 kat artırırken, % 1.5 Al_2O_3 katkısı 1.87 kat arttırmıştır.

- 110 °C sıcaklıkta %1.0 Al_2O_3 katkısı maksimum kürlenme hızını saf epoksiye göre 5.3 kat artırırken, % 1.5 Al_2O_3 katkısı 2.31 kat arttırmıştır.

Yukarıdaki veriler değerlendirildiğinde %1.0 Al_2O_3 katkısı ilavesi epoksi kürlenme reaksiyonu için katalizör etkisi göstermiş ancak katkı oranının artırılması ile reçine içerisinde mikro boyutlarda artan nano partikül konsantrasyonunun molekülleri birbirine yaklaştırdığı ve hareketlerinin azalmasına sebep olduğu düşünülmektedir. Moleküler hareketlerdeki bu yavaşlama entropi seviyesinin düşmesine ve partiküller arasında enerji bariyerlerinin oluşması ile çapraz bağlanmaların azalmasına sebep olmuştur.



Şekil 1. Al_2O_3 katkılı epoksin sıcaklığa bağlı kürleşme grafikleri a) 80 °C b) 110 °C

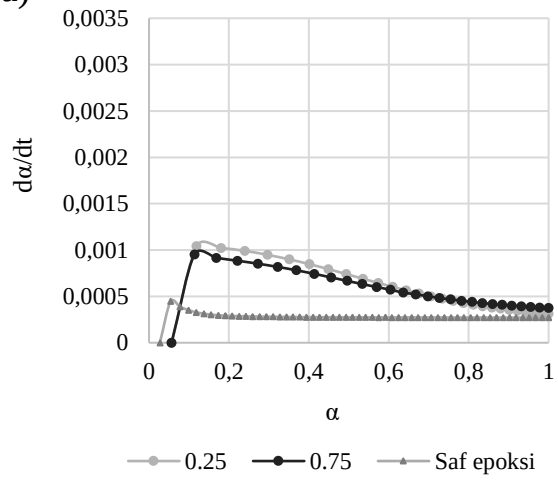
Epoksi-GNP karışımlarının 80,110 °C'de gerçekleştirilen kürlenme işleminde kürlenme hızı-

Kürlenme derecesi eğrilerini gösteren grafikler Şekil 2'de yer almaktadır.

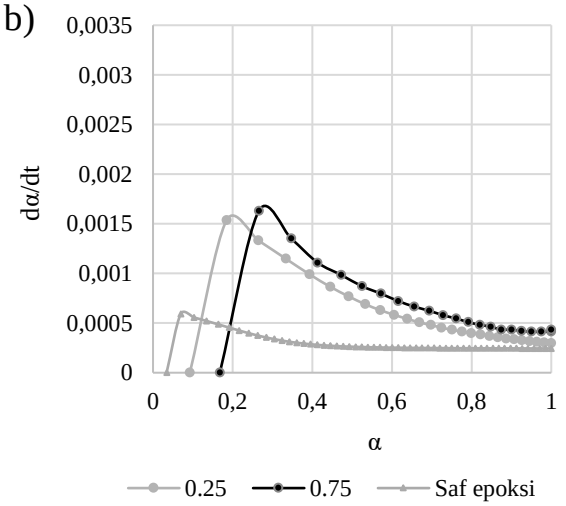
Şekil 2'de görüldüğü gibi,

- 80 °C sıcaklıkta GNP katkısının artması ile maksimum kürlenme hızı düşüş göstermiştir. Ancak sıcaklık 110 °C'ye çıkartıldığında ise katkı oranının artması maksimum kürlenme hızını arttırmıştır.
- 110 °C'de epoksiye eklenen GNP partikülleri katalizör etkisi göstermiş ve %0.75 GNP katkısı kürlenme hızını saf eposiye göre 2.75 kat arttırmıştır.

a)



b)



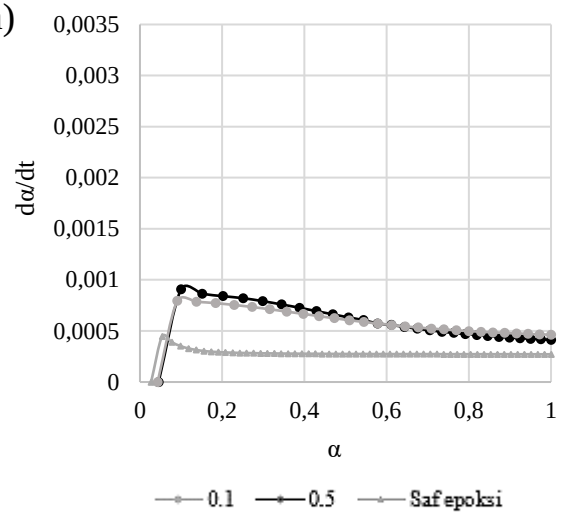
Şekil 2. GNP $_{katkılı}$ epoksin sıcaklığa bağlı kürleşme grafikleri a) 80 °C b) 110 °C

Epoksi-TiO_2 karışımlarının 80,110 °C'de gerçekleştirilen kürlenme işleminde kürlenme hızı- kürlenme derecesi eğrilerini gösteren grafikler Şekil 3'te yer almaktadır.

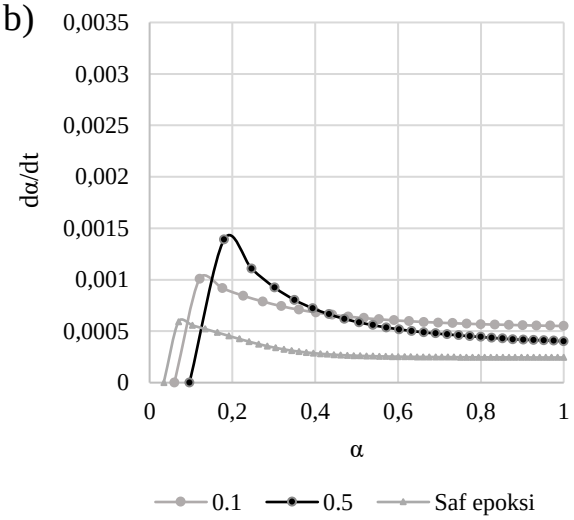
Şekil 3'te görüldüğü gibi,

- 80 ve 110 °C'de sıcaklıklarda TiO_2 katkısı ile maksimum kürlenme hızı saf epoksiye göre artış göstermiş, katkı oranının artması ile bu artışı iyileştirmiştir.
- Tüm sıcaklıklarda %0.1 katkı oranında kürlenme reaksiyonunun başlangıç evresinde artan kürlenme hızı maksimum kür hızına ulaşıldıktan sonra düşüş göstermiştir.
- 110 °C'de TiO_2 katkısı epoksi kürlenme reaksiyonunda diğer nano partikül katkılarında olduğu gibi katalizör etkisi oluşturmuştur. En yüksek kürlenme hızına %0.5 katkı oranında saf epoksiye kıyasla 2,35 kat artışla ulaşılmıştır.

a)



b)



Şekil 3. TiO_2 katkılı epoksin sıcaklığa bağlı kürleşme grafikleri a) 80 °C b) 110 °C

MATLAB-R2019b'deki eğri uydurma fonksiyonu kullanılarak **Hata! Başvuru kaynağı bulunamadı.**'te yer alan k ve m değerleri hesaplanmıştır. Modelde var olan n değeri ön kabuller kullanılarak ''1'' olarak kabul edilmiştir. Daha önce yapılan araştırmalarda da en iyi tahmin katsayısı değeri için n=1.0 kabulü ile analizler yapılmıştır [20].

Beklendiği gibi sıcaklığın artırılması ile reaktivitede artış gerçekleşmiş ve k-değerleri yükselmiştir. Maksimum "k" değerleri TiO_2, Al_2O_3 ve GNP için sırası ile 0.002389, 0.002288, 0.002663 olarak hesaplanmıştır. "m" reaksiyon sabitleri de benzer şekilde sıcaklık arttıkça artmış ve maksimum değerler TiO_2, Al_2O_3 ve GNP için sırası ile 0.6023, 0.4812, 0.5294 olarak hesaplanmıştır.

Çizelge 3.Nano partikül katkı oranlarına göre model denklem parametreleri.

Nano partikül	**Katkı oranı (ağırlıkça)**	**80 °C**		**110 °C**	
		k	**m**	**k**	**m**
Saf epoksi	%0	0.000997	0.6035	0.001216	0.6843
Al_2O_3	%1.0	0.001839	0.2872	0.002288	0.4812
	%1,5	0.002033	0.3379	0.002176	0.3599
GNP	%0.25	0.002070	0.2252	0.002296	0.4908
	%0.75	0.002516	0.4783	0.002663	0.5294
TiO_2	%0.1	0.002044	0.5414	0.002176	0.5886
	%0.5	0.002106	0.4469	0.002389	0.6023

Kamal Sourour modelinde m-T arasındaki ilişki için genel bir görüş yer almamaktadır [21]. Yapılan çalışmada "m" kinetik parametresi ise tüm nano katkı oranlarında sıcaklık artışına paralel olarak artış göstermiştir. "m" kinetik parametresi reaksiyonun maksimum kür hızına gelinceye kadar oluşan çapraz bağlanmaların oluşturduğu kürlenme oranını gösterdiği için erken dönem kürlenme evresinde epoksi içerisine eklenen nano partiküllerin kürlenmeyi olumlu etkileyeceği düşünülmektedir.

$$k = Ae^{-Ea/RT} \qquad (4)$$

Her epoksi-nano partikül sistemi için kürleme reaksiyonunun aktivasyon enerjisi Denklem 4'te verilen Arrhenius denklemi kullanılarak hesaplanmış, sonuçlar Çizelge 4'te gösterilmiştir.

Epoksi reaksiyon kinetiği alanında yapılan çalışmalar epoksit-amin reaksiyonu ile sertleşen epoksi ortamlara nano partikül katkısının kürleşme reaksiyonunun aktivasyon enerjisini saf epoksiye göre azalttığını göstermiştir [22], [23].

Çizelge 4'te de görüldüğü gibi reaksiyon aktivasyon enerjisi nano partikül katkı oranı arttıkça saf epoksiye kıyasla düşüş göstermiştir. Buna göre nano partikül katkısı epoksi reçinenin kürlenme reaksiyonlarının başlamasını kolaylaştırmaktadır.

Çizelge 4. Nano partikül katkı oranlarına göre aktivasyon enerjileri.

Nano partikül	**Katkı oranı (ağırlıkça)**	Aktivasyon enerjisi (kj/mol)
Saf epoksi	%0	7.43
Al_2O_3	%1.0	6.94
	%1.5	2.54
GNP	%0.25	3.89
	%0.75	2.13
TiO_2	%0.1	4.03
	%0.5	3.49

SONUÇLAR

Bu çalışmada, ağırlıkça farklı oranlarında Al_2O_3, GNP ve TiO_2 katkısının epoksinin kürlenme kinetiği üzerindeki etkisi değerlendirilmiş ve aşağıda yer alan sonuçlara ulaşılmıştır.

- Tüm sıcaklık değerlerinde ve katkı oranlarında kürlenme hızına artış göstermiş, maksimum kürlenme hızına ulaşıldıktan sonra ise düşüş eğilimi göstermiştir.
- Maksimum kürlenme hızı tüm nano partikül türlerinde sıcaklık arttıkça artmıştır. En yüksek değerine saf epoksiye göre 5.43 kat artış gösteren 110 °C'de %1 Al_2O_3 katkılı numunede ulaşılmıştır.
- Nano partikül katkısının türünden bağımsız olarak sıcaklıktaki artışa paralel olarak "k" artış göstermiştir. 80 ve 100 °C'de maksimum "k" değerlerine sırası ile saf epoksiye oranla % 152.4 ve % 118.99 artış gösteren %0.75 GNP katkılı numunelerde ulaşılmıştır. Bu durum kürlenme reaksiyonunun GNP'de, Al_2O_3 ve TiO_2'ye kıyasla daha hızlı gerçekleştiğini ifade etmektedir.
- Reaksiyon hızı/sıcaklık ilişkisini ifade eden Arheneuis denkleminden hesaplanan aktivasyon enerjileri değerlendirildiğinde reçine içerisine eklenen partiküllerin reaksiyonun aktivasyon enerjisini ~ %45 oranında düşürdüğü gözlenmiştir. Elde edilen veriler, partikül katkısı ile kürlenme reaksiyonun daha hızlı gerçekleşebileceğini ve buna bağlı olarak kürlenme süresinin düşürülebileceğini ortaya koymaktadır.

ÖNERİLER

- 80°C'de gerçekleştirilen çalışmalarda kürlenme kinetik parametrelerinde Kamal Sourour modeline yakınsamalarda sapmalar gözlenmiştir. Bu model ile gerçekleştirilecek izotermal analizlerde daha yüksek sıcaklıklarda çalışılmasının, kürlenme kinetiğinin tanımlanmasında daha uygun olacağı düşünülmektedir.
- Bu çalışmada elde edilen veriler farklı kürlenme kinetik modelleri kullanılarak analiz edildiğinde ulaşılacak sonuçların farklılıkları üzerine bir çalışma gerçekleştirilebilir.
- Reaksiyon parametrelerinin performans üzerindeki etkilerinin değerlendirilmesinde FTIR, React IR ve React Raman analizleri gerçekleştirilebilir. Reaksiyon eğilimlerinin ve profillerinin gerçek zamanlı olarak ölçülebilmesini sağlayan bu yöntemlerin kullanılmasıyla kürlenme reaksiyonlarına ait daha detaylı sonuçlara ulaşılabilir.

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THE IMPORTANCE OF RATIO CONCEPT IN LANDSCAPE DESIGN

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ABSTRACT
People have tried to make sense of the processes and events in nature with mathematics and to comprehend them by formulating them. Mathematics is actually a way of thinking and making sense. The origins of mathematical thinking are based on patterns, quantity, size and form concepts in nature (Boyer, 1991). Comparing these patterns, quantities, sizes and forms with each other and trying to make sense of them comparatively has brought the concept of ratio into our lives. Humans have a special intuition that enables them to perceive simple mathematical ratios in nature (Ching, 2010). These intuitions have inevitably influenced and still influence the activities (music, painting, architecture, etc.) carried out by humans. The followers of Pythagoras, who thought that music was a mathematical expression of the cosmic order, carried out various studies on the relationship of notes with each other and with the whole piece by using the concept of ratio (WWE, 2013). Based on a similar idea, Ching called architecture "frozen music". Compositions in architecture consist of forms that come together in proportional relationships with each other (Ching, 2010). The concept of proportion directly affects the functionality and form of an architectural design. Designers play with proportions in order to achieve the desired harmony between the parts and the whole and to realise the relationships they have built. A designer wants to achieve the desired result with functional and aesthetic concerns. In short, the concept of proportion is the most fundamental subject of architecture (Frings, 2007). While realising an architectural design, healthy results can be obtained in line with the rules of certain theories, and similar results can be obtained through experimental methods and intuitive approaches (Bell, 2005). In this study, the concept of proportion and various architectural proportion theories have been mentioned and the importance of this concept and theories in the professional discipline of landscape architecture has been scrutinised.
Keywords: Ratio, Proportion, Architecture, Landscape, Design

ORAN KAVRAMININ PEYZAJ TASARIMLARINDAKİ ÖNEMİ

ÖZET
İnsanlar doğada yaşanan süreçleri ve olayları matematikle anlamlandırmaya ve formüle ederek kavramaya çalışmıştır. Matematik aslında bir düşünce ve anlamlandırma şeklidir. Matematiksel düşüncenin kökenleri doğadaki örüntülere, miktar, büyüklük ve biçim kavramlarına dayanmaktadır (Boyer, 1991). Bu örüntülerin, miktarların, büyüklüklerin ve biçimlerin birbirleriyle kıyaslanması ve karşılaştırmalı olarak anlamlandırılmaya çalışılması oran kavramını hayatımıza dahil etmiştir. İnsanlar doğadaki basit matematiksel oranları algılayabilmelerini sağlayan özel bir sezgiye sahiptir (Ching, 2010). Bu sezgiler ister istemez insanların yürütmüş olduğu faaliyetlere (müzik, resim, mimari vb.) etki etmiştir ve etmektedir. Müziğin kozmik düzenin matematiksel bir ifadesi olduğunu düşünen Pisagor'un takipçileri notaların birbirleriyle ve parçanın bütünüyle olan ilişkileri üzerinde oran kavramını kullanarak çeşitli çalışmalar yapmıştır (WWE, 2013). Ching'de benzer bir düşünceden yola çıkarak mimariyi "donmuş müzik" olarak adlandırmıştır. Mimaride kompozisyonlar birbirleriyle orantılı ilişkiler içerisinde bir araya gelen formlardan oluşur (Ching, 2010). Oran kavramı mimari bir tasarımın işlevselliğini ve formunu doğrudan etkilemektedir. Tasarımcılar, parçalar ve bütün arasındaki arzulamış olduğu uyumu yakalamak ve kurgulamış olduğu ilişkileri hayata geçirebilmek adına oranlarla oynamaktadırlar. Bir tasarımcı işlevsel ve estetik kaygılarla arzu ettiği sonuca ulaşabilmek ister. Kısaca oran kavramı mimarlığın en temel konusudur (Frings, 2007). Bir mimari tasarım gerçekleştirilirken belli başlı teorilerin kuralları doğrultusunda sağlıklı sonuçlar alınabildiği gibi deneysel yöntemler ve sezgisel yaklaşımlar sayesinde de benzer sonuçlar elde edilebilir (Bell, 2005). Bu çalışma ile oran kavramına ve çeşitli mimari oran teorilerine değinilmiş olup peyzaj mimarlığı meslek disiplininde bu kavramın ve teorilerinin ne denli öneme sahip olduğu mercek altına alınmıştır.
Anahtar Kelimeler: Oran, Mimari, Peyzaj, Tasarım

GİRİŞ

Oran kavramının TDKS'ye göre tanımı: Büyüklük, nicelik, derece bakımından iki şey arasında veya parça ile bütün arasında bulunan bağıntı, nispet, rasyo şeklindedir. Mimaride ise oran; bir kompozisyon ögesinin bir diğeriyle veya bütünle olan boyutsal (Uzunluk, Genişlik, Yükseklik) ilişkisidir ve kompozisyon kurgusu içerisindeki denge ve uyuma odaklanan temel bir ilkedir. Ögelerin birbirleriyle ve bütünle olan boyut ve ölçek ilişkilerinin sağlıklı bir şekilde kurulmasına olanak tanır. Görsel düzen ve birlikteliğin sağlanabilmesi için oluşturulacak olan kompozisyon içerisinde birbirleriyle orantılı ve uyumlu ögeler kullanılmalıdır (Moughting, 1992). Mimarlığın en temel konularından biri olan oran kavramı konusunda çeşitli zaman aralıklarında ve coğrafyalarda tasarımlara yön veren teoriler ortaya atılmıştır. Bunlardan en popüler olanları: Altın Oran, Antropometri, Modulor, Klasik Düzen, Rönesans Teorileri, Ken'dir (Ching, 2010). Tüm bu teorilerin amacı, düzen ve uyum duygusu yaratmaktır (Ching, 2010) ve zaman zaman bu teorilerin sistematiği değişse bile ortak paydası tasarımda bütünlüğün her anlamda sağlanabilmesidir.

Antropometri

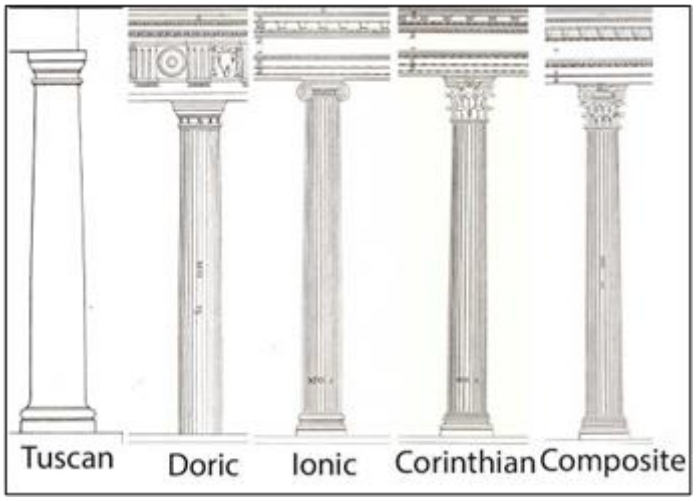
"Antropometri" terimi ilk olarak doğa bilimci Georges Cuvier tarafından kullanmıştır ve etimolojik olarak Yunanca anthropos (insan) ve metron (ölçü) kelimelerinin bir araya getirilmesiyle türetilmiştir (Herron, 2006). Başlarda fiziksel antropologlar tarafından yaşamaya devam eden veya soyu tükenmiş olan popülasyonlar içerisindeki ırk çeşitliliğinin ve evriminin incelenmesi için kullanılmıştır (Biology Dictionary, 2017). Tarihsel açıdan ırksal, kültürel ve psikolojik nitelikleri fiziksel özelliklerle ilişkilendirebilmek için bir araç olarak görülmüştür. Kısaca insan vücut ölçüleri ve oranları ile ilgilenmektedir. Bu ilgi mimari genelinde işlevsellik üzerinden yürütülmektedir ve insan ölçeğinde bir mekan kurgusu oluşturabilmek için fazlasıyla önemlidir. Antropometri insan vücut boyutlarını iki başlık altında ele alır. Bunlar: Durağan (Statik) Boyutlar ve Durağan Olmayan (Dinamik) Boyutlardır (Baytın, 1980). Durağan Boyutlar: Vücudumuzun hareketsiz bir haldeyken ve belirli bir pozisyona göre alınan ölçüleridir. Örnekle açmak gerekirse, ayaktayken boyumuzun, gözümüzün, göbek deliğimizin, dirseklerimizin vb. yüksekliği ya da oturma pozisyonunda boyumuzun, gözümüzün, dizimizin vb. yüksekliği gibi. Durağan Olmayan Boyutlar ise: Bir eylemi gerçekleştirirken hareket halinde alınan ölçülerimizdir. Ör: Yürüme eylemini gerçekleştirirken ki ayak açıklığı mesafesi. Günümüzde standart hale gelen ölçü birimleri henüz ortaya çıkmamışken insan organlarının boyutları (parmak, ayak, kol gibi) çeşitli coğrafyalarda ölçü birimi (inch, foot, yard, endaze, arşın) olarak kullanılmıştır (Ching F. 2010). Fakat bu durum aynı coğrafyalarda bile değişkenlik gösteren farklı vücut oranları

ve ölçüleri nedeniyle çeşitli karmaşalara sebebiyet vermiştir (Kaner, 2023). İngilizlerin kullanmış olduğu ölçü sistemi (Inch) İskoçya Kralı I. David tarafından yaklaşık 1150 yılında bir adamın başparmağının tırnak dibindeki genişliği olarak tanımlanmıştır. 14. yüzyılın başlarında Kral Edward II döneminde ise, "kuru ve yuvarlak, uzunlamasına uç uca yerleştirilmiş üç arpa tanesi" olarak tanımlanmıştır. Çeşitli zamanlarda inç, 12 haşhaş tohumunun uzunluklarının toplamı olarak da tanımlanmıştır. Tüm bu rivayet ve karmaşalardan sonra inch birimi 1959 yılında ABD ve Birleşik Krallık ülkeleri 1 inçlik uzunluk birimini 25,4 mm (2,54 cm) olarak tanımlamasıyla günümüzdeki halini almıştır (Britannica, 2016). İngilizler Inch (2,54 cm), Foot (30,48 cm) ve Yard (91,44 cm), birimlerini günümüzde de kullanmaya devam etmektedir. Benzer bir durum ve karmaşa Türklerin kullandığı sistemde de yaşanmıştır. Endaze (65,25 cm) ve Arşın (68,58 cm) adlandırılan bu ölçülerin uzunlukları zaman ve mekana göre çeşitlilik gösterdiği gibi ölçülen nesnelerin cinslerine göre de farklılıklar göstermiştir (Özdural, 1998; TDV İslâm Ansiklopedisi, 1991). Bu karmaşaların ortadan kalkması ve ortak bir payda da buluşulabilmesi için dünya genelinde kabul gören metrik sisteme geçiş yapılmıştır. Günümüzde metre, "ışığın boşlukta 1/299.792.458 saniyede aldığı yol" şeklinde tanımlanmaktadır (Yandayan, 2012). Her ne kadar metrik sisteme geçilmiş olsa da antropometri önemini günümüzde de korumaktadır. Antropometrik oranlar ürünün bir noktada kalıbını oluşturmaktadır (Kaya ve Özok, 2016). Bu bağlamda antropometri tasarımların standardı haline gelen bir kavram olmuştur ve antropometrik ölçüler dikkate alınmadan üretilen bir ürünün (tasarımın) işlevselliğinden söz etmek mümkün değildir. Çünkü insan üretmiş olduğu tüm bu tasarımların yapı taşıdır.

Klasik Düzen

Antik çağdaki Yunan ve Roma medeniyetlerinden günümüze miras kalan ve mükemmel estetik uyumu temsil eden Klasik Düzen sabit ölçü birimi yerine parçaların birbirleriyle ve bütünle oranlanmasına dayanan matematiksel bir sistem üzerine kurulmuştur. Temel ölçü birimi yapı içerisinde kullanılan kolonların çaplarıdır ve yapılar bu kolon çaplarına göre tasarlanmıştır (Ching, 2010). Kolonlar arasındaki mesafeler, karakteristik özelliklere sahip kaide, şaft, başlık ve saçaklık gibi parçaların boyutları tercih edilen kolon tipine ve çapına göre şekillenmiştir. Klasik düzende amaç, bir yapıya ait olan bütün bölümlerin, boyutsal ve görsel açıdan birbirleri ile orantılı ve uyumlu olmasıdır. Klasik Düzen kendi içerisinde 5 ayrı sütun türü ile tasarımları şekillendirmiştir. Bunlar: Doric (Dor), Ionic (İyon), Corinthian (Korint), Composite (Kompozit), Tuscan (Tuskan) düzenleridir (Ching, 2010) (Şekil 5). Dor, İyon ve Korint düzenleri Yunanlılar tarafından kullanılmıştır. Romalılar bunlara ek olarak

Korint düzeninden daha detaylı bir sütun türü olan Kompozit ve Dor düzenine göre daha sadece bir görünüme sahip Tuskan düzenini kazandırmıştır. Yukarıda belirtilen düzenleri birbirinden ayırabilmenin en kolay yolu tasarım içerisinde kullanılan sütunlara bakmaktır. Bu sütunlar görünüşleriyle ve boyutlarıyla birbirlerinden rahatlıkla ayırt edilebilmektedir.



Şekil 5. Antik Yunan ve Roma sütun düzenleri (Ching, 2010). Dor Düzeni (Doric Order): Antik Yunan mimarisin en eski (MÖ 7. Yy) ve basit görünüşlü sütün türüdür. Bu düzen, sade, süslemesiz bir sütun başlığı ve kaide olmaksızın doğrudan tapınağın stilobatına dayanan bir sütun şekliyle karakterize edilir (Becker, 2015). Dor düzeninde sütunların tabanı yoktur ve bu sütunlar başlığa doğru incelir. Ayrıca bir üst paragrafta bahsi geçen düzenlerin arasında boyut olarak en bodur (kısa ve geniş) olanıdır. Dor düzenine ait sütunları şaft kısmında 20 adet oluk bulunmaktadır (Britannica, 2014). İlk ortaya çıkışı adını aldığı bölge olan Yunanistan'ın batısındaki Dorian bölgesidir. Güç ve erkekliği temsil eden Dor düzeni MÖ 5. Yy'da form olarak en son halini almıştır. Dor düzenine verilebilecek en iyi örnek antik Yunan ve Atina demokrasisinin de sembolü haline gelen M.Ö. 480'de perslerin Athena Tapınağını yerle bir etmesinden sonra inşa edilen Parthenon tapınağıdır (Ching, 2010). İyon Düzeni (İonic Order): Sitil olarak dor düzenine göre daha ince ve zarif bir görüntüye sahiptir. Volütler (parşömen benzeri süslemeler) İyon başlığını karakterize eder ve Dor düzeninden farklı olarak sütunu bir kaide destekler (Becker, 2015). Dor düzeninin aksine zarafeti ve kadınsılığı temsil eder ve feminen bir karakteristiğe sahiptir. İyon düzenine ait sütunların şaft kısmında 24 adet oluk bulunmaktadır ve şaftın yüksekliği sütunun taban çapının 8 katı kadardır (Britannica, 2014). Bir dizi antik Yunan yerleşiminin bulunduğu bir kıyı bölgesi olan İyonya'da (Ege kıyıları) ortaya çıkmıştır. İyonik düzen M.Ö. altıncı yüzyılın ortalarında İyonya'da gelişmiş ve M.Ö. beşinci yüzyılda Yunanistan anakarasına taşınmıştır (Becker, 2015). İyon düzeni ile inşa edilmiş olan tapınaklara örnek olarak Athena Tapınağı verilebilir.

Bu sütunlara atfedilen güç – zarafet ve erkeksilik – kadınsılık Romalı Mimar Vitruvius kitabındaki ifadelere dayanmaktadır. Korint düzeni (Corinthian Order): İsim olarak Korint şehri ile ilişkilendirilmiştir ve MÖ 4. Yy'da karşımıza çıkmıştır. Korint düzeni bahsi geçen düzenler içerisinde en ayrıntılı ve zarif görünüşe sahip olanıdır (Becker, 2015; Britannica, 2014). Sütunların tabanı ve şaftı iyon düzeniyle benzerlik göstermektedir. Ancak Korint düzeninin belirleyici unsuru, İyon düzeninden bile daha fazla süsleme içeren ve özenle oyulmuş başlık bölümüdür. Sütun başlığında acanthus yaprağı ve anthemion süslemeleri bulunmaktadır. Akantus bitkisinin stilize edilmiş, oyulmuş yaprakları başlığın etrafında büyür ve genellikle abaküsün hemen altında son bulur (Becker, 2015). Korint düzenine ait sütunların şaft kısmında keskin kenarlı 24 adet oluk bulunmaktadır ve sütun yüksekliği taban çapının 10 katı kadardır (Britannica, 2014). Olimpos Zeus Tapınağı bu düzene verilebilecek güzel bir örnektir. Tuskan düzeni veya Toskana Düzeni (Tuscan Order): Bu düzen Yunanlıların kullanmış olduğu Dor düzenindeki sütun şaftlarının oluksuz ve tabanı olan bir modifikasyonudur. Bir nevi Antik Yunan Dor düzeninin Roma mimarisi içerisinde yer alan daha sade görünümlü bir uyarlamasıdır. Tuskan düzenine ait sütunların şaft kısmında diğer sütun türlerinde bulunan oluklardan bulunmaz ve sütun yüksekliği taban çapının 7 katı kadardır (Britannica, 2014). Kompozit düzeni (Composite Order): Bu düzen Antik Yunan İyon ve Korint düzenlerinin Roma döneminde kombine bir şekilde kullanılmış bir versiyonudur. Birleşik, karma gibi anlamlara karşılık gelen bu kelimenin seçilmesinin sebebi Antik Yunanda kullanılan iyon ve korint düzenlerinin izlerini taşımasından kaynaklanmaktadır. İyon düzenine ait sütun başlıklarının volütlerini Korint düzeninde görülen akanthus bitkisinin yaprakları ile harmanlayan bir düzendir. Bu düzende kullanılan sütun yüksekliği taban çapının 10 katı kadardır. Septimius Severus Takı bu düzenin özelliklerini taşıyan bir örnektir. Kompozit düzen ve Tuskan düzeni antik Yunan mimarisinde bulunmayan, Antik Roma mimarisinde görülse de rönesansa kadar ayrı bir düzen olarak değerlendirilmeyen düzenlerdir.

Rönesans Teorileri

Rönesans, neredeyse her dilde (Latince, İtalyanca, Fransızca, İngilizce) "yeniden doğuş" anlamına gelen bir kelimedir. Başlarla özellikle kilise tarafından dini bir anlam yüklenmeye çalışılsa da daha sonraları güzel sanatlar (mimari, resim, müzik, heykeltraşlık vb.), bilim ve teknoloji alanlarında gerçekleşen çalışmaları ve ilerlemeleri ifade eder bir hal almıştır. Orta çağın bitişi olan bu dönem içerisinde mimaride önemli ilerlemeler kat edilmiştir. Rönesans mimarisi, Klasik kültürün yeniden doğuşunu yansıtan, 15. yüzyılın başlarında Floransa 'da ortaya çıkarak ve sonralardan tüm Avrupa'ya yayılarak Orta çağ Gotik tarzının yerini

almıştır. Klasik dönemde olduğu gibi, orantı güzelliğin ve estetiğin en önemli faktörü olarak görülmüştür (Britanica, 2024). Bu dönem içerisinde tekrardan Antik Yunan'da kullanılan matematiksel oran sistemlerine geri dönülmüş ve rönesans mimarları da mimariyi mekânsal birimlere dönüştürülmüş matematiksel bir sistem olarak görmüştür (Ching, 2010). Rönesans oran teorileri altın oranın aksine 1/1, 1/2, 1/3, 2/3, gibi rasyonel sayı olarak adlandırılan sayısal orantılardan oluşmaktadır (Yıldız, 2023). Rönesans dönemi içerisinde özellikle de Leon Batista Alberti klasik düzenin prensiplerini sivil mimari ve şehircilik konuları üzerinde geliştirmiş ve yaygınlaştırmıştır. Ayrıca Romalı mimarların tasarlamış olduğu bina unsurlarını dönemin ihtiyaçlarına göre kendi tasarlamış olduğu binalara entegre etmiştir. Dönemin bir diğer ünlü mimarı olan Palladio'nun tasarlamış olduğu Villa Rotunda ve Capra tasarım açısından Roma Pantheon tapınağının rönesans sivil mimarisine yansımasıdır. Palladio'nun kaleme almış olduğu "I quattro libri dell'architettura" kitabında "Güzellik, bütünün çeşitli parçalara göre, parçaların birbirlerine göre ve bunların da yine bütüne göre biçim ve oransal uyumuyla ortaya çıkar" sözü dönemin estetik ve mimari anlayışını çok iyi bir şekilde yansıtmaktadır. Rönesans mimarisinin en temel özelliği tasarımlarda geometrik kusursuzluk ve birlikteliği elde etme arzusudur. Merkezi bir planda şekillenen yapılarda kare ve daire şekline atfedilen tanrısal kusursuzluğu inançları doğrultusunda ideal form olarak görülmüşlerdir. Simetri kullanmaktan çekinilmemiş aksine tasarımlar olabildiğince simetrik formlarda hayata geçirilmiştir.

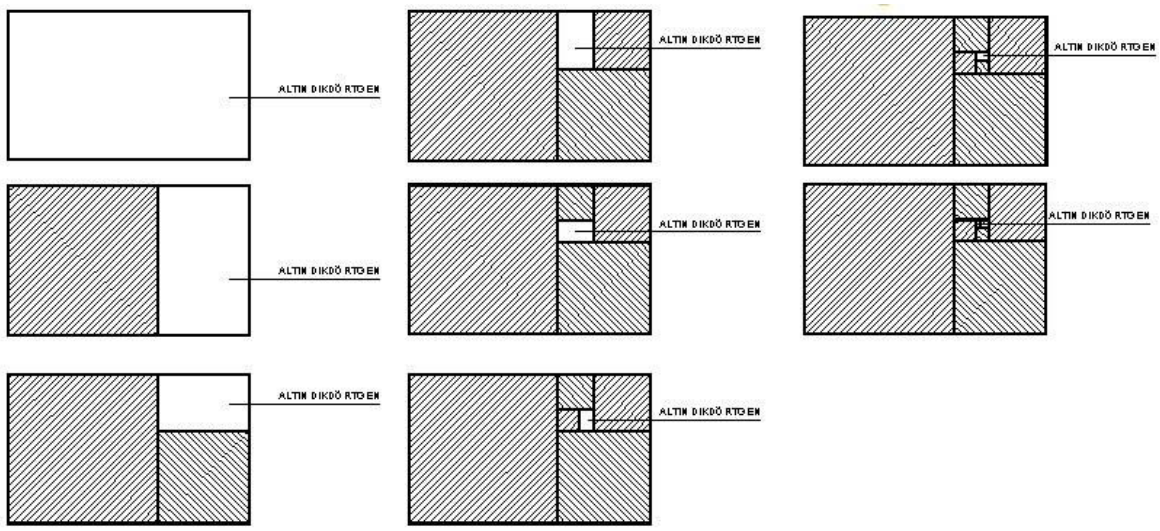
Altın Oran

Altın oran 1.618033... şeklinde sonsuza kadar devam eden irrasyonel bir sayıdır. Yunanca φ, ϕ veya Φ sembolleri ile gösterilen Altın Oran; "Kutsal Oran", "İlahi Oran" veya "Altın Sayı" gibi ifadelerle de karşımıza çıkmaktadır. Bu ifadelerin temelinde bir inanç yatmaktadır ve bu inanç doğrultusunda "Altın Oran" var olan en kusursuz, tanrısal ve estetik geometrileri oluşturmaktadır (Bakırcı, 2014). Altın orana çeşitli matematiksel serilerde ve geometrik şekillerde rastlamak mümkündür. Bu serilerden en popüler olanı ise matematiksel formülü: $Fn = Fn-1 + Fn-2$, $n>1$, $F0 = 0$, $F1 = 1$ olan Fibonacci Serisi'dir (Bakırcı, 2014). Bu seri, sonsuza kadar devam etmektedir ve sayılar sonsuza yaklaştıkça serinin içerisinde art arda gelen iki sayı arasındaki oran, Altın Oran'a yakınsamaya başlar (Günver ve ark, 2014). Ancak Tablo 1'de görüldüğü üzere formülize edilmiş olan sayılar arasındaki oranlar hiçbir zaman mutlak değildir ve tam olarak Altın Oran şeklinde ifade edilen "1.618033988749894848204…" sayısını vermemektedir.

GÜNCEL	SONRAKİ	SONRAKİ / GÜNCEL
1	2	2
2	3	1,5
3	5	1,66666667
5	8	1,6
8	13	1,61538462
13	21	1,61538462
21	34	1,61904762
34	55	1,61764706
55	89	1,61818182
89	144	1,61797753
144	233	1,61805556
233	377	1,61802575
377	610	1,61803714
610	987	1,61803279

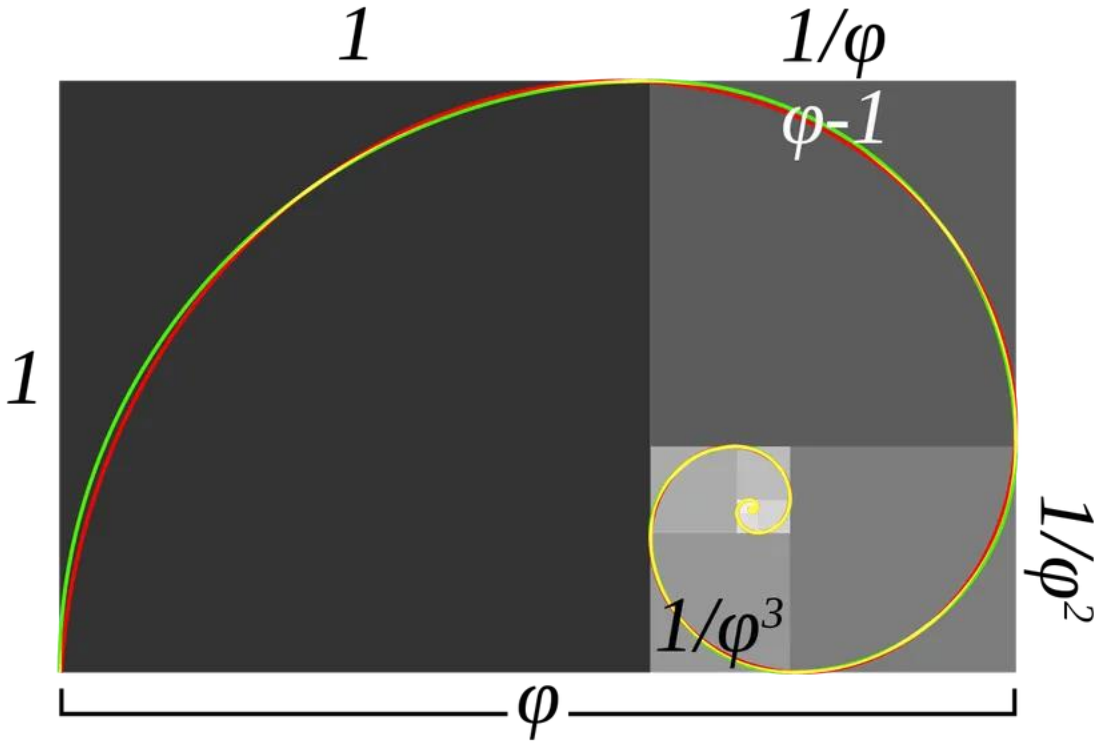
Tablo 1. Fibonacci Serisi

Geometrik açıdan da doğru parçası dışında bazı dikdörtgen, ikiz kenar üçgen ve beşgenlerde altın oranı bulmak mümkündür (Mario, 2003). Altın Dikdörtgenler kısa kenarı 1 birim uzun kenarı ise 1.618… birim olan dikdörtgenlerdir. Altın dikdörtgen şekli bir kare çizimi ile başlar. Ardından bu kare ortadan 2 eşit parçaya ayrılır. Kare tabanının orta noktasından pergel yardımı ile karenin köşesine değecek şekilde bir daire çizilir ve çizilen dairenin yarı çapı kare içerisindeki dikdörtgenin köşegenidir. Ardından, mevcut olan karenin tabanını, çizdiğimiz daireyle kesişene kadar uzatılır. Tüm bu aşamaların ardından ortaya çıkan şeklin dikdörtgene tamamlanmasıyla bir altın dikdörtgen elde edilir. Ardından bu dikdörtgen içerisinden kısa kenar uzunluğuna eşit uzunlukta bir kenarı olan kare çıkarıldığında, geriye tekrar altın dikdörtgen koşullunu sağlayan bir dikdörtgen kalmaktadır (Bell, 2005). Altın dikdörtgenin mistisizmi aslında burada başlamaktadır. Bu işlem tekrar tekrar devam ettirildiğinde geri kalan küçük dikdörtgenler her zaman altın dikdörtgenin sahip olduğu 1 birime 1,618… birim kenar uzunluklarını vermektedir (Şekil 1).



Şekil 1. İçerisinden kare şeklinde parçalar çıkartılan altın dikdörtgenler

Ayrıca çıkarılan bu karelerin içine yarı çapı karelerin bir kenar uzunluğuna eşit olan çeyrek çemberler çizerek Altın Spiral elde edilmiş olur. Bu spiral logaritmik bir büyüme gösterir ve altın oran içermektedir (Bell, 2005). Burada şunu atlamamak gerekir bütün altın spiraller logaritmik bir spiral olsa da her logaritmik spiral bir altın spiral değildir (Bakırcı, 2014), Altın spiral, kimi insanlarca hayat eğrisi ismi atfedilerek birçok anlam yüklenmeye çalışılmış olan bir şekil olmakla birlikte kimilerine göre ise logaritmik spiralin sahip olabileceği potansiyel bir formudur (Şekil 2).



Şekil 2. Altın Spiral (Bakırcı 2014).

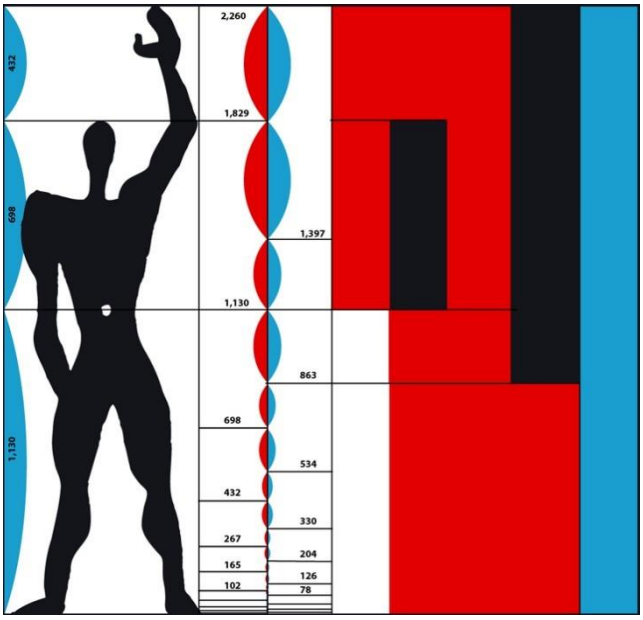
Sonuç olarak Altın Oran insanlar tarafından ortaya atılan ve ara sıra doğada da varlığına rastlayabildiğimiz bir oran teorisidir. Ancak buna rağmen altın orana atfedilen kusursuzluğun mimari ve sanattaki varlığı sorgusuz sualsiz bir şekilde kabul görebilmektedir. Altın Oran Neufert ve Le Corbusier gibi mimari kuramcıların yazılarında kesinlikle bir rol oynamaktadır. Ancak on dokuzuncu yüzyıldan önce, Altın Oran yazılı mimari teorilerde yer almamaktadır (Frings, 2002). Birçok tasarımcı kendi öznel tasarımlarını süslemenin bir yolu olarak altın oranı kullanmış veya kullandığını iddia etmiş ve yapmış olduğu eserleri bu vasıta ile yüceltmeye çalışmıştır.

Modulor sistem

Modulor kelimesi etimolojik olarak Fransızca "module" (Mimarlıkta: Bir yapıya ait bölümler arasında orantı sağlama amacıyla kullanılan ölçü birimi) ve "or" (altın) kelimelerinin bir araya gelmesiyle ortaya çıkmıştır (Berkin, 2021). Altın oran kavramının insan vücut ölçülerinde de var olduğunu savunan matematiksel bir sistemdir (Sözen ve Tanyeli, 2011). Ortaya atılan bu düşüncenin fikir babası 6 Ekim 1887 doğumlu mimar ve aynı zamanda şehir plancısı, ressam, heykeltraş ve modern mobilya tasarımcısı Le Corbusier (Charles-Edouard Jeanneret)'dir (Fondationlecorbusier, 2024). Modulor şeması, bir kenar uzunluğu 69,8 cm olan kare çizimi ile başlar ve bu kare altın oran kısmında anlatılan yöntemlerle altın dikdörtgene evrilerek şemanın ilk parçasını oluşturur. Elde edilen bu altın dikdörtgenin üzerine kendisiyle özdeş bir altın dikdörtgen daha yerleştirilir ve içerisine daha sonradan bir insan figürünün de dahil edileceği şemanın taslağı ortaya çıkar. Ardından şema içerisine 182,9 cm boyunda bir elini havaya kaldırmış ve bu pozisyonda 226 cm yüksekliğe erişen bir figür konumlandırılır. Figürün alt vücudu (ayaktan göbek deliğine kadar olan bölüm) 113 cm, üst vücudu (göbek deliğinden başa kadar olan bölüm) ise 69,8 cm uzunluğundadır. Bu şema içerisinde 2 adet (kırmızı ve mavi) seri bulunmaktadır. Vücut parçalarının uzunluklarını tasvir eden bu seriler içerisinde kırmızı olan seri 4, 6, 10.2, 16.5, 26.7, 43.2, 69.8, 113, ve 182,9 cm uzunluk değerlerinden oluşmaktadır. 12,6 20.4, 33, 53.4, 86.3, 139.7 ve 226 cm uzunluklarının olduğu seri ise mavi seriyi oluşturur (Şekil 3). Bu seriler Fibonacci serisinde olduğu gibi toplanarak büyüme gösteren bir sistematik üzerine inşa edilmiştir (Corbusier, 1954).

Berkin 2021'e göre "Mimarlık serüveninin tüm evrelerinde mimarlığı endüstriyel bir ürünmüş gibi kabul eden ve yapı tasarım sürecinin bir kruvazör gemi ya da bir kargo uçağınınkinden farklı ele alınamayacağını savunan" Le Corbusier'in "Modulor" teorisi mimari ve mobilya tasarımlarının standartlaşması amacıyla ortaya çıkmıştır. Bu teori sadece günümüzde kullanılan belli başlı konut ve mobilya standartlarını oluşturmakla kalmayıp

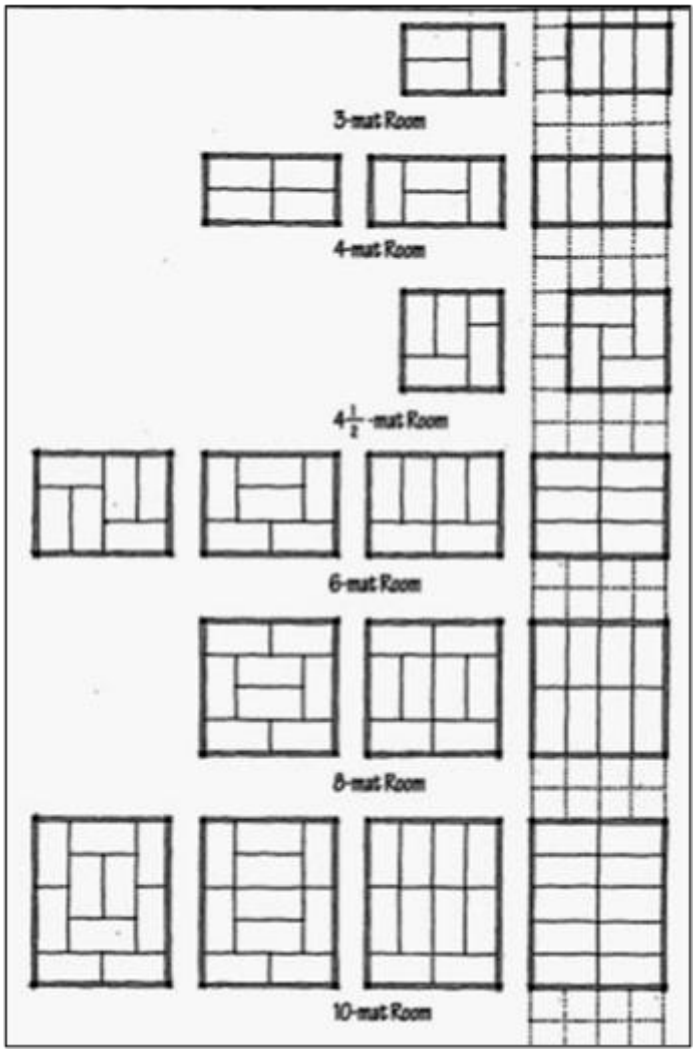
çağdaş mimariye ve şehirciliğe de yön vererek insan – çevre ilişkilerin geliştirilmesine yönelik fikirler üretilmesi açısından birçok tasarımcıya kılavuzluk yapmaya devam etmektedir.



Şekil 3. Modulor Şeması (Corbusier, 1954).

Ken

Ken anlam olarak geleneksel Japon ölçü birimidir (Ching, 2010). Japonya'nın Orta Çağ'ının ikinci yarısında kullanılmaya başlanmıştır. Başlarda yapı içerisindeki iki kolon arasındaki aralıkları belirlemek için kullanılsa da daha sonradan göze hitap edecek şekilde geleneksel Japon konut mimarisinin standardı haline gelmiştir. Tam değeri zamana ve konuma göre değişkenlik göstermesine rağmen genellikle 2 metreden biraz daha kısa olmuştur. Toyotomi Hideyoshi'nin zamanında bir ken, 197 cm'ye denk gelen 6,5 shakuya eşitken, Edo döneminin başlarında bir ken'in uzunluğu 6.0 shakuya 181.8cm'ye düşürülmüştür (JAANUS, 2024). Daha sonraları 1 ken ölçü birimi 182 cm olarak standardize edilmiştir. Günümüzde çoğu alanda yerini metrik sisteme bırakmış olsa da hala daha geleneksel tarzda inşa edilen yapılarda kullanılan bir sistemdir. Sistemin temelinde ½ oranına sahip dikdörtgen şeklinde tatamiler bulunmaktadır. Sıkı dokunmuş ot ve samandan yapılmış olan standart formattaki bir tatami 6 shaku uzunluğunda, 3 shaku genişliğinde ve 5,25 cm kalınlığındadır. Tatamiler iki insanın yan yana oturabileceği ya da bir insanın rahatlıkla uzanabileceği bir düşünce ile oranlanmıştır (JAANUS, 2024). Geleneksel yapılar ken modülüne göre şekillenmiş ve yere serilen tatami adındaki paspasların sayısına göre de boyutlandırılmıştır (Kaner, 2023).



Şekil 6. Tatamilerin dizilimine göre oda planlarının farklılıkları (Ching, 2010).

SONUÇ

Bu kısma kadar oran kavramı literatür olarak hep statik durumda olan mimari yapılar üzerinden irdelenmiştir. Peyzaj mimarlığında oran kavramının yerine değinmeden önce peyzajın kavramsal açıdan ne olduğuna bakmak gerekir.

Peyzaj: Doğal ve kültürel karakteristikleri bağlamında tanımlanabilen ve/veya ayrıştırılabilen dinamik bir çevre birimidir. Burada çevre ve dinamik terimlerinin altını çizmek gerekir. Çevre: "İnsanların ve diğer canlıların yaşamları boyunca ilişkilerini sürdürdükleri ve karşılıklı olarak etkileşim içinde bulundukları fiziki, biyolojik, sosyal, ekonomik ve kültürel ortamdır" (T.C. Çevre ve Şehircilik Bakanlığı, 2024). Kısaca yaşadığımız ortam ve gözün görmüş olduğu her şeydir. Bu tanımdaki dinamik kavramı ise sürekli değişen veya değişime uğratılan, sabit kalmayan, yaşayan anlamlarını taşımaktadır. Bunu da şu örneklem yöntemi ile açıklayabiliriz: İnsan diye tanımlanan varlık yaşamını sağlıklı bir şekilde sürdürebilmesi için belirli başlı koşullara ihtiyaç duyar. Ör: Organlarının

düzgün bir şekilde çalışması ve sağlıklı olması. Peyzajları da çevrenin sahip olduğu hayati organlar olarak düşünürsek, çevremizin sağlıklı bir şekilde hayatına devam edebilmesi için fazlasıyla önemli parçalardır. Bu tip hayati organlara müdahale gerektiği zamanlarda verilecek olan kararlar çok kritik olmakla birlikte ne yazık ki geliştirilen bir tedavi yöntemi mutlak bir şekilde her organın (peyzajın) ilacı olamayabiliyor. Çünkü peyzajlarda organlarımız (kalp, akciğer, beyin vb.) gibi yapısal ve işlevsel farklılıklar göstermekle birlikte çok fazla değişkeni içerisinde barındıran bir denkleme sahiptir. Bu denkleme yapılan bir müdahale (bir değişkenin eklenip veya çıkarılması) ne kadar iyi hesaplanmış olsa da yer yer öngörülemeyen sonuçlara sebebiyet verebilmektedir. Bu kötü sonuçlardan kaçınabilmek için; özellikle doğal bir ortam içerisinde peyzaj tasarım çalışması yürütülürken makale boyunca anlatılan çeşitli oran teorileri ve uyarlamalarını doğrudan bir çalışma alanı üzerinde uygulamaya çalışmak olaya çok dar bir bakış açısıyla bakmaktan farksız kalmaktadır. Bunun nedeni geniş yüz ölçümlerine sahip peyzajlardaki oran ve ölçek algısı, gözlemcinin konumu tarafından belirlenir ve gözlemcinin bulunduğu konumun yerinden, yüksekliğinden, o konumda bulunurken gözlemcinin manzarayla olan bakış uzaklığına ve açısına kadar değişkenlik göstermektedir. Peyzajlarda denge, nesnelerin hangi açıdan görüldüğüne bağlıdır ve peyzajın düzensiz olduğu, gözlemciye göre ölçek algısının değişkenlik göstereceği durumlarda daha pragmatik bir yaklaşıma ihtiyaç duyulur (Bell, 2005). Doğal bir peyzaj içerisinde denge asimetriktir ve Altın Oran vb. teorilerin kesin bir şekilde bütün alan üzerinde uygulanması imkansızdır (Bell, 2005).

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SOSYAL MEKAN TEORİSİ'Nİ METAVERSTE PEYZAJ MİMARLIĞIYLA KARŞILAŞTIRMAK

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ÖZET
Bu çalışma, metaverse ortamında peyzaj mimarlığıyla platformlar aracılığıyla karşılaştırılan Sosyal Mekân Teorisi'ni ele almaktadır. Sosyal Mekân Teorisi, insanların fiziksel mekanlarla etkileşimini ve bu etkileşimlerin sosyal ilişkileri nasıl şekillendirdiğini incelerken, metaverse'de peyzaj mimarlığı sanal mekanların tasarımı ve kullanımı konularını kapsar. Çalışma, metaverse'de peyzaj mimarlığının farklı platformlarda nasıl gerçekleştirildiğini, insanların bu sanal mekanlarla nasıl etkileşime geçtiğini ve sosyal dinamiklerini nasıl şekillendirdiğini incelemeyi amaçlamaktadır. Odak noktası, farklı platformlarda sunulan sanal peyzajların Sosyal Mekân Teorisi perspektifinden nasıl değerlendirilebileceği ve gerçek dünya mekanlarının sosyal etkileşimlerinden nasıl farklılık gösterebileceğidir. Bu bağlamda, farklı dijital platformlar aracılığıyla sunulan sanal mekanların tasarımı incelenerek çeşitli metaverse platformları üzerinden gerçekleştirilen peyzaj mimarlığı uygulamalarının, sosyal mekân teorisi perspektifinden nasıl değerlendirilebileceği ve insan davranışları üzerindeki etkilerini anlamayı amaçlamaktadır. Metaverse ortamındaki peyzaj mimarlığına dair kapsamlı bir anlayış geliştirmeyi ve Sosyal Mekân Teorisi'nin bu dijital ortamdaki etkilerini incelemeyi hedefler. Sosyal Mekân Teorisi ve peyzaj mimarlığının metaverse ortamındaki karşılaştırması, dijital platformlardaki insan etkileşimlerinin ve toplumsal dinamiklerin anlaşılmasına katkıda bulunabilir. Bu anlayış, gelecekteki dijital mekanların tasarımında daha insan odaklı ve etkili yaklaşımların benimsenmesine yardımcı olabilir. Bu sayede, dijital platformlar üzerindeki peyzaj tasarımının insan davranışları ve toplumsal etkileşimler üzerindeki etkileri daha iyi anlaşılabilir ve gelecekteki tasarımların daha etkili bir şekilde yönlendirilmesine katkıda bulunabilir. Metaverse'in tasarım ilkeleri ve bu ortamdaki insan davranışlarının daha iyi anlaşılmasına katkıda bulunabilir. Bu anlayış, daha yaşanabilir, sosyal ve kullanıcı dostu sanal mekanların tasarlanmasına yol gösterebilir.
Anahtar Kelimeler: Sosyal Mekan Teorisi, metaverse, peyzaj mimarlığı, sanal mekanlar, insan davranışları, toplumsal etkileşimler.

COMPARING "SOCIAL SPACE THEORY" WITH LANDSCAPE ARCHITECTURE IN THE METAVERSE

ABSTRACT
"Social Space Theory's comparison of landscape architecture with platforms in the environment of metaverse. "Social Space Theory" examines the interaction of people with physical spaces and how these interactions shape social relationships, while landscape architecture in metaverse ‘ covers the topics of design and use of virtual spaces. At Metaverse, it aims to examine how landscape architecture is performed on different platforms, how people interact with these virtual spaces and how they shape their social dynamics. The focus of the study is on how virtual landscapes presented on different platforms can be evaluated from the perspective of "Social Space Theory" and how real-world spaces can differ from social interactions. . In this context, the design of virtual spaces offered through different digital platforms aims to understand how landscape architecture practices realized through various metaverse platforms can be evaluated from the perspective of social space theory and their impact on human behavior. He develops a comprehensive understanding of landscape architecture in the Metaverse environment and examines the effects of "Social Space Theory in this digital environment. . He develops a comprehensive understanding of landscape architecture in the Metaverse environment and examines the effects of "Social Space Theory in this digital environment. "Social Space Theory" and the comparison of landscape architecture in the metaverite environment can contribute to an understanding of human interactions and societal dynamics on digital platforms. This understanding can help to adopt more human-centered and effective approaches to the design of future digital spaces. In this way, the effects of landscape design on digital platforms on human behavior and social interactions can be better understood and contribute to a more effective orientation of future designs. The design principles of Metaverse and can contribute to a better understanding of human behavior in this environment. This understanding can lead to the design of more livable, social and user-friendly virtual spaces.
Keywords: Social Space Theory, metaverse, landscape architecture, virtual spaces, human behavior, social interactions.

GİRİŞ

Teknolojinin hızla evrimiyle birlikte, insan yaşamının her alanında dijitalleşme ve sanallaşma trendi belirgin bir şekilde artmaktadır. Bu eğilimin önemli bir örneği, metaverse olarak adlandırılan sanal evrenlerdir. Metaverse, kullanıcıların etkileşime girebileceği, iletişim kurabileceği, oyun oynayabileceği ve hatta iş yapabileceği geniş bir sanal dünya olarak tanımlanmaktadır. Bu yeni dijital alanın, geleneksel disiplinlerle nasıl etkileşim içinde olacağı büyük bir merak konusudur. Peyzaj mimarlığı, doğal ve insan yapımı unsurları dengeleyerek estetik ve işlevsel mekanlar tasarlama sanatı ve bilimidir. Parklar, bahçeler, meydanlar, kamusal alanlar ve şehir yeşil alanları gibi farklı ölçeklerde mekanlar tasarlayan peyzaj mimarları, bu mekanların estetik ve işlevsel olmasının yanı sıra kullanıcıların ihtiyaçlarını karşılamasına ve sosyal etkileşimi teşvik etmesine özen gösterirler. Metaverse, peyzaj mimarlığı için yeni ve heyecan verici bir fırsat sunmaktadır. Sanal mekanlar tasarlama ve inşa etme imkânı, peyzaj mimarlarının becerilerini ve bilgilerini yeni bir kitleye sunmalarını ve geleneksel mekanların sınırlarını aşmalarını sağlar. Metaverse'de, peyzaj mimarları fiziksel yasalar ve bütçe gibi sınırlamalarla sınırlı değildir. Bu sayede hayal güçlerini kullanarak daha özgün ve yaratıcı mekanlar tasarlayabilirler. Bu çalışmada, metaverse'in peyzaj mimarlığıyla karşılaştırılması sosyal mekan teorisi bağlamında ele alınmıştır. Sosyal mekan teorisi, insanların mekanlarla etkileşimlerini ve bu etkileşimlerin sosyal davranışları nasıl şekillendirdiğini inceler. Metaverse, bu kapsamda, geleneksel fiziksel mekanların yerini alabilecek veya onlarla etkileşim halinde olabilecek bir dijital mekan olarak öne çıkmaktadır. Çalışmada, Decentraland ve Horizon Worlds platformları incelenerek ve bu platformların mekan tasarımı, insan-mekan etkileşimi, sosyal davranışlar ve sosyal mekan tasarımı gibi konulardaki yaklaşımları karşılaştırılırmıştır. Bu karşılaştırmalı analiz, metaverse evrenlerinin, sosyal mekan teorisi bağlamında nasıl değerlendirilebileceğini anlamak için bir çerçeve sunmayı amaçlamaktadır.

2. GENEL KAVRAMLAR

2.1. Metaverse

Metaverse, teknolojinin hızlı ilerlemesiyle ortaya çıkan kapsamlı dijital bir evreni ifade eder. Bu kavram, farklı dijital platformlarda birleşen kullanıcıların etkileşime geçebildiği, içerik oluşturabildiği ve ekonomik faaliyetlerde bulunabildiği bir yapıyı temsil eder. Sanal dünyalar, artırılmış gerçeklik ve sanal gerçeklik gibi teknolojilerin entegrasyonuyla oluşan bu evren, geniş ve etkileşimli bir dijital ortam sunar. Kullanıcılar, bilgisayarlar, akıllı telefonlar, sanal gerçeklik gözlükleri ve diğer cihazlar aracılığıyla bu dijital evrene erişim sağlarlar. Bu evrende, kullanıcılar kendi dijital varlıklarını oluşturabilir, sanal alanlarda

dolaşabilir, diğer kullanıcılarla etkileşimde bulunabilir ve ekonomik faaliyetlerde bulunabilirler. Metaverse, sanal dünyalar arasında geçiş yapma, özgün içerikleri paylaşma ve ticaret yapma gibi özellikleri içerir (Yıldız, 2023). Metaverse kavramının evrimi, 1970'lerden günümüze kadar olan süreçte hızla gelişmiştir. İlk ortaya çıktığı dönemden bu yana, teknolojinin ilerlemesiyle birlikte daha karmaşık ve dinamik bir dijital ekosistem halini almıştır. "Meta" kelimesinin Yunanca kökeniyle birleşen "universe" kelimesi, bulunan evrenin ötesini ifade ederek, metaverse'in geniş kapsamlı ve sınırları aşan bir dijital dünya olduğunu vurgular. Metaverse, kullanıcıların gerçek dünya ile sanal dünyanın birleşim noktasında etkileşimde bulunabileceği, içeriklerini paylaşabileceği ve sanal deneyimler yaşayabileceği bir platform sunmaktadır. Kullanıcılar, metaverse üzerinde sanal karakterler aracılığıyla birbirleriyle etkileşimde bulunabilir, ticaret yapabilir ve çeşitli deneyimler yaşayabilirler. (Ludlow, 2007)

2.2. Sosyal Mekan Teorisi

Sosyal mekan teorisi, insanların mekanlarla etkileşimlerini ve bu etkileşimlerin sosyal davranışları nasıl şekillendirdiğini inceleyen bir disiplindir. Bu teori, sosyoloji, psikoloji, coğrafya ve antropoloji gibi çeşitli disiplinlerden fikirleri bir araya getirerek, mekanların nasıl anlam kazandığını ve insanların hayatlarını nasıl etkilediğini anlamaya çalışır. İnsanların mekanlarla nasıl etkileşime girdiklerini ve bu etkileşimlerin sosyal davranışları nasıl etkilediğini inceler. Mekanlar, insanların birbirleriyle nasıl etkileşime girdiklerini, kimliklerini nasıl inşa ettiklerini ve sosyal grupların nasıl oluştuğunu etkileyebilir. Sosyal mekan teorisi, peyzaj mimarlığı için önemli bir çerçeve sunmaktadır. Peyzaj mimarları, mekanlar tasarlarken insanların bu mekanlarla nasıl etkileşime gireceğini ve bu etkileşimlerin sosyal davranışları nasıl etkileyeceğini göz önünde bulundurmalıdır. Sosyal mekan teorisinin ilkelerini kullanarak, peyzaj mimarları daha kapsayıcı, adil ve sürdürülebilir mekanlar tasarlayabilirler. Sosyal mekan teorisi, insanların mekanlarla etkileşimlerini ve bu etkileşimlerin sosyal davranışları nasıl şekillendirdiğini anlamak için önemli bir araçtır. Bu teori, peyzaj mimarlığı, şehir planlama ve kamu politikası gibi farklı alanlarda daha yaşanabilir ve sürdürülebilir mekanlar tasarlamak için kullanılabilir. (Massey, 1994).

Konu ile ilgili temel kavramlar aşağıdaki şekilde özetlenebilir.

Mekan: Fiziksel bir alandan daha fazlası olarak, sosyal ve kültürel anlamlarla yüklü olan bir ortamdır. Mekan, sadece somut yapılarla değil, aynı zamanda insanların günlük yaşamlarında gerçekleştirdikleri eylemler, kurdukları ilişkiler ve deneyimledikleri duygular aracılığıyla anlam kazanır. Bu bağlamda, mekan, salt bir fiziksel konumdan ziyade, insan

faaliyeti ve etkileşimleriyle şekillenen ve dinamik bir karaktere sahip bir ortamdır (Massey, 1994).

Yer: İnsanların anlam yüklediği ve kimliklerini inşa ettiği bir mekanı ifade eder. Yer, sadece fiziksel bir alan olmakla kalmaz, aynı zamanda insanların deneyimleri, duyguları ve anılarıyla şekillenen bir ortamdır. Yer kavramı, mekanın kişisel ve öznel boyutuna odaklanır ve insanların bu mekanlarla nasıl bağ kurduklarını ve bu mekanların kimliklerini nasıl etkilediğini vurgular (Edney, J. J.,1976).

Alan: Egemen güç ilişkileri tarafından kontrol edilen ve belirli anlamlar yüklenen bir mekanı ifade eder. Alan kavramı, mekanın siyasi ve ekonomik boyutuna odaklanır ve belirli güçlerin bu mekanları nasıl kontrol ettiğini ve bu mekanlara nasıl anlamlar yüklediğini vurgular (Lefebvre, 1995).

Mekan Algısı: Bireylerin mekanları nasıl algıladıkları ve yorumladıkları süreci ifade eder. Bireyler, kendilerini çevreleyen mekanları duyuları, önceki deneyimleri, kültürel kodları ve sosyal konumları aracılığıyla algılarlar. Bu süreç, mekanlara nasıl anlamlar yüklediklerini vurgular (Rapoport, 1990).

MATERYAL VE YÖNTEM

Materyal

Çalımada materyal olarak Metaverse ortamında halihazırda mevcut olan Decentraland ve Hoison Worlds evrenleri üzerindeki mekanlar kullanılmıştır.

2.1.1 Decentraland®

Decentraland, Second Life gibi bir sanal dünya platformu olmasına rağmen, ekonomik yapısı ve istatistikleri farklılık göstermektedir. Decentraland, Ethereum blockchain'i üzerine inşa edilmiş bir platform olduğundan, ekonomisi de kripto para birimine dayalıdır. Decentraland'da kullanılan para birimi MANA'dır. MANA, platformdaki alım satım işlemlerinde kullanılan ve gerçek dünya değeri olan bir kripto para birimidir. Kullanıcılar, bu kripto para birimini kullanarak sanal arazi, dijital varlıklar ve diğer içeriklerin satın alımını gerçekleştirebilirler. Ayrıca, kullanıcılar kendi içeriklerini oluşturarak bunları platformda satabilir ve MANA kazanabilirler. (Damar, 2021) Decentraland'ın ekonomik yapısı, kullanıcıların içerik yaratımı ve ticaretine dayanır. Kullanıcılar, arazi satın alarak veya kiralayarak bu arazilerde kendi dijital içeriklerini oluşturabilirler. Bu içerikler, sanal dünyadaki diğer kullanıcılara satılabilir veya kiralanabilir. Örneğin, dijital sanat eserleri, kıyafetler, aksesuarlar, oyunlar ve eğlence mekanları gibi içeriklerin alım satımı gerçekleşebilir. Bu şekilde, kullanıcılar yaratıcılıklarını sergileyerek ve içeriklerini pazarlayarak MANA kazanabilirler. Decentraland'da istatistiklere tam olarak

erişilememekle birlikte, platformun kullanıcı tabanının sürekli olarak büyüdüğü ve içerik oluşturma ve ticaretin aktif bir şekilde devam ettiği bilinmektedir. Kullanıcılar, diğer kullanıcılarla etkileşimde bulunabilir, etkinliklere katılabilir ve ticaret yapabilirler. Ayrıca, platformda yapılan etkinlikler, konserler, sergiler ve topluluk etkinlikleri gibi sosyal ve kültürel deneyimler sunulmaktadır.

2.1.2 Horizon Worlds

Decentraland'a benzer bir sanal dünya platformu olmasına rağmen, farklı bir ekonomik yapısı ve kullanıcı istatistikleri ile öne çıkmaktadır. Decentraland gibi, Horizon Worlds da kullanıcıların sanal dünyada etkileşime girebilecekleri ve içerik oluşturabilecekleri bir ortam sunar. Horizon Worlds'ün öne çıkan özelliklerinden biri, platformun kendi kripto para birimi üzerine kurulu olmamasıdır. Decentraland'da MANA gibi bir kripto para birimi kullanılırken, Horizon Worlds'te platformun kendi kripto para birimi bulunmamaktadır. Bunun yerine, kullanıcılar geleneksel para birimleri veya platform içi dijital varlık satın alma yöntemlerini kullanabilirler. Ayrıca, Horizon Worlds'te içerik oluşturma ve ticaret farklı bir model üzerine kurulmuştur. Decentraland'da kullanıcılar arazi satın alarak veya kiralayarak kendi dijital içeriklerini oluşturabilir ve bunları platformda satabilirlerken, Horizon Worlds'te kullanıcılar daha çok önceden oluşturulmuş içerikleri kullanma eğilimindedirler. Platform, kullanıcıların özel etkinlikler düzenlemesine, oyunlar oynamasına ve topluluk etkinliklerine katılmasına olanak tanır, ancak içerik oluşturma ve ticaretin Decentraland'a kıyasla daha sınırlı olduğu bilinmektedir. Horizon Worlds'te istatistiklere tam olarak erişilememekle birlikte, platformun kullanıcı tabanının istikrarlı bir şekilde büyümekte olduğu ve çeşitli etkinliklerin düzenlendiği bilinmektedir. Kullanıcılar, diğer kullanıcılarla etkileşimde bulunabilir, sanal etkinliklere katılabilir ve topluluklar oluşturabilirler. Platform, sanal konserler, sergiler ve topluluk etkinlikleri gibi sosyal ve kültürel deneyimler sunarak kullanıcılarına çeşitli içerikler sunar. Horizon Worlds, kullanıcıların sanal deneyimlerini zenginleştirmek ve farklı içeriklerle etkileşime geçmelerini sağlamak için çeşitli özellikler sunar. Platform, kullanıcıların sanal dünyada özgürce dolaşmalarını, etkinliklere katılmalarını ve diğer kullanıcılarla etkileşimde bulunmalarını sağlayarak dinamik bir deneyim sunar.Bununla birlikte, Horizon Worlds'teki içerik oluşturma ve ticaret fırsatları platformun sunduğu çeşitli araçlar ve özelliklerle sınırlı değildir. Kullanıcılar, kendi özel etkinliklerini düzenleyebilir, sanal oyunlar oluşturabilir, interaktif deneyimler tasarlayabilir ve diğer kullanıcılarla paylaşabilirler. Ayrıca, platformda düzenlenen resmi etkinliklere katılma ve topluluk etkinliklerine dahil olma imkanları da bulunmaktadır.

Yöntem

Çalışmada, örnek araştırma evreni olarak seçilen meta verse evrenlerinden, Decentraland ve Horizon Worlds platformlarında mevcut olan mekanları aktif bir şekilde gözlemleyerek tasarım, işlevsellik, kullanıcı etkileşimi ve sosyal dinamikler hakkında bilgi toplanmıştır. Bu gözlemler, notlar, fotoğraflar ve videolar aracılığıyla kaydedilmiş, resmi platform belgeleri incelenerek mekan tasarımı ve kullanıcı deneyimi ile ilgili detaylı bilgilere erişilmiştir. Kullanıcı yorumları ve sosyal medya paylaşımları da araştırmamızın veri toplama sürecinde önemli bir rol oynamıştır. Bu çerçevede, görüşmelerden, gözlemlerden ve platform belgelerinden elde edilen verilerin tematik analizleriyle tekrarlayan temalar ve kalıplar belirlenmiş, akabinde; kullanıcı yorumları ve sosyal medya verilerinden elde edilen veriler incelenerek kullanıcıların mekanlarla ilgili davranışlarını ve tutumlarını anlamak için kullanılıştır. Değerlendirmede Gülce Solak (2017)'ın çalışmasında yer alan mekansal tasarımda kullanılan temel kavramlar kullanılmış, değerlendirmeler ve karşılaştırmalar bu başlıklar altında yürütülmüştür. Gülce Solak Mekansal Tasarım ilkeleri olarak; Mekânsal Algı, Mekânda Anlam, Aidiyet ve Yere Bağlılık, Kendileme ve Egemenlik Alanı Ancak Mahremiyet kavramlarlarına ilişkin değerlendirmelerin metaverse ortamlarında verisi bulunmadığı için değerlendirmeye alınmamıştır. Bu bütüncül yaklaşım, platformların kullanıcı deneyimlerini ve mekanlarının sosyal dinamiklerini detaylı bir şekilde değerlendirmeyi amaçlamaktadır.

ARAŞTIRMA VE BULGULAR

Sosyal Mekan Teorisi ve Peyzaj Mimarlığı Arasındaki Bağlantının İrdelenmesi

Sosyal mekan teorisi, insanların mekanlarla etkileşimlerini ve bu etkileşimlerin sosyal davranışları nasıl etkilediğini anlamaya çalışan bir sosyoloji dalıdır. Peyzaj mimarlığı ise estetik, işlevsel ve sürdürülebilir dış mekanlar tasarlamak için doğa bilimleri, sosyal bilimler ve sanatın ilkelerini kullanan bir disiplindir. Bu iki alan arasındaki bağlantı, peyzaj mimarlarının tasarımlarında insanların nasıl davranacaklarını ve etkileşime gireceklerini göz önünde bulundurmalarını gerektirir. (Aydın, 1999), Peyzaj mimarları, sosyal mekan teorisinin temel kavramlarını kullanarak mekanların nasıl kullanılacağını ve insanların bu mekanlarda nasıl hissedeceğini daha iyi anlayabilirler. Bu bağlamda, sosyal mekan teorisi peyzaj mimarlığına derin bir bakış açısı sunar. Özellikle, peyzaj alanlarının tasarımında, insanların mekanlarla etkileşimlerini ve bu etkileşimlerin sosyal davranışlarına nasıl yansıdığını anlamak için sosyal mekan teorisinden faydalanabilirler. Peyzaj mimarlarının sadece fiziksel mekanı değil, aynı zamanda insanların mekanda nasıl hissedecekleri, nasıl etkileşime girecekleri ve nasıl davranacakları gibi faktörleri de dikkate almalarını sağlar.

Sosyal mekan teorisi, peyzaj mimarlarının tasarımlarını daha insan odaklı hale getirmelerine yardımcı olabilir. Mekânın sadece fiziksel özelliklerini değil, aynı zamanda kullanıcı deneyimini ve sosyal etkileşimi de göz önünde bulundurarak, daha işlevsel, estetik ve kullanıcı dostu mekanlar tasarlanabilir. Örneğin, bir parkın veya kamusal alanın tasarımında, sosyal mekan teorisinden elde edilen bilgilerle, insanların buluşabilecekleri, etkileşime girebilecekleri ve topluluk duygusunu hissedebilecekleri alanlar oluşturulabilir. (Güleç Solak, 2017) Sosyal mekan teorisi, peyzaj mimarlarının tasarımlarını daha sürdürülebilir hale getirmelerine de yardımcı olabilir. İnsanların mekanlarla etkileşimlerini anlamak, mekanların daha verimli ve sürdürülebilir bir şekilde kullanılmasına olanak sağlar. Bu da çevresel etkilerin azaltılması ve doğal kaynakların daha etkili bir şekilde kullanılması anlamına gelir. Sosyal mekan teorisi ile peyzaj mimarlığı arasındaki bu bağlantı, insan odaklı, işlevsel ve sürdürülebilir mekanlar tasarlamak için önemli bir çerçeve sunar. Bu bağlamda, sosyal mekan teorisinden elde edilen bilgilerin peyzaj mimarlarının tasarımlarını zenginleştirdiği ve kullanıcı deneyimini iyileştirdiği söylenebilir.

Metaverse'de Sosyal Mekan Teorisi: Sanal Mekanlarda Yeni Bağlantılar Kurulması

Metaverse, insanların sanal avatarlar aracılığıyla etkileşime girebilecekleri ve birbirleriyle bağlantı kurabilecekleri yeni bir dijital ortam türüdür. Bu sanal mekanlar, gerçek dünyadaki sosyal mekanlara benzer şekilde tasarlanabilir ve kullanıcıların yeni deneyimler yaşamalarına, yeni insanlarla tanışmalarına ve yeni topluluklar oluşturmalarına olanak tanır. Sosyal mekan teorisi, insanların mekanlarla nasıl etkileşime girdiklerini ve bu etkileşimlerin sosyal davranışları nasıl etkilediğini anlamaya çalışan bir sosyoloji dalıdır. Bu teori, metaverse'in tasarımı ve kullanımı için önemli bilgiler sağlayabilir. Metaverse'in sosyal mekan teorisiyle ilişkilendirilmesi, bu dijital ortamın tasarımı ve kullanımı üzerinde derin bir anlayış sağlar. Özellikle, sosyal mekan teorisi metaverse'in farklı yönlerine ve kullanıcı deneyimine nasıl uygulanabileceği konusunda önemli bilgiler sunabilir. Mekan tasarımı açısından, sosyal mekan teorisi, metaverse'deki sanal mekanların nasıl düzenleneceği ve yapılandırılacağı konusunda rehberlik sağlar. Örneğin, geniş ve açık alanlar, kullanıcıların etkileşimlerini teşvik ederken, daha dar ve özel alanlar daha samimi bir ortam sunabilir. Ayrıca, sanal mekanların estetik ve işlevselliği, sosyal mekan teorisinin prensiplerine dayanarak kullanıcıların deneyimlerini şekillendirebilir. Topluluk oluşturma açısından, metaverse'deki sanal topluluklar gerçek dünyadaki topluluklara benzer şekilde oluşturulabilir ve yönetilebilir. Ortak ilgi alanlarına sahip kullanıcılar, sanal ortamlarda bir araya gelerek etkileşime geçebilir ve sosyal ihtiyaçlarını karşılayabilir. Bu, kullanıcıların metaverse'deki aidiyet duygularını güçlendirebilir ve topluluk hissini artırabilir. Kimlik ve

aidiyet konusunda, metaverse'deki kullanıcılar avatarları ve sanal ortamlar aracılığıyla yeni kimlikler oluşturabilir ve farklı topluluklara aidiyet duyguları geliştirebilirler. Bu durum, kullanıcıların kendilerini ifade etme özgürlüğünü artırırken, farklı sosyal kimliklerin ve grupların oluşumuna olanak tanıyabilir. Sosyal mekan teorisi, metaverse'in tasarımı ve kullanımı için önemli bir çerçeve sağlayabilir. Bu teoriyi anlamak, metaverse'in kullanıcılar üzerindeki sosyal ve psikolojik etkilerini daha iyi anlamamıza ve bu sanal ortamları daha adil ve kapsayıcı hale getirmemize yardımcı olabilir.

İnsan-Mekan Etkileşimi: Sosyal Mekan Teorisi ve Metaverse'deki Farklılıklar

Gerçek dünya mekanlarının etkileşimi: Gerçek dünya mekanlarının etkileşimi, insanların doğrudan fiziksel çevreleriyle etkileşime geçtiği ve duyularını kullanarak çevrelerini algıladığı bir süreçtir. Bu etkileşim, kişinin dokunma, görme, işitme gibi duyuları aracılığıyla gerçekleşir. Örneğin, bir kişi bir parkta yürüdüğünde, çimenlerin kokusunu hisseder, kuşların cıvıltısını duyar ve ağaçların gölgelerini görür. Bu duyusal deneyimler, kişinin mekanı algılamasına ve onunla etkileşime girmesine yardımcı olur. Gerçek dünya mekanları belirli bir coğrafi konumda bulunur ve fiziksel sınırlara sahiptir. (Eyce,2011), Örneğin, bir evin bahçesi, bir parkın sınırları veya bir alışveriş merkezinin duvarları gibi fiziksel sınırlar, mekanın tanımlanmasına ve kullanıcıların mekana yönelik davranışlarını şekillendirmesine yardımcı olur. Bu fiziksel sınırlar, mekanın bölünmesine ve belirli aktivitelerin belirli alanlarda gerçekleşmesine olanak tanır. Bu sayede, insanlar farklı mekanların farklı kullanım amaçlarına uygun olarak tasarlanmış olduğunu algılarlar ve bu amaçlar doğrultusunda davranışlarını düzenlerler.

Kullanıcıların deneyimleri ve kimlik oluşumu: Gerçek dünya mekanlarında, insanlar çeşitli deneyimler yaşayarak ve bu deneyimler aracılığıyla kimliklerini şekillendirirler. Örneğin, bir kişi bir kütüphanede sessizlik içinde çalışırken, kendini derin düşüncelere dalmış veya bilgiye odaklanmış bulabilir. Bu deneyim, kişinin kendini entelektüel olarak ifade ettiği ve bilgiye olan değerini vurguladığı bir kimlik oluşturabilir. Benzer şekilde, bir kişi doğada yürüyüş yaparken huzur bulabilir ve bu deneyim, kişinin doğayla olan bağını ve iç huzurunu vurgulayan bir kimlik oluşturabilir. Sanal mekanlarda ise, kullanıcılar farklı avatarlar aracılığıyla farklı kimlikler oluşturabilirler. Bir kullanıcı, sanal bir dünyada bir karakteri yönetirken, bu karakterin deneyimleri ve etkileşimleri kullanıcının sanal kimliğini şekillendirir. Örneğin, bir kullanıcı bir rol yapma oyununda savaşçı bir karakteri yönetiyorsa, bu deneyimler onun cesaretini, kararlılığını ve liderlik yeteneklerini vurgulayan bir sanal kimlik oluşturabilir. (Edney, J. J.,1976).

Sanal mekanlardaki etkileşim dinamikleri: Sanal mekanlarda, insanlar avatarlar aracılığıyla etkileşime girerler ve çevrelerini sanal bir ortamda deneyimlerler. Bu etkileşim, kullanıcıların klavye, fare veya sanal gerçeklik ekipmanı gibi araçlarla sanal dünyada hareket etmeleriyle gerçekleşir. Kullanıcılar, avatarlarıyla sanal mekanlarda dolaşabilir, diğer kullanıcılarla iletişim kurabilir, nesneleri manipüle edebilir ve etkileşimli içeriklere katılabilirler. Sanal mekanlar, genellikle sınırsız bir genişliğe sahip olabilir ve fiziksel olarak sınırlı değildir. Bu durum, kullanıcıların istedikleri gibi hareket etmelerine ve keşfetmelerine olanak tanır. Örneğin, bir sanal gerçeklik oyununda kullanıcılar, kendi istedikleri yönde dolaşabilir ve sanal dünyadaki farklı bölgeleri keşfedebilirler. Bu, gerçek dünya mekanlarında olduğu gibi fiziksel sınırların olmaması ve özgür bir dolaşım imkanının bulunması, kullanıcıların deneyimlerini zenginleştirir ve keşfetme duygusunu artırabilir (Tanlo1). Sanal mekanlardaki etkileşim dinamikleri, gerçek dünya mekanlarından farklılık gösterebilir. Örneğin, sanal mekanlarda iletişim genellikle yazılı veya sesli mesajlar aracılığıyla gerçekleşirken, gerçek dünya mekanlarında ise yüz yüze iletişim ve beden dili gibi farklı etkileşim biçimleri söz konusudur. Bu durum, insanların sanal mekanlarda farklı bir iletişim tarzı geliştirmelerine ve etkileşimlerinin doğasının değişmesine neden olabilir (Güleç Solak, 2017).

Tablo1. İnsan-Mekan Etkileşimi: Sosyal Mekan Teorisi ve Metaverse'deki Farklılıklar Decentraland. (2018a) den alınan veriler irdelenerek

Etkileşim Türleri	**Gerçek Dünya Mekanları**	**Sanal Mekanlar**
İletişim	Yüz yüze iletişim	Yazılı veya sesli mesajlar
Hareket Serbestisi	Fiziksel sınırlar	Sınırsız hareket imkanı
Duyusal Deneyimler	Dokunma, görme, işitme gibi	Görsel ve işitsel deneyimler
Kullanıcı Araçları	Doğal beden hareketleri	Klavye, fare, VR ekipmanı

3.4. Sosyal Davranışlar: Metaverse ve Gerçek Dünya Karşılaştırması

Sanal Mekanların Sosyal Etkileri: Sanal mekanlar, modern iletişim teknolojilerinin gelişmesiyle birlikte sosyal etkileşimin yeni bir boyut kazandığı dijital platformlardır. Bu mekanlar, kullanıcıların etkileşimlerini sanal avatarlar aracılığıyla gerçekleştirdiği, çeşitli iletişim araçlarının kullanıldığı ve sanal toplulukların oluştuğu dijital ortamlardır. Kullanıcılar, bu sanal mekanlarda ortak ilgi alanlarına sahip gruplar oluşturabilir, etkinliklere katılabilir ve sanal topluluklar içinde etkileşimde bulunabilirler. (Bilgin,1990) Metaverse gibi platformlar, kullanıcıların coğrafi sınırları aşarak küresel bir çapta bağlantı kurmalarını sağlayarak, sosyal ağların genişlemesine ve insanlar arasındaki etkileşimin

artmasına katkıda bulunur. Bu bağlamda, sanal mekanlar sosyal etkilerin çeşitlenmesine ve insanların sosyal ilişkilerini dijital ortamda geliştirmesine imkân tanır.

Gerçek Dünya Mekanlarında Sosyal Davranışlar: Gerçek dünya mekanlarında sosyal davranışlar, insanların karşılıklı etkileşimleri ve fiziksel çevrenin etkileri doğrultusunda şekillenir. İnsanlar, belirli coğrafi konumlarda bulunan mekanlarda bir araya gelerek, yüz yüze iletişim kurarlar, sosyal etkileşimlerde bulunurlar ve çeşitli topluluklar oluştururlar. Bu mekanlar, insanların doğrudan etkileşimde bulunarak duygusal bağlar kurmalarını, sosyal ilişkiler geliştirmelerini ve toplumsal kimliklerini oluşturmalarını sağlar. Gerçek dünya mekanları, insanların birbirleriyle etkileşime girmesine ve sosyal deneyimler yaşamasına imkan tanıyan fiziksel alanlardır.

Topluluk Oluşumu ve Etkileşim Dinamikleri: Metaverse'deki topluluklar, ortak ilgi alanlarına sahip kullanıcıların bir araya gelmesiyle oluşur. Sanal mekanlar, kullanıcıların etkileşim dinamiklerini çeşitlendirir ve farklı kültürel, sosyal ve ekonomik arka planlara sahip insanların bir araya gelmesine olanak tanır.(Tablo2) Gerçek dünya mekanlarındaki topluluklar ise genellikle belirli bir coğrafi bölgeye veya fiziksel alana dayalıdır ve daha yerel odaklıdır. Bu mekanlar, insanların bir araya gelmesini ve belirli etkinliklere katılmasını sağlar (Bechtel, Churchman, 2002).

Tablo 2. Sosyal Davranışlar: Metaverse ve Gerçek Dünya Karşılaştırması Decentraland. (2018a) den alınan veriler irdelenerek

Özellik	**Metaverse'deki Topluluklar**	**Gerçek Dünya Mekanlarındaki Topluluklar**
Etkileşim Şekli	Sanal avatarlar aracılığıyla dijital iletişim	Yüz yüze iletişim ve fiziksel etkileşim
İletişim Araçları	İnternet tabanlı iletişim araçları, metin, ses, video	Yüz yüze konuşma, bedensel ifadeler, jestler
Sosyal Etkileşim	Ortak ilgi alanlarına sahip kullanıcıların bir araya gelmesi	Genellikle belirli coğrafi bölgeye veya fiziksel alana dayalı
Katılımcıların çeşitliliği	Farklı kültürel, sosyal ve ekonomik arka planlara sahip	Daha yerel odaklı, bölgenin nüfus profiline bağlı
Etkileşim dinamikleri	Sanal ortamların sunduğu çeşitli etkileşim seçenekleri	Yüz yüze etkileşimler, bedensel ifadeler ve jestler
Fiziksel sınırlar	Sınırsız bir genişlik, fiziksel sınırlar yoktur	Belirli bir coğrafi bölgede sınırlı fiziksel alanlar
Bağlantı ve erişim	Dünya çapında bağlantılar, sınırları aşan ilişkiler	Genellikle yerel, bölgesel düzeyde erişim
Topluluk aktiviteleri ve etkinlikler	Sanal etkinlikler, topluluk tabanlı etkinlikler	Yerel etkinlikler, bölgeye özgü kültürel etkinlikler

3.5. Peyzaj Mimarlığı ve Metaverse Bağlamında Sosyal Mekan Tasarımı

Dijital mekanlarda peyzaj tasarımı, sanal ortamların estetik ve işlevsel özelliklerini planlama ve yönlendirme sürecidir. Bu tasarım süreci, sosyal mekan teorisi tarafından desteklenir ve insan davranışlarını, toplumsal ilişkileri ve mekanların sosyal etkilerini anlamak için kullanılır. Sosyal mekan teorisi, insanların mekanlarla etkileşimini ve bu etkileşimlerin sosyal davranışları nasıl etkilediğini anlamaya yönelik bir çerçeve sunar. Sosyal mekan teorisi, insanların mekanlarla olan etkileşimlerini ve bu etkileşimlerin tasarım üzerindeki etkisini inceleyen bir disiplindir. Bu teori, mekanların insan davranışlarını nasıl şekillendirdiğini, toplumsal etkileşimleri ve insanların mekanlardaki rolünü araştırır. Dijital peyzaj tasarımında, sosyal mekan teorisi, sanal ortamların kullanıcılar üzerindeki etkilerini ve bu ortamların tasarımında dikkate alınması gereken faktörleri anlamak için önemli bir rehber sağlayabilir.

3.6. Horizon Worlds İle Decentraland® Platformları Örneklerinde, Sosyal Mekanların Tasarımda Kullanılan Temel Kavramların İrdelenmesi

Metaverse'de sosyal mekanların tasarımı, kullanıcıların bu mekanlarda nasıl etkileşime gireceğini ve nasıl hissedeceğini büyük ölçüde etkiler. Peyzaj mimarisi, bu mekanların tasarımında önemli bir rol oynayabilir. Peyzaj mimarları, sosyal etkileşimi, estetiği ve işlevselliği göz önünde bulundurarak sanal alanlar tasarlayabilirler. Horizon Worlds ve Decentraland®, metaverse'de iki popüler sosyal mekan platformudur. Her iki platform da kullanıcıların sanal avatarlar aracılığıyla etkileşime girebilecekleri ve birbirleriyle bağlantı kurabilecekleri mekanlar sunmaktadır. Bu platformların peyzaj mimarisi açısından bazı önemli farklılıkları vardır.

3.6.1. Mekan Tasarımı ve Üretimi: Metaverse'deki sosyal mekanların oluşturulması için kritik bir adımdır. İki popüler metaverse platformu olan Horizon Worlds ve Decentraland®, bu süreçte farklı seçenekler sunmaktadır.Horizon Worlds platformunda, doğal araçlar ve bitkilerin kullanımı sınırlıdır. Bu platformda, peyzaj mimarları daha kısıtlı bir doğal öğeler yelpazesiyle çalışmak zorundadır. Ayrıca, arazi düzenleme seçenekleri de sınırlıdır, bu da tasarımcıların mekanları daha az özelleştirmesini ve dönüştürmesini gerektirir. Su öğeleri ve etkileri de kısıtlıdır, bu da tasarımcıların su özelliklerini ve etkilerini mekanlara entegre etme yeteneklerini sınırlar. Aydınlatma ve gölgelendirme seçenekleri Horizon Worlds'te daha az gelişmiştir ve fiziki simülasyonlar da sınırlıdır. (Göregenli,2010) Decentraland® platformu daha geniş bir doğal araçlar ve bitkiler yelpazesi sunar. Bu, peyzaj mimarlarının daha çeşitli ve özgün mekanlar tasarlamalarına olanak tanır. Ayrıca, arazi düzenleme seçenekleri daha fazladır, bu da tasarımcıların mekanları daha özelleştirmesine ve kişiselleştirmesine olanak

sağlar. Decentraland®'da su öğeleri ve etkileri de daha geniş bir yelpazede bulunur, bu da tasarımcıların su özelliklerini mekanlara daha etkili bir şekilde entegre etmelerine izin verir. Aydınlatma ve gölgelendirme seçenekleri daha gelişmiştir ve fiziki simülasyonlar daha fazla esneklik sunar. Decentraland® platformu Horizon Worlds'e kıyasla daha geniş seçenekler sunar ve peyzaj mimarlarının daha yaratıcı ve özgün mekanlar tasarlamasına olanak tanır. Bu, metaverse'deki sosyal mekanların tasarımında daha fazla esneklik ve kişiselleştirme sağlayabilir.

Horizon Worlds ve Decentraland®, metaverse'de mekan ve özne arasındaki ilişkiyi farklı şekillerde ele alır. Her iki platformun da kendine özgü avantajları ve dezavantajları vardır. Hangi platformun daha iyi olduğu, tasarımcının ihtiyaçlarına, tercihlerine bağlıdır.

3.6.2. Mekan ve Özne: Peyzaj mimarlığında, mekan ve özne arasındaki ilişki, bir mekanın tasarımının deneyimlenmesi ve algılanmasında önemli bir role sahiptir. Mekan, insanların içinde bulunduğu ve etkileşimde bulunduğu fiziksel bir ortamdır. Özne ise bu mekanı deneyimleyen ve etkileşim kuran bireydir. Horizon Worlds ve Decentraland® platformları, metaverse'de mekan ve özne arasındaki ilişkiyi farklı şekillerde ele alır. Her iki platformun da kendine özgü avantajları ve sınırlamaları bulunmaktadır. Horizon Worlds platformunda, mekan algısı daha önceden tasarlanmış ve kontrol edilmiş bir ortamda gerçekleşir. Kullanıcıların mekanı deneyimlemesi, platform tarafından belirlenen kurallar ve etkinlikler doğrultusunda gerçekleşir. Kişiselleştirme imkanı sınırlıdır ve kullanıcılar belirli kurallara tabidirler. Sosyal etkileşim imkanları da önceden belirlenmiş ve kontrol edilen etkinliklerle sınırlıdır. Özne özerkliği Horizon Worlds'te sınırlıdır. Öte yandan, Decentraland® platformunda, mekan algısı daha kişisel ve öznel bir şekilde gerçekleşir. Kullanıcılar, mekanı kendi tercihlerine ve deneyimlerine göre deneyimler ve özelleştirirler. Kişiselleştirme imkanı daha fazladır ve kullanıcılar mekanlarını istedikleri gibi düzenleyebilirler. Etkinlikler ve deneyimler kullanıcılar tarafından oluşturulur ve özelleştirilebilir. Sosyal etkileşim imkanları daha özgür ve doğaldır ve kullanıcılar arasında belirli kurallara tabi olmadan gerçekleşir. Özne özerkliği Decentraland® platformunda daha fazladır. Gerçek dünyada, peyzaj mimarlığı projelerinde de mekan ve özne arasındaki ilişki önemlidir. Tasarlanan mekanların kullanıcılar tarafından nasıl algılanacağı ve deneyimleneceği, tasarımcıların tasarım kararlarını etkiler. Tasarımcılar, mekanları tasarlarken kullanıcıların tercihlerini ve ihtiyaçlarını dikkate alarak kişiselleştirilmiş ve kullanıcı dostu mekanlar oluşturmayı hedeflerler. Gerçek dünyadaki peyzaj mimarlığı projelerinde, mekanın kullanıcılar tarafından nasıl algılanacağı ve deneyimleneceği, tasarımcıların tasarım kararlarını etkiler. Tasarımcılar, mekanları tasarlarken kullanıcıların

tercihlerini ve ihtiyaçlarını dikkate alarak kişiselleştirilmiş ve kullanıcı dostu mekanlar oluşturmayı hedeflerler. Bu doğrultuda, mekanın estetik, işlevsellik ve kullanıcı deneyimi açısından optimize edilmesi önemlidir. Örneğin, bir park veya bahçe tasarımında, kullanıcıların doğayla etkileşim kurabilecekleri ve dinlenebilecekleri alanlar oluşturulabilir. Yol ve patika düzenlemeleri, kullanıcıların rahatça dolaşabilecekleri ve mekanı keşfedebilecekleri şekilde planlanabilir. Oturma ve dinlenme alanları, kullanıcıların rahatlayabileceği ve manzaranın keyfini çıkarabileceği şekilde düzenlenebilir. Bununla birlikte, kullanıcıların farklı ihtiyaçları ve tercihleri olabileceğinden, tasarımcılar mekanı çeşitli aktivitelere uygun hale getirmeye çalışırlar. Bu, çocuk oyun alanları, spor alanları, piknik alanları gibi farklı kullanım amaçlarına yönelik alanların tasarımını içerebilir. Mekanın güvenliği ve erişilebilirliği de göz önünde bulundurulmalıdır. Engellilerin ve yaşlıların mekana kolayca erişebilmesi için uygun rampalar, düzgün yollar ve güvenli alanlar sağlanmalıdır. Güvenlik önlemleri, kullanıcıların mekanda rahatça vakit geçirebilmeleri ve keyif alabilmeleri için önemlidir. Tasarımcılar, kullanıcıların mekanı nasıl algılayacağını ve deneyimleyeceğini anlamak için gözlem ve kullanıcı geri bildirimlerine de önem verirler. Bu sayede, mekanın tasarımı sürekli olarak iyileştirilebilir ve kullanıcıların beklentilerine daha iyi cevap verebilir hale getirilebilir. (Futura Tech. News Bulletin ,2021).

3.6.3. İnsan-Mekân Etkileşimi: Peyzaj mimarlığında, insan-mekân etkileşimi, insanların mekanları nasıl algıladıkları, deneyimledikleri ve etkileşime girdikleri ile ilgilidir. Peyzaj mimarları, insanların mekanlarda nasıl hareket edeceklerini, nasıl hissedeceklerini ve nasıl davranacaklarını etkileyen mekanlar tasarlar. (Graumann, 2002).

Tablo 3. İnsan-Mekân Etkileşimi Karşılaştırması Decentraland. (2018a) den alınan veriler irdelenerek

İlke	**Horizon Worlds**	**Decentraland®**	**Gerçek Dünya**
Mekan Algısı	Önceden tasarlanmış ve kontrollü ortamda mekan algısı	Daha kişisel ve öznel mekan algısı	Karmaşık ve çeşitli mekan algılarına sahip, bireysel deneyimlere bağlı
Kişiselleştirme	Sınırlı kişiselleştirme imkanı	Daha fazla kişiselleştirme imkanı	Kişisel tercihler ve ihtiyaçlara göre geniş bir özelleştirme yelpazesi
Etkinlik ve Deneyim	Platform tarafından kontrol edilen ve belirli kurallara tabi etkinlikler ve deneyimler	Kullanıcı tarafından oluşturulan ve özelleştirilebilen etkinlikler ve deneyimler	Çeşitli etkinlikler ve deneyimler, kullanıcıların tercihlerine ve mekana bağlı olarak farklılık gösterir
Duyusal Geri Bildirim	Sınırlı duyusal geri bildirim	Daha fazla duyusal geri bildirim	Çeşitli duyusal deneyimler, sesler, kokular, dokunsal hisler ve görüntüler gibi çeşitli duyuları içerebilir
Hareket ve Navigasyon	Önceden belirlenmiş hareket ve navigasyon imkanları	Daha özgür ve doğal hareket ve navigasyon imkanları	Farklı koşullar altında serbest dolaşım, doğal navigasyon ve çevresel etkileşimler

Horizon Worlds ve Decentraland®, metaverse'de peyzaj mimarlığı, mekan tasarımı ve üretimi, insan-mekân etkileşimi gibi çeşitli açılardan farklı yaklaşımlar sunmaktadır. Hangi platformun daha iyi olduğu, kullanıcının ihtiyaçlarına, tercihlerine ve becerilerine bağlıdır.

3.6.4. Sosyal Davranışlar: Sosyal davranışlar, insanların diğer insanlarla etkileşim kurarken gösterdikleri davranışlardır. Bu davranışlar, sözlü ve sözsüz iletişim, beden dili, jestler ve mimikler gibi çeşitli unsurları içerir. Sosyal davranışlar, kültürel normlara, sosyal statüye ve kişisel özelliklere göre değişebilir. (Wang, X., Qin, H. 2020).

Tablo 4. **S**osyal Davranışlar Karşılaştırması (Decentraland , 2019) den alınan veriler irdelenerek

İlke	Horizon Worlds	Decentraland®	Gerçek Dünya
Kimlik	Avatarlar aracılığıyla temsil edilir	Avatarlar aracılığıyla temsil edilir	Gerçek kimlikler aracılığıyla temsil edilir
Sosyal Etkileşim	Platform tarafından kontrol edilen ve belirli kurallara tabi sosyal etkileşimler	Kullanıcı tarafından oluşturulan ve özelleştirilebilen sosyal etkileşimler	Kurallar ve normlar tarafından yönetilen yüz yüze sosyal etkileşimler
Sözlü İletişim	Metin sohbeti, sesli sohbet ve video sohbeti gibi çeşitli araçlar kullanılabilir	Metin sohbeti, sesli sohbet ve video sohbeti gibi çeşitli araçlar kullanılabilir	Yüz yüze iletişim ve çeşitli sözlü iletişim araçları kullanılabilir
Sözsüz İletişim	Avatar hareketleri ve ifadeleri aracılığıyla sınırlı sözsüz iletişim	Avatar hareketleri ve ifadeleri, metin sohbeti ve sesli sohbet aracılığıyla daha geniş sözsüz iletişim	Yüz ifadeleri, beden dili ve jestler gibi çeşitli sözsüz iletişim araçları kullanılabilir
Empati ve Anlayış	Sınırlı empati ve anlayış	Sınırlı empati ve anlayış	-
Sosyal Normlar	Platform tarafından belirlenmiş sosyal normla	Kullanıcı topluluğu tarafından belirlenmiş sosyal normlar	Kültürel ve toplumsal normlar tarafından belirlenmiş sosyal normlar
Güven ve Güvenlik	Sınırlı güven ve güvenlik	Sınırlı güven ve güvenlik	-

Horizon Worlds ve Decentraland®, metaverse'de peyzaj mimarlığı, mekan tasarımı ve üretimi, insan-mekân etkileşimi gibi çeşitli açılardan farklı yaklaşımlar sunmaktadır. Hangi platformun daha iyi olduğu, kullanıcının ihtiyaçlarına, tercihlerine ve becerilerine bağlıdır.

3.6.5. Horizon Worlds ve Decentraland®: Mekan, Yer, Alan ve Mekan Algısı Karşılaştırması

mekan, yer, alan ve mekan algısı kavramları önemli bir rol oynar. Mekan, insanların içinde bulunduğu ve hareket ettiği fiziksel bir ortamdır. Yer, bir mekanın coğrafi konumu ve bağlamıdır. Alan, bir mekanın büyüklüğü ve hacmidir. Mekan algısı ise insanların mekanları nasıl algıladıkları ve deneyimledikleridir. (Wang, Chong. 2021)

Tablo 5. Şekil Mekan, Yer, Alan ve Mekan Algısı Karşılaştırması (Decentraland., 2018a) den alınan veriler irdelenerek

İlke	Horizon Worlds	Decentraland®	Gerçek Dünya
Mekan	Önceden tasarlanmış ve kontrol edilmiş mekan	Kullanıcı tarafından oluşturulan ve özelleştirilebilen mekan	Geniş bir doğal ve insani çeşitliliğe sahip mekanlar
Yer	Sınırlı kimlik inşa etme ve topluluk duygusu geliştirme imkanı	Daha fazla kimlik inşa etme ve topluluk duygusu geliştirme imkanı	Çeşitli kimliklerin ve toplulukların oluşmasına olanak tanıyan geniş bir sosyal ve kültürel yelpaze
Alan	Merkezi platform tarafından kontrol edilen ve belirli kurallara tabi alan	Daha merkeziyetiz ve kullanıcıların katılımına açık alan	Daha merkeziyetiz ve farklı toplulukların katılımına açık alanlar
Mekan Algısı	Önceden tasarlanmış ve kontrollü ortamda mekan algısı	Daha kişisel ve öznel mekan algısı	Kişisel deneyimler ve çevresel etkileşimlerden oluşan daha karmaşık ve çeşitli mekan algıları

Horizon Worlds ve Decentraland®, metaverse'de peyzaj mimarlığı, mekan tasarımı ve üretimi, insan-mekân etkileşimi gibi çeşitli açılardan farklı yaklaşımlar sunmaktadır. Hangi platformun daha iyi olduğu, kullanıcının ihtiyaçlarına, tercihlerine ve becerilerine bağlıdır.

4. DEĞERLENDİRME VE SONUÇ

Metaverse peyzaj mimarları için yeni ve heyecan verici bir fırsat sunmaktadır. Decentraland ve Horizon Worlds gibi platformlar, peyzaj mimarlarının sanal mekanlar tasarlamasına, inşa etmesine ve yönetmesine olanak tanıyarak becerilerini ve bilgilerini yeni bir kitleye sunmalarını sağlar. Çalışmada, bu yönde yapılan değerlendirmeler sonucunda Güleç Solak (2017)'nin çalışmasında yer alan sosyal mekan için temel kavramlar, metaverse ortamında değerlendirilerek aşağıdaki şekilde özetlenmiştir.

Mekan Tasarımı ve Üretimi

- Gerçek ve Dijital Ortamlar: Peyzaj mimarları, gerçek mekanlarda olduğu gibi sanal mekanlarda da mekan tasarımı ve üretiminde becerilerini kullanabilir.
- Benzerlikler: Her iki ortamda da estetik, işlevsellik ve kullanıcı deneyimi önemlidir.
- Farklılıklar: Dijital araçlar ve yöntemler, fiziksel sınırlamaların olmaması ve kullanıcı etkileşiminin farklı olmasıyla sanal mekan tasarımını farklılaştırır.

Mekan ve Özne

- Kimlik ve Deneyim: Sanal mekanlar, kullanıcıların kimliklerini keşfetmelerine ve gerçek hayatta mümkün olmayan deneyimler yaşamasına olanak tanır.
- Peyzaj Mimarı Rolü: Peyzaj mimarları, kullanıcıların kimlik ve deneyimlerine katkıda bulunacak sanal manzaralar tasarlayabilir.

İnsan-Mekân Etkileşimi

- Etkileşim Türleri: Kullanıcılar, sanal mekanlarda dolaşabilir, nesnelerle etkileşime girebilir ve diğer kullanıcılarla iletişim kurabilir.
- Geri Bildirim: Gerçek zamanlı geri bildirim, tasarımı optimize etmeye yardımcı olabilir.
- Peyzaj Mimarı Rolü: Peyzaj mimarları, kullanıcı etkileşimini optimize eden ve kullanıcı deneyimini iyileştiren sanal mekanlar tasarlayabilir.

Sosyal Davranışlar

- Anonimlik ve Sosyal Normlar: Sanal mekanlar, kullanıcı davranışlarını ve sosyal etkileşimi farklı şekillerde etkileyebilir.
- Topluluk Oluşturma: Sanal mekanlar, topluluk duygusu geliştirmeye ve sosyal etkileşimi teşvik etmeye katkıda bulunabilir.
- Peyzaj Mimarı Rolü: Peyzaj mimarları, kullanıcıların bir araya gelmesini ve etkileşime girmesini teşvik eden sanal mekanlar tasarlayabilir.

Sosyal Mekan Tasarımı

- Sosyal Mekan Teorisi: Sanal mekanlar, Sosyal Mekan Teorisi'nin ilkelerini kullanarak tasarlanabilir.
- Topluluk, Erişilebilirlik ve Sürdürülebilirlik: Sanal mekanlar, bu ilkeleri göz önünde bulundurarak tasarlanmalıdır.
- Peyzaj Mimarı Rolü: Peyzaj mimarları, bu ilkeleri kullanarak işlevsel, estetik ve sürdürülebilir sanal mekanlar tasarlayabilir.

Sonuç olarak, elde edilen bulguların ışığında, gerçek dünyadaki sosyal mekan temel ilkeleri ve tasarımlarıyla, Metaverse ortamında yer alan Decentraland ve Horizon Worlds platformlarının mekan tasarımı ve kullanıcı deneyimi açısından farklılık gösterdiği görülmüştür. Ortamlar özelinde, Decentraland, kullanıcıların kendi mekanlarını oluşturabileceği ve özelleştirebileceği merkeziyetsiz bir yapı sunarken, Horizon Worlds daha önceden tasarlanmış ve kontrol edilmiş mekanlar sunmaktadır. Bu durum, farklı evrenlerde kullanıcıların mekanlarına yaklaşımının ve deneyimlerinin değiştiği varsayımını güçlendirmektedir.

Diğer yandan, elde edilen veriler, metaverse'deki ortak dış mekanlar çerçevesinden elde edildiği için, çalışma alanı ortak açık alanlar olan peyzaj mimarlığı çalışmaları, metaverse ortamları ve sosyal mekan teorisi arasında bir bağıntının olduğunun söylenmesi mümkündür. Metaverse'deki peyzaj mimarlığı, sanal mekanların estetik ve işlevsel özelliklerinin

planlanması ve yönlendirilmesi olarak tanımlanırken, sosyal mekan teorisi ise insanların mekanlarla etkileşimini ve bu etkileşimlerin tasarım üzerindeki etkisini analiz etmektedir. Çalışma, Metaverse ortamında peyzaj mimarlığı ve sosyal mekan teorisi arasındaki ilişkiyi derinlemesine incelemekte ve sanal dünya platformlarının tasarımında insanların sosyal etkileşimlerini nasıl şekillendirdiğini anlamak için bir referans noktası sunmaktadır. Elde edilen verilerin ve yapılan değerlendirmelerin, gelecekte, dijital ortamların tasarımında daha fazla kullanıcı ve etkileşim odaklı yaklaşımların benimsenmesinde katkıda bulunacağı düşülmektedir.

5. TEŞEKKÜR

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İlgili Bağlantılar:

Decentraland® web sitesi: https://decentraland.org/

Horizon Worlds web sitesi: https://www.meta.com/experiences/2532035600194083/

DİŞ HEKİMLİĞİNDE KENEVİRİN GELECEĞİ

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ÖZET

Kenevirin farmakolojik olarak aktif sekonder metabolitleri olan kannabinoidler, terpenler ve flavonoidler antioksidan, antikanser, antiinflamatuar, antimikrobiyal, analjezik ve anksiyolitik özelliklere sahiplerdir. Bu özelliklere sahip olması ile ağız sağlığının korunmasında, ağız ve diş hastalıklarının tedavisinde kannabinoid içerikli farmasötik ajanlara yönelimi artırmıştır. Piyasada satışa sunulan kannabidiol içerikli ağız gargaraları, diş macunları, kenevir yağı tentürleri, kapsüller, ağız spreyleri ve dental dolgu materyalleri bulunmaktadır. Yapılan çalışmalar ile kannabinoidlerin; dental plağı uzaklaştırmak için florür ve alkol içeren gargaralara alternatif olabileceğini, antibakteriyel etkiye sahip olması ile diş çürüğünün tedavisinde terapötik amaçlı uygulanabileceklerini, antiinflamatuar, antioksidan, nöroprotektif aktiviteleri sayesinde oral mukozit tedavisinde kullanılabileceğini, çeşitli ağız kanserlerinin tedavisinde terapötik faydalar sağlayabileceğini ortaya çıkmıştır. Bunun yanı sıra yanan ağız sendromu semptomlarına karşı kannabinoidlerin güvenli ve etkin olduğu ve son zamanlarda kannabidiollerin anksiyolitik ve antikompulsive etkileri ile dental anksiyete tedavisinde etkili olabileceği yapılan çalışmalarda ortaya çıkmıştır. Sonuç olarak; kenevirin diş hekimliği alanında tedavi amaçlı kullanımına dair kanıtlar çoğunlukla anekdotsal düzeydedir ve bilimsel kanıtlar sınırlıdır. Bu çalışmada diş hekimliği alanında kannabinoidlerin geniş terapötik penceresini ve analjezik, antioksidan, antiinflamatuar, antimikrobiyal ve antikanser özelliklerini inceleyen bilimsel çalışmalar irdelenmiştir. Literatür araştırması sonucunda kenevirin diş hekimliği alanında güncel çalışmalara ve yenilikçi yaklaşımlara fayda sağlaması beklenmektedir. Özellikle diş ağrısı, bakteriyel enfeksiyon kaynaklı gingivitis ve periodontitis, diş çürüğü, tükürük bezi iltihapları, inflamasyon kaynaklı ağız hastalıkları, ağız ve tükürük bezi kanseri, yanan ağız sendromu, oral mukozit, dental anksiyete tedavisinde ve ağız hijyeninin sağlanmasında kannabinoidler önemli rol oynamaktadır.

Anahtar Kelimeler: Kenevir, Diş Hekimliği, Kannabinoid, Ağız sağlığı

THE FUTURE OF HEMP IN DENTISTRY

ABSTRACT
Cannabinoids, terpenes and flavonoids, which are pharmacologically active secondary metabolites of cannabis, have antioxidant, anticancer, anti-inflammatory, antimicrobial, analgesic and anxiolytic properties. Having these features has increased the tendency towards cannabinoid-containing pharmaceutical agents in the protection of oral health and the treatment of oral and dental diseases. There are cannabidiol-containing mouthwashes, toothpastes, hemp oil tinctures, capsules, mouth sprays and dental filling materials available for sale in the market. According to studies, cannabinoids; It has been revealed that it can be an alternative to mouthwashes containing fluoride and alcohol to remove dental plaque, can be applied for therapeutic purposes in the treatment of tooth decay due to its antibacterial effect, can be used in the treatment of oral mucositis thanks to its anti-inflammatory, antioxidant and neuroprotective activities, and can provide therapeutic benefits in the treatment of various oral cancers. In addition, studies have revealed that cannabinoids are safe and effective against the symptoms of burning mouth syndrome, and that cannabidiol may be effective in the treatment of dental anxiety with its anxiolytic and anticompulsive effects. In conclusion; Evidence for the therapeutic use of cannabis in dentistry is mostly anecdotal, and scientific evidence is limited. In this study, scientific studies examining the wide therapeutic window of cannabinoids and their analgesic, antioxidant, anti-inflammatory, antimicrobial and anticancer properties in the field of dentistry were examined. As a result of the literature research, it is expected that hemp will benefit current studies and innovative approaches in the field of dentistry. Cannabinoids play an important role, especially in the treatment of toothache, gingivitis and periodontitis caused by bacterial infection, tooth decay, salivary gland inflammations, inflammation-related oral diseases, mouth and salivary gland cancer, burning mouth syndrome, oral mucositis, dental anxiety and in ensuring oral hygiene.
Keywords: Hemp, Dentistry, Cannabinoid, Oral Health

Giriş

Kenevir birçok rahatsızlığı tedavi etmek için geleneksel Asya, Afrika ve Hint tıbbında uzun yıllardır kullanılmaktadır. Kullanım alanları arasında oral ülserler, periodontal apseler, oral mukozit, mikrobiyal enfeksiyonlar, inflamatuar hastalıklar, diş ağrısı, ağız kokusu ve boğaz ağrısı gibi ağız ve diş hastalıkları yer almaktadır. Daha yakın zamanlarda geleneksel Çin tıbbı, bunlarla sınırlı kalmayarak oral liken planus, tekrarlayan aftöz stomatit, oral lökoplaki ve Sjögren sendromu dahil olmak üzere birçok ağız hastalıklarının tedavisinde kenevir bitkisi kullanılmıştır [1]. Günümüzde sağlık alanındaki en büyük sıkıntılardan biri olan sentetik antimikrobiyallere karşı artan direnç ve kimyasal ajanların olası olumsuz etkileri dolayısı ile günümüzde de doğal ağız hijyeni ürünlerine doğru da artan bir eğilim vardır.Kannabidiol (CBD), Cannabis sativa bitkisinden elde edilen psikoaktif aktivitesi olmayan bir bileşiktir [2]. CBD'nin terapötik kullanımları; anti-inflamatuar, antioksidan, analjezik, kemik dokusunda hücre farklılaşmasını uyarma, nöroproteksiyon, antiepileptik, anksiyolitik ve anti-kanser ajanları şeklindedir [3-10]. CBD ayrıca stres giderme, rahatlama ve uyku iyileştirme dahil henüz tam olarak araştırılmamış birçok sağlık durum için de kullanılabilir. Bugüne kadar, genel ağız hijyeninin korunması ve idame ettirilebilmesi, spesifik ağız ve diş hastalıklarının tedavi edilmesi için kannabinoid bazlı farmasötik bileşimlerin patenti alınmıştır. Şu anda piyasada çok çeşitli kannabinoid bazlı oral ürünler bulunmaktadır ve genel olarak kannabinoid bazlı farmasötikler üzerinde yürütülen çalışmalar giderek daha olumlu ve kanıta dayalıdır. Bu ürünler arasında kannabidiol kapsülleri, kannabidiol hapları, kenevir yağı tentürleri, kannabidiol içeren diş macunları, spreyler, ağız gargaraları, sakız hatta diş dolguları bulunmaktadır [2,11-14]. Bu derlemenin amacı, C. sativa L.'nin sekonder metabolitlerinin ağız ve diş hastalıklarına karşı terapötik potansiyeli hakkında genel bilgilendirme yapmaktır. Ancak bu ikincil metabolitlerin etki mekanizmaları, etkinlikleri, güvenirlikleri ve toksisitelerini değerlendirebilmek için daha ileri çalışmalara ihtiyaç vardır.

Diş ağrısı: Dental ağrı hem hasta hem de hekim için istenmeyen bir durum olup hekim bu durumun üstesinden gelebilmelidir. Dental ağrılar tipik olarak dişin enfeksiyonu veya yaralanması, pulpa hassasiyeti, çevre dokuların yaralanması veya diş çürüğünden kaynaklanabilir. Ağrı sisteminin anlaşılması ile doğru bir endodontik prosedür ve uygun analjeziklerin kullanımı dental ağrının kontrolünde önemli adımları oluşturmaktadır. Endodontik ağrının yönetiminde narkotik ve non-narkotik analjezikler, asetaminofen ve non-steroid antiinflamatuar ilaçlar veya opioid analjezikler ile bu ilaçların kombinasyonları sıklıkla kullanılmaktadır. Çalışmalar sınırlı olmasına ve etki mekanizmaları tam

aydınlatılamamış olmasına rağmen Delta 9-tetrahidrokanabinol (Δ9-THC), Cannabidiol (CBD) ve Cannabigerol (CBG) gibi kannabinoidlerin analjezik özelliklerinin var olması bunların diş ağrılarının tedavisinde etkili olacağını düşündürmüştür [12,15-16]. Kannabinoidlerin analjezik özellikleri aynı zamanda onları diş çekimleri ve ameliyat sonrası ağrı tedavisinde de yararlı kılabilir.

Periodontal Hastalık: Dişin destek dokularını etkileyerek yıkıcı bir yol seyreden periodontal hastalık en yaygın kronik enfeksiyonlardan biridir. Periodontal enfeksiyonlar, yaklaşık 350 bakteri türünün yer aldığı karmaşık bir mikroflora ile ilişkilidir. Periodontal hastalık oral mikroorganizmalar tarafından başlatılır ancak periodontal yıkımın şiddeti konağın enflamatuvar cevabı ile ilişkilidir [17]. Endokannabinoid sistem periodontal hastalığın tedavisinde umut verici bir hedef olabilir çünkü periodontal ligament (PDL) hücreleri tarafından inflamatuar yanıtların modülasyonunda/baskılanmasında rol oynadığı gösterilmiştir [18,19]. Periodontitisli hastalarda, periodontal cerrahi sonrası diş eti oluğu sıvısında endokannabinoid ekspresyonu artar [20]. Kannabinoidler, periodontal ligament hücrelerini enflamasyona bağlı diş eti hastalıklarının tedavisinde kullanılabilecek güçlü antiinflamatuar ve analjezik etkiler göstermektedir [21-24]. CBD'nin antiinflamatuar özellikleri dolayısı ile indüklenen periodontitiste alveoler kemik kaybını azaltabildiği gösterilmiştir [25,26]. Optimal antibakteriyel, antiinflamatuar, antioksidan ve analjezik etkiler üretebilen kannabinoidler arasındaki sinerjistik oranların var olması dikkatleri daha da üzerine çekmektedir.

Diş Çürüğü: Diş çürüğü, karyojenik mikroorganizmaların ortamda bulunan şekerli gıdaları parçalaması sonucu ortaya çıkan asitin dişin sert dokularında meydana getirdiği lokalize yıkım ile karakterize patolojik bir süreçtir. Diş çürükleri birçok ülkede önemli bir halk sağlığı sorunudur. Bu nedenle çürük çalışmalarının odak noktası diş çürüğünün önlenmesi ve başlangıç çürüklerinin remineralizasyonuna doğru yönelmiştir. Yapılan çalışmalar ile antibakteriyel özellikleri sayesinde kannabidiolün diş çürüklerinin tedavisinde terapötik olarak kullanılabileceği bildirilmiştir [27]. Kannabinoid içeren ağız gargaralarının, diş hekimliğinde altın standart bir antiseptik ajan olan klorheksidin ile aynı etkinlikte dental plak bakteriyelerini inhibe ettiği görülmüştür [27]. Vasudevan ve ark., yaptıkları bir çalışmada, biri ağırlık başına <%1 kannabidiol (CBD) içeren, diğeri ağırlık başına <%1 kannabigerol (CBG) içeren iki gargara ürününün dental plak kültürlerindeki bakterilere karşı etkinliği araştırılmıştır. Sonuçlar %0,2'lik klorheksidin ile karşılaştırıldığında her iki kannabinoid içeren gargara ürünü de çok benzer bakterisidal etkinlik göstermiştir [27]. Kannabidiol içeren diş macunlarının da dental plak bakterilerini inhibe ettiği rapor edilmiştir [27].

Antimikrobiyal direnç nedeniyle, bu kannabinoidlerin geleneksel sentetik ağız hijyeni ürünlerine göre daha güvenli bir alternatif olabileceği sonucuna varılmıştır [27].

Yanan Ağız Sendromu: Herhangi bir nedene bağlı olmaksızın dile ve ağzın diğer bölgelerine yayılan kronik veya tekrarlayan yanma hissi ile karakterize edilen ve hayat kalitelerini düşüren nöropatik bir ağrı durumudur. Yapılan birçok çalışmada, Yanan Ağız Sendromu semptomlarına karşı kannabinoidlerin güvenliğini ve etkinliğini araştırmış ve doğrulamıştır [28]. Borsani ve arkadaşları tarafından 2014 yılında yapılan bir araştırmada, geçici reseptör potansiyeli vanilloid kanal tip 1 (TRPV1) ve kannabinoid reseptörleri tip 2'nin (CB2) ekspresyonunda bir artış olduğunu ancak epitel hücrelerinde kannabinoid reseptörleri tip 1 (CB1) ekspresyonunda bir azalma tespit etmiştir [29,30]. Bu çalışmalar endokannabinoid sistemin Yanan Ağız Sendromu tedavisinde potansiyel bir hedef olabileceğini düşündürmektedir.

Oral Mukozit: Oral mukozit (OM), gastrointestinal sistemi kaplayan mukoza zarının iltihaplanması ve ülserasyonu ile karakterize bir hastalıktır. Özellikle baş ve boyun bölgesine uygulanan radyoterapi (RT) ve kemoterapi (CT) ile sık görülen bir komplikasyondur. OM, Oral kavitede genellikle yeme/içme zorluğuna neden olur ve bunun sonucunda da kilo kaybı, yetersiz beslenme ve fırsatçı enfeksiyonlara yatkınlığa yol açar. CBD'nin özellikleri, etki mekanizmaları ve diğer karmaşık hastalıkların tedavisindeki olumlu sonuçları göz önüne alındığında, oral kavitede hala zorlayıcı olan OM gibi patolojiler üzerinde olumlu bir terapötik etki oluşturabileceğine inanılmaktadır. Kanıtlar sınırlı olmasına rağmen kannabidiolün (CBD) antioksidan özellikleri oral mukozit ile ilişkili oksidatif stresi kontrol etmek için kullanılabileceğini düşündürmektedir [31].

Dental Anksiyete: Dental anksiyete, kaygı ve kuruntular duyumu ile gelişen tam olarak ifade edilemeyerek yoğun bir huzursuzluğa, panik derecesine ulaşan endişeye ve korku ile psikolojik ve nörovejetatif belirtilerle karakterize bir sendrom olarak tanımlanmaktadır. Diş tedavilerinin karşısındaki en yaygın küresel sorunlardan biridir. Birçok çalışma diş kaygısı ile diş hastalıklarının gelişimi arasında pozitif bir ilişki olduğunu göstermektedir [32-35]. Yakın zamanda yapılan bir çalışmada, anksiyolitik, panikolitik ve antikompulsif özellikleri nedeniyle kannabidiolün dental anksiyete tedavisindeki terapötik potansiyeli araştırılmıştır. Tedavi seansı öncesinde dil altına uygulanan 15-30 miligram CBD'nin diş kaygısına ve diş ağrısına karşı etkili olabileceği bildirilmiştir [36-37].

Ağız Cerrahisi ve Travmatoloji: Yapılan çalışmalar CBD için olumlu biyolojik ve osteoindüktif özellikler göstermiştir. CBD tek başına veya diğer materyaller ile kombinasyon halinde kullanıldığında endokannabinoid sistemin aktivasyonu yoluyla

mikroglial hücrelerin pro-göç aktivitesi üzerinde bir etki yaratmıştır. Bu sayede hücre göçü ve kemik farklılaşmasını sağlamak için yeterince etkili ve güvenilir bir yöntemdir [26, 6, 8, 38].

Sonuç ve Gelecek Yönü

Kannabinoidlerin ağız ve diş hastalıklarını tedavi etmek için kullanıldığına dair çok sayıda çalışma bildirilmiş olmasına rağmen diş hekimliğinde kannabinoidlerin kullanımına ilişkin sınırlı kesin bilimsel kanıt bulunmaktadır. Bununla birlikte kannabinoidlerin analjezik, antioksidan, antiinflamatuar, antimikrobiyal, antipruritik, antikanser gibi geniş terapötik özelliklerinin olduğunu destekleyen güçlü kanıtların bulunduğu unutulmamalıdır. Bu nedenlerden dolayı kannabinoidlerin diş hekimliğinde; diş ağrıları, periodontal hastalık, diş çürüğü, tükürük bezi enfeksiyonları, ağız hastalıkları, ağız ve tükürük bezi kanserleri, Yanan Ağız Sendromu, diş kaygısı ve ağız hijyeninin genel bakımı gibi geniş bir kullanım alanı sunmaktadır. Kannabinoidler, ağız ve diş hastalıklarını tedavi etmek için kullanılan sentetik ilaçlara ve genel olarak ticari ürünlerine göre daha güvenli bir alternatif olabilir. Mevcut patentler de şu anda endüstrinin ilgisinin diş macunu, gargara ve diş ipi dahil olmak üzere ağız bakım ürünlerine yönelik bileşimlere dayandığını göstermektedir. Kannabinoidlerin ve kannabinoid bazlı ürünlerin diş hekimliğinde daha yaygın kullanılabilmesi için bunların güvenliğini, tolere edilebilirliğini, toksisitesini, etkinliğini, optimal dozajlarını ve optimal dağıtım sistemlerini doğrulamak için daha fazla bilimsel çalışmalara ihtiyaç vardır.

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21. YÜZYIL DİL TEST VE DEĞERLENDİRMELERİNİN TEMEL İLKELERİ

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ÖZET
21. Yüzyıl, yabancı dil öğretimi ve öğrenimi alanında bir dizi yeni düzenleme ve yeniliğin ortaya çıkmasına neden olmuştur. Teknoloji entegrasyonunun alana çok fazla dahil olması ve yeni neslin bireysel farklılıkları, ve ilgili bir dizi faktörün müdahalesi göz önüne alındığında, dil testi kavramının gözden geçirilmesi ve yeniden şekillendirilmesi gerekmektedir. Bu nedenle bu çalışma, 21. Yüzyılda dil sınavlarının özelliklerini ölçme ve değerlendirme kapsamında ortaya koymayı ve geleceğin öğretmen adayları için süreci sınav oluşturulması ve değerlendirilmesii açısından aydınlatmayı amaçlamaktadır. Öğretmen adayları için sürecin çerçevesinin çizilmesi ve net bir şekilde ifade edilmesi amaçlanmaktadır.
Anahtar Kelimeler: Yabancı dil öğretimi, ölçme ve değerlendirme, bireysel farklılıklar

THE KEY PRINCIPLES OF 21st CENTURY LANGUAGE TESTING AND ASEESSMENTS

ABSTRACT
The 21 century has given rise to a number of new regulations and ınnovations in the field of foreign language teaching and learning. As the technology integration is too much involved in the area, as well as the individual differences of the new generation, the concept of language testing needs revision and reshaping given that the interference of a number of factors should be taken into consideration. Therefore, this study aims to reveal the characteristics of language testing for the 21 st century and enlighten the process for the future prospective teachers. The process is aimed to be framed and clearly stated for the inservice language teachers.
Keywords: Foreign language teaching, assesments and testing, individual differences

INTRODUCTION

Assessment is essential to ELT since it helps determine learners' requirements, assess language proficiency, and guide teaching strategies. Multiple language skills, such as speaking, listening, reading, writing, and language use in everyday situations, are assessed in ELT. They may consist of summative evaluations, which take place at the conclusion of a unit, course, or academic term to measure student success, as well as formative assessments, which happen during the learning process to inform instruction, as Bachman (1990) emphasized.From the early 1900s, when the reforms in language education gained traction, there has been a gradual shift toward approaches that emphasize meaningful contact and increased communication. When it came to teaching English as a foreign language, the direct method approach and grammar translation were the main focus. As a result, the assessments were overly mechanical and focused on the language's structure (Clark, 1983). The field of language testing is expected to undergo an unavoidable transition with the development of the communicative approach in foreign language reaching. This flow has raised various issues, and care must be made to maintain the integrity of justice and fairness in the testing environment.Numerous concerns are deemed crucial since teaching foreign languages is always a challenging endeavor requiring global efforts (Oktay, 2015). The language instructers are expected to take five basic principles of language assessment into consideration while assessing and teaching language as a continuum. When it comes to the terrain where language is taught, particularly in Türkiye, prep class education is the main source of funding for language instruction at the tertiary level. This is the year that the university students start their education to fix their language deficiency before they go to their own faculty. This system, therefore, requires a scientific plan and curriculum development given that students from diverse linguistic and cultural backgrounds are part of this language ecosystem, and their departments mandate the use of a foreign language as the primary medium of instruction either 100% or 30% of the time. In addition to coming from various cultural backgrounds inside the nation, some students are international as well. This harmony of diverge students from different cultures and nations gives rise to a solid and comprehensive planning before hand and administering the assessment tools so that the objectivity and fairness can well be sustained. As a result, during the testing and assessment process, a variety of evaluation concerns and potential issues could surface. Depending on all these factors cited above, there are three main question raised through the assesments of a foreign language teaching;

• What are the principles that we must consider while assessing a language?

• Are there any other concerns?

• What are the possible recommendation for the teachers?

METHODOLOGY

This research was constructed as a descriptive study, describing events, objects, circumstances, institutions, groups and various areas as what they are (Kaptan, 1998) • The study took place at a prep school in state university in Turkey • 10 instructors from different levels are taken into through random sampling. • One of the qualitative research methods, case study, was preferred to reveal perceptions and cases in their natural environment as exact and integrated (Yıldırım and Simsek, 2008). A semi-constructed interview form was used to collect data • The form included questions regarding personal information and two openended questions about problems they have experienced or observed during their language assesment process and their suggestions for each problem they stated. In terms of data analysis, the data from document analysis and interviews were transferred to computer. Texts were examined in detail and categories and terms were then determined. Then, data was separated to meaningful parts and we tried to determine the conceptual meanings of each part. Parts with a meaningful whole were coded. After finding common codes, categories were determined. In terms of reliability, the research process was explained in detail, starting from the preparation of data collection tool to the application and analysis steps Secondly, research results were shared with individuals participating to the research, and they were asked to comment on these results. Thirdly, raw data was presented to another researcher specializing in this field, and the researcher was asked to establish themes and coded opinions.

a) The concern of administering the assessment principles

b) The concern of individual differences

c) The concern of administering the alternative assessments

b) *The concern of administering the assessment principles*

Mc Namara (2000) defines the principles of language testing and assessment as; Practicality, Validity, Reliability, Authenticity and Washback Practicality is an emerging concern given that the number of the students make the differences. The cost and the assessments of the papers after the exam is time consuming. Validity refers to the use of right tool to asses the perfoemnce of a skill or language improvement. Reliability is another issue to be dealt with mostly the individual differencers of the students matter a lot. The originality and the real life resemblence of the exam questions is a significant concern in language assessment. Necessary studies and investigations should be made in order to sustain the washback effect.

Additionally, the number of the students whose either proficiency or language accumulation are tested is too many, therefore, to test them fairly and in an appropriate way is unrealistic. Thus, the principles of language assessments and their applicability are far-fetched.

b) *The concern of individual differences*

Individual differences play a significant role in English Language Teaching (ELT) Cronbach (1956) cited that they influence how students learn, process information, and interact with the language. These differences encompass a wide range of factors including cognitive styles, learning preferences, motivation, personality traits, prior knowledge, cultural background, and linguistic aptitude. Understanding and addressing these differences can greatly enhance the effectiveness of assesment process in the ELT context. For example, language aptitude is regarded as a prominent skill in language learning and acquisition and constitutes the foundation of language proficiency (Dörnyei, 2005; Ehrman, 1996) it is also referred to "an individual's initial state of readiness and capacity for learning a foreign language" (Carrol, 1981, p. 86). In terms of language assessments, this difference play a significant role either in administrating the test or evaluating it. Additionally, the learning styles and strategies of the students generate the dilemma of creating a common, reconciled type of test and exam. One teacher says" it is truly intriguing to find a perfect match exam which accentuates the learning habits of all the learners". It is apparent that these distinctive features create contradictory situations for the assessor when administering a foreign language measures.

c) *The concern of using alternative assessments*

Alternative assessments offer diverse ways to evaluate students' understanding, skills, and knowledge beyond traditional tests and exams. They aim to provide a more holistic view of students' learning and abilities while promoting creativity, critical thinking, and practical application of knowledge. In English Language Teaching (ELT), alternative assessments can be particularly valuable for assessing language proficiency in authentic contexts. These are protfolios, observations, interviews, presentations, online homeworks, perfomance based assesments. High-stakes testing may lead some concerns as asingle testing item, alternate assessment and classroom-based measurements of student progress give teachers an array of different ways to promoto testing and assessment. As a result, it is crucial to assist college students enrolled in teacher preparation programs and in-service educators in comprehending substitute classroom-based assessments as well as the fundamental principles and practices of standardized testing. However, as there are some drawbacks of this type of assesment, implementing and administering it is rather time-consuming. To

observe a class individually, with 22 students in total may be costly as alternative types of asessment is long-term based unlike high stake exams. The usefullness of these methods is also criticized given that for teachers to be fair and impartial is difficult to manage. Therefore, the administeration of alternative assesments required a well-structured pattern beforehand, when the previous educational season is over.

CONCLUSION, DISCUSSIONS AND RECOMMENDATIONS

In terms of assesments and testing in a foreign language domain, there are a number of issues and ipmlications can be drawn. These are;

- Individual differences in foreign language teaching environment must be taken into account in assessing a foreign language.
- The exam practicality is of crucial importance in terms of administering it before and assessing it after the process.
- Pure alertness of teacher is required in language assessment process.
- The way how the performances are assessed should be kept free from the unethical implications.
- The alternative assesments types should be prdetermined and administred.
- The individuals' ideas and reflections have to be taken into account in all layers of language assessments.
- In order to sustain a solid and precise assessment, the reflections of the learners should be taken into consideration.
- Alternative types of assesments and measurements need well-constructed planning and administration.
- An eclective approach shoul be adopted while assessing the learners' language level and proficiencies.

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SAĞLIK SEKTÖRÜNDE İŞ YAŞAM KALİTESİ VE ÖNEMİ

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Özet
İş yaşam kalitesi tanımının geniş kapsamlı ve çok boyutlu olması literatürde farklı tanımların yapılmasına neden olmuştur. En geniş bakış açısı ile iş yaşam kalitesi, kişinin ve çalışma ortamının ekonomik, sosyal ve fiziksel karakteristikleri arasındaki ilişki olarak tanımlanır ve aynı zamanda çalışma sırasında ve çalışma dışında toplumun önem verdiği davranış ve düşünceleri de yansıtmaktadır. Bir insanın hayatında çalışma hayatı önemli bir yer kaplamaktadır ve hayatında önemli bir zaman tutmaktadır. Çalışanlar tarafından bu zamanın istekli ve kaliteli olarak geçirilmesi iş çıktı kalitesini etkilemektedir. Bu nedenle yöneticilerin dikkate alması gereken bir kavram, iş yaşam kalitesi kavramıdır. İster sağlık sektöründe olsun ister diğer sektörler de olsun, iş yaşam kalitesini etkileyen bazı unsurlar mevcuttur. Bunlardan en önemlileri çalışma koşulları, ücret ve yönetim ile olan ilişki olarak ele alınabilir. Sağlık sektörü kendine has özelliklerden, 7 gün 24 saat hizmet vermesi ve sonuçlarının direk olarak insan sağlığını etkilemesinden dolayı diğer sektörlere göre iş yaşam kalitesine vereceği önem daha da artmaktadır. Birçok çalışmada gösterildiği gibi, iş yaşam kalitesinin artması iş performansında ve bireyin yaşam kalitesinde artışa neden olmaktadır. Bu nedenle yöneticilerin sağlık çalışanlarının iş yaşam kalitesini geliştirmeye yönelik uygulamaları yapması önemlidir.
Anahtar Kelimeler: İş yaşam kalitesi, sağlık sektörü, sağlık çalışanları

QUALITY OF WORK LIFE AND ITS IMPORTANCE IN HEALTHCARE SECTOR

Abstract
The definition of quality of work life has been defined differently in the literature due to its broad and multidimensional nature. In its broadest perspective, quality of work life is defined as the relationship between the economic, social, and physical characteristics of the person and the working environment. It also encompasses the behaviors and thoughts that society values during and outside of work. Working life plays a crucial role in an individual's life and consumes a substantial amount of time. The quality of work output is influenced by employees who willingly and effectively spend this time. Therefore, it is important for managers to consider the concept of quality of work life. Several factors, such as working conditions, wages, and the relationship with management, can affect the quality of work life. It is worth noting that nurses constitute a significant portion of healthcare professionals. Working conditions, shift work, long hours, working outside of one's desired field, and underemployment despite certification and training can all have a negative impact on nurses' quality of life. These factors may even lead to self-harm, such as injuring oneself with cutting or piercing tools, and can also result in medical errors that harm patients. The importance of the healthcare sector to the quality of work life is increasing compared to other industries due to its unique characteristics, providing service 24 hours a day, seven days a week, and its results directly affecting human health. As shown in many studies, increasing the quality of work life leads to increased work performance and the individual's quality of life. Therefore, it is essential for managers to implement practices aimed at improving the quality of work life of healthcare workers and to avoid some practices that reduce the quality of work life.
Keywords: Quality of work life, healthcare sector, healthcare workers

Yaşam kalitesi Dünya Sağlık Örgütü (DSÖ)tarafından kişinin içinde yaşadığı değer ve kültür sistemlerinde, standartları, beklentileri, hedefleri ve kaygılarına ilişkin olarak yaşamdaki durumuna ilişkin algısı olarak tanımlamaktadır (1). DSÖ tarafından geliştirilen yaşam kalitesi , psikolojik, fiziksel, sosyal ilişkiler, bağımsızlık düzeyi, ruhani/dinsel/kişisel inançlar ve çevre alt grupları olarak değerlendirilmektedir. Bağımsızlık düzeyinde iş kapasitesi, çevre değerlendirmesinde ise iş tatmini bulunmaktadır. Erişkin bir insanın hayatında çalışma hayatı önemli bir yer kaplamaktadır ve hayatında önemli bir zaman tutmaktadır. Çalışanlar tarafından bu zamanın istekli ve kaliteli olarak geçirilmesi iş çıktı kalitesini etkilemektedir (2). Bu nedenle yöneticilerin dikkate alması gereken bir kavram, iş yaşam kalitesi kavramıdır.İş yaşam kalitesi tanımının geniş kapsamlı ve çok boyutlu olması nedeniyle bu konuda çalışan akademisyenler belirli bir tanım yapmakta zorlanmışlardır ve iş yaşam kalitesi ile ilgili birçok ölçek hazırlanmıştır. Ancak, bazıları iş yaşam kalitesinin genelde çalışanların iyilik hali ile uğraştığını kabul etmektedirler (3). Fakat çoğu zaman iş yaşam kalitesi farklı biçimlerde tanımlanmaktadır. İş yaşam kalitesi farklı araştırmacılar tarafından farklı tanımlar içermektedir. Walton 1975 yılında, iş yaşam kalitesi, organizasyonun, çalışanların çalışmaları ile ilgili düzenlemeleri için kararlara katkılarını sağlayacak düzenlemeleri geliştirmesi olarak tanımlar (4). Wood ve arkadaşları, kişinin ve çalışma ortamının ekonomik, sosyal ve fiziksel karakteristikleri arasındaki ilişki olarak tanımlar ve aynı zamanda çalışma sırasında ve çalışma dışında toplumun önem verdiği davranış ve düşünceleri de yansıttığını belirtir (5). Glaser ise iş yaşam kalitesinin, adil ve yeterli ücret, iyi çalışma şartları, eşit istihdam fırsatları ve çalışma güvencesinden daha fazlası olduğunu belirtir (6). Nadler ve Lawler tarafından çalışanlar, örgüt ve çalışma üzerine düşünmenin bir yolu olarak tanımlanırken (7), Yousuf ise, bireyin ekonomik ödüller, çalışma şartları, güvenlik, çalışma şartları, faydalar, örgütsel ve kişilerarası ilişkiler gibi çalışmanın tümüyle ilgili dahili olarak kaynaklanan değerlendirmeler olduğunu belirtir (8). Sirgy ve arkadaşları tarafından çalışanların yönetime katılımının sağlanmasıyla çalışma doyumlarının arttırılması olarak tanımlanır (9). Davis ise, çalışma hayatında olan çalışanların fikirlerine göre ortamın istenen iyi ve istenmeyen kötü özelliklerini belirtmektedir (10). Lau ve arkadaşları ise, çalışanlara sağlanan kariyer, güvenli çalışma ortamı ve ödüller gibi fırsatlarla çalışma yaşamı tatminini arttırmaya yönelik yaklaşımları tanımlamaktadır (11). İş yaşam kalitesinin boyutlarında ise aynı ortak bir yön yoktur. Farklı araştırmacılar tarafından iş yaşam kalitesi farklı boyutlarca ele alınmıştır. İlk çalışmalardan birinde, Walton 1973 yılında iş yaşam kalitesi boyutlarını güvenli ve sağlıklı çalışma koşulları, yeterli ve adil maaş, kendini geliştirme, güvenlik, sosyal uyum, kurumsallaşma, çalışmanın sosyal bağlantısı ve

çalışma yaşamı olarak ele almıştır (4). Taylor ve arkadaşları, harici etmenler (çalışma şartları, çalışma saatleri ve maaş), dahili etmenler (işin yapısı ile bağımlı etmenler) ve çalışmayla alakalı diğer etmenler (sosyal destek, çalışanların yönetime katılımı, kendini geliştirme, adalet, üretimin veya çalışmanın toplumsal bağlantısı) olarak ele almıştır (12). Levine ve arkadaşları, iş yaşam kalitesinin boyutlarını güvenli ve sağlıklı çalışma koşulları, hakkaniyetli ve yeterli maaş, yeteneğin kullanımı, güvenlik, kurumsallaşma, sosyal bütünleşme, çalışmanın sosyal bağlantısı ve çalışma hayatı olarak belirlemiştir (13). Efraty ve Sirgy, kişinin varlığının sürdürülmesi ile ilgili gereksinimler (maaş, güvenlik), benlik gereksinimleri (otonomi, kendine saygı), sosyal gereksinimler (bireylerarası ilişkiler, önemli sosyal gruplara katılım ve kabul) ve kendini gerçekleştirme gereksinimi olarak belirlemişlerdir (14). Baba ve Jamal ise 1991 yılında, iş yaşam kalitesinin boyutlarını iş tatmini, iş görevinin belirsizliği, işe katılım, iş yükünün fazlalığı, iş görevi çatışması, iş stresi, örgütsel bağlılık olarak ele almışlardır (15). 1998 yılında May ve arkadaşları ise, çalışma güvencesi, ödüllendirme, uygun çalışma imkanları ve ortamı, kendini geliştirme imkanları sağlayarak çalışan doyumunu destekleme olarak belirlemişlerdir (16). 2000 yılında Chen ve Farh, iş yaşam kalitesi boyutlarının çalışma karakteristikleri, çalışma/yaşam dengesi, maaş, yararlar ve yönetimsel davranış olarak belirtmişlerdir (17). 2000 yılında Cobb, yaşam kalitesinin ölçümleri ile ilgili olarak, direk ve indirek değerlendirmeleri ele alan çalışmaların kaliteyi direk olarak saptayamadıklarını ve kaliteye ulaşma hedefine yaklaştıklarını düşünmektedir. Yaşam kalitesinin çoğulcu ölçülebileceğinin altını çizmektedir. (18). İş yaşam kalitesi ile ilgili ölçekler geliştirilirken bazı teoriler ile geliştirilmektedir. 2001 yılında Sirgy ve arkadaşlarının geliştirdiği iş yaşam kalitesi ölçeği hali hazırda kullanılan önemli ölçeklerden birisidir (9). Geliştirilen bu ölçek yayılma ve ihtiyaç doyumu kuramına dayanmaktadır. Maslow tarafından geliştirilen ihtiyaç doyumunda, kişilerin belirli kategorilerdeki ihtiyaçlarını karşılamalarıyla, hiyerarşik olarak daha yukarıda olan 'üst ihtiyaçlar'ın doyumu arayışına girdiklerini belirtir (19). Bu hiyerarşiye bakıldığında en aşağıda, hayatı idame ettirmek için gerekli olan barınma, yeme ve içme gibi ihtiyaçların olduğu temel gereksinimler vardır. Bir üst basamağında maddi ve fiziki anlamda güvenlik gereksinimi yer alır. Ardından, sosyal yönden kabul edilme, sevgi ve aidiyet gereksinimleri yer alırken, dördüncü basamakta çevresindekiler tarafından onaylanma ihtiyacı ve saygınlık gelmektedir. En üst basamakta ise, kendi kendine yönünü tayin edebilme ve bireysel bağımsızlık gibi bireyin kendini gerçekleştirebilme gereksinimleri barındırmaktadır. Ayrıca, kişinin karakter gelişiminin, o anda belirgin olan gereksinim basamağı tarafından belirlendiğini düşünülmektedir. Kişi, aşağı kategoride yer

alan ihtiyaçlarını gidermeden üst düzeyde yer alan diğer ihtiyaç basamağına geçmesi mümkün değildir. İş yaşam kalitesi ile ilişkili olan bu yaklaşımda, kişilerin iş hayatıyla gerçekleştirmeyi hedeflediği temel gereksinimlere sahiptir ve bu gereksinimler karşılandıkça iş yaşam kalitesi artar. Yayılma yaklaşımında, hayatın bir bölümündeki doyum başka bir bölümdeki kaliteyi etkileyeceği hipotezini kurar. Örnek olarak, bir kişinin çalışma yaşamından sağladığı kalite, aile, sosyal ve ekonomik alan gibi diğer yaşam alanlarındaki kaliteyi etkileyebilir (9). Bu ölçek, ihtiyaçlar tatminini karşılamakla kalmaz, aynı zamanda kişinin çalışma çevresi, yönetimin davranışı, işin gereklilikleri ve diğer programlardan kaynaklanan gereksinim doyumunun örgütsel kaynaklarının algılanışını da kapsar. Bir başka teori ise, Herzberg tarafından geliştirilen motivasyon temelli çift faktör teorisidir. Bu teori, çalışan bireyin çalıştığı yer ile ilgili tatmin düzeyi teorisinde bulunur ve bu da iş yaşam kalitesine temel oluşturur. Çalışmanın iş tatmininin ana temeli olduğu öne sürülmektedir. Çalışmadan duyulan memnun olma durumunu ve memnun olmama durumunu iki zıt kutba yerleştirir. Bu iki boyuta etki eden etmenler motive edici etmenler ve hijyen etmenler olarak isimlendirilir. Motive edici etmenler işin kendisini, ilerleme imkânları, sorumluluk, başarma, tanınma ve statü gibi etmenleri içermektedir. Bu etmenler, kişiye kişisel başarı hissi verdiğinden, bireyin motivasyonun sağlayacaktır yani bu etmenler memnuniyeti yükselten, çalışmaya özendiren, kişiyi çalışma ortamına bağlayan ve doyum sağlayan dahili öğelerdir. Bu etmenlerin eksikliği çalışanın motivasyon düşüklüğüne neden olmaktadır. Hijyen etmenleri ise, çalışma koşulları, ücret, maaş, organizasyonda astlar ve üstler arasındaki ilişkiler, işletme politikası ve yönetimi, iş güvenliği gibi etmenlerdir. Hijyen etmenleri kişinin motivasyonunu sağlayacağı minimum şartları temin edecektir. Bu etmenler tek başlarına iş memnuniyeti ve motivasyonu sağlamamaktadır. Motivasyon, motive edici etmenlerin olması ile sağlanmakla birlikte hijyen faktörleri ile de desteklenmektedir. Hijyen etmenleri eksik olduğu durumlarda, işin kendisi memnuniyet verici olmayacaktır ve çalışanın işten ayrılmasına, tatminsizliğine yol açabilecek etmenler olarak gösterilebilir (20). Bir başka teori ise Allardt'a aittir. Bu teoride, üç temel ihtiyaca bağlı, geniş bir yaşam kalitesi düşüncesi hakimdir ve yaşam kalitesi düzeyinin artması için gereken üç önemli ihtiyaç olduğunu belirtir. İlki, yaşamak için olması gereken kişinin var olması için gereksinim duyduğu maddi şartlar olan sahip olma ihtiyacıdır. Bunlar, barınma koşulları, ekonomik kaynaklar, çalışma koşulları, istihdam, eğitim ve sağlık ile ilgilidir. İkincisi ise sevgi ihtiyacıdır. Aile bireylerine ve akrabalara olan bağlılık, yerel toplulukta iletişim ve bağlılık, arkadaşlığın aktif görünümleri, çalışma arkadaşlarıyla olan ilişkileri, toplumdaki kişilerle arkadaşlık ve iletişimi içeren diğer bireylerle ilişki gereksinimi ve toplumda sosyal

kimliklerin biçimlendirilmesi gereksinimidir. Son olarak, var olma gereksinimidir. Bu gereksinim, toplumla bütünleşme ve doğa ile uyumlu biçimde hayatını idame ettirmektir (21). Wyatt ve Wah tarafından 2001 yılında yapılan çalışmada, iş yaşam kalitesinin dört boyutu olduğu ortaya konmuştur. Ayrıca, iş yaşam kalitesinin bu dört boyut tarafından etkilendiğini belirtmişlerdir. Bu dört boyut, kişisel gelişim ve özerklik, çalışma ortamı ve uygun yönetim, meslektaşlar ile işin doğası ve teşvik edici fırsatlar olarak saptanmıştır. Bu dört boyutun var olmadığı durumda düşük iş yaşam kalitesi ortaya çıkmaktadır (22). 2007 yılında Chan ve Wyatt tarafından yapılan bir çalışmada ise, Çin'de çalışan kişilerin iş yaşam kalitesi ile genel iyilik durumu, yaşam tatmini, iş tatmini, işten ayrılma niyeti ve duygusal örgütsel bağlılık arasındaki ilişki araştırılmıştır. Çalışmada, iş yaşam kalitesi ile genel iyilik hali, iş tatmini, yaşam tatmini ve örgütsel bağlılık arasında anlamlı bir ilişki saptanmıştır. Sonuç olarak yazarlar, iş yaşam kalitesi ile genel iyilik, iş tatmini, yaşam tatmini, işten ayrılma niyeti ve duygusal örgütsel bağlılık arasındaki ilişkilerde yayılma teorisinin doğrulandığını sonucuna varmışlardır (23). Sirgy ve arkadaşlarının ölçeğini kullanan 2007 yılındaki başka bir çalışmada ise iş yaşam kalitesi, işle ilgili çıktılar ve kurumsal etik arasında olumlu yönde bir ilişki olduğu saptanmıştır (24). Farklı alanlarda yapılan çalışmalarda, iş yaşam kalitesinin artması, çalışanların örgütsel kimlik oluşturmasını ve çalışma performanslarında artış göstermelerini sağlamaktadır. Ayrıca, mesleki girişimlerini ve iş doyumunu arttırmakta, tükenmişlik yaşama düzeylerini ve işten ayrılma niyetlerini azaltmaktadır. İş yaşam kalitesi bileşenlerinden biri olan iş güvenliğinin çalışanların örgütsel bağlılığı üzerinde güçlü etkiye sahip olduğu saptanmıştır. Başka bir çalışma iş ortamının geliştirilmesinin devamsızlığı azalttığını, bağlılığı arttırarak artan çalışma performansı gibi istenen örgütsel çıktıların belirmesine neden olan daha pozitif duyguların ortaya çıktığını göstermiştir (25). Diener ve Seligman ise çalışan kişilerin iyi olma halini arttırmak için işi yeniden tasarlayan organizasyonlarda daha üretken ve verimli olmaya meyilli çalışan bireylerin görüleceğini belirtilmektedir (26). Başka araştırmada ise çalışanların iş yaşam kalitesi algılarının pozitif yönde değişmesinin çalışan kişilerin zarar verici ve üretim karşıtı davranışlarını azalttığı gösterilmiştir (27). Sağlık alanı insanoğlunun varlığından beri olan bir alandır. İş yaşam kalitesi ile alakalı araştırmalar daha çok üretim sektörlerinde çalışan kişiler üzerine olup, sağlık alanındaki araştırmalar daha azdır (28). Sağlık alanındaki iş şartları, diğer alanlara kıyasla stres yaratıcı ve problematik olarak değerlendirilmektedir (29). Sağlık alanında çalışan kişilerin, çalışma saatleri içerisinde karşılaştığı zorluklar ile yöneticiler ve çalışma arkadaşları ile olan ilişkilerinin yapısı gibi iş yaşam kalitesine etki eden birçok etmen bulunmaktadır (30). Bir çalışmada yaşam kalitesi yüksek hemşirelerin

klinik yetkinliğinin daha yüksek olduğu, dolayısıyla hemşirelerin yaşam kalitesi ile klinik yeterliliği arasında anlamlı pozitif ilişki olduğu ortaya konmuştur. İş yaşam kalitesi ile hemşirelerin üretkenliği arasında anlamlı bir ilişki olduğunu bildirmiştir (31). Çalışanlar daha mutlu ve daha tatminkâr hale geldikçe verimliliğin arttığı saptanmıştır (32). Polonya'da yapılan bir çalışmada iş yaşam kalitesi ile önemli ölçüde ilgili olan faktörler arasında haftalık çalışma saati ve genel yaşam kalitesi yer aldığı saptanmıştır (33). Hemşireler ile yapılan bir çalışma sonucunda çalışma ortamında stresin artması iş yaşam kalitesini düşürmektedir (34). İş yaşam kalitesindeki azalma tükenmişlik ile pozitif bir ilişki olduğu saptanmıştır (35). Başka bir çalışmada, hemşirelerde kesici ve delici aletler ile yaralanma artışının iş yaşam kalitesi ile negatif ilişki olduğu tespit edilmiştir. Bu durumun özellikle çalışma ortamından kaynaklandığı tespit edilmiştir (36). Aynı şekilde, çalışma şartlarının ağır olması, özellikle iş yaşam kalitesini azaltan vardiya sistemi ile çalışılmasının, mesai saatlerinin fazla olması da hemşirelerde kesici ve delici aletler ile yaralanmayı arttırmaktadır (37). Ayrıca, hemşirelere yöneticilerin ve iş arkadaşlarının az saygı göstermesi, hemşirelerin daha az kendi kendine karar alması ve ağır çalışma şartları hemşirelerde hem genel hem de akıl sağlığında daha düşük sonuçlar almasına neden olmaktadır. Aynı şekilde, hemşirelerde iş stresi, iş arkadaşlarından ve yöneticilerden daha az destek görmeleri ve ağır çalışma şartları stres ile ilgili olarak hem genel hem de akıl sağlığında daha düşük sonuçlara yol açmaktadır. Bir hemşireye beklenilen iş için yeterli zamanın olmaması, iş yükünün fazla olması ve buna bağlı olarak daha düşük çıktılar iş yaşam kalitesinde azalmaya neden olmaktadır (38). Hemşirelerde iş yaşam kalitesini etkileyen başka bir etken iş yükünün artmasına ve fazla mesaiye neden olan personel sayısı eksikliğidir. Hemşire sayısının eksik olması hasta sonuçlarında bazı istenmeyen sonuçlara da neden olabilmektedir. Personel sayısının az olması, hastaların düşmesinde artmaya ve bazı tıbbi hatalara neden olmaktadır. Tersine, personel sayısının artması ile azalmış hasta düşmeleri ve tıbbi hatalar tespit edilmiştir (39).Türkiye'de Şantaş ve arkadaşları tarafından 275 hemşire üzerinde yapılan bir çalışmada, iş yaşam kalitesinin yaşam tatminini ve çalışma motivasyonu pozitif olarak etkilediği, çalışma motivasyonu ile yaşam tatminini arasında pozitif anlamlı bir ilişki göstermişlerdir. İş yaşam kalitesinin artırılmasının yaşam tatmini ve çalışma motivasyonu üzerinde pozitif etki yapacağı, yine çalışma motivasyonu düzeyinin artması ile yaşam tatmininin artıracağını düşünmüşlerdir (40). Alan ve Yıldırım'ın hemşireler üzerinde yaptıkları çalışmalarında, hemşirelerin çalışma yaşam kalitelerini en çok etki eden faktör olarak hemşirelik yönetimini ve kurum yönetimi politikalarını saptanmıştır. Hemşirelerin çalışma yaşam kalitelerine etki eden mesleki ve bireysel değişkenler incelendiğinde, yaş

grubu, deneyim, kurum, mesai saatleri, birimde çalışma süresinin de iş yaşam kalitesini etkilediği saptanmıştır (41). Memiş ve arkadaşlarının çalışmasında, çalışma koşulları, çalışma ortamı ve sağlanan hizmetlerin iş yaşam kalitesine etki ettiği bulunmuştur. Çalışmaya katılanların motivasyonlarının beş alt boyutu, yöneticilerle ilişkiler, karar verme süreci, takım olma, maaş sistemi ve teşvik ve değerlendirme sisteminden etkilendiği tespit edilmiştir. Motivasyon alt boyutları ile iş yaşam kalitesi alt boyutlarının hepsinde anlamlı olarak pozitif bir ilişki olduğu saptanmıştır. Bu incelemede, çalışma ortamı ile karar verme süreci alt boyutları arasında en anlamlı ilişkinin olduğu bulunmuştur (42). Şen ve arkadaşlarının 2017 yılında yaptığı bir çalışmada, Diyarbakır'da bulunan üniversite hastanesinde görev yapan hemşirelerin yarısının iş yaşam kalitesinin düşük olduğu saptanmış. Yine yarısına yakın bir kısmının çalışma ortamından memnun olmadığı ve hemşirelerin %60'ında mesleğini bazen veya az sevdiği saptanmıştır. Hemşirelerin düşük iş yaşam kalitesine düşük aylık gelir, sertifikasına göre uygun yerde görev yapmama durumunun, çalışma bölümünü isteyerek seçmeme durumunun etkili olduğu saptanmıştır (43). Aynı şekilde, hemşireler üzerinde yapılan başka bir çalışmada, iş yaşam kalitesine görev yerlerinin, çalışma şekillerinin ve çalışma sürelerinin etki ettiği saptanmıştır (44). Benzer bir sonuç ise, Güçlü ve Kurşun'un 2018 yılında hemşireler üzerinde yaptığı bir çalışmada saptanmıştır. Çalışan hemşirelerde düşük iş yaşam kalitesi tespit edilirken, çalışılan birim, şimdiki pozisyonda çalışma süresi, çalıştığı serviste isteyerek çalışma durumu ve çalışma statüsünün iş yaşam kalitesine etkisi saptanmıştır (45). Sağlık çalışanlarının iş ortamlarından ve çalışma koşullarından memnun olmaları iş yaşam kalitesi düzeylerinin yüksek olmasına neden olmakta ve bu durumunda çalışma performanslarında artış ile sonuçlandığı tespit edilmiştir (46). Yine diğer ülkelerde olduğu gibi, Türkiye'de de sağlık çalışanlarının daha istekli ve daha mutlu çalışmaları meydana gelebilecek tıbbi hataların sayısında düşüşe neden olacağı düşünülmektedir (2).Sonuç olarak, iş yaşam kalitesi çok boyutlu olarak inşa edilmektedir. İster sağlık sektöründe olsun ister diğer sektörler de olsun, iş yaşam kalitesini etkileyen bazı unsurlar mevcuttur. Bunlardan en önemlileri çalışma koşulları, ücret ve yönetim ile olan ilişki olarak ele alınabilir. Birçok çalışmada gösterildiği gibi, iş yaşam kalitesinin artması iş performasında ve bireyin yaşam kalitesinde artışa neden olmaktadır. Bu bağlamda, ilgili yerlerin çalışanların iş yaşam kalitesini arttırmak için bazı uygulamaları hayata geçirmeleri ve iş yaşam kalitesini azaltan bazı uygulamalardan vazgeçmeleri gerekmektedir.

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ÖZET
Bu çalışma, geleneksel sucuk üretiminde yaygın olarak kullanılan bir renklendirici olan karmin yerine doğal bir alternatif olarak pancar kökü ekstraktının kullanılabilirliğini araştırmaktadır. Karmin, birçok gıda ürününde kırmızı renk verici olarak tercih edilen ancak vegan veya belli dinlere mensup tüketiciler tarafından tüketimi tercih edilmeyen bir madde olup, bu çalışma ile karminin yerini alabilecek doğal ve kabul edilebilir bir alternatifin potansiyelini ortaya koymayı amaçlamaktadır. Araştırma kapsamında, üç farklı sucuk örneği hazırlanmıştır: Karmin içeren (Kontrol örneği), karmin içermeyen %1 pancar kökü ekstraktı içeren ve karmin içermeyen %2 pancar kökü ekstraktı içeren sucuk örnekleri, hem duyusal özellikler (görünüm, tat, koku ve genel beğeni) hem de renk açısından detaylı bir şekilde değerlendirilmiştir. Duyusal değerlendirme, panelistler tarafından gerçekleştirilmiş ve her bir sucuk örneğinin tüketici beğenisi üzerindeki etkisi incelenmiştir. Ayrıca, renk ölçümleri spektrofotometrik analiz yöntemiyle yapılarak her bir sucuk örneğinin renk değerleri karşılaştırmalı olarak incelenmiştir. Araştırmanın bulguları, pancar kökü ekstraktının sucuk üretiminde kullanıldığında renk açısından tatmin edici sonuçlar elde edilebileceğini ve duyusal özellikler üzerinde olumsuz bir etki yapmadan karminin yerine geçebileceğini göstermiştir. Bu sonuçlar, pancar kökü ekstraktının gıda endüstrisinde doğal bir renklendirici olarak kullanımının olası avantajlarını ortaya koymaktadır. Çalışma sonucunda, pancar kökü ekstraktının, karminin alternatifi olarak kullanılmasının gıda endüstrisindeki doğal ürün talebini karşılayabileceği ve tüketici sağlığına olası pozitif etkileri göz önünde bulundurularak, gıda üreticileri tarafından daha geniş bir kabul görebileceği sonucuna varılmıştır. Bu bulgular, doğal renklendiricilerin kullanımını teşvik eden mevcut trendlere önemli bir katkı sağlamakta ve pancar kökü ekstraktının gıda renklendiricileri arasında potansiyel bir alternatif olarak daha fazla araştırılmasına yol açabilir.
Anahtar Kelimeler: Sucuk üretimi, Karmin, Pancar kökü ekstraktı, Doğal renklendiriciler

THE IMPACT OF BEETROOT USE ON SAUSAGE PRODUCTION

ABSTRACT
This study investigates the feasibility of using beetroot extract as a natural alternative to carmine, a widely used colorant in traditional sausage production. Carmine, favored for imparting red color to many food products, is avoided by vegans and followers of certain religions, driving the need for a natural and acceptable alternative. The research involved preparing three distinct sausage samples: a control sample containing carmine, and two samples without carmine but containing 1% and 2% beetroot extract, respectively. These samples were evaluated in detail for both sensory attributes (appearance, taste, smell, and overall acceptance) and color. Sensory evaluation was conducted by panelists to assess the impact of each sausage sample on consumer preference. Additionally, color measurements were performed using spectrophotometric analysis to compare the color values of each sausage sample. The findings indicate that the use of beetroot extract in sausage production can achieve satisfactory color results without negatively affecting sensory properties, suggesting the potential advantages of using beetroot extract as a natural colorant in the food industry. The study concludes that beetroot extract could meet the demand for natural products in the food industry and be more widely accepted by food manufacturers, considering the possible positive effects on consumer health. These results contribute significantly to the current trend of encouraging the use of natural colorants and suggest further research into the potential of beetroot extract as an alternative among food colorants.
Keywords: Sausage production, Carmine, Beetroot extract, Natural colorants

GİRİŞ

Renk, gıda ürünlerinin en dikkat çekici özelliklerinden biridir ve tüketicilerin alım tercihlerini büyük ölçüde etkiler. Gıdalar doğal olarak kendi renklerine sahiptir, ancak depolama ve üretim yöntemleri gibi faktörler nedeniyle bu renkler değişebilir. Bu sebeple, gıda renklendiricileri ürünlerin istenmeyen renklerini gizleyerek daha çekici hale getirmekte kullanılır. Tüketiciler genellikle doğal renklendiricilerin daha güvenli olduğuna inanmakta ve bu nedenle dünya genelinde doğal renklendiricilerin popülaritesi artmaktadır. "Doğal" etiketi, ürünlerin sağlıklı olduğu algısını güçlendirir ve ekonomik bir değer taşır. Bu nedenle, tüketicilerin beklentilerini karşılamak ve renk, tat, doku gibi özellikleri geliştirilmiş sağlıklı et ürünleri üretmek amacıyla et ürünlerinin formülasyonlarında çeşitli düzenlemeler yapılmaktadır (Turp, Kazan, & Ünübol, 2016).Günümüz tüketici bilincinin yükselmesiyle birlikte, et ürünleri sektöründe doğal katkı maddelerinin kullanımının artırılması zorunlu hale gelmiştir. Özellikle renklendiriciler söz konusu olduğunda, doğal alternatiflerin sağladığı avantajlar ve kabul edilebilirliği, ürün geliştirme süreçlerinde ön plana çıkmaktadır. Bu bağlamda, karmin gibi geleneksel renklendiricilerin yerine geçebilecek doğal kaynaklardan elde edilen renklendiriciler, sadece renk vermekle kalmayıp, tüketicilerin sağlıkla ilgili endişelerine de yanıt vermektedir. Karmin, hayvansal kaynaklı olması nedeniyle veganlar ve bazı dinlere mensup bireyler tarafından tüketilmesi uygun görülmemekte, ayrıca alerjik reaksiyonlara yol açabilen maddeler içerebilmektedir. Pancar kökü kırmızısı gibi doğal renklendiriciler, bu yeni trendin mükemmel bir örneğini oluştururken, gıda endüstrisindeki 'doğal' vurgusunu güçlendiren etkenler arasında yer almaktadır.Bu çalışmada, pancar kökü kırmızısının, et ürünlerine doğal ve sağlıklı bir renk katkısı sağlayarak, karminin yerini alabilecek potansiyeli incelenmektedir. Renk, tüketicinin ilk izlenimini ve dolayısıyla satın alma kararını etkileyen bir faktör olduğundan, pancar kökü ile renklendirilmiş sucuk örneklerinin tüketici beğenisini ve pazar kabulünü artırma potansiyeli büyüktür. Ayrıca, bu doğal renklendiricinin kullanımı, etiketleme ve pazarlama stratejilerinde 'doğal' ifadesinin güçlü bir şekilde kullanılmasına olanak tanıyarak, tüketici güvenini ve marka sadakatini artırabilir.Sonuç olarak, gıda ürünlerinde doğal renklendiricilerin kullanımı, sağlık, estetik ve etik standartları karşılayarak, tüketici ihtiyaçlarını daha etkin bir şekilde adreslemekte ve gıda üreticilerine sürdürülebilir bir rekabet avantajı sunmaktadır. Bu araştırma, pancar kökü ekstraktının kullanımıyla ilgili bulguları değerlendirerek, gıda endüstrisinin bu doğrultuda nasıl bir yol izleyebileceğine dair bilgiler sunmaktadır.

GELİŞME

Karmin ve Pancar Tozu Kırmızısı

Cochineal böcekleri, Güney Amerika ve Meksika'daki Opuntia kaktüsleri üzerinde yaşayan parazitlerdir. Bu böceklerden, özellikle dişilerden ekstrakte edilen karminik asit, kırmızı karmin boyası yapımında kullanılır. Bu boyanın üretimi için geleneksel ve kontrollü yöntemler uygulanır ve karmin boyası, çeşitli kırmızı tonlarında gıda ve kozmetikte kullanılır (Wikipedia, 2009). Karmin kullanımı, düşük kaliteli ürünlerin daha iyi görünmesini sağlayarak tüketicilerin yanıltılmasına yol açabileceği için kullanımları sınırlanmıştır. Türk Gıda Kodeksi Gıda Katkı Maddeleri Yönetmeliği'nde belirtilen mevcut düzenlemeler, hangi gıdalarda ne kadar karmin kullanılabileceğini açıkça belirtmektedir (T.C. Tarım ve Orman Bakanlığı, 2017). Gıda ürünlerinde karmin kullanıldığında, bu bilginin ürün etiketlerinde açıkça gösterilmesi zorunludur. Türk Gıda Kodeksi'nde yer alan Gıdalarda Kullanılan Renklendiriciler Tebliği'ne göre, Kosineal, Karminik asit ve Karmin, E120 kodu altında izin verilen gıda renklendiriciler arasında listelenmiştir (TKB, 2002). Et ürünlerinde renk, tüketicinin göz zevkine hitap etmesi gereken önemli bir faktördür ve diğer organoleptik özellikler gibi tat, koku ve yapıyı da etkiler. Özellikle jambon, sosis ve salam gibi yüksek üretim yapılan et ürünlerinde, hemoglobin ve miyoglobin eksikliği renk kayıplarına yol açar. Bu tür ürünlerde karmin kullanımı yaygındır. (Hoogenkamp, 2001) Ancak Koşineal boyası, toksik veya kanserojenik etkilere sahip olmamasına rağmen, bazı insanlarda anafilaktik şok gibi ciddi alerjik reaksiyonlara sebebiyet verebilir. Bu reaksiyonlar genellikle karminik asitten değil, boyanın işlenmesi sırasında kontamine olan maddelerden kaynaklanır (Lucas et al., 2001). En yaygın alerji vakaları, kozmetik ürünlerdeki karmin kullanımı sırasında ortaya çıkar ve günlük kabul edilebilir alım miktarı, vücut ağırlığı başına 5mg olarak belirlenmiştir (Anonim, 2019). Karmin, içerdiği böcek protein kalıntıları nedeniyle alerjik etkilere neden olabilir; örneğin, bir boya tesisinde toz halindeki karminin solunmasıyla alerjik reaksiyonlar gözlemlenmiştir, ancak gıdalarla alınan karminde bu tür bir etki rapor edilmemiştir (Acero et al., 1998). Ayrıca, karmin içeren gıdaları tükettikten sonra anafilaksi ve ürtiker şikayetiyle hastaneye başvuran üç kadın hastada yapılan testler, karmin alerjisini doğrulamıştır (Chung et al., 2001). Başka bir vakada, her gün karmin içeren bir içecek tüketen 39 yaşındaki bir kadın hasta, anafilaktik şok belirtileri göstermiştir ve yapılan testler, koşineale karşı bir duyarlılık olduğunu ortaya koymuştur (Sugimoto et al., 2013). Bu bulgular ışığında, Gıda Katkıları Ortak Uzmanlar Komitesi, koşineal ekstraktı ve karmin için günlük alım dozunu vücut ağırlığı başına 0-5 mg olarak belirlemiştir (Delgado & Paredes, 2003). Karmin, özellikle koşineal böceklerinden

geçen proteinler nedeniyle alerjen olarak kabul edilmektedir (Lucas et al., 2001). Dini açıdan bakıldığında gıda katkı maddelerinin kaynakları, dini inançlar ve sağlık nedenleriyle sıkça sorgulanmaktadır. Özellikle Müslüman topluluklar, domuz ürünleri ve İslami olmayan kesim yöntemleriyle elde edilen katkı maddelerini tüketmemektedir. Karmin, dini açıdan tartışmalı bir katkı maddesi olarak öne çıkmaktadır çünkü böceklerden elde edilir ve bu durum farklı mezhepler arasında helal veya haram oluşu konusunda farklı görüşlere neden olmaktadır (Küçüköner, 2020).Kırmızı pancar, sağlık açısından son derece değerli betalainler bakımından oldukça zengindir. Bu pigmentler, gıda, kozmetik, tekstil ve sanat alanlarında doğal renklendirici olarak yaygın bir şekilde kullanılmaktadır (Pavlov ve diğ., 2002; Georgiev ve diğ., 2010; Tomar ve Yıldırım, 2019). Kırmızı pancarın kendine özgü rengi, çoğu zaman gıda sektöründe tercih edilen bir faktördür. Beyazdan koyu kırmızıya kadar değişen çeşitli renk tonlarına sahip olan pancarlar, çeşitli gıda ürünlerine estetik bir görünüm kazandırır (Eşiyok ve Bozokalfa, 2007; Sawicki ve diğ., 2016). Bununla birlikte, kırmızı pancarın sağlık üzerindeki olumlu etkileri de dikkate değerdir. Yapısında bulunan betalainler, karotenoidler, askorbik asit, nitrat ve diğer fenolik bileşenler sayesinde kırmızı pancar, antioksidan kapasitesi yüksek bir sebze olarak öne çıkar. Yapılan araştırmalar, kırmızı pancarın kalp ve damar hastalıklarını önlemede etkili olduğunu göstermektedir. Özellikle Wootton-Beard ve diğerleri (2011) tarafından yapılan bir çalışmada, kırmızı pancar suyunun diğer sebze sularına kıyasla daha yüksek antioksidan aktiviteye sahip olduğu ve daha fazla fenolik bileşik içerdiği belirlenmiştir. Bu nedenle, kırmızı pancarın antioksidan özellikleri, sağlık açısından önemli bir rol oynamaktadır (Wootton-Beard ve diğ., 2011). Raikos ve diğerleri (2016) tarafından yapılan bir başka çalışmada ise, kırmızı pancar betalainlerinin mayonez gibi gıda ürünlerinde lipid oksidasyonunu önlediği tespit edilmiştir. Bu da kırmızı pancarın sadece doğal bir renklendirici olarak değil, aynı zamanda gıdaların raf ömrünü uzatan ve besin değerini koruyan bir bileşen olarak da değerlendirilebileceğini göstermektedir (Raikos ve diğ., 2016).

Materyal Metod

Araştırmada kullanılan et, yağ ve baharatlar Afyonkarhisar'da faaliyet gösteren yerel işletmelerden temin edilmiştir. Araştırmanızın kapsamında, çeşitli sucuk örnekleri üretmek için her adım ve her bir örneğin değerlendirme süreci titizlikle gerçekleştirilmiştir. Bu süreç, örneklerin hazırlanmasını ve sonrasında duyusal ile renk analizi yöntemlerinin uygulanmasını içermektedir. Örneklerin hazırlanması sürecinde, deneyin amacına uygun olarak farklı bileşenlerin etkisini değerlendirmek adına çeşitli örnekler üretilmiştir. Bunlar arasında, karmin içeren kontrol örneği ve karmin içermeyen pancar kökü kırmızısı içeren

(%1 ve %2) iki örnek bulunmaktadır. Bu çeşitlilik, sonuçların karşılaştırılabilirliğini artırarak deneyin güvenilirliğini artırmaktadır. Sucuk üretimi için gerekli olan et, yerel ve güvenilir bir kasaptan temin edilmiştir. Baharatlar ve diğer katkı maddeleri ise, kalite sertifikalarına sahip yerel tedarikçilerden sağlanmıştır. Temin edilen et, öncelikle karıştırma ve öğütme işlemine tabi tutulmuştur. Bu işlemde, et parçaları ve diğer malzemeler homojen bir karışım elde edene kadar öğütülmüş ve karıştırılmıştır. Karışımın dinlenmesi için 4 ºC' de 12 saat beklenmiştir. Bu süre, malzemelerin bir araya gelmesine ve lezzetin gelişmesine olanak tanımıştır. Dinlenme sürecinin ardından, karışım dolum işlemine geçirilmiştir. Sucuk karışımı, geleneksel yöntem ile bağırsaklara doldurulmuştur. Dolum işleminden sonra, sucuklar 6 gün fermantasyona bırakılmıştır. Bu süreç, sucuğun karakteristik tat ve dokusunun oluşmasına yardımcı olmuştur. Fermentasyon koşulları günlere göre değişmekle birlikte 20-30 ºC'de %80-90 bağıl nem seviyesinde gerçekleştirilmiştir. Fermentasyonun tamamlanmasının ardından, sucuklar **%** nem içeriği ve aw değerleri takip edilerek kurutulmuştur. Bu işlem, sucuğun su içeriğini azaltarak dayanıklılığını artırmış ve karakteristik aroma ve lezzetin gelişmesine katkı sağlamıştır. Her bir örnek, standart üretim prosedürlerine uygun olarak hazırlanmıştır.

Renk Analizi

Sucuk örneklerinin renk değerleri Kolorimetre (Minolta Chroma Meter CR-400, Osaka) kullanılarak analiz edilmiştir. Rasgele seçilen numuneler ortadan ikiye kesilmiş ve üzerine cam plaka kapatılmıştır. Cam plaka üzerine sabitlenen kolorimetre cihazı ile 3 paralelde okuma yapılmıştır (Atik, 2013).

Duyusal Analiz

10 paneliste sucuk kalite ölçütleri ve sucuk kalitesinin değerlendirilmesi üzerine toplam 3 saatlik bir eğitim verilmiştir. Panelistler sucuk örneklerini görünüm, tat, koku, genel beğeni kriterleri üzerinden hedonik skala kullanarak derecelendirmişlerdir (Elmacı ve Altuğ, 1999).

İstatistiksel Analiz

Çalışmada elde edilen veriler SPSS V 23.0.0 istatistik paket programı kullanılarak analiz edilmiştir. Örnekler arası anlamlı bir fark olup olmadığı Duncan'ın çoklu aralık testleri ile belirlenmiştir (*P<0.05)

Bulgular

Sucuk örneklerinin renk değerleri Kolorimetre (Minolta Chroma Meter CR-400, Osaka) kullanılarak analiz edilmiştir. Duyusal analiz için, 10 kişilik eğitimli bir panelist grubu kullanılmıştır. Panelistler, sucuk örneklerini görünüm, tat, koku ve genel beğeni açısından

değerlendirmişlerdir. Bu değerlendirme süreci, sucuğun kalitesini ve tüketici memnuniyetini belirlemede önemli bir role sahiptir.

Panelistler tarafından gerçekleştirilen duyusal değerlendirme sonuçları Tablo 1 de verilmiştir.

Tablo 1. Sucuk örneklerinin duyusal analiz sonuçları

Örnek	Görünüm	Tat	Koku	Genel Beğeni
K	4,57±0,15^{a}	3,90±0,15^{a}	3,70±0,17^{a}	4,50±0,10^{a}
KPE1	4,33±0,13^{a}	3,73±0,23^{a}	3,90±0,13^{a}	4,40±0,12^{a}
KPE2	4,43±0,18^{a}	3,85±0,11^{a}	3,80±0,14^{a}	4,50±0,26^{a}

a-b(↓): Aynı sütunda farklı harfler istatistiksel anlamda farkı belirtmektedir (P<0,05). ±: Standart sapma

K: Kontrol, KPE1: %1 kırmızı pancar tozu ekstraktı içeren örnek, KPE2: %2 kırmızı pancar tozu ekstraktı içeren örnekPancar kökü ekstraktı içeren sucuk örnekleri olumlu tepkiler almıştır. Görünüm, tat, koku ve genel beğeni açısından değerlendirilen örnekler, tüketiciler arasında genellikle tercih edilmiştir. Görünüm açısından, pancar kökü kırmızısı içeren sucuklar doğal ve çekici bir renge sahiptir. Renkleri, tüketicilerin dikkatini çekmiş ve ürünün kalitesini yansıtmıştır. Bu durum, sucukların tüketici gözünde görsel olarak çekici olduğunu ve alımı teşvik ettiğini göstermektedir. Tat ve koku açısından, pancar kökü kırmızısı içeren sucuklar, hoş ve dengeli bir lezzete sahiptir. Baharatların ve diğer katkı maddelerinin uyumu, ürünün aromasını zenginleştirmiştir. Bu da tüketicilerin üründen memnuniyet duymasını sağlamıştır.

Sucuk örneklerinin kolorimetre (Minolta Chroma Meter CR-400, Osaka) kullanılarak yapılan renk analizi sonuçları Tablo 2 de verişmiştir.

Tablo 2. Sucuk örneklerine ait renk (L*, a*, b*) değerleri

Örnek	L*	a*	b
K	30,68±1,63^{a}	14,23±1,07^{b}	15,41±0,18^{a}
KPE1	31,40±0,54^{a}	15,27±0,41^{ab}	14,99±0,17^{b}
KPE2	32,00±1,98^{a}	16,21±0,23^{a}	15,09±0,14^{ab}

a-b(↓): Aynı sütunda farklı harfler istatistiksel anlamda farkı belirtmektedir (P<0,05). ±: Standart sapma

K: Kontrol, KPE1: %1 kırmızı pancar tozu ekstraktı içeren örnek, KPE2: %2 kırmızı pancar tozu ekstraktı içeren örnek Sonuçlar, pancar kökü ekstraktının karminin yerini alabileceğini göstermiştir. Renk değerleri açısından, pancar kökü kırmızısı içeren örnekler kontrol örneği

ile benzer düzeyde renk sağlamıştır. Bu da pancar kökü kırmızısının, sucuklara istenilen renk tonunu vermede etkili bir alternatif olduğunu göstermektedir.

SONUÇ

Sonuç ve Tartışma

Bu çalışma, farklı pancar kökü kırmızısı konsantrasyonlarının kullanılmasının sucuk üretimindeki renklendirme üzerindeki etkisini değerlendirmiştir. Karmin içeren kontrol örneği ile karşılaştırıldığında, %1 ve %2 oranlarında pancar kökü kırmızısı içeren sucuk örneklerinin renk değerleri ve duyusal özellikleri incelenmiştir.

Elde edilen sonuçlar, pancar kökü kırmızısının etkili bir doğal renklendirici olarak kullanılabileceğini göstermektedir. %1 ve %2 oranlarındaki pancar kökü kırmızısı içeren örneklerin renk değerleri, karmin içeren kontrol örneğiyle benzerlik göstermiş ve istenen renk tonunu başarılı bir şekilde sağlamıştır. Bu durum, pancar kökü ekstraktının, geleneksel olarak kullanılan karminin yerine geçebileceğini ve sucuk üretiminde tercih edilebilecek bir alternatif olduğunu göstermektedir.

Ayrıca, duyusal analiz sonuçları da pancar kökü kırmızısı içeren örneklerin tat ve kokularının karmin içeren örnekle benzerlik gösterdiğini göstermektedir. Panelistler, bu örnekleri genel olarak olumlu bir şekilde değerlendirmiş ve tat - koku açısından belirgin bir farklılık tespit etmemişlerdir. Bu da pancar kökü kırmızısının, sucukların lezzet profilini olumsuz etkilemeden başarılı bir şekilde kullanılabileceğini göstermektedir.

Bununla birlikte, bu çalışmanın bazı sınırlılıkları vardır. Örneğin, sadece belirli bir pancar kökü kırmızısı kullanılmış ve farklı konsantrasyonların etkisi incelenmemiştir. Ayrıca, farklı fermentasyon sürelerinin ve koşullarının sonuçlar üzerindeki etkisi değerlendirilmemiştir.

Gelecekteki araştırmalar, farklı pancar kökü kırmızısı konsantrasyonlarının, farklı üretim koşullarının ve fermentasyon sürelerinin sucuk renklendirme üzerindeki etkisini daha detaylı bir şekilde incelemelidir. Ayrıca, diğer doğal renklendirici maddelerin (örneğin, turmeric, paprika) kullanımının da araştırılması önemlidir.

Sonuç olarak, bu çalışma pancar kökü ekstraktının sucuk endüstrisinde etkili bir doğal renklendirici olarak kullanılabileceğini göstermektedir. Doğal kaynaklı renklendiricilerin kullanımı, tüketicilerin sağlık ve çevre odaklı taleplerine yanıt vermenin yanı sıra ürünlerin genel kabulünü artırabilir.

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YAKIT PİLLERİNDE KATOT-ANOT YÜZEYLERİNİN PERFORMANS VE ÖMÜRLERİNİ ARTIRMAK İÇİN YÜZEYLERİN FONKSİYONEL İNCE FİLMLER İLE KAPLANMASI

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ÖZET
Yakıt pilleri günümüz şartlarında verimli, ekonomik olarak uygun, sessiz ve çevreye kolayca uyum sağlayabilen bir enerji üretim teknolojisi olarak giderek daha yaygın uygulama alanlarında gözlemlenmektedir. Yakıt pilleri yanma gerçekleşmeksizin ve herhangi bir ara eleman kullanılmadan yakıtın kimyasal enerjisini, elektrik ve ısı formunda kullanılabilir düzeyde enerjiye çeviren güç elemanlarıdır. Yakıt pili performansı üzerinde sıcaklık, basınç ve gaz bileşenlerinin etkilerini anlayabilmek için yakıt pilleri ile ilgili kimyasal ve termodinamik bağıntıların açıklanması gerekmektedir. Yakıt pili performansı üzerinde sıcaklık, basınç ve gaz bileşenlerinin etkilerini anlayabilmek için yakıt pilleri ile ilgili kimyasal ve termodinamik bağıntıların açıklanması gerekmektedir. Bir yakıt pilinin temel bileşenlerini anot, elektrolit, katot ve ara bağlantıları oluşturur. Bununla birlikte, bir yakıt pilinin bileşenleri, çalışma ortamları ile kimyasal ve termal olarak uyumlu ve stabil olmalıdır. Termodinamik prensipler ve yasalar, bir yakıt pilinin performansını incelemek için çok önemlidir. Temel olarak verimliliği termodinamik, voltaj ve akım verimliliği olarak karakterize edilebilir. Bunlar arasında termodinamik verim, hücrenin Nernst voltajına bağlı olan baskın olanıdır. Hidrojen, doğal gaz, biyogaz, metanol, etanol ve hidrokarbonlar gibi farklı yakıtların hepsi yakıt hücreleri için potansiyel enerji kaynağı olarak araştırılmıştır. Son çalışmalardan yola çıkarak ve sektördeki eksiklikler göz önünde bulundurarak, yakıtı amonyak olan katı oksit yakıt pillerinin PEN malzemeler karakterizasyonu ve üretim, fonksiyonel katmanlar kalınlığı ve onun performansı ile ilgili, yakıt depolama ve yakıt hücresi verimliliği artışı üzerine çalışmalar yürütülebilir. COMSOL Multi-physics kullanılarak AS-, ES ve CS- T-SOFC arasında ağ karşılaştırma analizi yapılabilir. Diğer bir yöntem olarak ince filmlerin üretilmesi ve karakterizasyonları laboratuvar çalışma ortamında gerçekleştirilebilir.
Anahtar Kelimeler: Yakıt Pilleri, Katot-Anot Yüzeyleri, Fonksiyonel Kaplama

COATING THE CATHODE-ANODE SURFACES IN FUEL CELLS WITH FUNCTIONAL THIN FILM TO INCREASE THE PERFORMANCE AND LIFETIME

ABSTRACT

In today's conditions, fuel cells are being observed in more and more widespread application areas as an energy production technology that is efficient, economically suitable, silent and easily adaptable to the environment. Fuel cells are power elements that convert the chemical energy of the fuel into usable energy in the form of electricity and heat, without combustion and without the use of any intermediate elements. In order to understand the effects of temperature, pressure and gas components on fuel cell performance, the chemical and thermodynamic relationships related to fuel cells need to be explained. In order to understand the effects of temperature, pressure and gas components on fuel cell performance, the chemical and thermodynamic relationships related to fuel cells need to be explained. The basic components of a fuel cell are the anode, electrolyte, cathode and interconnects. However, the components of a fuel cell must be chemically and thermally compatible and stable with their operating environment. Thermodynamic principles and laws are crucial to studying the performance of a fuel cell. Basically, its efficiency can be characterized as thermodynamic, voltage and current efficiency. Among these, thermodynamic efficiency is the dominant one, which depends on the Nernst voltage of the cell. Different fuels such as hydrogen, natural gas, biogas, methanol, ethanol and hydrocarbons have all been investigated as potential energy sources for fuel cells. Based on recent studies and considering the deficiencies in the sector, studies can be carried out on PEN materials characterization and production of ammonia-fueled solid oxide fuel cells, functional layers thickness and its performance, fuel storage and fuel cell efficiency increase. Network comparison analysis between AS-, ES and CS- T-SOFC can be performed using COMSOL Multi-physics. As another method, the production and characterization of thin films can be carried out in a laboratory environment.

Keywords: Fuel Cells, Cathode-Anode Surfaces, Functional Coating

GİRİŞ

Yakıt pilleri günümüzde verimli, ekonomik olarak daha uygun, sessiz ve çevreyle uyumlu bir şekilde bulunabilen enerji üretim teknolojisi olarak giderek daha yaygın uygulama alanlarında gözlemlenmektedir. Yakıt pilleri yanma olmaksızın ve herhangi bir ara eleman kullanmadan giren yakıtın kimyasal enerjisini, elektrik ve ısı formunda kullanılabilir düzeyde enerjiye çeviren güç elemanlarıdır.Bu yakıt pilleri, ısı makinalarında görülen Carnot verimi gibi termodinamik sınırları içerisindeki limitlerde sınırlı değildir. Buna ek olarak yanma olayından kaçınılmış olmasıyla, yakıt pilleri güç üretimini çok düşük çevre kirletici etkilere sahiptir. Yakıt hücresinin verimliliği ise Gibbs serbest enerjisi tarafından belirlenir. Yakıt pilleri, teknolojik gelişimlerin sonucunda yakıt pili tipine bağlı olarak düşük sıcaklık, yüksek verimlilik, yapısı içerisinde hareketli parça içermemeleri ve buna bağlı olarak titreşimsiz çalışma gibi temel teknolojik üstünlükler göstermektedir.Elektrolit ve yakıt türlerine göre çeşitli elektrokimyasal teknolojiler geliştirilerek sınıflandırılmıştır [1]. Bunlar;

Polimer elektrolit membran yakıt hücresi (PEMFC) [80°C, H+],

Doğrudan metanol yakıt hücresi (DMFC) [80°C, H +],

Alkali yakıt hücresi (AFC) [150°C, OH–] ,

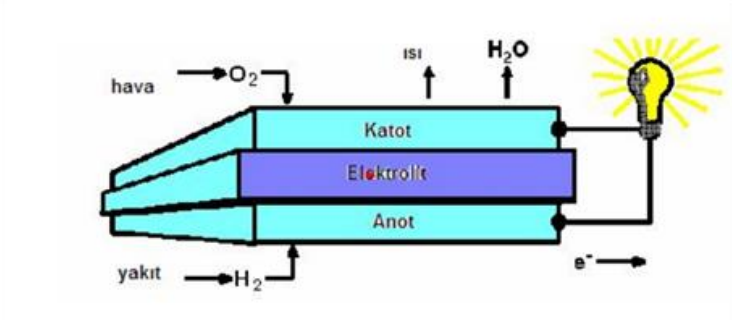
Fosforik asit yakıt hücresi (PAFC) [220°C, H+],

Erimiş karbonat yakıt hücresi (MCFC) [700°C, CO3 -2],

Oksijen ve proton iyonu iletken katı oksit yakıt pilleri (KOYP) [650°C, H +], [900°C, O-2]'dir [1].

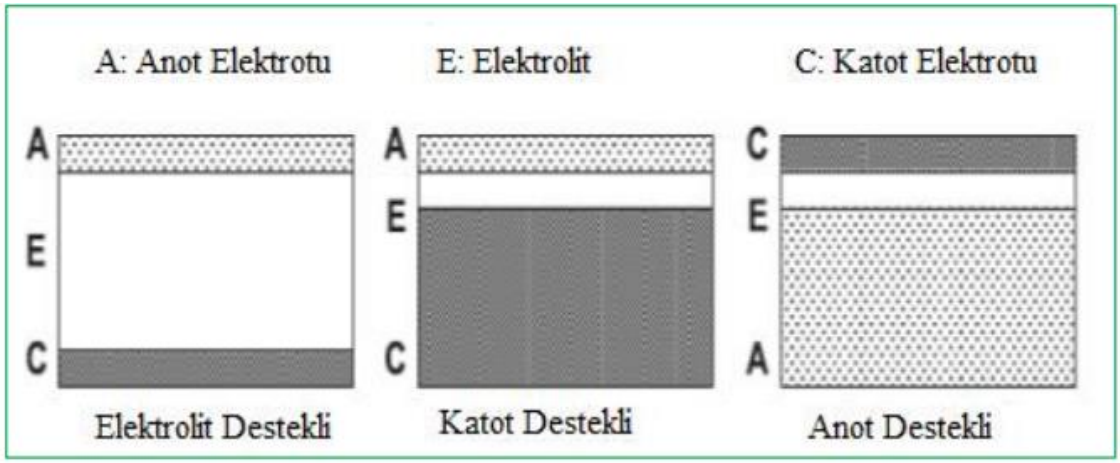
KATI OKSİT YAKIT PİLLERİ (KOYP)

Yakıt pili performansını incelemek için sıcaklık, basınç ve gaz bileşenlerinin etkilerini daha iyi anlayabilmek için yakıt pilleri ile ilgili kimyasal ve termodinamik bağıntıların açıklanması daha verimli olacaktır. KOYP'leri, temel olarak bir hava içeren oksidan veya saf oksijenle çok sayıda yakıtın bir araya gelmesiyle yakıtın kimyasal enerjisini ara ürünler olmadan doğrudan elektriğe verimli şekilde dönüştüren elektrokimyasal cihazdır [2].KOYP'leri yanma olmadan elektrik enerjisi üretimi için icat edilmiş ve geliştirilmiş en verimli elektrokimyasal cihazlardır.

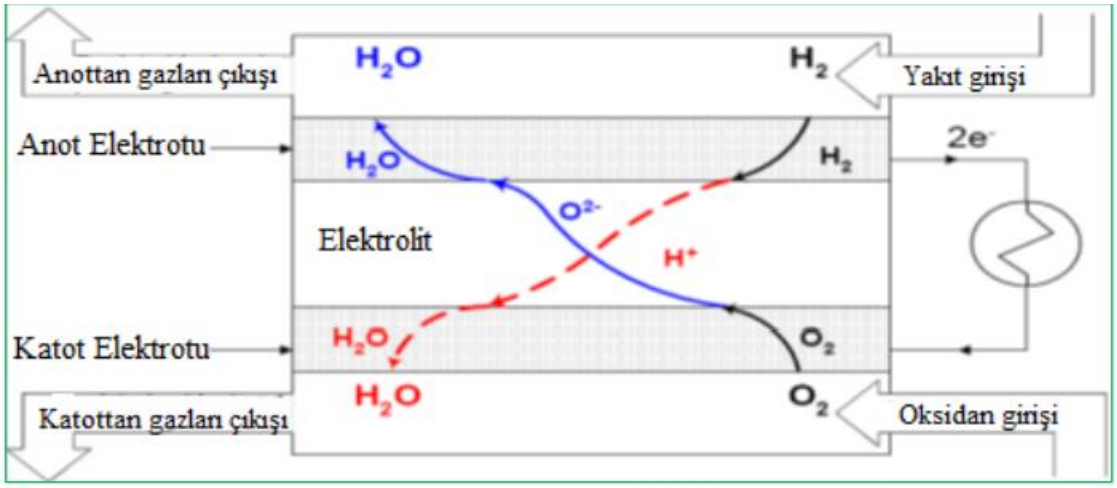


Şekil 2.1 Katı oksit pilinin çalışma prensibi

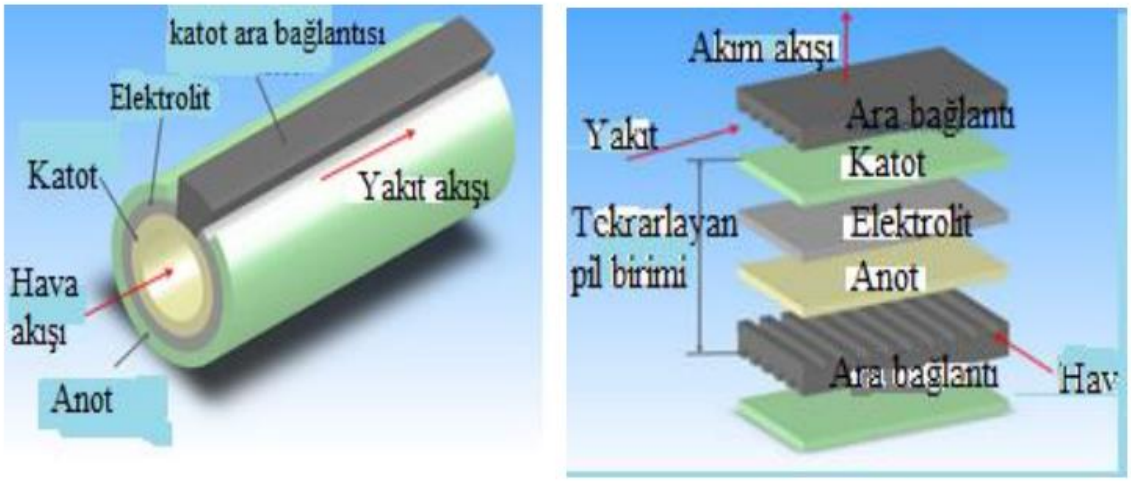
KOYP'lerinin başlıca zorluklarından birisi, düzlemsel tasarım için gerekli olan uygun sızdırmazlık malzemelerinin geliştirilmesidir [4]. Kalın bir elektrolit ve katot tabakası büyük ohmik dirençlere ve polarizasyona sebep olur. Bu yüzden, düşük hücre performansıyla sonuçlanır. Bunun yerine, anot destekli yapılandırma küçük bir katot kalınlığı ve özellikle elektrolit nedeniyle daha yüksek performans sunar.



Şekil 2.2. Katı oksit yakıt pillerinin anot, elektrolit ve katot destekli yapılandırması



Şekil 2.3. Tek bir pik için KOYP-O ve KOYH çalışma ilkelerini gösteren şematik diyagram



Şekil 2.4. Katı oksit yakıt pilinin farklı konfigürasyonları

Tablo 2.1 Tübüler ve düzlemsel karşılaştırması

Tübüler	Düzlemsel
Sızdırmazlık maddeleri gerekli değildir, bu nedenle istifleme, mühürleme ve Mâni katlama için kolay bir tasarım şansı verir	Sızdırmazlık maddeleri zorunludur
Daha uzun akım yolları	Daha kısa akım yolları
Düşük güç yoğunluğu (0,1-1 W/cm^2)	Daha yüksek güç yoğunluğu (1-2 W/cm^2)
Termal şoklara karşı mükemmel dayanıklılık	Termal olarak hafif dengesiz
Hızlı başlatma/kapatma yeteneği	Uzun başlama ve kapanma süresi
Yüksek mekanik bütünlük	Oldukça düşük mekanik bütünlük
Üretim maliyeti daha yüksek	Üretimi kolay ve ucuz
Yüksek hacimsel yoğunluk	Düşük hacimsel güç yoğunluğu
Taşınabilir uygulamalar için tercih edilir	Sabit uygulamalar için tercih edilir
İstifleme için Orta düzey	İstifleme için daha kolay
Daha yüksek aktif yüzey alanı	Alt aktif yüzey alanı

Tablo 2.2. $LaCrO_3$ Detayları

Parametre	$LaCrO_3$	Birim
Termal iletkenlik	25	W/ (m · K)
Isı kapasitesi	100- 150	J/ (mol · K)
Kütle yoğunluğu	3-8	g/cm
Molekül ağırlığı	239	g/mol

Özellikleri yukarıda verilen lantan kromit ($LaCrO_3$) ara bağlantı malzemesi için en çok kullanılan malzemedir. Bunun sebebi, yakıt hücresi ortamlarında kararlı kimyasallara sahip olması, nispeten yüksek elektronik ve termal iletkenliğe sahip olmasıdır.

Tablo 2.3 Yakıt pili türleri ve karşılaştırmalı özellikleri

	Elektrolit	Taşınan Yük	Çalışma Sıcaklığı (°C)	Katalizör	Verim (%)	Pil Bileşenleri	Yakıt Çeşitleri	Uygulamalar
Fosforik Asit Yakıt Pili (FAYP)	Fosforik Asit (H_3PO_4)	H^+	150 220	Platin	37-42	Karbon Yapılı	H_2, Metanol	Kojenerasyon Sabit Güç, Taşıma
Erimiş Karbonat Yakıt Pili (EKYP)	Eriyik Karbonat	CO_3^{2-}	600 700	Nikel	55-65	Paslanmaz Çelik Yapılı	H_2, Doğalgaz	Kojenerasyon Sabit Güç
Alkali Yakıt Pili (AYP)	Potasyum Hidroksit (Sıvı KOH)	OH^-	120 250	Platin v.b.	45-60	Karbon Yapılı	H_2	Uzay, Sabit Güç
Polimer Elektrolit Yakıt Pili (PEMYP)	Polimer Membran	H^+	50 100	Platin	40-55	Karbon Yapılı	H_2, Metanol	Uzay, Taşıma
Katı Oksit Yakıt Pili (KOYP)	Seramik (ZrO_2 CeO_2, Bi_2O_3 v.b.)	O^{2-}	650 1000	Katalizör Kullanılmaz	55-70	Seramik Yapılı	H_2, CH_4, Doğalgaz	Sabit Güç, Kojenerasyon Ticari ve Sanayi Uygulama

Yakıt elektrotları (Anot)

Anot, yakıt oksidasyonunu ve elektronların elektrolit ya da elektrot ara yüzünden kendisine doğru transferini kolaylaştıran KOYP'lerin temel bileşenlerinden birisidir. Bununla bağlantılı olarak, anot bileşeninde kullanılan malzeme yakıt oksidasyonu polarizasyon kayıplarını azaltmak için minimum elektronik iletkenlik değeri, yeterli elektro-katalitik kapasite, kimyasal sabitleştirilmiş ve diğer bileşenleriyle termal uyumluluk sağlamalıdır[6].

1. Elektrotun pürüzlülüğü,
2. Taneciklerin boyutları,
3. Tabakanın kalınlığı,
4. Elektronik (baskın) ve iyonik iletkenliğinin derecesi,
5. Tabakanın, katot ve katı elektrolit tabakasına yakın seviyelerde termal genleşme katsayısına sahip olması,
6. Mekanik sağlamlılığı,
7. Termal kararlılık (stabilite),
8. Üretim maliyeti,
9. Hücrede kullanılabilen katı elektrolitle olan uyumluluğu yüksek ve diğer hücre bileşenlerine bozucu etki yapmaması,
10. Hidrojen gazı atmosferinde kararlılığının yüksek olması,
11. Tabaka yüzey düzgünlüğü ve homojenliği,

12. Aktif çalışma süresinin olabildiğince yüksek olması,

13. Katı elektrolitle düzgün, homojen ve sağlam temas/kontak yüzeyi oluşturabilmesi,

14. Deneysel üretim basamak sayısının az sayıda olması gibi özellikler olarak bilinmektedir. Gözenekli Ni/YSZ (Nikel-zirkona) sermet, yüksek elektrokimyasal performans, yüksek çalışma sıcaklıklarında kimyasal kararlılığı, düşük maliyeti ve TEC'nin(Thermo Electric Cooler) YSZ-elektrolite yakın olması nedeniyle KOYP sistemleri için en yaygın anot malzemesidir.

Elektrolitler

Bir elektrolit, protonları, oksitleri veya karışık iyonları aktarmaya yarayan ve gözenekli elektrotlar arasına sığan bir yakıt hücresinin kalbi olarak tanımlanır. Elektrotlar arasında kısaltılmış olarak hizmet verir ve çözelti, membran veya katı yapıda kullanılabilir. KOYP'leri için en geniş alanda kullanılan elektrolit Zirkonyum bazlı tiplerdir.

2.3. Hava elektrotları (katot)

Katot elektrotu, elektrokimyasal reaksiyonlar aracılığıyla oksijen indirgenmesi yaşanan bölümdür. Bu nedenle, atmosferik havayı oksitlemek amacıyla yüksek sıcaklıklarda sabit olmalı, uygun katalitik aktiviteye ve yüksek elektrik iletkenliğine sahip olmalıdır.

Anot destekli KOYP yapılarında, üst sınır olarak mekanik kuvvet yerine elektriksel iletkenlik gerekliliğiyle ayarlanır [8]. Bu nedenle, katot elektrotu, hücre operasyonu sırasında elektrolit ve ara bağlantıları yapısal ve kimyasal olarak uyumlu olmalıdır.

Katot olarak kullanılan malzemenin güç yoğunluğu ise sıcaklığına, tanecik büyüklüklüğüne, mikro yapısal özelliklerine ve kaplama süreçlerine bağlıdır. İyileştirme yapılan katot elektrotlarından yoğun kısmı; mangan, kobalt ve demir esaslı perovskit tipi malzemeler olduğu gözlenmektedir.

Ayrıca, oksijenin azaltılması için etkili bir kataliz olan asal metaller (Pd, Pt ve Co) eklenerek katot performansı arttırılabilir. Bu nedenle polarizasyon kayıpları düşerek pozitif hücre performansı gözlenmektedir.

Katı Oksit Yakıt Pillerinin Terimleri ve Polarizasyonu

Isıtma gerilimi (UH): Isıtma gerilimi, elektrokimyasal reaksiyonlar sırasında yakıtların daha yüksek veya daha düşük ısıtma değerlerinde belirlenebilen reaksiyon entalpinin potansiyeli olarak tanımlanır.

Tablo 2.4.1 Yakıt türleri ve ısıtma değeri yakıt miktarı

Yakıt	Isıtma değeri yakıt miktarı [KJ/mol]		Katılan elektron sayısı(n)	U(V)
Hidrojen	HHV	286,06	2	1,48
	LHV	241,54	2	1,25
Metan	HHV	888	8	1,14
	LHV	600 ton	8	1,04
Amonyak	HHV	382,6	3	1,32
	LHV	317,56	3	1,097
Metanol	HHV	726	6	1,25
	LHV	631,5	6	1,09
Etanol	HIV	1.367	12	1,18
	LHV	1.230,1	12	1,03

Gibbs serbest enerjisi: Gibbs serbest enerjisi, sabit basınçta kimyasal bir reaksiyon sırasında elektrik enerjisine dönüştürülebilecek ideal miktarda kimyasal enerjidir.

Termodinamik voltaj (Eo): Termodinamik voltaj aynı zamanda ideal voltaj, tersinir ya da standart potansiyel olarak adlandırılır. Sıfır iç dirençle elektrik enerjisine aktarılabilen standart koşullarda ölçülen maksimum enerjidir. Termodinamik voltaj doğrudan Gibbs'in enerji değişimine bağlıdır.

Tablo 2.4.2 Yakıtların ısınma değeri ve Gibbs serbest enerjisi

Yakıt	Yakıtın ısınma değeri (KJ/mol)		Yakıtın Gibbs Serbest Enerji değerindeki değişim (KJ/mol)	katılan elektronlar (n)	E_0 (V)
Hidrojen	HHV	286,06	237,34	2	1,23
	LHV	241,54	192,32	2	0,997
metan	HIV	890	817,6	8	1,06
	LHV	802,75	730,35	8	1,04
Amonyak	HHV	382,6	338,2	3	1,168
	LHV	317,56	237,3	3	0,939
Metanol	HHV	726	584,69	6	1,01
	LHV	631,5	486,28	6	0,84
Etanol	HIV	1.367	1076,77	12	0,93
	LHV	1.230,1	903,09	12	0,78

Nernst gerilimleri: Bir yakıt pilinin elektrokimyasal performansı gömülü akım toplayıcının etkisini belirlemek için voltaja karşılık akım yoğunluk grafikleri ile incelenir.

Aktivasyon polarizasyonu: Tüm kimyasal reaksiyonlar gibi, elektrokimyasal reaksiyon da türlerin reaksiyona girmesiyle çözülmesi gereken bir enerji bariyeri içerir. Bu enerji bariyerine, iyonik ve elektronik iletkenler arasındaki yük transferi nedeniyle aktivasyon veya şarj transferi kaybıyla sonuçlanan aktivasyon enerjisi denir [10].

Tablo 2.4.3. Farklı çalışmaların sonuçlarına dayanan üstel faktör ve aktivasyon değerleri

Yakıt	Tasarım	γ_a $[A/m^2]$	$\gamma_c[A/m^2]$	$E_{act,a}$ [kJ/mol]	$E_{act,c}$ [kJ/mol]	Referans
Y_2	Tübüler	$3{,}68*10^9$	$1{,}39*10^{10}$	120	120	[91]
NH_3	Düzlemsel	$1{,}87*10^7$	$2{,}77*10^5$	81,6	45,3	[93]
Y_2	Düzlemsel	$6.54 * 10^{11} \frac{RT}{nF}$	$2.35 * 10^{11} \frac{RT}{nF}$	140	137	[54]
NH_3	Düzlemsel	$3{,}608 *10^5$	$1{,}004*10^{13}$	79,587	54,409	[94]
Y_2	Tübüler	$7*10^9$	$7*10^9$	110	120	[92]

Ohmik polarizasyonu: Hücre malzemelerinin ohmik direncinin neden olduğu akım ve akım yolunun doğrusal bir denklemidir. Her elektrottaki elektronik kayıpların ve elektrolitteki iyonik polarizasyonun toplam etkilerinden kaynaklanan bir voltaj düşüşüdür.

Konsantrasyon polarizasyonu: Gaz türlerinin elektrotlardaki direncinin yayılması nedeniyle ortaya çıkan voltaj kaybıdır.

Gözenekli Ortamlardaki Gazların Dağılımı: Prensipte, gözenekli ortamlarda gaz difüzyonu, normal ve Knudsen difüzyonu kullanılarak da açıklanabilir.

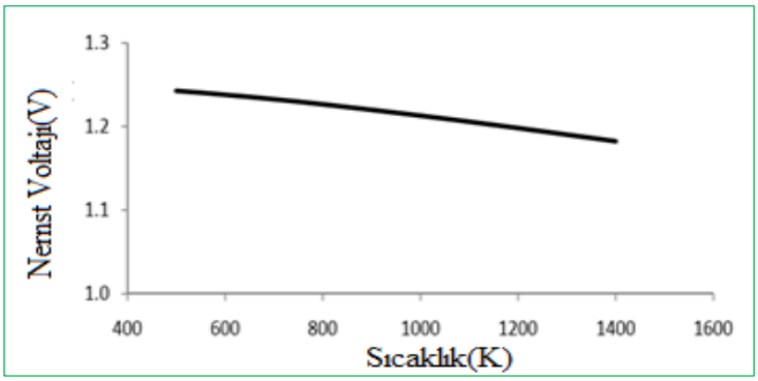
Nikel Bazlı Anot Elektrotu Kullanılarak Amonyağın Ayrışması: Amonyak, uygun bir katalizör, dahili veya harici ayrıştırıcı kullanılarak ayrışma reaksiyon endotermik olarak serbest hidrojen ve nitrojene parçalanır.

Yakıt Pili Verimlilik Analizleri

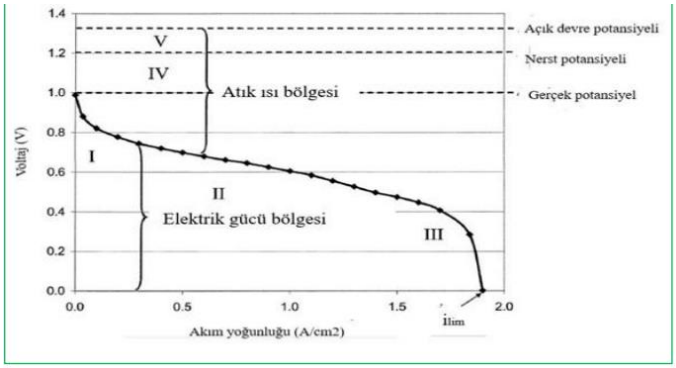
Termodinamik prensipler ve yasalar, bir yakıt pilinin performansını incelemek için çok önemlidir.

Temelinde KOYP'nin verimliliği termodinamik, voltaj ve akım verimliliği olarak karakterize edilebilir. Bunlar arasında termodinamik verim, hücrenin Nernst voltajına bağlı olan baskın olanıdır.

Buna rağmen bir yakıt hücresinin genel termodinamik verimliliği, azaltılmış ohmik kayıp ve eş zamanlı olarak artan elektrolit iyonik iletkenliği nedeniyle daha yüksek çalışma sıcaklıklarında daha fazladır.



Şekil 2.5.1. Nernst-Sıcaklık Eğrisi



Şekil 2.5.2. Voltaj-Akım Yoğunluğu Eğrisi

Ayrıca, voltaj verimliliği, şekildeki polarizasyon eğrisindeki erişilebilen aktivasyon, ohmik ve konsantrasyon kayıplarının bir fonksiyonun sonucudur. Buna karşılık, akım verimliliği, reaktanların, daha düşük akım çıkışı ile sonuçlanan istenmeyen ürünlere dönüştürüldüğünde meydana gelmiştir. Bu nedenle, bir yakıt hücresinin toplam verimliliği, tüm bireysel verimliliğin toplamıdır.

Yakıt- Oksidan kullanımı: Yakıt-Oksidan Kullanımı, tüketilen reaktan miktarının sağlanan reaktant miktarına oranı olarak ifade edilebilir.

Yakıt Pilleri İçin Yeşil Yakıt Seçimi

Katı oksit yakıt pilleri, gelecekteki sabit ve hareketli güç sistemleri için birincil güç sistemleri olarak iyi düşünülmüştür. Nispeten yüksek sıcaklıkta çalışabilmeleri çok çeşitli yakıtların kullanımına imkân tanır.

Hidrojen, doğal gaz, biyogaz, metanol, etanol ve hidrokarbonlar gibi farklı tipteki yakıtların hepsi yakıt hücreleri için potansiyel enerji kaynağı olarak görülür.

Bunların arasında hidrojen, çevresel görünümler ve enerji yoğunluğu açısından mükemmel bir yakıt seçimidir, ancak üretim, depolama ve dağıtım arasındaki bağlantı sorunları günümüzde operasyon için kritik sorulardır.

Tablo 2.5.1. Yakıt Depolama Sistemleri ve Parametreleri

Yakıt Depolama Sistemi	P (bar)	Enerji Yoğunluğu (GJ/m³)	Hacim Başına maliyet ($/m³)	Enerji maliyet ($/GJ)
Amonyak gazı / basınçlı tank	10	13,6	181	13,3
Hidrojen / metal hibrit	14	3,6	125	35,2
Benzin (C_8H_{18}) / sıvı tank	3	34,4	1000	29,1
LPG (C_3H_8) / basınçlı tank	14	19,0	542	28,5
CNG (CH_4) / entegre depolama	250	10,4	400	38,3
Metanol (CH_3OH) / sıvı	3	3	11,4	693

Amonyak, elektrokimyasal teknolojiler için son derece mümkün ve uygun fiyatlı bir yakıt olarak bulunur. Farklı uygulamalarda kullanılabilen ana hidrojen kaynağıdır [13].

Amonyakla çalışan yakıt pillerinin modellenmesinde çalışmalar da bulunmaktadır. Matematiksel modelleme, doğrudan yerinde ölçmenin mümkün olmayacağı laboratuvar şartlarının sağlanamadığı yakıt pilleri hakkında net bilgi elde etmek için etkili bir bilimsel araçtır.

ARAŞTIRMALAR VE BULGULAR

Katı oksit yakıt pillerinin diğer yakıt pillerine göre birçok avantajları mevcuttur. Tüm yakıt pillerine göre daha yüksek verimliliğe sahiptir. (%50-60) 40.000- 80.000 saat aralığında potansiyel uzun ömürlüdürler. Platin gibi değerli maddelerden kıyasla kolayca elde edilebilen seramik malzemelerden üretilebilirler. Elektrolitlerin çalışmalarında az problemlerle karşılaşılabilir. (örneğin sıvı elektrolitlerin korozif ve yapımında zorluklar ile karşılaşılır) Yüksek dönüşüm oranına sahip atık üretirler, sıcaklık ve güç iş birliği uygulamalarında %80'in üzerinde toplam etkiye sahip olup bu etkiyi arttırırlar. Yakıt esnekliğini sağlarlar. (hidrokarbonların kullanımı) [5].İyi bir hücre güç yoğunluğu için katot elektrotunda bulunması gereken genel özellikler vardır. Yüksek elektronik ve iyonik iletkenlik derecesine sahip olmalıdır. Kimyasal olarak elektrolit ile uyumlu olarak çalışabilmelidir. İnce (kalınlık) ve gözenekli yapılar oluşturabilmelidir (kütle transfer kaybını azaltmak ve akımı yaymak için yeterli düzeyde incelikte olmalı). Kaplamalar veya ince tabaka çalışmalarından sonra düzgün, homojen ve mekanik sağlamlığı yüksek tabakalar olarak üretilebilir olmalıdır. Çok sayıda üçlü faz bağları içermelidir. Diğer KOYP bileşenlerine (anot ve katı elektrolit) yakın termal genleşme katsayısına sahip olmalıdır. KOYP sistemlerinde çalışma sıcaklıklarının yüksekliğinden kaynaklı olarak termal kararlılığı yüksek olmalıdır. KOYP sistemlerinde aktif kullanım sürelerinin daha uzun olması, zamanla KOYP güç yoğunluğunu düşürücü yönde etki yapmaması önemlidir. Katot Katı Elektrolit temas yüzeyi boyunca katı elektrolit ile düzgün, homojen, temas yüzeyi boyunca mikro yapısal kusurlar oluşturmayacak şekilde ve olabildiğince kuvvetli

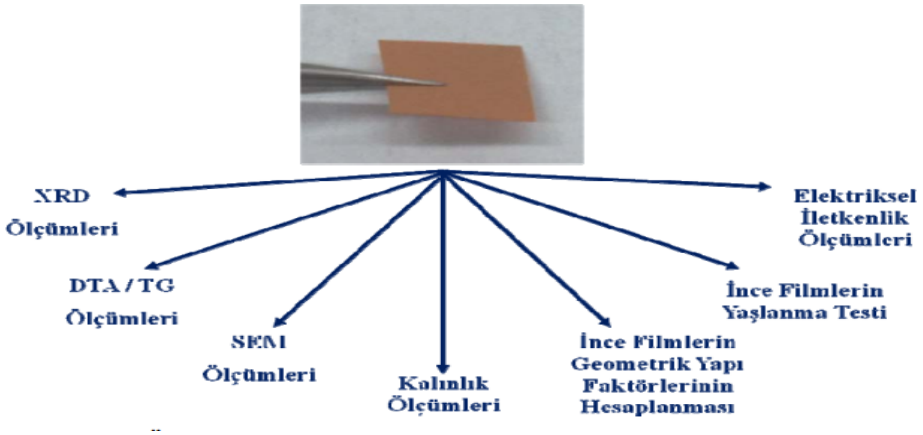
bağlanmalar oluşturabilmelidir. Katı elektrolit ile istenmeyen ve bozucu etki yapabilecek kimyasal etkileşimlere girmemelidir. Üretim maliyetinin düşük ve fabrikasyon için pahalı seviyelerde olmayan başlangıç maddelerinden üretilebilir olması kritiktir. Üretiminin kolay ve üretim süresinin kısa olması, bunun için deneysel sentez basamak sayısının az sayıda olması da önemlidir.Birinci aşama olarak modelin ağ analizi, ikinci aşama olarak da gerekli ekonomik ve fiziksel şartlar sağlandığı taktirde laboratuvar ortamı kullanılabilir. 3.1 Aşama 1: Modelin Ağ Yapısı (Ağ Analizi)COMSOL Multiphysics kullanılarak anot destekli, elektrolit destekli ve katot destekli silindirik katı oksit yakıt pili arasında ağ karşılaştırma analizi yapılabilir. Bunun nedeni meshleme yakınsama hesaplamasına kabul edilebilir bir süre içinde izin veren makul sayıda ağ sayısı elde etmek için önemli bir yaklaşımdır.Ağ analizine göre, tüm ağ elemanlarında elektrolit desteği anot ve katot desteğine göre daha yüksektir. Ek olarak, Katot destekli ve anot destekli silindirik tasarımında karşılaştırılabilir ağ elemanları bulunur. Analizler, optimizasyon ve karşılaştırmalar için uygun ve daha az maliyetli olabilecek yöntemdir.

Aşama 2: İnce Filmlerin Üretilmesi ve Karakterizasyonları (Laboratuvar Çalışma Ortamı)

1. Uygun organik bağlayıcı sisteminin belirlenmesiyle beraber çalışmalara başlanır.
2. Kaplama karışımın (çamurunun) hazırlanması için yapılan stokiyometrik oran taramaları ile devam edilir.
3. Beraberinde toz katı elektrolit malzemelerin tanecik boyutları ile ilgili yapılabilecek mekanik öğütme işlemleri önemlidir.
4. Kaplama karışımının manyetik karıştırıcıda ön karıştırma işlemi ve kaplama karışımının yatay karıştırıcı (jar mill) sisteminde karıştırılması bir sonraki basamağı oluşturur.
5. Çözücü uzaklaştırma işlemiyle devam edilir.
6. Uygun kaplama yüzeyinin (substrat) belirlenmesi ile ilgili yapılan denemeler, döner kaplama sisteminde (spin coater) taraması yapılan parametreler, kaplama karışımının spin coater sistemine enjeksiyon (ekleme) hacmi,
7. Kaplama sonrası sinterleme işlemleri ile tamamlanır.

Ön kaplama deneylerinin sonucunda çalışılan katı elektrolitler için en uygun ve verimli sistemin etil selüloz temelli organik bağlayıcı sistemi olduğu sonucuna varılmış akademik sonuçlar vardır. Kaplama çamurunun hazırlanmasında, organik bağlayıcı, dispersant, plastikleştirici, çözücü, toz örnek (katı elektrolit) malzemelerinin karıştırılma oranları için hacim/kütle taramaları gerçekleştirilebilir. Bunun için ayrıca sinterlemelerden sonra yapılan SEM, XRD ve DTA/TG ölçüm sonuçlarından da faydalanıp sonuçlandırabilir. Sonuç olarak,

tanecik boyutlarının istenilen düzeyden çok küçük olması veya çok büyük olmasının hücre güç yoğunluğunu olumsuz yönde etkilediği hesaplanmaktadır. İnce tabaka üretimindeki en önemli ve son aşaması olan sinterleme basamağında; sinterleme sıcaklığı, ısıtma hızı, ısıl işlem süresi ve sinterleme yüzeyi (sinterleme tabakası) etkin olan faktörlerdir. Sinterleme basamağı, organik bağlayıcı sisteminin uçurulması ve devamında başlangıçta toz olan örneklerin tabaka haline gelmesini içermektedir. Bu nedenle organik bağlayıcının uygun bir sıcaklıkta ve hızda uçurulması önemli bir ölçüt olabilir.



Şekil 3.2.1 İnce Film Üretimi İçin Yapılabilecek Laboratuvar Ölçümleri

SONUÇ

Son akademik çalışmalardan yola çıkarak ve sektördeki eksiklikler göz önünde bulundurup, yakıtı amonyak olan katı oksit yakıt pillerinin PEN malzemeler karakterizasyonu ve üretim, fonksiyonel katmanlar kalınlığı ve onun performansı ile ilgili, yakıt depolama ve yakıt hücresi verimliliği konusunda çalışmalara odaklanılabilir. Yakıtın amonyak seçilme sebebiyse elektrokimyasal teknolojiler için son derece mümkün ve uygun fiyatlı bir yakıt olarak kullanabilme potansiyelidir ayrıca matematiksel modelleme ile yakın sonuçlar elde etmek mümkündür.Aşama 1'de bilgisayar ortamında COMSOL Multiphysics programı aracılığıyla anot destekli, elektrolit destekli ve katot destekli silindirik katı oksit yakıt pili arasında ağ karşılaştırma analizi yapılabilir ve laboratuvar ortamına gerek kalmaksızın meshleme yöntemi ile yakıt analizinde yaklaşık bir sonuçlara ulaşılabilir.Aşama 2'de laboratuvar ortamında birden fazla ölçüm aletleri ile hata payı çok düşük olan analizlerle uygulamalı olarak ince filmlerin üretilmesi için karşılaştırmalı olarak daha verimli sonuç elde edilir. Bu aşama laboratuvar ortamının gerekliliklerinden dolayı maliyetli ve daha uzun süre alabilir.Uygulama üzerinden yapılan yakıt ve optimizasyon analizinden sonra katmanlarda kullanılan ince filmlerin ölçüm aletleri ile karakterizasyon sonucunda daha verimli malzeme seçimi ve yakıt analizi yapılabilir.

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TERS ROBOT KOL MEKANİZMA TASARIMI

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ÖZET
Endüstriyel fabrikalarda bir malzemeyi bir noktadan bir noktaya iletmek ve insan gücünün kaldıramayacağı ağırlıktaki malzemeleri bir yerden başka bir yere taşıma gibi güç gerektirecek yerler hem zaman hem de maddi kayıplara neden olmaktadır. Bu bağlamda otomasyonun vazgeçilmez unsuru olan robotlar büyük önem arz etmektedir. Endüstriyel robot sanayisinde yaşanan gelişmelere paralel olarak sanayide kullanılan robot kol sayısı da önem teşkil etmektedir. Bu amaçlar doğrultusunda hazırlanan çalışmada, tasarımı gerçekleştirilen tavandan robot kol mekanizmasın iki temel probleme çözüm üretmesi amaçlanmıştır. Bu problemlerden ilki şöyledir; bilindiği üzere robot kollar yerden montaj olduğu için üretim bandının içinde bulunması ve bu sebeple belli bir alana ihtiyaç duyulmasıdır. Bu da yer sorununu ortaya çıkarmaktadır. İkinci ana problem ise sahip olunan robot kolun hareket kabiliyeti ve sistemdeki görevi yalnızca bir üretim hattına özel olduğu çalışma alanlarında ve diğer üretim bantları için başka kollar alınması gerekmektedir. Bu da maliyet vb. problemler teşkil etmektedir. Bu çalışmanın, bu iki temel probleme çözüm üretmesi amaçlanmıştır. Bu amaçlar doğrultusunda çalışmada, tavandan robot kol mekanizması ile hem insan gücü maliyetlerini düşürmeyi hem alan ve zaman veriminin artırılması hedeflenmiştir. Modelleme bilgisayar destekli üç boyutlu bir tasarım programı vasıtasıyla gerçekleştirilmiştir. Tasarlanan mekanizmada, robot kol tavandan raylı sisteme entegre olması nedeniyle hareket kabiliyetinin yüksekliği ve üretim alanlarında alandan tasarrufu hedeflenmiştir. Bu çalışmada, tavana monte edilebilecek altı eksenli robot kol mekanizmasının tasarımı gerçekleştirilmiştir. Tasarım bileşenleri; tavan mekanizması, taban, omuz, ön kol, bağlantı kolu, bilek ve tutucu parçasından oluşmaktadır. Eksenlerin hareketi için beş servo motor ve son olarak kızak mekanizmasının hareketi için bir adet step motor kullanılmıştır.
Anahtar kelimeler: Endüstriyel robot, ters robot kol, tavan mekanizması

REVERSE ROBOT ARM MECHANISM DESIGN

ABSTRACT
In industrial factories, places that require power, such as moving material from one point to another and carrying materials that are too heavy for human power to lift, cause both time and financial losses. In this context, robots, which are indispensable elements of automation, are of great importance. In parallel with the developments in the industrial robot industry, the number of robot arms used in industry is also important. In the study prepared for these purposes, the designed ceiling robot arm mechanism was aimed to provide solutions to two basic problems. The first of these problems is as follows; As it is known, since robot arms are mounted from the ground, they are located inside the production line and therefore a certain area is required. This raises the problem of space. The second main problem is that in work areas where the mobility of the robot arm and its function in the system is specific to only one production line, other arms must be purchased for other production lines. This includes cost etc. poses problems. This study aims to provide solutions to these two basic problems. In line with these aims, the study aims to reduce manpower costs and increase space and time efficiency with the ceiling robot arm mechanism. The study prepared for these purposes, it is aimed to reduce manpower costs, increase space, and time efficiency with the ceiling robot arm mechanism designed. Modeling was carried out through a computer-aided three-dimensional design program. The designed mechanism aims to increase mobility and save space in production areas, as the robot arm is integrated into the ceiling rail system. In this study, the design of six-axis robot arm mechanism that can be mounted on the ceiling was carried out. Design components; It consists of ceiling mechanism, base, shoulder, front arm, link arm, wrist and holder part. Five servo motors were used for the movement of the axes and finally one stepper motor for the movement of the slide mechanism.
Keywords: Industrial robot arm, Reverse robot arm, ceiling mechanism

GİRİŞ

Gelişen teknoloji ile beraber endüstride malzemelerin bir yerden başka bir yere taşınımı gibi güç gerektirecek işlemler maliyet, zaman, kalite vb. parametreler göz önüne alındığında otomasyon sistemlerinin kullanımını zorunlu kılmaktadır. Bilindiği üzere otomasyon sistemlerinin vazgeçilmez uygulama alanlarından biri şüphesiz ki robotlardır [1]. Robotların kullanımı ile problemlere hızlı ve hassas çözümler getirilir ve aynı zamanda insan sağlığı ve güvenliğine zararlı olan faktörlerden etkilenmemeleri de bir diğer tercih sebebidir [2].Robotlar çeşitli ihtiyaçlardan doğan işlerin yapılabilmesi için kullanım alanlarına ve gerek duyulma nedenlerine göre farklı biçimlerde tasarlanmış insan gücünün gereksinimini azaltmanın yanı sıra zaman tasarrufu sağlayan yeniden programlanabilir makinelerdir [3].Bu makineler endüstri sanayisinin her alanın da farklı amaçlar için oldukça yaygın olarak kullanılmaktadırlar [4]. Otomotiv sanayisinde, ilaç endüstrisinde, ısıl işlemlerde kullanılan tezgâhlara iş parçası yerleştirmesinde, imalat tezgâhlarında malzeme taşınımı, yük indirme-bindirme, parça montajı vb. işlerde ve daha birçok alanda faaliyet göstermektedirler[5]. Bu çalışmada tasarlanan robot kolun ise malzemeyi bir noktadan başka bir noktaya taşıma işleminde insan gücüne gerek duyulmaması; mekanizmasının ters olması sebebiyle kullanılacağı tezgâhta yerden tasarruf ve mekanizmanın eksen üzerinde hareketli olması ile tek tezgahda birden çok işin yapılmasını sağlaması amaçlanmıştır.Robotik biliminin en büyük ilham kaynağı kuşkusuz ki doğadaki canlılardır [6]. Robot endüstrisinde insanların doğadaki canlıları taklit ederek canlıların vücut yapılarını modellenmesinin ardından mekanizmaya dönüştürdüğü bu disiplin biyomimetik bilimi olarak tanımlanmaktadır [7]. Gerçekleştirilen çalışma kapsamında biyomimetik yaklaşım kullanılarak doğanın en büyük ilham kaynağı olan insan vücudunun kol uzvu örnek alınmış ve tasarımı gerçekleştirilmiştir.Endüstriyel fabrikalarda genellikle en az üç, en fazla altı eksenli robot kolları kullanılmaktadır. Tasarlanan robot kolun eksen sayısı belirlenirken çalışma yeteneğinin eksen sayısı ile doğru orantılı olduğunun ve bu doğrultuda eksen sayısı arttıkça hareket yeteneğinin arttığı bilgisi göz önüne alınmıştır[8]. Bu doğrultuda çalışmada tasarlanan robot kolun gereksinimleri göz önünde bulundurulduğunda 6-eksenli olması planlanmıştır. Literatürde robot kollar üzerine farklı gereksinimler doğrultusunda birçok çalışma mevcuttur. Bu bağlamda gerçekleştirilen çalışma öncesinde malzeme taşınımı amacıyla gerçekleştirilen robot kol çalışmaları incelenmiştir. Aşağıda son zamanlarda yapılan bu çalışmaların özeti sunulmuş ve çalışmanın özgünlüğü ortaya konmuştur.Gürler vd. çalışmalarında teknolojinin gelişmesiyle insanların ihtiyaçlarının karşılanması için yapılmış çalışmaların hayatı daha kolay bir hale getirdiğini vurgulamış ve bu teknolojik

gelişmelerin robot kol çalışmalarında yoğunlaştığını ifade etmişlerdir. Yapmış oldukları çalışmada beş eksenli bir robot kolu geliştirmişlerdir. Geliştirdikleri robot kol ile bir malzemeyi bir noktadan başka bir noktaya taşımanın yanı sıra karıştırma işlemi de yaptırdıklarını belirtmişlerdir [9]. Lin vd. endüstriyel robotların görme tabanlı malzeme taşıması, tercih edilen malzemenin robot - kamera ölçümlemesi, koordinat dönüşümü ve konum tahminini içeren bir çalışma yapmışlardır. Altı serbestlik derecesine sahip endüstriyel bir robot kol için geometrik şekilleri farklı olan malzemelerin al- bırak işlemlerini gerçekleştiren görme tabanlı malzeme taşıma algoritması geliştirmişlerdir. Çalışmada paylaşılan deneysel sonuçlar ele alındığında geliştirdikleri algoritmaya sahip görme sistemi olan bir endüstriyel robot kolun otomatik bir şekilde malzemeyi alıp bırakma işlemini %100 oranda bir başarıyla gerçekleştirdiği görülmüştür [10]. Wang vd. altı serbestlik dereceli bir robot kol kullandıkları çalışmalarında, çalışma uzayının içerisinde rastgele bir konumdaki malzemeyi alıp bırak işlemini gerçekleştirmek için üç boyutlu malzeme konum ve yönelimini tahmin etmeyi hedefleyen stereo görüş sisteminin (nesnelerin farklı açılardan görüntülenmesi) kullanımını inceledikleri bir çalışma gerçekleştirmişlerdir [11]. Bhambere, çalışmasında malzemenin alma, yerleştirilme işlemleri için insan kolunun hareketlerini baz alarak altı eksenli bir robot kolu tasarlamıştır. Altı eksenli robotik kolun; tasarımı, tork hesaplamaları, fizibilite analizi ve simülasyonu için V-Rep isimli bir yazılım kullanmıştır. Çalışma sonucunda; geliştirdiği tasarımın, insan koluna benzer bir şekilde malzeme alma yerleştirme işlemlerini başarılı bir şekilde yaptığını ortaya koymuştur [12]. Sarıaltın çalışmasında tasarladığı altı eksenli bir robot kol ile bir ürünü bir noktadan başka bir noktaya tutucular sayesinde taşıma işlemi yapmayı amaçlamıştır. Tasarladığı robot kolun hareket kabiliyetlerini Arduino Uno R3 micro controller kullanarak programlamış ve servo motorların her birinin kontrolünü gerçekleştirmiştir. Daha sonrasında üç boyutlu yazıcı kullanarak tasarım parçalarını üç boyutlu yazıcıdan almış ve montajını gerçekleştirmiştir. Çalışmasının sonucunda robot kolu fiziksel olarak gerçekleştirerek istenilen hareketleri yaptığını deneysel olarak sunmuştur [4].

Robot kollar üzerine yapılan çalışmalar literatürde incelendiğinde bu çalışmada gerçekleştirilen ters kol robot mekanizmasına benzer bir çalışmaya rastlanılmamıştır.

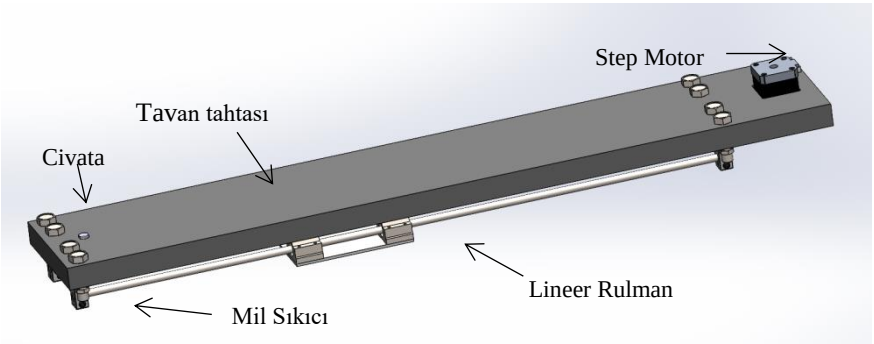
TASARIM

Robot kol tasarımları bir takım aşamalar doğrultusunda gerçekleştirilmektedir. Bu aşamaların ilk ve en önemlisi robot kolun tasarlanma amacı ve amaca uygun bileşenlerin seçilmesidir. Sonraki aşama ise istenen amaç doğrultusunda gerekli görülen bileşenlerin mekanik tasarımının gerçekleştirilmesidir. Bu çalışmada tasarımın iki amacı vardır. Birinci

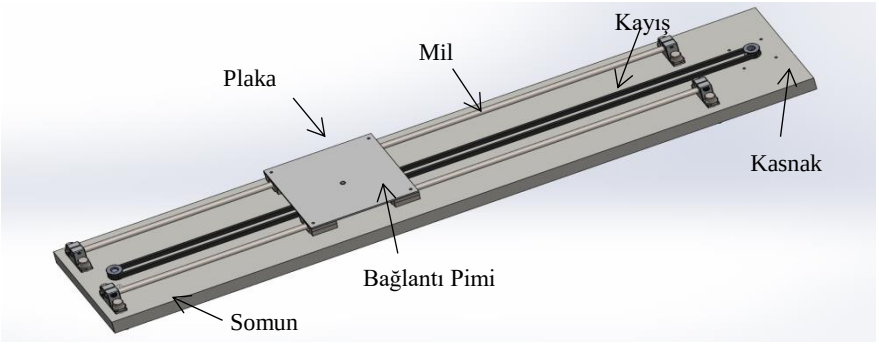
amaç; kullanılan tezgâhta yerden tasarruf sağlamak; ikinci amaç ise birden çok robot kol gereken tezgâhlarda tek bir robot kol ile işin yapılabilmesidir. Tasarım tavan ve robot mekanizması olmak üzere iki temel bölümden oluşmaktadır. Tasarım oluşturulurken ilk olarak bu iki temel bölüm için gerekli bileşenler belirlenmiştir. Tasarım bileşenleri; tavan mekanizması, taban, omuz, ön kol, bağlantı kolu, bilek ve tutucu parçasından oluşmaktadır. Eksenlerin hareketi için iki çeşit servo motordan toplam beş adet ve son olarak kızak mekanizmasının hareketi için bir adet step motordur. Gerekli parçaların ölçü ve toleransları tasarımda en uygun olacak şekilde planlanmış ve birbirleri ile olan uyumları kontrol edilmiştir. Bilgisayar destekli üç boyutlu bir tasarım programı kullanılarak çizimleri yapılan parçalar, tavan mekanizması ve robot kol mekanizması olarak iki ayrı şekilde bağlantı yerleri toleranslarının doğruluğundan ve birbirleri ile örtüştüğünden emin olunduktan sonra iki ayrı mekanizmanın da montaj ilişkileri kurulmuştur. Son olarak tasarım amaçları doğrultusunda yerden tasarruf sağlaması için robot kolun, tavan mekanizmasına ters bir şekilde montaj ilişkisi oluşturulmuştur. Tek tezgâhta birden çok işi yapabilmesi için ise tavan mekanizmasında oluşturulan eksen üzerinde robot kolun doğrusal hareket edebileceği bir sistem kurulmuştur.

Tavan Mekanizması Tasarımı

Tavan mekanizmasında ilk olarak robot kolun oturtulduğu plakanın yatay hareketi için kayış kasnak sistemi tasarlanmış ve plaka 2 adet mil üzerine oturtulmuştur. Milleri tavan tahtasına sabitlemek için 8 adet cıvata, 4 adet somun, 4 adet mil sıkıcı kullanılmıştır. Oluşturulan bu doğrusal düzlem mekanizmasında robot kolun ileri geri hareketleri için lineer rulman kullanılmıştır (Şekil 1 ve Şekil 2). Lineer rulman kullanımı ile hareket esnasında sürtünme kuvvetini azaltarak herhangi bir bozulma durumunun önüne geçilmesi hedeflenmiştir. Tasarımı tamamlanan sistemin hareketini sağlamak için son olarak 1 adet Step motor kullanılmıştır. Böylece kurulan mekanizma ile robot kolun ile eksen üzerinde serbestçe malzemeyi bir noktadan alıp başka bir noktaya bırakabilmesi sağlanmıştır.



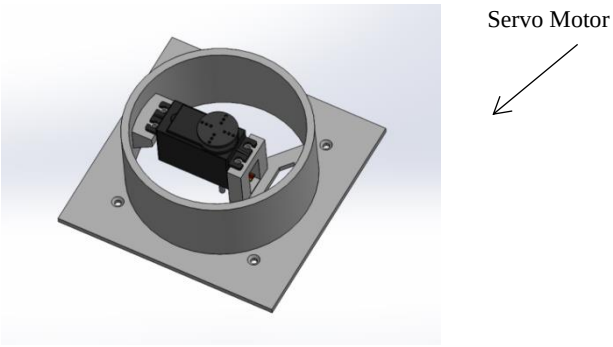
Şekil 1. Tavan mekanizma tasarımı üst görünüş



Şekil 2. Tavan mekanizma tasarımı ön görünüş

Taban Tasarımı

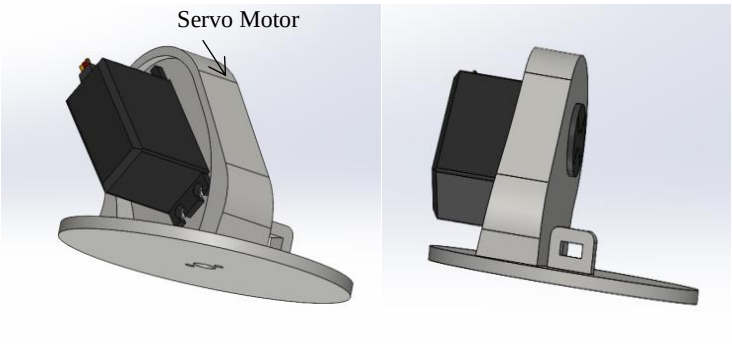
Robot kolun taban mekanizması, tavan mekanizmasında ki plakaya sabitlenecek şekilde tasarlanmıştır. Mekanizmanın içerisine Servo motor yerleştirilmiştir (Şekil 3).



Şekil 3. Robot kol taban tasarımı

Omuz Tasarımı

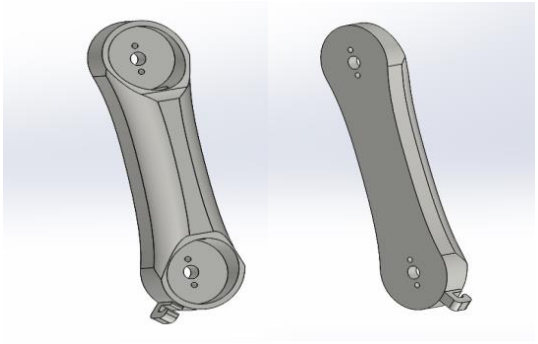
Robot kolun omuz tasarımında 1 adet Servo motor kullanılmıştır. Omuz tasarımının alt kısmı taban mekanizmasının üstüne gelecek şekilde plaka olarak tasarlanmıştır (Şekil 4).



Şekil 4. Robot kol omuz tasarımı

Bağlantı Kolu Tasarımı

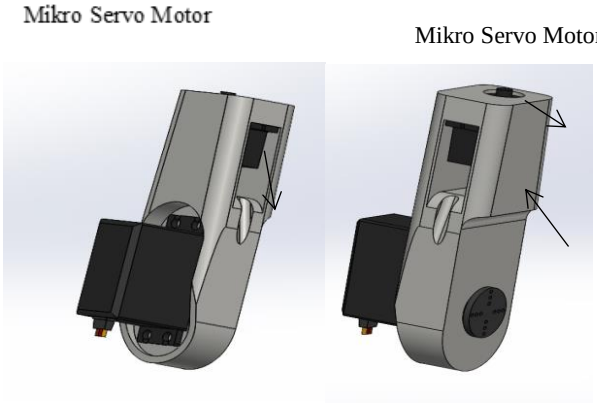
Omuz ile ön kol arasında bağlantı sağlayan bileşendir. Üst kol olarak da adlandırılır (Şekil 5).



Şekil 5. Robot kol bağlantı kolu tasarımı

Ön Kol Tasarımı

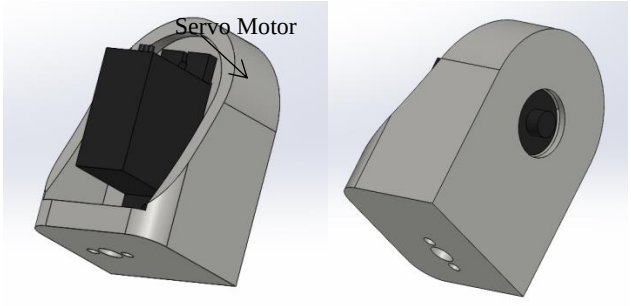
Ön kol tasarımında iki adet mikro servo motor kullanılarak hareket sağlanmıştır. Ön kol ve bağlantı kolunun birleşimi dirsek olarak adlandırılmaktadır (Şekil 6).



Şekil 6. Robot kol ön kol tasarımı

2.5. Bilek Tasarımı

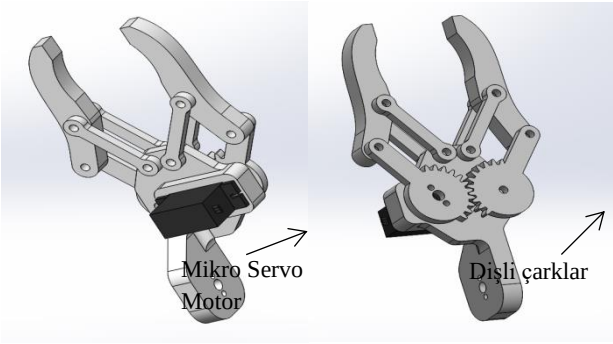
Tutucu ile ön kolun birleşim noktası olan bilek bileşenin tasarımında bir adet servo motor kullanılarak hareket sağlanmıştır (Şekil 7).



Şekil 7. Robot kol bilek tasarımı

Tutucu Mekanizması Tasarımı

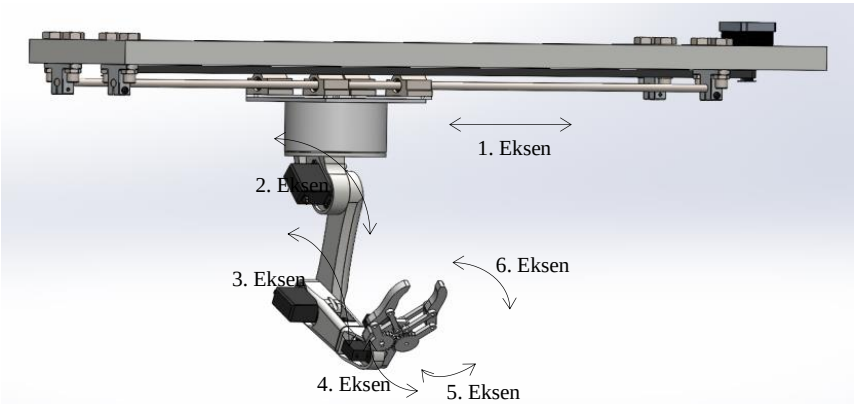
Tutucu mekanizması, malzemenin bir noktadan başka bir noktaya taşınması için tasarlanmıştır. Dişli çarklar ile sıkma ve bırakma hareketinin yapılması sağlanmış ve üzerine eklenen bir servo motor sayesinde hareketlendirilmiştir (Şekil 8).



Şekil 8. Tutucu mekanizması tasarımı

Montaj Tasarımı

Tasarlanan ters robot kolun montaşı ve hareket eksenleri Şekil 9'da gösterilmiştir.



Şekil 9. Ters Robot kol mekanizması ve hareket eksenleri

SONUÇLAR

Endüstri dünyasında; üretim süreçlerini otomatik hale getirmeleri, tekrarlayıcı işleri üstlenmeleri, daha hassas koşullarda daha hızlı çalışabilmeleri, insanların yapması riskli görevleri yapabilmeleri gibi birçok nedenden dolayı robotik biliminin önemi ortadır. Dünya endüstrisinde büyük önem taşıyan bu biliminin kuşkusuz en büyük ilham kaynağı doğadır. İnsanın biyomimetik yaklaşım ile doğada ki canlılardan esinlenerek geliştirdiği robotik bilimi gün geçtikçe kendini daha da öne çıkartmaktadır. Fakat teknolojinin ışığında gelişen robotik endüstrisinin sağladığı büyük kolaylıkların yanı sıra bazı problemlerle de karşılaşılmaktadır. Çalışma koşulları gözlemlendiğinde, robot veya robot uzuvlarının kapladığı alan ve hareket kabiliyetinin esnekliği karşılaşılan problemlerin başında gelmektedir. Bu çalışmada doğanın en temel varlığı olan insandan ilham alınarak altı eksende hareket kabiliyeti sağlayan ters mekanizmalı bir robot kol tasarımı yapılmış ve tespit

edilen bu iki probleme çözüm üretmeye çalışılmıştır. Çalışmadan elde edilen sonuçları şu şekilde sıralamak mümkündür;

- Kullanılan tezgâhta yerden tasarruf etmektedir.
- Hareket kabiliyetinin esnekliği ile daha hassas çalışma ortamı sağlamıştır.
- Tercih edilen motor bileşenleri sayesinde daha hızlı çalışmasıyla işin tamamlanma süresini kısaltmıştır.
- Birden çok robot kol gereken alanlarda tek bir robot kol ile işin yapılabilmesini mümkün kılmıştır.

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EFFECT OF PROBIOTIC ADDITION OF BACILLUS SUBTILIS TO LAMB RATIONS ON FATTENING PERFORMANCE AND CARCASS QUALITY

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ABSTRACT
The use of probiotics in ruminant diets has attracted considerable interest for its potential benefits on health and productivity. In this context, the present study evaluated the effects of Bacillus subtilis supplementation on the growth performance of Akkaraman male lambs. Twelve lambs, aged 3 months and with live weights ranging from 18.2 to 22.4 kg, were studied for 60 days in two groups of six animals each. Initial results showed that during the first 15 days, daily live weight gain was significantly higher in the probiotic-supplemented group than in the control group. However, at subsequent intervals of 16-30, 31-45 and 46-60 days, the rate of live weight gain was very similar between the two groups, with no statistically significant differences. At the end of the study, it was observed that there was no significant difference in total live weight gain between the probiotic and control groups over the entire 60-day period. This finding suggests that while probiotic supplementation may provide temporary growth benefits, its effect on long-term overall growth appears to be limited.
Key words: Bacillus subtilis, lambs performance, probiotics

INTRODUCTION

Research conducted in ruminants has demonstrated an increase in the number of cellulose-degrading bacteria in the presence of yeast-based probiotics. This phenomenon manifests its effects on microbial fermentation, leading to enhanced cellulose breakdown and improved microbial protein production (Amin and Mao 2021). Both Lactobacilli and Bifidobacteria help reduce the number of harmful microorganisms in the intestine by promoting the growth of closely related bacterial species and producing protein or polypeptide bacteriocins. It has been reported that lactic acid bacteria, bifidobacteria, and probiotic species such as *Bacillus*, *Staphylococcus*, *Enterococcus*, *Listeria* and *Salmonella* can produce several types of thermostable bacteriocins exhibiting antimicrobial effects against various pathogens (Piqué et al. 2019).

Recently, there has been an increasing interest in the use of *Bacillus* species as probiotics in ruminants due to specific characteristics such as heat stability and their ability to survive in the low pH of the digestive system. *Bacillus subtilis* (BS) is one of the species from the Bacillus genus known for its strong environmental adaptability (Luise et al. 2017). During growth, Bacillus subtilis produces various active substances such as polymyxins, nystatin, gramicidin, enzymes (alpha-amylase, protease, lipase, cellulase, etc.), and vitamins. These active substances not only exhibit strong inhibitory effects on pathogens and subsequent infections but also positively modulate nutrient metabolism and immune function (Pan and He 2022). *Bacillus subtilis* rapidly consumes free oxygen in the intestine, preventing the growth of harmful bacteria while promoting the growth of beneficial anaerobic bacteria, leading to hypoxia. The effects of *Bacillus subtilis* on live weight gain have been investigated in numerous studies. For example, it has been reported that supplementation of *Bacillus subtilis* at different levels in broiler chicken rations resulted in higher live weight gain without changes in feed intake and feed conversion ratio (Park et al. 2020, Ciurescu et al. 2020). Similarly, in a study on beef cattle farming, it was reported that cattle supplemented with Bacillus subtilis showed higher live weight gain and better carcass quality (Smock et al. 2020).

The effects of *Bacillus subtilis* on meat quality have also been investigated. Studies have shown that supplementation of *Bacillus subtilis* can positively affect the carcass characteristics and meat quality of chickens (Tang et al. 2021). Additionally, supplementation of *Bacillus subtilis* in pigs has been observed to significantly improve meat quality, enhance antioxidant function, and reduce skatole production (Sheng et al. 2015). A

literature review did not yield any studies on the effect of adding *Bacillus subtilis* bacteria as a probiotic to lamb rations on lamb fattening performance and carcass quality.

The aim of this study is to investigate the effect of adding *Bacillus subtilis* bacteria as a probiotic to lamb rations on lamb fattening performance and carcass quality. The data obtained will contribute to the development of more effective feeding strategies in animal husbandry and the development of practices aimed at improving animal health, growth performance, and carcass quality.

2. MATERIALS AND METHODS

The aim of this study was to investigate the effect of adding Bacillus subtilis bacteria as probiotic to lamb diets on lamb fattening performance and carcass quality.

2.1. Animal Material

In the study, 12 Akkaraman male lambs aged 3 months with live weights between 18.2 and 22.4 kg were used as animal material. Animal materials were obtained from a private animal husbandry enterprise located in Kadınhanı district of Konya province.

2.2. Feed Material

The animals used in the study were fed a ration consisting of dry alfalfa, sunflower meal, barley grits, ground maize and soda (sodium bicarbonate). Bacillus Subtilis (CFU/kg > 1.0×10^{10}) was added to the ration of the animals in the experimental group. Barley, maize, dry alfalfa and soda water were obtained from the enterprise where the animals were obtained, and Basillus Subtilis were obtained from Selçuk Univercity Department of Animal Nutrition and Nutritional Diseases.

2.3. Method

A total of 12 animals, 6 animals in the experimental group and 6 animals in the control group, were used in the study. The animals were treated with internal and external parasites one month before the start of the study. The ration prepared for the study was gradually switched to 15 days. Each day, the amount of concentrate feed in the ration was increased by a certain amount, so that the ration foreseen in the experiment was consumed by the animals at the end of 15 days. The animals used in the study were weighed on an empty stomach using a 100 g weighing scale. The study lasted for a total of 60 days.

Bacillus Subtilis (CFU/kg > 1.0×10^{10}) was added to the rations of the experimental group. The other group, which constituted the control group, was fed with the same ration without probiotic supplementation.

In order to determine the feed consumption of the animals in the groups, the amount of feed consumed at the end of the 15th, 30th, 45th and 60th days of the study was calculated. The live weights of the animals were recorded by weighing the animals on an empty stomach at 15-day intervals.

2.4. Statistics

All parameters were presented as mean ± standard deviation (SD) and SPSS (26.0 software; IBM) programme was used for statistical analysis. Independent Two Sample T-Test was used to determine the differences between the obtained data.

3. RESULTS AND DISCUSSION

This research investigated the impact of probiotic supplementation on the live weight of lambs. At the start of the study, the initial live weights of lambs in the control and probiotic groups were statistically similar (averaging 20.55±1.74 kg and 20.63±1.62 kg, respectively), indicating no significant difference between groups at the outset.Measurements taken on the 15th, 30th, 45th, and 60th days revealed weight gains in both groups. By the 15th day, the average weight of the probiotic group had increased more than that of the control group (23.82 kg vs. 23.18 kg). Subsequent measurements on the 30th, 45th, and 60th days showed average weights of approximately 27.38 kg and 28.03 kg, 31.5 kg and 32.4 kg, and 35.9 kg and 36.4 kg for the control and probiotic groups, respectively. Statistical analyses at these points showed no significant difference between the groups (p-values were 0.597, 0.547, 0.404, and 0.650, respectively).

Table 1. The live weights of the lambs used in the study in 15-day intervals and in total

Measurement Day	Control Group Average Weight (kg)	Control Group SD (kg)	Probiotic Group Average Weight (kg)	Probiotic Group SD (kg)	P-Value	Statistical Significance
Initial	20,55	1,74	20,63	1,62	-	-
Day 15	23,18	1,81	23,82	1,68	0.597	No
Day 30	27,38	1,75	28,03	1,54	0.547	No
Day 45	31,5	1,87	32,4	1,49	0.404	No
Day 60	35,9	1,72	36,4	1,56	0.650	No

During the first 15 days, the daily weight gain of the probiotic group was significantly higher than that of the control group (p=0.00). However, during the 16-30, 31-45, and 46-60 day periods, weight gains for both groups were similar and did not show a statistically significant difference (p=0.95, p=0.06, and p=0.10, respectively). Overall, at the end of the 60-day

period, there was no significant difference in total weight gains between the two groups (p=0.27), indicating that probiotic supplementation did not have a significant effect on overall growth.

Days	Control Group Daily Weight Gain (g)	Control Group SD (g)	Probiotic Group Daily Weight Gain (g)	Probiotic Group SD (g)	P-Value
0-15	175,6	9,9	212,2	11,2	0
16-30	280	28	281,1	27,6	0,95
31-45	271,1	18,7	290	7,5	0,06
46-60	297,8	13,1	267,8	42,2	0,1
0-60	256,1	8,7	262,8	9,4	0,27

The findings suggest that probiotic supplementation can increase weight gain in the short term (first 15 days) but does not lead to a statistically significant difference in total weight gains between the groups at the end of 60 days. These results imply that the effect of probiotics on lamb growth is limited and diminishes over time.Probiotics, increased cellulose activity and enhanced fiber breakdown may lead to increased microbial protein synthesis and increased attachment to the intestinal mucosa, preventing potential pathogens from adhering and increasing the digestion of nutrients with a higher supply of amino acids. These mechanisms may contribute to increased feed consumption and feed utilization efficiency (Abd El-Trwab et al., 2016). Results of studies conducted on sheep and goats fed diets containing probiotic supplementation vary in the literature. In a study by Haddad and Goussous (2005), it was found that the addition of Saccharomyces cerevisiae to the diets of Ivesi lambs led to higher weight gain (266 g/day) compared to the control group (212 g/day). Khattab et al. (2020) reported that supplementation of *B. subtilis* and *L. casei* to lamb diets improved weaning weight, average live weight gain, and health status of the lambs. Supplementation with Lactobacillus acidophilus increased feed intake and daily weight gain in Nubian goats (Azzaz et al., 2015). Devyatkin et al. (2021) reported that supplementation with *Bacillus subtilis* B-2998D, B-3057D, and *Bacillus licheniformis* B-2999D added to lamb rations increased live weight gain by 18.8%. It was reported that supplementation of *Lactobacillus acidophilus* and *Bacillus subtilis* improved the growth performance of lambs with growth retardation (Mao et al., 2023). Furthermore, in another study by Gao et al. (2022), lambs weaned at 3 months of age were fed a diet supplemented with *B. subtilis* for 80 days, which significantly increased daily weight gain, total weight gain, rumen microbial

abundance, and rumen microbial diversity.The effects of probiotics depend on a variety of factors such as the physiological status of the animal, the type of probiotic used, dosage, feeding regimen, and environmental conditions. Probiotics have potential benefits such as increasing nutrient digestibility, stabilizing the rumen ecosystem, stimulating immune responses, and increasing milk production during lactation. However, due to limited research on the exact mechanisms of these effects and the application of probiotics in small ruminants, it is possible that the addition of probiotics may not always show a consistent effect on growth and live weight gain (Abd El-Trwab et al., 2016). Despite studies showing a positive effect of probiotic supplementation on live weight gain in the ration, there are also studies showing no effect. Titi et al. (2008) reported that yeast supplementation had no effect on the growth rate of lambs and kids. Baranowski et al. (2007) observed no difference in average daily live weight gain between lambs fed a diet supplemented with flaxseed and mineral bioplex and those fed the control diet (238 g vs. 225 g). Macedo et al. (2006) stated that the addition of probiotics to sheep rations did not improve average daily weight gain, dry matter intake, and feed conversion. Soren et al. (2013) observed no effect on body weight and daily weight gain when lambs were given *S. cerevisiae* or a combination of *S. cerevisiae* and *L. sporogenes*. Similarly, Whitley et al. (2009) reported no change in the growth performance of goats with probiotic supplementation. The examples given above are consistent with the results of this study.

CONCLUSİON

This study investigated the effect of adding Bacillus subtilis bacteria to lamb diets on feeding performance and carcass quality. Research results showed that probiotic supplementation increased the weight gain of lambs in the first 15 days, but there was no statistically significant difference in total weight gain between the two groups at the end of the 60-day period. These findings suggest that the effect of probiotics on lamb growth is limited and decreases over time. It is consistent with other studies in the literature showing that probiotic supplementation may increase weight gain in the short term but does not make a significant difference in the long term.

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COVİD19 PANDEMİSİ SÜRECİNDE FARKLI MAÇ SIKLIKLARINDA ANTRENMAN YÜKLERİ DEĞİŞİMİNİN İNCELENMESİ

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ÖZET

Değişen antrenman/gün sayıları sebebiyle daha az antrenman sayısına ve daha fazla maç sayısına ulaşan sporcuların antrenman yüklerinin hesaplanıp doğru değerlendirilmesi ile hem oluşabilecek sakatlıkları öngörebilme hem de maç içindeki performansları için doğru tercihler yapabilme imkânı sağlanabilir Çalışmanın amacı, Covid 19 pandemisi sebebiyle, ertelenen lig müsabakalarının, devam eden ligin ilerleyen haftalarında farklı maç sıklıklarına ve iki maç arasındaki farklı antrenman /gün sayılarına sebebiyet verdiği dönemdeki antrenman yüklerinin hesaplanması ve değerlendirilmesidir.Çalışmaya 2020-2021 sezonunda Türkiye Futbol Federasyonu Spor Toto Süper Liginde yer alan takımda oynayan 20 erkek profesyonel oyuncu (yaş:28,6±4,01, boy:1.80±,07, kg: 79,2±6,57, BKI: 24,45±1,43) katılmıştır.Verilere incelendiğinde hazırlık dönemi 1.2.haftalarında kondisyonel özelliklere yönelik antrenmanların olması nedeniyle özellikle akut kronik iş yükü oranının yüksek olduğu (min. 1.10±0.26–maks. 2.20±0.26) ve bu durumu akut kronik iş yükü oranına göre değerlendirdiğimizde AKİYO>1.5 olduğunda sakatlık riskinin yüksek olabileceği bilinmektedir. Ancak hazırlık dönemi futbola özgü kondisyonel özelliklerinde geliştirilmesi için yüklenmelerin yapıldığı dönem olarak geçmektedir. Hazırlık dönemi haftalık toplam yük değerleri ise min. 1961±5 ve maks. değerlerinin ise 6172±7 olduğu görünmektedir. Bu durumda hazırlık dönemi başlar başlamaz antrenman yükü kademeli olarak arttığı için bu değişken antrenman yükü değerlerinin oluşması hazırlık dönemine ait normal olarak bilinmektedir. Kas zorlanması strain değerlerinde ise 1. ve 2. hafta değerlerin yüksek 3. Ve 4.haftadaki değerlerin daha düşük olması ise sezona hazırlık döneminde anatomik adaptasyon sürecinde kas hasarlarının daha fazla olabileceği üzerine yorumlanabilir.Farklı dönemlere ait antrenman yükü değişkenlerinin haftalık antrenman programının türünden, oyuncunun müsabakaya başlangıç durumundan, mevkisel farklılıklardan, antrenman modundan ve durumsal faktörlerden etkilendiğini söyleyebiliriz. Bu nedenle müsabakanın olmadığı (hazırlık dönemi), haftada 1 maç olan dönemde antrenman yükünün daha fazla olduğunu ve buna karşıt olarak yoğun maç döneminde antrenman yüklerinin çok düşük olduğu şeklinde yorumlanabilir.

Anahtar Kelimeler: Futbol, Antrenman Yükü, Akut/Kronik İş Yükü, Pandemi

INVESTIGATION OF THE CHANGE IN TRAINING LOADS AT DIFFERENT MATCH FREQUENCIES DURING THE COVID19 PANDEMIC

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By calculating and correctly evaluating the training loads of the athletes who reach less training number and higher number of matches due to the changing training/day numbers, it is possible to both predict the injuries that may occur and make the right choices for their performance in the match. The aim of the study is to calculate and evaluate the training loads in the period when the postponed league competitions due to the Covid 19 pandemic cause different match frequencies and different training / days between two matches in the following weeks of the ongoing league.Twenty male professional players (age: 28.6±4.01, height: 1.80±.07, kg: 79.2±6.57, BMI: 24.45±1.43) playing in the Turkish Football Federation Spor Toto Super League in the 2020-2021 season participated in the study.When the data are analysed, it is known that the acute chronic workload ratio is high (min. 1.10±0.26-max. 2.20±0.26) and when we evaluate this situation according to the acute chronic workload ratio, it is known that the risk of injury may be high when the ACWL>1.5. However, the preparation period is the period in which loads are performed for the development of football-specific conditional characteristics. The weekly total load values of the preparation period were min. 1961±5 and max. values were 6172±7. In this case, since the training load increased gradually as soon as the preparation period started, the occurrence of these variable training load values is known as normal for the preparation period. In the muscle strain values, the fact that the values in the 1st and 2nd weeks were higher and the values in the 3rd and 4th weeks were lower can be interpreted that muscle damage may be more during the anatomical adaptation process in the preparation period for the season. We can say that the training load variables of different periods are affected by the type of weekly training programme, the player's starting status in the competition, positional differences, training mode and situational factors. Therefore, it can be interpreted that the training load is higher in the period when there is no competition (preparation period), 1 match per week, and on the contrary, the training loads are very low during the intensive match period.
Keywords: Football, Training Load, Acute/Chronic Work Rate, Pandemic

GİRİŞ

Futbol, maç içerisinde yer alan hareket modellerinin yüksek şiddette ve çok sayıda olduğu dönemleri içeren karmaşık ve aralıklı yapıda bir spordur. Bu tür hareket kalıpları, bir futbol maçı sırasında yüksek düzeyde anaerobik ve aerobik enerji dönüşümüne yol açmaktadır (Bangsbo, 1994). Yüksek şiddetli egzersizler arasında toparlanma ve yüksek seviyelerde sprint mesafesi üretme yeteneği, elit seviyedeki futbolcular ile daha düşük standarttaki futbolcular arasındaki en büyük farklardan biridir (Mohr ve ark., 2003). Futbol maçı ile ilişkili fizyolojik stres, futbol performansıyla yakından bağlantılı olan psikolojik, taktik ve teknik unsurlar gibi birbirine bağlı bir dizi faktör tarafından daha da karmaşık hale gelmektedir. Her seviyede başarılı bir futbol performansı için top sürme, tekme atma ve topa vurma gibi belirli maç aktivitelerinin geliştirilmesi de gereklidir. Bu sayısız faktör nedeniyle, futbolcuların çeşitli fiziksel uygunluk ve teknik yetenek alanlarında yeterli düzeyde olmaları gerekmektedir (Mohr ve ark., 2003). Futbolda sakatlıklar, ilgili oyuncunun antrenman seanslarını ve maçları kaybetmesi nedeniyle hem oyuncunun hem de takımın performansı üzerinde büyük bir etkiye sahiptir (Dupont ve ark., 2010; Hulin ve ark., 2017). 25 oyuncudan oluşan profesyonel bir futbol takımının sezon başına yaklaşık 50 sakatlık yaşadığı, bu da her sezonda oyuncu başına iki sakatlığa eşdeğer olduğu bildirilmiştir (Ekstrand ve ark., 2011). Ayrıca, futbolda yaşanan sakatlıklar futbol kulüplerinin ekonomisini doğrudan etkiler ve sakatlanan oyuncu başına aylık ortalama maliyet yaklaşık 500.000 Euro'dur (Ekstrand, 2013). Son günlerde yapılan bir meta-analiz sonuçlarında, erkek profesyonel futbolculardaki genel sakatlık oranının 8.1 sakatlık/1000 saat antrenmana maruz kalındığında ve bu oranın farklı lig ve seviyelerdeki profesyonel takımlar arasında önemli ölçüde farklılık olmadığını göstermektedir. Bu oranın, maçlarda antrenmanlara göre 10 kat daha yüksek olduğu (maçlarda yaşanan 36 sakatlık/1000 saate karşı 3.7 sakatlık/1000 saat antrenmanda), alt ekstremite daha fazla sakatlık yaşanan bölgedir (6.8 sakatlık/1000 saat maruz kalma) ve en sık görülenler bu bölgede kas ve bağ sakatlıklarıdır (4.6 sakatlık/1000 saat maruz kalma) (López-Valenciano ve ark., 2020). Son 20 yılda, Uluslararası Futbol Federasyonu (FIFA) ve Avrupa Futbol Federasyonları Birliği (UEFA) gibi uluslararası kuruluşlar, fiziksel talepler de dahil olmak üzere futbol sakatlıkları ile ilgili farklı değişkenleri incelemeye ilgi göstermektedirler (Dupont ve ark., 2010; Ekstrand ve ark., 2013), çünkü son yıllarda futbolun, özellikle yüksek şiddetli hareketlerde fiziksel taleplerinde önemli derecede bir artış yaşanmaktadır (Bush ve ar., 2015). Bu nedenle, potansiyel sakatlık riskini tespit etmek için müsabakaların fiziksel ve fizyolojik taleplerini izlemek önem kazanmıştır (Cardinal ve ark;

2017). Sezonluk antrenman/maç yükü varyasyonlarını ve ölçümler arasındaki ilişkileri anlamak, en uygun izleme stratejisini tanımlamak için önemli görünmektedir. Bu nedenle, bu çalışmanın amacını üç farklı yönden ele alabiliriz, (1) bir hafta (mikro döngü), haftalar (mezo döngü) içindeki oyuncular arası ve haftalar arası toplam antrenman yükü dağılımını analiz etmek; (2) bir hafta (mikro döngü), haftalar (mezo döngü) içindeki oyuncular arası ve haftalar arası monotonluk ve zorluk derecesinin dağılımını analiz etmek; ve (3) müsabaka sayısına göre değişen antrenmman yükü verileri arasındaki ilişkileri analiz etmek. Bu yüzden bu çalışmayla 4'er haftalık antrenman periyotları ele alınarak haftalık içsel antrenman yükleri arasında anlamlı farklılıkların olup olmadığına ilişkin bilgilerin elde edilmesi amaçlanmaktadır.

GELİŞME

Profesyonel dünyanın elit sporları, spor bilimciler ve sağlık ekibi (SSM) uygulayıcıları için antrenman yükü ve bu yük üzerinde antrenman uygulamaları sırasındaki manipülasyonunu izlerken benzersiz zorluklar sunmaktadır. Bu zorluklar tipik olarak sporcu ve antrenör inancını, eldeki mevcut imkanları ve uygulanan ortam ile mevcut bilimsel kanıtlar arasındaki ilişkiyi çevrelemektedir. Antrenman yükü takibi ile ilgili kanıtlar genellikle yarı elit popülasyonlar üzerinde gerçekleştirilen uzak ve geriye dönük çalışmalarda toplanmaktadır. Bu tür kanıtları uygulamak isteyen spor bilimciler ve sağlık ekibi (SSM) uygulayıcıları, kanıta dayalı uygulamaları tamamen benimsemek yerine özellikle kendi ekiplerine uyarlamalı ve muhtemelen uygulamalarının kurum içi doğrulamasını yapmalıdırlar (Bourdon ve ark., 2017). Antrenman yükü takibinin birinci amacı, Antrenörün/Performans Uzmanının oyuncunun antrenmana hazır olup olmadığı konusunda karar vermesine yardımcı olmak ve sakatlık riski hakkında bilgi vermek olmalıdır. Mümkün olduğunda, antrenman yükü takibinin nedenleri ve sonuçları hakkında antrenör/oyuncu eğitimi her sezon öncesi başında yapılmalıdır. Bilgiler basitleştirilmeli ve raporlama birkaç temel ölçütle sınırlandırılmalıdır. SSM uygulayıcılarının ayrıca oyunculara geri bildirimde bulunmaları ve kendi özel durumları bağlamında antrenörlere tavsiyelerde bulunmaları gerekir. İdeal olarak, antrenman yükü raporları sadece grup/takım halinde verilmesi yerine bireysel geri bildirimlerle soyunma odalarına/tesislere uygun şekilde yerleştirilmelidir. Bu sadece daha fazla oyuncu eğitimi sağlamakla kalmaz, aynı zamanda oyunculara ve antrenörlere, uygulayıcıların sonuçları bağlamsallaştırma yeteneğine sahip olduğunu gösterir (Gabbet, 2016; Gabbet ve ark.,2019). Futbol, 90 dakikalık müsabaka süresince maksimal oksijen tüketiminin ortalama %70-80'ine (Hulin ve ark.; 2014) veya maksimal kalp atımının %80-

90'ına denk gelen anaerobik eşik şiddetinin biraz üstünde, farklı aktivite profilleri ile birlikte yaklaşık 9-14 km mesafe kat edilerek oynanan çok boyutlu fizyolojik taleplere sahip bir takım sporudur (Rampini ve ark., 2017). Futbolun sahip olduğu bu çok boyutlu fizyolojik taleplerden dolayı futbolda hem yüksek seviyede kas kuvvetine hem de iyi gelişmiş aerobik kapasite ve güce ihtiyaç duyulmaktadır (Bangsbo, 1994). Dolayısıyla futbolun bu fiziksel ve fizyolojik taleplerinin üst düzeyde karşılanarak takımların ligteki sıralamada üst noktalarda olması içsel ve dışsal olarak ifade edilen antrenman yüklerinin ölçülerek antrenmanların denetlenmesiyle sağlanabilmektedir (Coutts ve ark.; Stolen ve ark.; 2005) Futbol, dinlenme periyotları veya düşük şiddetli koşu ile serpiştirilmiş tekrarlayan yüksek şiddetli koşu zamanları ile karakterize edilen aralıklı bir spordur (Mclaren ve ark., 2018). Profesyonel futbolda rekabetçi maçların oluşumu yüksektir ve oyuncuların sıklıkla 3 günlük toparlanma ile ardışık maçlar oynaması gerekir (Mclaren ve ark., 2018). Bu nedenle bu oyuncular, maçlar ve sonraki antrenman bölümleri arasındaki düşük toparlanma süreleri nedeniyle doğal olarak yüksek bir antrenman yüküne sahiptirler. Bu üst düzey profesyonel oyuncular, genellikle, sakatlık riskini artıran, sıkışık bir lig takvim periyotları ile yıl boyu süren antrenman ve yüksek maç frekanslarına maruz kalmaktadırlar. Bu yarışmacı talepler, sakatlanma ve hastalıktan kaçınmak ve en iyi performansı sergilemek için iyi geliştirilmiş fiziksel özelliklere sahip olma zorunluluğu gerektiren oyuncularda fiziksel stres yaratmaktadır. (Gabbett, 2016).

Antrenman Yükü Takibini Tanımlama

Günümüzde elit seviyede performans sporu içerisinde yer alan oyuncular giderek artan antrenman yükü, yoğun lig takvimi, dinlenme ve toparlanma için çok kısa süreli periyotlar ile karşı karşıya kalmaktadırlar (Soligard ve ark; 2016). Yapılan bir araştırmada Begstsson ve arkadaşları (Bengtsson ve ark; 2013), maç yapma sıklığının, artan sakatlık düzeyi ile ilişkili olduğunu rapor etmişlerdir. Konuyla ilgili benzer çalışmalar, yüksek sakatlık düzeylerinin, takımların genel performans düzeyi ve ligdeki yerini, performans düzeylerini etkileyen temel etkenlerden biri olduğunu göstermektedir (Mclaren ve ark., 2018). Bu nedenle oyuncuların sakatlık sürecinde geçirdikleri zamanı azaltmak ve düzenli olarak sezon boyunca antrenman yapabiliyor olmasını sağlamak da son derece önemli bir durumdur. Antrenmanın etkileri şiddet, süre, sıklık ve toparlanma periyotları bakımından fizyolojik uyarana bağlıdır (Reilly, 2006; Branquinh ve ark., 2021). Dış antrenman yükü; antrenman kalitesini, miktarını ve antrenman bileşenlerini ölçmek, antrenman reçetesine genel bir bakış sağlama için antrenman organizasyonunun düzenlemesini sağlar (Impellizzeri ve ark., 2005;

Mujika ve ark., 2018. Bununla birlikte, performansı tahmin etmek için fitnes-yorgunluk bu iki terimi değerlendirmek için kullanılabilecek özel bir fizyolojik belirteç yoktur (Borresen ve Lambert, 2009). İç ve dış antrenman yük verilerinin birleştirilmesi, fitnes-yorgunluk iki terimliyle ilgili kavramsal engelin üstesinden gelmek için bir yaklaşım olarak kullanılabilir (Akubat ve ark., 2014). Ancak profesyonel futbolda antrenman yükü takibi sistemi konusunda fikir birliği yoktur (Akenhead ve Nassis, 2016). Takım sporlarında antrenman yükü ölçümündem genellikle büyük bir zorluk olarak bahsedilir. Bunun nedeni, yetenekli performansı ve karar verme becerisini etkileyen bilişsel yükü doğru bir şekilde değerlendirmenin zorluğu olabilir (Halson, 2014). Ayrıca, izleme araçlarının çeşitliliği, doz-yanıt değerlendirmelerinde kafa karışıklığı yaratmış gibi görünmektedir. Gerçekten de, bu verileri ilgili bilgilere dönüştürmek, antrenörler ve spor bilimcileri için önemli bir zorluk haline gelmiştir (Vanrenterghem ve ark., 2017). Antrenman yükü takibi açısından son zamanlarda çok fazla araştırma yapılmaktadır. Takım sporlarına odaklanan son araştırmalar ve meta-analizler, yükleme ve performans (Fox ve ark., 2018; McLaren ve ark., 2018), şiddet (Jasper ve ark., 2017), antrenman çıktıları (Silva ve ark., 2018), akut/kronik yorgunluk (Hader ve ark., 2019) ve sakatlanma/ağrı, hastalık arasındaki ilişkiyi değerlendirmeyi amaçlamışlardır. Antrenman yükünü toplamak ve yorumlamak için mikroteknolojinin kullanımı, takım sporlarında ve özellikle profesyonel futbolda büyük ölçüde revize edilmiştir. Maç koşu performansı (kat edilen mesafe), oyun içindeki pozisyon, formasyon ve rakip takım oyuncularının pozisyonu göz önüne alındığında geniş çapta tanımlanmıştır (Rampinin ve ark., 2007). Bununla birlikte, birikmiş antrenman ve maç yükünün izlenmesi hakkında daha önce yayınlanmış sistematik incelemeler ve/veya meta-analizler bulunmamaktadır. Maç oyunu en büyük fizyolojik uyarıcıyı temsil eder ve birincil performans sonucunu temsil eder (Mohr ve ark., 2003). Bununla birlikte, haftalık antrenman yükünün yaklaşık %80'i antrenman seanslarından, yaklaşık %20'si ise maçlardan kaynaklanmaktadır (Rebelo ve ark., 2012; Bangsbo ve ark., 2006). Antrenmanın kümülatif etkisini anlamak, bireysel sporcunun performansına rehberlik etmek için esastır (Coutts ve ark., 2018). Araştırmacılar, günümüze kadar bireysel antrenman şiddetini kapsayarak iç ve dış antrenman yükünü takibinde en uygun metodu geliştirmek için birçok çaba ortaya koymaktadırlar. Bu ortaya konan çabalar sonucunda günümüzde dış antrenman yükünü takip etmek için GPS, iç antrenman yükünü takip etmek için ise algılanan zorluk düzeyi skorunun (AZD) kullanılmasını futbol gibi aralıklı hareket içeriği temelli takım sporlarında kullanılmaktadır (Foster ve ark.; 2001). Hissedilen yorgunluk düzeyi skoruna göre içsel

antrenman yükü, dakika olarak antrenman süresinin ve hissedilen yorgunluk düzeyi skalasından elde edilen sayının çarpılmasıyla belirlenmektedir. Bununla birlikte içsel antrenman yükünün hesaplanabildiği hissedilen yorgunluk düzeyi verilerinden antrenman monotonluğu, zorluğu ve akut kronik iş yükü de hesaplanabilmektedir. Antrenman monotonluğu haftalık antrenman programında antrenmanların günden güne olan değişimini ifade ederken antrenman zorluğu ise yapılan antrenmanların sporcular üzerinde oluşturduğu zorluk seviyesini göstermektedir (Implelizzeri ve ark.; 2004).

Antrenman Yükü Takibinde İç Yükler

İç antrenman yükü, antrenmanlar esnasında oyunculara uygulanan fizyolojik ve psikolojik uyaranların ya da stresin toplamı olarak ifade edilmektedir (Cardinale ve Varley, 2017). Diğer bir deyişle dış antrenman yüküne bir yanıt olarak verilen tepkiler toplamıdır (Implelizzeri ve ark.; 2004). İç antrenman yükü oyuncuların fizyolojik ve psikolojik durumlarına, toparlanma zamanlarına, antrenmanın şiddetine, antrenman haricindeki yaşam stres kaynaklarına ve stresi tolere etme becerilerine bağlıdır. Bu yüzden oyuncuların antrenman yükü takibinde bireysel olarak değerlendirilmeleri oldukça önem taşımaktadır (Implelizzeri ve ark.; 2004). Meeusen ve arkadaşlarının yaptıkları araştırmada; oyunculardan elde edilen psikolojik belirteçlerin fizyolojik belirteçlerden çok daha hassas ve sabit olduğunu rapor etmişlerdir. Dahası psikolojik ölçümlerin, değerlendirmesi uzun zaman alabilen (birkaç gün/hafta) kan takip ölçüm yöntemleri ile karşılaştırıldığında zamandan da tasarruf edilerek uygulanabilir, veriler toplanabilir ve sonuçları raporlandırılabilir (Implelizzeri ve ark.; 2004). Antrenmanlar; antrenman şiddeti, antrenmanın türü ve antrenmanın hacmi bakımından içerisinde birçok faz bulundurmaktadır. Bu nedenle belirtilen bu antrenman fazları ayrı ayrı değerlendirmektense bir bütün olarak ele alınıp değerlendirilmesi antrenman yükü takibi açısından daha verimli olacaktır (Cardinale ve Varley, 2017). İç antrenman yükün takibi, antrenmanların bireyselleştirilmesine ve olası sakatlık risklerinin önlenmesine/en aza indirilmesine de olanak sağlamaktadır (Cardinale ve Varley, 2017).

Algılanan Zorluk Derecesi (AZD)

Bireylerin anlık durum ve düşüncelerinin değerlendirilmesi ile belirlenen subjektif değerlerin, objektif değerlere bağlı olup olmadığı literatürde araştırılan konular arasında yer almaktadır (Borg, 1982). Bu nedenle subjektif değerlendirme kapsamında elde edilen değerleri gerçeğe en yakın şekilde tanımlamak için Borg Skalası gibi birçok ölçek geliştirilmiştir (Borg, 1982). AZD, bireyin yapmış olduğu egzersizi subjektif bir şekilde

organizmada uyandırdığı şiddeti belirlemek amacıyla değerlendirilmesi olarak tanımlanmaktadır (Borg, 1982). Bu bağlamda sporcuların ise antrenmanların şiddetini belirleme konusunda pratik/kullanışlı ve verimli bir yöntem olarak da rapor edilmektedir. Literatürde elde edilen bilgiler doğrultusunda antrenman yükü takibi için tasarlanan birçok ölçek tabloları arasında en yaygın kullanımı olan ölçek Borg Skalası`dır. AZD (Borg Skalası) hem hastaların tedavilerinde hem de antrenman ve maçların değerlendirilmesinde kullanılmaktadır.Sporcularda, CR-10 Borg skalası ile antrenman ve müsabakaların algılanan zorluk dereceleri belirlemektedirler. Literatürde konuyla ilgili yapılan çalışmalardan elde edilen anlamlı ilişkilerden dolayı antrenman ve müsabaka değerlendirmelerinde antrenman algılanan zorluk derecesinin kullanılması önerilmiştir. AZD kullanımının antrenmandan 30 dakika sonra değerlendirilmiştir böylece, antrenman sonrası oluşabilecek akut etkilerden kaçınılmıştır. 30 dakika sonrasındaki değerlendirmenin dışında ek olarak; 24 saat ve 72 saat sonrasında da değerlendirme yapılabilmektedir (Scott TJ ve ark.; 2013). Bunun yanı sıra yetişkin bireylere ek olarak adölesan dönemdeki bireyler de AZD yöntemini kullanarak antrenman yükü takibi yapabilir ve müsabaka/antrenman sonuçları değerlendirebilirler (Scott TJ ve ark.; 2013). Yapılan bu çalışmada 10'luk Borg Skalası AZD kullanılarak antrenman iç yükü belirlenmiştir.

Antrenman Yükü Takibi: Akut/Kronik İş Yükü (AKİYO)

Sporda sakatlıkların antrenman ve müsabakalarda aşırı yüklenmeler sonucunda meydana geldiği söylenebilir ancak asıl problemin daha çok sporculara uygulanan yetersiz ve uygunsuz antrenman programları olduğu söylenebilir (Gabbett, 2016). Bu nedenler yetersiz ve uygunsuz antrenmanları önlemek antrenman yükü takibi ile mümkün olmaktadır. Bu nedenle konuyla ilgili son zamanlarda popüler olan antrenman yükü takibi metodu AKİYO ön plana çıkmaktadır (Banister ve ark.; 1983). Antrenman yükü takibi metodu olarak kullanılan Akut/Kronik İş Yükü Oranı 1975'te Bannister ve arkadaşları tarafından (Banister ve ark.; 1983) *"*Bir sporcunun antrenmana cevap olarak gösterdiği negatif fonksiyon (yorgunluk ile pozitif fonksiyon (fiziksel uygunluk) arasındaki fark ile değerlendirilen performans*"* şeklinde ifade edilmiştir. Akut iş yükü 7 günlük (1 haftalık) uygulanan antrenman ve maçların şiddetini belirtmektedir. Akut iş yükü, AKİYO'da "yorgunluk*"* değeri olarak tanımlanmaktadır. Kronik iş yükü ise 21 günlük (3 haftalık) uygulanan antrenman ve maçların ortalama şiddetini belirtmektedir. Aynı zamanda AKİYO'da sporcunun "fiziksel uygunluk*"* durumu da gösterilmektedir. AKİYO; akut iş yükü değerinin, kronik iş yükü oranına bölünmesi hesaplanmaktadır (Williams S. ve ark., 2017).Antrenman

yükü takibi hesaplamasında AKİYO oranlarının değerleri, kontaksız sakatlıkları önlemek ya da sporcuların performans değerlerini geliştirmek için çok önemlidir. AKİYO oranının düşük olması (<0,80) maksimum performans gösterildiğinde sakatlıklara ortam hazırlarken, bu oranın yüksek değerlerde olması (>1,50) aşırı yüklenmeden kaynaklı sakatlıklara zemin hazırlayacağı rapor edilmiştir (Gabbett, 2016). AKİYO'dan elde edilen optimal değerler ise, spor branşlarına ve kategorilere göre değişkenlik gösterebilmektedir. 0,80-1,30 arası değerler "en etkili bölge" olarak adlandırılırken, futbolcularda yapılan bir çalışmada 1,00 - 1,25 arası değerler en verimli AKİYO olarak rapor edilmiştir (Gabbett, 2016; Malone ve ark.; 2017).

GEREÇ VE YÖNTEM

Bu bölümde araştırmaya ait katılıcımlar, veri toplama aracı, araştırmanın hipotezi, evren ve örneklem, araştırmanın tasarımı, araştırmanın sınırlıkları, veri toplama yöntemleri ve verilerin istatistiksel analizleri hakkında bilgiler verilmiştir.

Katılımcılar

Bu çalışma, 2020-2021 sezonunda Türkiye Futbol Federasyonu Spor Toto Süper Liglerinde yer alan Antalyaspor takımında oynayan 20 erkek profesyonel oyuncu katılmıştır. Çalışmada yer alan katılımcılara ait fiziksel özellikler tablo 2'de gösterilmiş ve çalışmaya kaleciler dahil edilmemiştir.

Çalışma Dizaynı

Bu çalışma, 2021-2022 sezonunda TFF Spor Toto Süper Liginde resmi müsabakalara katılan Antalyaspor takımının sezon önce ve sezon içindeki 4'er haftalık antrenman periyotlarının ve lig maçlarının takibi ile gerçekleştirilmiştir. Çalışma süresince herhangi bir antrenman müdahalesinde veya tavsiyesinde bulunulmamıştır. Çalışmanın başlamadan önce takım oyuncularına ve teknik ekip içerisinde yer alan antrenörlere ve sağlık personeline iç antrenman yükü takibi metodu olan AZD'nin eğitimi ve uygulanmış olan sistem ile ilgili gerekli bilgiler verilmiştir. 12 haftalık çalışma süresince Antalyaspor'da düzenli olarak antrenman ve lig müsabakalarına dahil olan çalışmadaki 20 katılımcı, antrenman programları dahilinde toplamda 60±10 dk. süren 63 birim antrenman ve 11 lig müsabakasında yer almıştır. Oyuncuların katıldıkları bu antrenman ve lig müsabakaları sonucunda oluşan iç antrenman yükü bu değerlere bağlı olarak hesaplanmıştır.

Algılanan Zorluk Derecesi (AZD)

Futbolcularda uygulanan hazırlık dönemi ve müsabaka dönemi antrenmanlarından elde edilen algılanan zorluk dereceleri (AZD) subjektif bir şekilde değerlendirmeye alınmıştır.

Yapılan değerlendirmelerde CR-10 Borg Skalası kullanılmıştır (Borg, 1982; Malone ve ark.; 2017). 11 değeri olan skalada 0; dinlenmeyi tanımlarken, 10; tükenmişlik seviyesi olarak belirtilmektedir. Antrenman verilerinin değerlendirmesi, antrenmanların hemen ardında meydana gelen akut etkiden kurtulmak için 30 dakika sonrasında yapılmıştır (Borg, 1982). Araştırmada CR-10 Borg Skalasının kullanılma sebebi kısa süreli ve maliyetsiz olmasının yanında, futbolcular üzerinde yapılan bir çalışmada antrenman yükünü, kalp atım hızını baz alarak hesaplanan TRIMP yöntemleriyle yüksek korelasyon (r = 0.82 – 0.92) göstermiş olmasıdır (Scott ve ark.; 2013). AZD ile antrenman yükü, AKİYO ve monotonluk değerleri belirlenmiştir.

Antrenman Monotonluğu

Antrenman stresi ve kaygısı gibi psikolojik özellikler sporcuların performansını belirlemede önemli rol oynamaktadır. Psikolojik ölçütler de antrenman stresini tanımlamada, fiziksel stres ölçütleri kadar verimli olduğu söylenebilir. Sonuç olarak, yorgunluk veya aşırı yüklenmenin erken belirtilerini tespit etmek amacıyla antrenman stresi, gerginlik ve iyileşmedeki değişiklikleri izlemek için çeşitli psikolojik anketler uygulanmıştır (Elloumi ve ark., 2012). Antrenörler, yük hesaplama yöntemlerinin sonuçlara nasıl etki ettiğini dikkatle analiz etmelidir. Genel olarak antrenörler, takip için antrenman yüküne güvenmişlerdir. AZD'den hesaplanan antrenman yükü aynı zamanda takip için önemli olan 2 yöntemi de ortaya çıkarmaktadır (McGuigan, 2017). Antrenman zorluğu ve monotonluğu, parametrelerinin eklenmesi, sporcu ile antrenman sürecinde neler olup bittiğini tam olarak ortaya çıkarabilmektedir (McGuigan, 2017). Antrenman monotonluğu, günlük antrenman değişkenliğinin bir göstergesi olarak tanıtılabilir (McGuigan, 2004). Günlük ortalama yükün, günlük standart sapma değerine bölünmesiyle hesaplanır. Doğru hesaplama için antrenman yapılmayan günlere değer olarak "0" girilmelidir. Eğer antrenman yükü, haftanın her günü benzer değerlerde ise monotonluk değeri yüksek çıkacaktır. Fakat antrenman yükleri düşük ve yüksek olarak eşit şekilde dağılmış ise monotonluk değeri orta veya düşük seviyede olacaktır (McGuigan, 2004).

Monotonluk değeri haftalık ortalama yükün haftalık yükün standart sapma değerine bölünmesi ile hesaplanır.

Tablo 1. Antrenman Monotonluğunun Hesaplanması

$$\text{Akut / Antrenman Monotonluğu} = \frac{\text{1 Haftalık Günlük Ortalama Antrenman Yükü}}{\text{1 Haftalık Günlük Antrenman Yüklerinin Standart Sapması}}$$

Kronik İş Yükü Oranı Hesaplaması

Akut/Kronik İş Yükü Oranını 1975'te Bannister ve arkadaşları (Bannister ve ark., 1975) "Bir sporcunun antrenmana cevap olarak gösterdiği negatif fonksiyon (yorgunluk) ile pozitif fonksiyon (fiziksel uygunluk) arasındaki fark ile değerlendirilen performans" olarak tanımlamışlardır. Akut yük 7 günde (1 hafta) gerçekleştirilen antrenman ve maçların şiddetini temsil eder. Akut yük, AKİYO'da "yorgunluk" olarak değerlendirilir. Kronik yük ise 21 günde (3 hafta) gerçekleştirilen antrenman ve maçların ortalama şiddetini temsil eder. Sporcunun AKİYO'da "fiziksel uygunluk" durumunu gösterir. AKİYO'nun hesaplaması, akut iş yükü değerinin kronik iş yükü oranına bölünmesi ile bulunmaktadır. Oranların değerleri, temassız yaralanmaları önlemek veya performansı geliştirmek için önem arz eder. Oranın düşük olması (1,50) aşırı yüklenmeden yaralanmaya zemin hazırlayabilmektedir (Gabbett ve ark., 2016). Optimal değerler, branşlara ve kategorilere göre değişkenlik gösterebilir. 0,80-1,30 arası değerler "tatlı bölge" olarak adlandırılırken, futbolcularda yapılan bir çalışmada 1,00-1,25 arası değerler en verimli AKİYO olarak belirlenmiştir (Malone ve ark., 2017; Gabbett, 2016).

BULGULAR

"Bir Türkiye Süper Lig Futbol Takımında, Covid19 Pandemisi Sebebiyle Farklı Maç Sıklıklarında Antrenman Yükleri Değişimi" adlı araştırmanın sonucunda elde edilen bulgular bu bölümde sunulmuştur. Elde edilen bulgular, 2021-2022 sezonunda TFF Spor Toto Süper Liginde mücadele eden Antalyaspor takımında yer alan 20 katılımcının verilerinin değerlendirilmesiyle elde edilmiştir. Parametreler ile ilgili bulgular ayrı ayrı tablolarda verilerek değerlendirilmiş ve yorumlanmıştır. Bu parametreler, hazırlık dönemi, sezon içi ve Covid-19 dönemindeki antrenmanlarda kaydedilen AZD'ye göre değerlendirilen haftalık iç antrenman yükü ve monotonluğu, AKİYO ve antropometrik özelliklere ilişkin veri sonuçlarının anlamlılık düzeylerini ortaya koymuştur. Bu araştırma

sonucunda elde edilen bulguların ayrı ayrı normallik testi yapılmış ve verilerin "p>0,05" düzeyinde normal dağılım gösterdiği rapor edilmiştir.

Katılımcılara ait demografik özellikler

Çalışmaya katılan futbolcuların yaş, boy, vücut ağırlıkları, beden kütle indekslerine ilişkin istatistiksel değerlendirmeler gösterilmiştir. Katılımcılarının antropometrik özelliklerine ilişkin ön test verileri arasında istatistiksel açıdan bir fark bulunmamış (p>0,05) ve homojen bir grup oldukları belirlenmiştir.

Çalışmaya katılan futbolcuların demografik özelliklerine yönelik ön test verilerinin istatistiksel değerlendirilmesi tablo 2'de verilmiştir.

Tablo 2. Demografik Özellikler

	n	Min.	Maks.	Ort.	Ss.
Yaş (yıl)	20	18,00	35,00	28,6	4,01
Boy (cm)	20	1,68	1,92	1,80	,072
Vücut kütlesi (kg)	20	68,00	93,00	79,2	6,57
BKI	20	22,00	27,00	24,45	1,43

Tablo 3. Hazırlık Dönemi haftalık toplam yük, monotonluk, strain ve AKİYO verileri.

	n	Min.	Maks.	Ort.	Ss.
HTY 1	20	2493,0	5174,00	4098,2	745,4
HTY 2	20	2927,0	6173,00	3876,45	708,0
HTY 3	20	1327,0	4925,00	1862,6	740,5
HTY 4	20	1961,0	3990,00	2854,15	507,1
Monotonluk 1	20	,80	2,20	1,89	,377
Monotonluk 2	20	,80	2,60	1,87	,389
Monotonluk 3	20	,60	1,40	1,18	,149
Monotonluk 4	20	,90	1,40	1,15	,150
Strain 1	20	3319,0	11091,00	7883,4	2429,6
Strain 2	20	4879,0	10243,00	7101,0	1612,7
Strain 3	20	1547,0	2942,00	2143,15	325,1
Strain 4	20	1709,0	4870,00	3337,9	776,7
Akut/Kronik 1	20	1,20	2,00	1,63	,225
Akut/Kronik 2	20	1,10	2,20	1,56	,262
Akut/Kronik 3	20	,60	2,00	,94	,294
Akut/Kronik 4	20	,70	1,20	,89	,123

Tablo 3'te tanımlayıcı istatistik verilerine bakıldığında hazırlık dönemi 1.2.haftalarında kondisyonel özelliklere yönelik antrenmanların olması nedeniyle özellikle akut kronik iş yükü oranının yüksek olduğu (minimum 1.10± 0.26 – maksimum 2.20±0.26) ve bu durumu Şekil 2'deki Akut Kronik iş yükü Oranına göre değerlendirdiğimizde AKİYO>1.5 olduğunda sakatlık riskinin yüksek olduğu bilinmektedir ancak hazırlık dönemi futbola özgü kondisyonel özelliklerinde geliştirilmesi için yüklenmelerin yapıldığı dönem olarak geçmektedir. Hazırlık dönemi haftalık toplam yük değerleri ise minimum 1961±507.11 ve maksimum değerlerin ise 6172±708.05 olduğu görülmektedir. Bu durumda hazırlık dönemi başlar başlamaz antrenman yükü kademeli olarak arttığı için bu değişken antrenman yükü değerlerinin oluşması hazırlık dönemine ait normal olarak bilinmektedir.

Tablo 4. Hazırlık Dönemi, Haftada 1 Maç ve Yoğun Haftalara ait 1.Hafta Verileri

	n	Min.	Maks.	Ort.	Ss.
Yoğunhafta_HTY_1	20	900	3040	2053	625,74
Hazırlıkdönemi_HTY_1	20	2493	5174	4098,2	745,42
Haftada1maç_HTY_1	20	2315	3285	2766,2	280,52
Yoğunhafta_AC_CR_1	20	,80	2,60	1,365	,428
Hazırlıkdönemi_AC_CR_1	20	1,20	2,00	1,63	,225
Haftada1maç_AC_CR_1	20	,70	1,20	,880	,147

Tablo 5. Hazırlık Dönemi, Haftada 1 Maç ve Yoğun Haftalara ait 2.Hafta Verileri

	n	Min.	Maks.	Ort.	Ss.
Yoğunhafta_HTY_2	20	1235	3190	2044,2	491,16
Hazırlıkdönemi_HTY_2	20	2927	6173	3876,4	708,05
Haftada1maç_HTY_2	20	1553	3718	2647,8	583,52
Yoğunhafta_AC_CR_2	20	,60	3,80	1,500	,772
Hazırlıkdönemi_AC_CR_2	20	1,10	2,20	1,565	,261
Haftada1maç_AC_CR_2	20	,50	1,10	,830	,178

Tablo 6. Hazırlık Dönemi, Haftada 1 Maç ve Yoğun Haftalara ait 3.Hafta Verileri

	n	Min.	Maks.	Ort.	Ss.
Yoğunhafta_HTY_3	20	1250	3645	2205,9	604,1
Hazırlıkdönemi_HTY_3	20	1327	4925	1862,6	740,59
Haftada1maç_HTY_3	20	1901	3361	2507,9	364,14
Yoğunhafta_AC_CR_3	20	,80	3,70	1,61	,876
Hazırlıkdönemi_AC_CR_3	20	,60	2,00	,940	,294
Haftada1maç_AC_CR_3	20	,60	1,00	,790	,091

Tablo 7. Hazırlık Dönemi, Haftada 1 Maç ve Yoğun Haftalara ait 4.Hafta Verileri

	n	Min.	Maks.	Ort.	Ss.
Yoğunhafta_HTY_4	20	1230	2300	1758	307,95
Hazırlıkdönemi_HTY_4	20	1961	3990	2854,1	507,11
Haftada1maç_HTY_4	20	1922	4013	2558,2	528,29
Yoğunhafta_AC_CR_4	20	,70	2,90	1,265	,596
Hazırlıkdönemi_AC_CR_4	20	,70	1,20	,8950	,123
Haftada1maç_AC_CR_4	20	,80	1,30	,9700	,141

TARTIŞMA VE SONUÇ

Elit erkek futbolcularda (Anderson ve ark., 2016; Saw ve ark., 2016) yapılan önceki araştırmalar, maçlar sırasında kat edilen toplam mesafenin; 10.000 ila 11.000 m arasında değiştiğini, antrenman bölümleri sırasında kat edilen toplam mesafenin ise ortalama 5.223 ila 6.406 m olduğunu bildirmiştir (Anderson ve ark., 2016). Ayrıca yüksek şiddetli koşu mesafesi ve oyuncu yükü ortalamaları sırasıyla 515 ± 213 m ve 523 ± 88 AU (Malone ve ark., 2018) olarak belirlenmiştir. Malone ve arkadaşları yapmış oldukları çalışmada futbol oyuncularının yüksek akut yüke sahip futbolcuların, düşük yüke sahip futbolcularla kıyaslandığında, daha yüksek derecede bir sakatlık riski ile karşılaşabileceğini belirtmişlerdir. Ayrıca ani yüklenmelerde yüksek kronik yüke sahip futbolcuların, düşük kronik yüke sahip futbolculara oranla yükü daha iyi tolere edebileceğini belirtmiştir (Malone ve ark.; 2017). Sampson ve arkadaşları yüksek (Akut Kronik İş Yükü Oranı) AKİYO'nun düşük zindelik ve gecikmiş kas ağrıları ile doğrudan ilişkili olduğunu belirtmiştir. Bunun yanı sıra zindelik değerlerinin ve gecikmiş kas ağrısı değerlerinin normalin altında olması yüksek AKİYO ile sakatlık riskini artırabileceğini belirmişlerdir (Sampson ve ark., 2019). Whitehead ve arkadaşlarının (Whitehead ve ark., 2019) futbol oyuncuları ile yapmış oldukları çalışmada antrenman yükünün güvenli oran aralığının 1,02-1,14 olarak belirtildiğini rapor etmişlerdir. Belirtilen bu oranlar aralığında yapılan araştırmaların daha güvenli olabileceğini de belirtilmişlerdir. Akut Kronik İş Yükü Oranı ve sakatlanma ilişkisi üzerine Griffin ve arkadaşlarının düzenlemiş oldukları derleme çalışmasında temassız sakatlıkların AKİYO ile ilişkili olduğunu ve bu oranların takip edilmesi gerektiğini belirtmişlerdir (Griffin ve ark., 2019). Hulin ve arkadaşları kriket sporcularında yaptığı çalışmada, dış ve iç yük AKİYO hesaplamalarındaki yüksek değerlerin yaralanma riskini artırabileceğini belirtmiştir (Hulin ve ark.; 2014). Malone ve arkadaşları 1,00-1,25 AKİYO değerinin referans grubuna oranla (≤ 0,85) daha düşük yaralanma riski olduğunu gözlemlemişlerdir (Malone ve ark., 2017). Antrenman yükü takibi üzerine son dönemlerde AKİYO ve sakatlık ilişkisi ile ilgili çalışmalar yapılmaktadır. Ancak bu çalışmalarda bazı araştırmacılar sakatlık öngörüsünde AKİYO'nun etkili olduğu görüşünü savunurken, diğer araştırmacılar ise bu görüşü reddetmektedir (Impellizzeri ve ark.; 2019). Çalışmalar >2,00 oranları için, aşırı antrenman sendromuna yol açabileceğini belirtmektedir (Paulauskas ve ark.; 2022). Thornton ve arkadaşları profesyonel takım sporcularında yaptığı bir çalışmada, haftalık antrenman monotonluğu ile hastalanma riskini ve zindelik durum ile hastalanma riskinin ilişkili olduğunu belirtmiştir (Torren ve ark.; 2016). Paulauskas ve arkadaşları elit

kadın basketbol takımında yaptığı bir çalışmada, en düşük monotonluk değerini 0,82, en yüksek monotonluk değerini ise 1,65 olarak görüldüğünü belirtmişlerdir (Paulauskas ve ark.; 2022). Foster ve arkadaşları tecrübeli sporcularda antrenman yükünü, antrenman monotonluğu, aşırı antrenman sendromu ve hastalanma durumuna olan etkisini incelediği çalışmada, antrenman yükündeki ani çıkışların sporcuların hastalanma olasılığını %84, antrenman monotonluğundaki ani çıkışların hastalanma olasılığını %77 oranında tahmin edebileceğini savunmuştur (Foster, 1998).Bazı araştırmacılar, bir futbol takımında oyuncunun taktiksel rolünün önemini ve bunun performansla ilişkisini ortaya koymuşlardır. TD, LIS ve HIS gibi fiziksel değişkenlerin incelenmesi de fiziksel performans ve sakatlanma oranı ile ilişkilendirilmiştir (Di Salvo ve ark., 2007). Ancak bazı yazarlar hızlanma, yavaşlama, toplam yük veya akut:kronik yük oranlarının hesaplanması gibi diğer performans değişkenlerinin önemini vurgulamıştır (Gabbett, 2016). Sezon öncesi 1 haftalık ≥1500 ila ≤2120 AU arası yüklere maruz kalan oyuncular, ≤1500 AU kontrol grubuna kıyasla önemli ölçüde daha yüksek sakatlanma riski altındalardır (OR = 1.95, p = 0.006). Artmış aralıklı aerobik kapasiteye sahip oyuncular, antrenman yükündeki artan 1 haftalık mutlak değişiklikleri daha düşük kondisyon seviyelerine sahip oyunculara göre daha iyi tolere edebildiler (OR = 4.52, p = 0.011). Sezon içinde>1.00 ila <1.25 (OR = 0.68, p = 0.006) akut:kronik iş yükü oranları uygulayan oyuncular, kontrol grubuna (≤0.85) kıyasla önemli ölçüde daha düşük sakatlanma riski altında oldukları rapor edilmiştir (Malone ve ark., 2017).Antrenman ve maç yüküne ek olarak birçok faktör, oyuncuların yaralanma riskini etkiler. Örneğin önceki yaralanma algılanan kas ağrısı, yorgunluk, ruh hali, uyku derecelendirmeleri (Issurin, 2010) ve psikolojik stresörler mevcut analizde hesaba katılmamıştır. Algılanan zorluk derecesi (AZD) takım sporlarında antrenman yükünü ölçmek için kabul edilebilir bir yöntem olarak önerilmiştir (Clarke ve ark., 2013).

SONUÇ

Çalışmamız profesyonel futbolcularda hazırlık dönemi, haftada 1 maç ve pandemic döneminde oynanan yoğun maç dönemine ait raporu bulgularda göstermektedir. Farklı dönemlere ait antrenman yükü değişkenlerinin haftalık antrenman programının türünden, oyuncunun müsabakaya başlangıç durumundan (ilk 11), mevkisel farklılıklardan, antrenman modundan ve durumsal faktörlerden etkilendiğini söyleyebiliriz. Bu nedenle müsabakanın olmadığı (hazırlık dönemi), haftada 1 maç olan dönemde antrenman yükünün daha fazla olduğunu ve buna karşıt olarak yoğun maç döneminde antrenman yüklerinin çok düşük olduğunu çalışmamız bulgularından elde edilen sonuçlardandır.

Öneriler

- Çalışma 20 profesyonel erkek oyuncu ile yapılmıştır. Benzer çalışmalar daha fazla oyuncu sayısı ile yapılabilir.
- Çalışma Covid Döneminde tek bir takımı temsil etmek üzere yapılmıştır. Benzer çalışmalar daha fazla sayıda takımlara uygulanarak da karşılaştırma yapılabilir.
- Çalışma elit erkek futbolcular üzerinde yapılmıştır. Benzer çalışmalar elit kadın futbolcular üzerinde, amatör futbolcular üzerinde de yapılabilir.
- Çalışmada iç yük belirlemede subjektif yöntem kullanılmıştır. Sonraki benzer çalışmalarda iç yükü belirlemede objektif yöntemler ile sübjektif yöntemler arasındaki ilişki incelenebilir.
- Çalışmada sadece iç yük belirleme yöntemleri dahil edilmiştir. Sonraki çalışmalarda iç ve dış yükler birlikte ölçülerek elde edilen verilerler; hızlanma, yavaşlama, yüksek şiddetli hız, yön değiştirme, sıçrama gibi değişkenler de analize katılabilir.
- Çalışmada tek bir AKİYO hesaplaması kullanılmıştır. Sonraki çalışmalarda AKİYO hesaplanırken Üssel Ağırlıklı Hareketli Ortalama (EWMA) ve Yuvarlanan Ortalama (RA) yöntemleri karşılaştırılabilir.
- Profesyonel futbolcularda optimal AKİYO değerleri belirlenebilir.

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LASTİK PİŞİRME KALIPLARINDAKİ DESEN SEGMENTLERİNİN DÖKÜM YÖNTEMİYLE İMALATINDA MEYDANA GELEN HATALARIN İNCELENMESİ

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ÖZET
Teknolojik gelişmelerin en fazla olduğu alanların başında otomotiv sektörü gelmektedir. Taşıtları meydana getiren bileşenlerin her birisi için hem maliyet hem de güvenirlilik bakımından önemli araştırma ve çalışmalar yapılmaktadır. Lastikler otomobilin yerle temasını sağladığı için sürüş güvenliği açısından çok önemlidir. Hava koşullarını da dikkate alarak, kullanılan lastiğin iyi bir yol tutuşu hem kazaları önleme hem de verimli performans alabilme açısından oldukça önemli olmaktadır. Lastiklerin imalatı, istenilen tasarımlara göre imalatı yapılmış olan kalıplar kullanılarak, lastik pişirme preslerinde yapılmaktadır. Lastik pişirme preslerinde kullanılan kalıplar, istenilen desen tasarımına göre imalatları yapılmış olan desen segmentlerinin birleştirilmesinden meydana gelmektedir. Desen segmentlerinin imalatları, lastiklerin sırt desenine göre farklı malzemeler kullanılarak ve farklı imalat yöntemleri ile yapılmaktadır. Genellikle kış lastiklerinin imalatında kullanılan lastik pişirme presindeki desen segmentleri alüminyum alaşımlı malzemelerden döküm yöntemiyle üretilmektedir. Yaz lastiklerinin imalatında kullanılan lastik pişirme presindeki desen segmentlerinin imalatları ise CAD-CAM teknolojisi kullanılarak talaşlı imalat ve 5 eksen üretim yöntemiyle alüminyum alaşımlı ve çelik malzemelerden yapılmaktadır. Desen segmentlerinin imalatında malzeme seçiminin doğru yapılması, imalat esnasında ve imalat sonrasında önemli kalite kontrollerinin yapılması gerekmektedir. Döküm yöntemiyle üretilen segmentlerde mikroyapıda porozite miktarının yüksek olması ve döküm hatalarının meydana gelmesi nedeniyle imalatta önemli zorluklarla karşılaşılmaktadır. Bu çalışmada, bir lastik pişirme presi kalıbında kullanılan desen segmentinin döküm yöntemiyle imalatında meydana gelen hatalar ve önleme yöntemleri hakkında bilgiler verilmiştir.
Anahtar Kelimeler: Lastik, Desen Segmenti, Döküm, Hatalar.

INVESTIGATION OF FAILURES OCCURRED IN THE MANUFACTURING OF TREAD SEGMENTS IN TIRE CURING MOLDS USING THE CASTING METHOD

ABSTRACT
The automotive industry is one of the areas where technological developments occur the most. Significant research and studies are carried out for each of the components that make up the vehicles, in terms of both cost and reliability. Tires are very important for driving safety as they ensure the contact of the car with the ground. Taking into account the weather conditions, good road holding of the tire used is very important in terms of both preventing accidents and achieving efficient performance. Tires are manufactured in tire curing presses using molds manufactured according to the desired designs. Molds used in tire curing presses consist of combining tread segments manufactured according to the desired tread design. Tread segments are manufactured using different materials and different manufacturing methods depending on the tread pattern of the tires. The tread segments in the tire curing presses, which is generally used in the production of winter tires, are produced from aluminum alloy materials by the casting method. The tread segments in the tire curing presses used in the production of summer tires are manufactured from aluminum alloys and steels materials using CAD-CAM technology, machining and 5-axis manufacturing method. It is necessary to make correct material selection in the manufacturing of tread segments and to carry out important quality controls during and after manufacturing. In the segments produced by the casting method, significant difficulties are encountered in manufacturing due to the high amount of porosity in the microstructure and the occurrence of casting failures. In this study, information is given about the failures that occur in the casting method of manufacturing the tread segment used in a tire curing press mold and the prevention methods.
Keywords: Tire, Tread Segment, Casting, Failures.

GİRİŞ

Taşıtların yüksek performansları ve kullanıcılara sağlanan yenilikler için önemli teknolojik yenilikler yapılmaktadır. Taşıtların kullanımları esnasında yerle temasını sağlayan lastiklerin de performansları çok önemli olmaktadır. Lastikler sırt, omuz, yanak ve topuk olmak üzere dört farklı bölümden oluşmaktadır. Üzerinde kılcal kanallar bulunan sırt bölgesi lastiğin zeminle temasını sağlamaktadır. Mevsimlere göre kullanılan lastikler üretim malzemelerinin haricinde, sırt deseni, kanallar ve diş derinliğinde de farklı özellikler göstermektedir (Rodgers, 2020, French, 1989). Lastiklerin imalatı, istenilen tasarımlara göre imalatı yapılmış olan kalıplar kullanılarak, lastik pişirme preslerinde yapılmaktadır. Lastik pişirme preslerinde kullanılan kalıplar, istenilen desen tasarımına göre imalatları yapılmış olan desen segmentlerinin birleştirilmesinden meydana gelmektedir. Desen segmentlerinin imalatları, lastiklerin sırt desenine göre farklı malzemeler kullanılarak ve farklı imalat yöntemleri ile yapılmaktadır. Genellikle kış lastiklerinin imalatında kullanılan lastik pişirme presindeki desen segmentleri alüminyum alaşımlı malzemelerden döküm yöntemiyle üretilmektedir. Yaz lastiklerinin imalatında kullanılan lastik pişirme presindeki desen segmentlerinin imalatları ise CAD-CAM teknolojisi kullanılarak talaşlı imalat ve 5 eksen üretim yöntemiyle alüminyum alaşımlı ve çelik malzemelerden yapılmaktadır. Desen segmentlerinin imalatında malzeme seçiminin doğru yapılması, imalat esnasında ve imalat sonrasında önemli kalite kontrollerinin yapılması gerekmektedir. Döküm yöntemiyle üretilen segmentlerde mikroyapıda porozite miktarının yüksek olması ve döküm hatalarının meydana gelmesi nedeniyle imalatta önemli zorluklarla karşılaşılmaktadır.Desen segmentlerinin imalatında alüminyum alaşımlarının tercih edilmesinde, bu malzemelerin hafiflik, korozyon direnci, elektrik ve ısı iletkenliğinin yüksek olması, yüksek dayanıma sahip olmalarıdır. Desen segmentlerinin alüminyum alaşımlarından döküm yöntemiyle imalatları esnasında istenilen kalitede üretim yapılabilmesi için üretim proseslerine çok dikkat edilmesi gerekmektedir. Alüminyum alaşımı malzemelerin metal kokil kalıba dökümde en çok rastlanan döküm hataları; gaz boşlukları, porozite, sıcak yırtılmalar, sıvı alüminyumun kuma işlemesi ve çarpılmadır. Bu hataların meydana gelmemesi ve minimuma indirilmesi için ergimiş olan alüminyum alaşımının çok temiz olması, parça tasarımının iyi yapılması, kalıp ve yolluk tasarımının uygun olması gerekmektedir. Tasarımı yapılan lastiklerin imalatında kullanılacak olan desen segmentlerinin ayrı ayrı imalatları yapılarak kovan olarak adlandırılan yerde bir araya yerleştirilmeleri yapılarak lastiğin imalatında bütün kalıbı oluşturmaktadır. Aşağıdaki Şekil 1'de döküm yöntemiyle imalatı yapılan bir

desen segmentine örnek verilmektedir. Şekil 2'de ise lastik pişirme kalıbının ayrıntılı resmi ve burada desen segmentlerinin kullanım yeri verilmiştir.



Şekil 1. Desen segmentinin görünüşü



Şekil 2. Lastik pişirme kalıbı (Uzer Makina Şirket Kataloğu, 2023)

DESEN SEGMENTLERİNİN İMALATI

Desen Segmentlerinin Döküm Yöntemi İle İmalatı

Makine parçalarının döküm yöntemlerini kullanarak imalatında farklı döküm yöntemleri kullanılmaktadır. Desen segmentlerinin alüminyum malzeme kullanarak metal kokil kalıba döküm yöntemi ile imalatı en çok kullanılan yöntemlerin başında gelmektedir. Bu çalışma kapsamında desen segmentlerinin imalatında kullanılan kokil (metal) kalıba döküm sistemi aşağıdaki Şekil 3'de ve döküm yapılan desen segmentine bir örnek ise Şekil 4'de verilmiştir. Desen segmentlerinin alüminyum malzemeden döküm işlemi sonrasında mikro yapıda porozitelerin meydana gelmesini engellemek için önemli önlemlerin alınması gerekmektedir (Vinarcik, 2003, Campbell, 2015). Desen segmentlerinde porozitelerin meydana gelmesi desen segmentlerine yerleştirilen kerflerin montajında önemli sorunlar oluşturmaktadır. Desen segmentlerinin döküm yöntemi ile imalatında pek çok işlem aşamaları vardır ve bu süreçte gerekli kalite kontrol işlemlerinin yapılması gerekmektedir.



Şekil 3. Desen segmentlerinin döküm işlemlerinin yapıldığı metal kalıba döküm sistemi



Şekil 4. Desen segmentlerinin döküm işlemi sonrası resmi

Aşağıda bir desen segmentinin metal kalıba döküm yöntemi ile imalatında uygulanan işlemler verilmiştir.

1. Malzeme temini
2. Müşteriden 2D ve 3D ürün datası temini
3. Kerf ve model tasarımının yapılması
4. Model malzemesinin kesilmesi
5. Modelin teknik resimde belirtilen değerlere göre işlenmesi
6. Kalite kontrol
7. Model kerflerinin çakılması
8. Silikonun hazırlanması
9. Silikona kerflerin yerleştirilmesi
10. Alçı kalıbın hazırlanması
11. Döküm işleminin yapılması
12. Kalite kontrol

2.2 Desen Segmentlerinde Meydana Gelen Döküm Hataları

Desen segmetlerinin metal kalıba döküm yöntemiyle imalatında ürün kalitesini etkileyen pek çok faktör vardır. Döküm yapılan parçaların kalitesini etkileyen faktörler; malzeme bileşimi, parçanın tasarımı, döküm kalıbı tasarımı, yolluk tasarımı, döküm hızı ve sıcaklıktır. İstenilen kalitede üretim yapılabilmesi için kaliteyi etkileyen faktörlere çok dikkat edilmesi gerekmektedir. Desen segmentlerinin metal kalıba döküm yöntemiyle imalatlarında, alçı problemleri, sıcak yırtılma, hidrojen boşluğu, porozite ve boyutsal hassasiyetlerde sapmalar hataları meydana gelebilmektedir. Desen segmentlerinin metal kalıba döküm yöntemiyle üretimi esnasında döküm işlemleri yapıldıktan sonra alçıların kalitesi ve üretim proseslerine bağlı olarak desen segmentlerinin bazı bölgelerinde alçı kopmaları meydana gelebilmektedir. Aşağıdaki Şekil 5'de desen segmentlerinin döküm işlemleri sonrasında meydana gelen alçı problemine bir örnek resim verilmiştir.



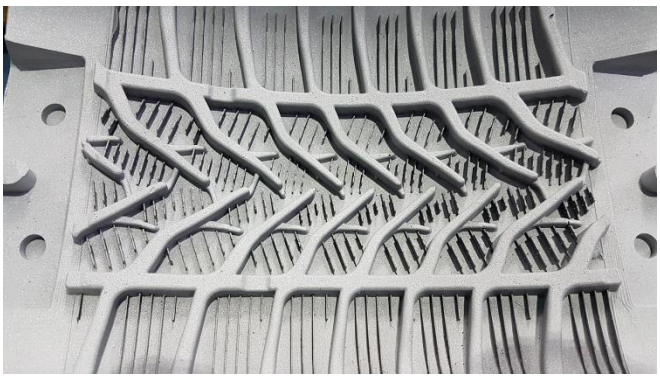
Şekil 5. Desen segmentlerinde meydana gelen alçı hatası

Desen segmentlerinin alüminyum alaşımı malzemeden metal kalıba döküm işlemleri esnasında, desen segmentinin soğuması sırasında oluşan iç gerilmelerin kesit farklılıklarında değişiklik göstermesi sonucu desen segmentlerinin bazı bölgelerinde sıcak yırtılmalar meydana gelmektedir. Aşağıdaki Şekil 6'da desen segmentlerinin metal kalıba döküm işlemi esnasında meydana gelen sıcak yırtılma hatasına ait bir resim verilmektedir. Sıcak yırtılma hatalarının önlenmesi için, desen segmenti tasarımında büyük kesit farklılıklarının olmamasına dikkate edilmelidir (Kaufman, 2004).



Şekil 6. Desen segmentlerinde meydana gelen sıcak yırtılma hatası

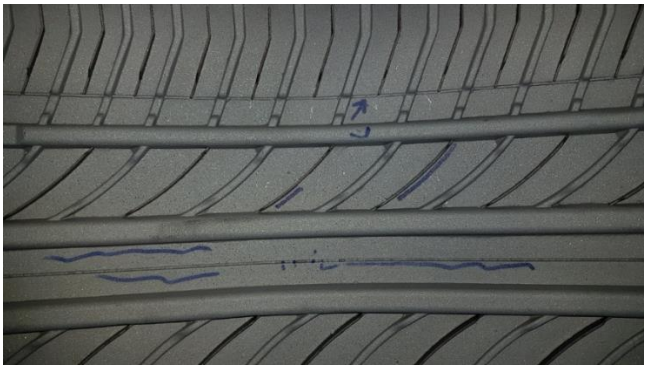
Desen segmentlerinin metal kalıba döküm işlemleri esnasında meydana gelen önemli hatalardan bir tanesi de hidrojen boşluğu hatasıdır. Döküm işlemleri esnasında, yüksek döküm sıcaklığında sıvı alüminyum içinde çözünmüş olarak bulunan hidrojen gazının büyük bir kısmı, katılaşma sırasında dışarı atılır. Ancak, gaz giderme işleminin yetersizliğinden dolayı dışarıya atılamayan hidrojenden dolayı hidrojen boşluğu hatası meydana gelebilmektedir (Kaufman, 2004).



Şekil 7. Desen segmentlerinde meydana gelen hidrojen boşluğu hatası

Desen segmentlerinin metal kalıba döküm işlemleri esnasında, ocaklarda ergitilen sıvı alüminyumun potalar ile kalıba aktarılması esnasında veya kalıplardan gelen oksit filmler ile döküm işlemleri esnasında türbülans oluşumundan kaynaklanan yeni oksit filmlerin

segmentlerin içerisine sürüklenmesi segmentlerin içerisinde poroziteye neden olmaktadır (Vinarcik, 2003, Campbell, 2015). Aşağıdaki Şekil 8'de desen segmentlerinde meydana gelen porozite hatalarını göstermektedir.



Şekil 8. Desen segmetlerinde meydana gelen porozite hatası

Desen segmetlerinin döküm işlemleri sonucunda meydana gelen porozite hataları, üretilen üründe birçok olumsuz etkiye sebep olur.

SONUÇ

Bu çalışmada, bir lastik pişirme presi kalıbında kullanılan desen segmentinin döküm yöntemiyle imalatında meydana gelen hatalar ve önleme yöntemleri hakkında bilgiler verilmiştir. Desen segmentlerinin metal kalıba döküm yöntemiyle imalatlarında, alçı problemleri, sıcak yırtılma, hidrojen boşluğu, porozite ve boyutsal hassasiyetlerde sapmalar hataları meydana gelebilmektedir. İstenilen kalitede üretim yapılabilmesi için kaliteyi etkileyen faktörlere çok dikkat edilmesi gerekmektedir.

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TÜRKİYE'DE TÜKETİM VERGİLERİNİN YAŞAM STANDARDINA ETKİSİ: MEVCUT YAKLAŞIMLAR VE GELECEK PERSPEKTİFLERİ

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Özet
Türkiye'deki tüketim vergilerinin yaşam standartlarına etkisi üzerine yapılan araştırma, bu vergilerin ekonomik ve sosyal etkilerini incelemektedir. Tüketim vergileri ülkenin gelir kaynaklarından biridir ve bu vergiler, fiyatlardaki etkileri nedeniyle toplum üzerinde büyük bir etkiye sahiptir. Türkiye'de tüketim vergilerinin fiyatları yükselmesi, genel olarak daha düşük tasarruflar ve yatırımlar, daha yüksek işsizlik ve daha düşük yaşam standartlarına neden olabilir.Bu araştırma, Türkiye'deki tüketim vergilerinin yaşam standartlarına etkisi mevcut yaklaşımlar ve gelecek perspektifleri açısından incelenmektedir. Bu konudaki çalışmalar ve uygulamalar analiz edilmiş ve geleceğe yönelik senaryolar için tahminlerde bulunulmuştur. Ayrıca, vergi politikalarının yaşam standardı üzerindeki etkisi konusunda önerilerde bulunulmuştur.Özetle, Türkiye'deki tüketim vergilerinin yaşam standartlarına etkisi üzerine yapılan araştırma, mevcut yaklaşımlar ve gelecek perspektifleri açısından bu vergilerin ekonomik ve sosyal etkilerini incelemekte ve vergi politikalarının yaşam standardı üzerindeki etkisi konusunda öneriler sunmaktadır.
Anahtar Kelimeler: Tüketim vergileri, Türkiye ekonomisi, Yaşam standardı, Mevcut yaklaşımlar, Gelecek perspektifleri

IMPACT OF CONSUMPTION TAXES ON THE STANDARD OF LIVING IN TURKEY: CURRENT APPROACHES AND FUTURE PERSPECTIVES

Abstract
The research on the impact of consumption taxes in Turkey on living standards examines the economic and social effects of these taxes. Consumption taxes are one of the country's sources of income, and due to their effects on prices, they have a significant impact on society. The increase in consumption taxes in Turkey may lead to generally lower savings and investments, higher unemployment, and lower living standards.This research investigates the impact of consumption taxes in Turkey on living standards in terms of current approaches and future perspectives. Studies and practices on this topic have been analyzed, and predictions have been made for future scenarios. Additionally, recommendations have been made regarding the impact of tax policies on living standards.In summary, the research on the impact of consumption taxes in Turkey on living standards examines the economic and social effects of these taxes in terms of current approaches and future perspectives, and provides recommendations on the impact of tax policies on living standards.
Keywords: Consumption taxes, Turkish economy, Living standards, Current approaches, Future perspectives

Giriş

Son yıllarda Türk ekonomisi hızla gelişen ve değişen bir yapıya sahiptir. Bu değişim süreci birçok faktör tarafından belirlenirken, tüketim vergileri de bunlardan biridir. Tüketim vergileri, ülkedeki ekonomik faaliyet ve yaşam standardı üzerinde doğrudan bir etkiye sahiptir. Tüketim vergileri, ülkenin ekonomik yapısını ve büyümesini etkilerken, aynı zamanda sosyal adalet, tasarruf oranı ve dış ticaret gibi konuları da etkilemektedir. Çalışmamızda, Türkiye'de tüketim vergilerinin yaşam standardı üzerindeki etkisi, farklı sosyo-ekonomik gruplar üzerindeki etkiler ve iyileştirme yolları açısından incelenmiştir. Türkiye'de tüketim vergilerinin yaşam standartları üzerindeki etkisi, farklı sosyo-ekonomik gruplarda nasıl görülmektedir? Türkiye'deki tüketim vergi sistemi nasıl iyileştirilebilir ve vergilerin yaşam standartları üzerindeki etkisi nasıl azaltılabilir? Bu sorular, bu çalışmanın odak noktası olarak belirlenmiştir. Türkiye'deki tüketim vergilerinin etkileri farklı sosyo-ekonomik gruplar üzerindeki vergilerin yapı ve uygulamasındaki eşitsizlikleri ortaya koymuştur. Vergilerin yapı ve uygulamasındaki eşitsizlikler aynı zamanda sosyal adalet konularını da etkilemektedir. Türkiye'deki tüketim vergilerinin yapı ve uygulaması, tasarruf oranı üzerindeki etkileri ve bu etkilerin nasıl yönlendirilebileceği? ile Türkiye'deki tüketim vergi sistemi, diğer ülkelerdeki tüketim vergi sistemleri ile karşılaştırıldığında nasıl değerlendirilmelidir? gibi sorular, farklı sosyo-ekonomik gruplar üzerinde tüketim vergilerinin etkilerini ve iyileştirme yollarını araştırmayı amaçlamaktadır. Çalışmanın diğer odak noktalarından bazıları ise tüketim vergilerinin yapı ve uygulamasındaki eşitsizlikleri azaltmak, tasarruf oranı üzerindeki etkileri yönlendirmek ve vergilerin dış ticaret üzerindeki etkilerini değerlendirmektir. Bu çalışma, Türk ekonomisini ve tüketim vergilerinin yaşam standardı üzerindeki etkilerini daha iyi anlamak için önemlidir. Ayrıca, tüketim vergi sisteminin iyileştirilmesi ve vergilerin yaşam standardı üzerindeki etkilerinin azaltılması açısından da önemlidir.

Vergi ve Vergi Türleri

Vergi; devletlerin, vatandaşlarından ve şirketlerden yasayla belirtilen şekline uygun olarak kamu hizmetleri karşılığında topladığı ücrettir. Bu ödemeler kamu kurumlarında sunulan hizmetlerin karşılanması ve döngüsel olarak devlet hizmetlerinin işlemesi için talep edilir.

Vergiler, kamu gelirlerinin en büyük payını oluşturmasına rağmen, belirli makroekonomik hedeflerin gerçekleştirilmesinde çok önemli bir araç olarak kullanılırlar. Vergilerin finansal ve ekonomik amaçlarının yanı sıra sosyal ve siyasi amaçları da vardır. Verginin en önemli amacı, kamu harcamalarının işleyişini sağlamaktır. Devletler, faaliyetlerine devam etmek

için gerekli finansal kaynakları elde etmek amacıyla vergi toplamak zorundadır. Vergilerin amacı, sadece devletin ihtiyacı olan finansmanı sağlamakla sınırlı değildir. Aynı zamanda vergi yükünün adil bir şekilde dağıtılması amaçlanmaktadır. Vergilerin, sadece devletin finansmanı için toplanmadığı düşünülmektedir. Aynı zamanda vergiler, tam istihdam, gelir dağılımının iyileştirilmesi, ekonomik büyüme ve kalkınma gibi ekonomik, sosyal, teknik ve siyasi hedefleri de içerebilir. Bu vergiler, mali vergilerin aksine, "ekstra-fiskal" olarak da adlandırılır (Aksoy, 1998). Ancak, her ülkenin sosyo-ekonomik gelişim düzeyi farklı olduğundan, vergi politikasının amaçları da değişebilir (Öztürk, 2012).

Mal ve hizmetlerin tüketimi, ekonomik refah düzeyini belirleyen en önemli faktördür ve yaşam standardının en önemli göstergesidir. Diğer tüm faktörler eşit olsa bile, daha yüksek bir tüketim düzeyine sahip bir birey, daha düşük bir tüketim düzeyine sahip bir bireyden daha yüksek bir ekonomik refah düzeyine sahiptir (OECD, OECD Framework for Statistics on the Distribution of Household Income, Consumption and Wealth, 2013). Araştırmalar, tüketimin gelir ve servet dağılımından daha iyi bir refah ölçüsü olduğunu göstermektedir (Modigliani & Brumberg, 1954). Bunun ilk nedeni, tüketimin gelire kıyasla yıl içinde bu kadar büyük değişiklikler göstermeyebilmesidir. Çünkü insanlar tüketimlerini düzeltmeye eğilimlidirler. İkinci neden ise gelirin, refahı artıran tüm kaynakları içermemesidir, örneğin servet ve tasarrufları içermez (Meyer & Sullivian, 2016).

Bu vergi türleri, "dolaylı" ve "doğrudan" vergiler olmak üzere iki kategoriye ayrılır. Dolaylı vergiler; bir işlem üzerinden alınan vergilerdir (Uluslararası Şeffaflık Derneği, Türkiye'de Dolaylı ve Dolaysız Vergiler, 2016). Doğrudan vergiler ise; gelir veya servetten alınan vergilerdir. Bu vergiler şu şekilde sınıflandırılır:

Türkiye'de vergiler üç ana başlık altında sınıflandırılmaktadır:

Gelir Vergileri: (doğrudan vergiler)

- Kişisel gelir vergisi
- Kurumlar vergisi

Harcama Vergileri: (dolaylı vergiler)

- Katma Değer Vergisi (KDV)
- Özel tüketim vergisi (ÖTV)
- Banka ve sigorta işlemleri vergisi
- Damga vergisi

Servet Vergileri: (doğrudan vergiler)

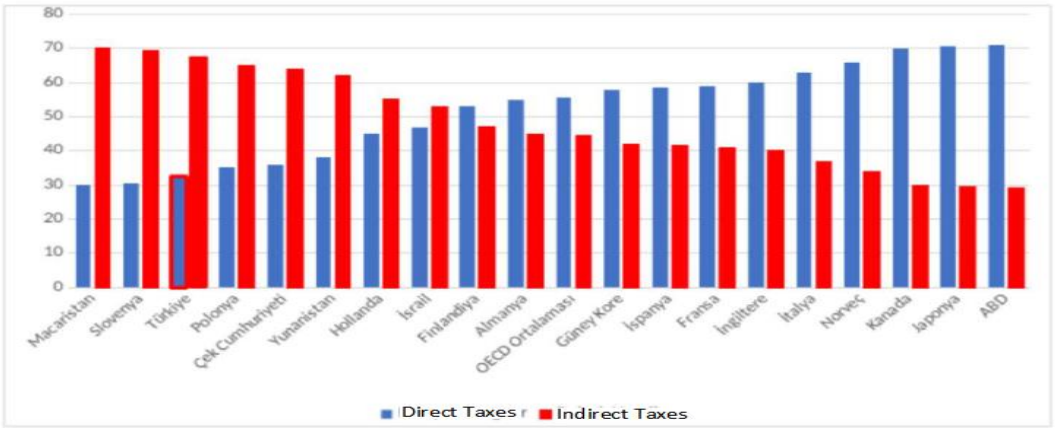
- Emlak vergisi

- Motorlu taşıtlar vergisi
- Miras ve bağış vergisi

Dolaylı Vergiler

Tasarruf ve satın alma gücünün yanı sıra, vergilerin hane halkı tüketimi üzerindeki etkisi de belirleyici bir faktördür. Dolaylı vergiler, harcama yaparken toplanır ve bu vergiler tüketimi azaltan faktörlerdir. Dolaylı harcama vergilerinin türü ve oranı, tüketilen mal ve hizmetlerin gruplarına göre değişebilir. Örneğin, Türkiye'de Katma Değer Vergisi, Özel Tüketim Vergisi, Banka ve Sigorta İşlemleri Vergisi ve Damga Vergisi gibi dört farklı dolaylı vergi bulunmaktadır. Türkiye'de en yaygın vergi olan Katma Değer Vergisi (KDV), mal ve hizmet türüne bağlı olarak %1, %10 veya %20 olmak üzere üç farklı oranda uygulanır (Gazete, 2023). Bu nedenle, her hane halkının ödediği toplam harcama vergisi, belirli tüketim sepetine harcama yapmasından dolayı farklı olabilir. Dolaylı vergilerin tüketim harcamaları üzerinden alınması, vergilerin adil bir şekilde dağıtımı üzerindeki etkisi hakkında önemli bir tartışma konusudur. Vergilerin, gelir dağılımından daha adil bir tüketim dağılımı yaratıp yaratmadığı, vergilerin artan oranı olarak tahmin edilir (Slemrod, 1996). Dolayısıyla, orantılılık, daha yüksek gelir veya tüketim düzeyine sahip bireylerin daha yüksek vergi yüküne tabi olup olmayacağını belirlemeyi amaçlar. Gelir veya tüketim arttıkça, ödenen vergi miktarının payı da artar, buna karşılık gelen vergi ilerici olup, eşitsizliği azaltıcı etkiye sahiptir. Türkiye'nin 2021 genel bütçesinde, dolaylı vergilerin toplam vergi gelirlerinin %65'ini oluşturduğu gözlemlenmiştir. Türk vergi sisteminde dolaylı vergilerin hakça ve etkinlik açısından hakimiyeti problemli olarak değerlendirilmektedir (Akkoç, Gemicioğlu, & Kızılırmak, 2023).

Şekil 1: Türkiye'de Dolaylı ve Doğrudan Vergi Dağılımının OECD Ülkeleri ile Karşılaştırılması

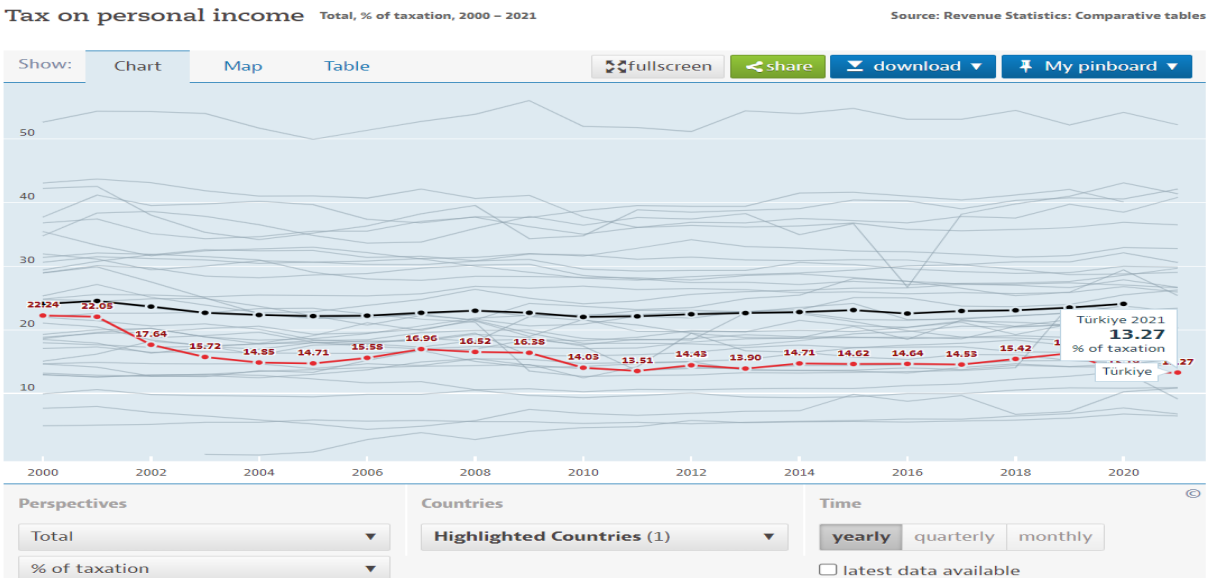


Kaynak: OECD, https://stats.oecd.org

Doğrudan Vergiler

Doğrudan vergiler, bireylerin geliri, kazancı veya serveti üzerinden alınır. Bu vergilerin toplanması için herhangi bir işlem yapılmasına gerek yoktur, sadece gelir veya servet verginin alınmasına neden olur. Gelir vergisi, kurumlar vergisi, miras ve bağış vergisi, emlak vergisi, motorlu taşıtlar vergisi bu vergilere örnek olarak verilebilir. Vergi mükellefi kimliğinin net ve açık bir şekilde ortaya çıkması nedeniyle, bu vergiler ekonomik, sosyal ve siyasi etkilerini daha net bir şekilde ortaya koyarlar (Türkiye'de Dolaylı ve Dolaysız Vergiler, 2016). Türkiye'de doğrudan vergilerin oranı, gelişmiş ülkelerdeki oranlardan daha düşüktür. Bu durum, ekonomisi iyi olan insanlara vergi kolaylığı sağlar ve sosyo-kültürel gruplar arasındaki ekonomik gelir dağılımını olumsuz etkiler. Aşağıdaki tabloya göre, OECD ülkelerinin doğrudan vergi ortalaması %24,07 iken; Türkiye'de bu oran %13,27'dir.

Şekil 2: Kişisel Gelir Vergisi (toplam gelir yüzdesi, 2000-2021)



Kaynak: https://data.oecd.org/tax/tax-on-personal-income.htm

Türkiye'de Tüketim Vergilerinin Yaşam Standartlarına Etkisi

Hanehalkının tükettiği bazı mal ve hizmetler tek vergiye tabi olurken, bazı mal ve hizmetler birden fazla vergi içerebilir. Örneğin, gıda ve alkolsüz içecekler alt-harcama grubundaki mallara sadece KDV uygulanırken, alkollü içkiler ve tütün alt-harcama grubundaki mallara hem KDV hem de Özel Tüketim Vergisi (ÖTV) uygulanır. Türkiye'de merkezi hükümet vergi gelirleri zaman içinde değişebilir, ancak ortalama olarak %65'i dolaylı vergilerden ve %35'i doğrudan vergilerden oluşur. Bu vergiler gelir ve harcamalar üzerinden toplanır ve vergi gelirlerinde en büyük paya sahip olanlar gelir vergisi, kurumlar vergisi, Katma Değer

Vergisi (KDV) ve Özel Tüketim Vergisi (ÖTV)'dir. Dikkate alınan oranların incelenmesi, vergi dağılımındaki vergi yükünün vergi mükelleflerine yoğunlaştığını gösterir. Dolaylı vergilerin herkese uygulanabilir olma, kolay toplanabilir olma ve düşük toplama maliyetleri gibi avantajları vardır. Ancak, diğer yandan, vergilendirme adiliği, gelir dağılımı ve ekonomik büyüme gibi ekonomik faktörler üzerinde olumsuz etkilere sahip olma potansiyeli yüksektir (Gündoğdu, 2022).

Dolaylı vergiler genellikle düz oranlı bir vergi yapısına sahiptir. Ancak, tasarruf eğilimine göre değişen bu vergiler, gelir üzerinden toplandığı için ters orantılı bir yapıya dönüşebilir. Bu vergilerin düşük gelir grupları üzerindeki yükü, yüksek gelir gruplarına göre daha fazladır, çünkü düşük gelirli insanlar gelirlerinin tamamını harcamaya eğilimlidirler. Ancak, yüksek gelirli insanlar orantılı olarak gelirlerinin daha azını harcadıkları için, düşük gelir grubundakilere göre daha az vergilendirilirler. Bu nedenle, tüketime dayalı dolaylı vergiler, düşük gelirli gruplar için adil olmayan bir vergi yapısı oluşturur. Bu vergiler, düşük gelirli grupların yüksek oranda vergilendirilmesi ve yüksek gelirli grupların düşük oranda vergilendirilmesi nedeniyle, vergilendirme alanında dikey eşitliği zayıflattığı düşünülmektedir. Bu durumda, mal ve hizmetlere olan talebin esnekliği, vergilerin mükelleflerin gelir kaybı üzerindeki etkisini de dikkate almalıdır. Talep esnekliği, bir malın fiyatındaki değişime bağlı olarak piyasa talebinin nasıl değiştiğini gösterir. Esneklik değeri, vergi kararı etkilerinde önemlidir. Frank P. Ramsey'nin bir çalışmasında, esneklik değerlerini dikkate alarak mal ve hizmetlere olan vergilerin etkileri incelenmiş ve Ramsey, esneklik değerlerini dikkate alarak vergilendirmenin tasarruf kararlarını nasıl etkileyeceğini araştırmıştır. Çalışmasında, Ramsey, düşük esneklik değerine sahip mallar için daha yüksek vergi oranı, yüksek esneklik değerine sahip mallar için daha düşük vergi oranı öngörür ve malın esnekliğini dikkate alarak farklılaştırılmış vergi oranlarının etkinliğinin önemli olduğunu vurgular. Bu şekilde vergilendirme, toplumsal refah kaybının minimal olacağını belirler (Ramsey, 1927).AB ve OECD ülkelerinde, vergi gelirlerinin %67'si doğrudan vergilerden ve %33'ü dolaylı vergilerden toplanır (OECD, Revenue Statistic 2018: Tax revenue trends in the OECD, 2022). Türkiye'de vergi yapısının benzer olmasına rağmen, vergi yasalarının uygulanması ters sonuç verir. Örneğin, 2023 bütçesinde toplanan vergi gelirlerinin %35'sinin doğrudan vergilerden ve %65'inin dolaylı vergilerden toplanmıştır (Batı, 2023). Türkiye'deki dolaylı vergilerin yüksek oranının nedeni, yüksek dolaylı vergi oranları değil, yetersiz doğrudan vergi gelirleridir. Türkiye'deki vergi sistemi farklı çalışır ve insanların satın alma gücünü azaltarak yaşam standartlarını olumsuz etkiler.Türkiye'deki

yaşam standardını anlamak için, ülke içinde gelir dağılımına bakmak gereklidir. Ülkedeki gelir dağılımı düzeyini ölçmek ve ardından refah düzeyini belirlemek için "Gini Katsayısı" hesaplanmalıdır. OECD verilerine göre, 2021 için Gini Katsayısı 0,415 olarak hesaplanmıştır (OECD, Income Inequality, 2022). Dünya Bankası'nın belirlediği kritik değerin %35 olduğunu düşünürsek, Türkiye'de gelir dağılımında eşitsizlik olduğunu söyleyebiliriz.

Şekil 3: Gelir Eşitsizliği (Gini Katsayısı)



Kaynak: https://data.oecd.org/inequality/income-inequality.htm

Sonuç ve Öneriler

Türkiye'de tüketim vergilerinin sosyo-ekonomik gruplar üzerindeki etkisi değişkenlik gösterir ve farklı gruplar için farklı sonuçlar ortaya çıkar. Genel olarak, dolaylı vergiler, yüksek gelir grupları için daha az etkilidir çünkü daha fazla gelir elde ederler ve vergi yükümlülüğü ile daha kolay başa çıkabilirler. Ancak, tüketim vergileri, daha düşük gelir grupları için daha büyük bir yük oluşturur ve bu grupların yaşam standartlarını olumsuz etkiler. Örneğin; Gıda ve temel ihtiyaçlar gibi temel gereksinimler için yüksek vergiler, daha düşük gelir grupları için daha yüksek maliyetlere neden olur ve dolayısıyla bu grupların yaşam standartlarını olumsuz etkiler. Benzer şekilde, enerji ve ulaşım gibi alanlarda yüksek vergiler, daha yüksek maliyetlere neden olur ve daha düşük gelir grupları için yaşam standardını olumsuz etkiler. Genel olarak, tüketim vergileri, sosyo-ekonomik farklılıklara dayalı olarak farklı etkiler ortaya çıkarır ve daha düşük gelir gruplarının yaşam standartlarını

olumsuz etkiler. Bu nedenle, vergi politikalarının tasarım sürecinde, sosyo-ekonomik grupların ihtiyaçları ve durumları göz önünde bulundurularak adil bir vergi yapısı oluşturulmalıdır. Türkiye'deki tüketim vergi sisteminin iyileştirilmesi ve vergilerin yaşam standartları üzerindeki etkisinin azaltılması için birkaç farklı yol bulunmaktadır:Orantılılık İlkesi (vergi adaleti): Vergi politikaları, orantılılık ilkesini takip edebilir. Bu ilkeye göre, daha yüksek gelir veya tüketim düzeyine sahip bireylerin, daha yüksek vergi yüküne tabi olması beklenir. Yani, gelir veya tüketim arttıkça, ödenen vergi miktarının payı da artar. Bu, daha düşük gelir grupları için vergi yükünü hafifleterek yaşam standartlarını iyileştirebilir. Örneğin; Diğer OECD ülkeleri gibi "dolaylı vergileri" azaltmalı ve "doğrudan vergileri" artırmalıyız.Vergi yapısının gözden geçirilmesi: Türkiye'deki vergi yapısı gözden geçirilmeli ve daha adil bir vergi yapısı oluşturulmalıdır. Örneğin; Temel ihtiyaçlar için yüksek vergiler yerine, daha düşük vergiler uygulanmalıdır.Vergi kolaylığı: Vergi teşvikleri veya vergi indirimleri, vergi yükünü hafifletmek için uygulanabilir. Bu, daha düşük gelir grupları için vergi yükünü hafifleterek yaşam standartlarını iyileştirebilir.Vergi denetimi: Vergi denetimine odaklanılmalı ve vergi kaçakçılığının önlenmesine yönelik adımlar atılmalıdır. Bu, vergi kayıplarını önlemek ve vergi yapısını daha adil hale getirmek için faydalı olabilir.Bu önerilerin hayata geçirilmesi, Türkiye'deki vergi sisteminin daha adil ve etkili hale gelmesine ve daha düşük gelir guruplarının yaşam standartlarının artmasına yardımcı olabilir.

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TÜRKİYE'DE BEŞ YILLIK BEBEK ÖLÜM HIZLARININ BÖLGESEL DEĞİŞİMİ

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Özet:
Bebek ölüm hızı bir toplumun sağlık düzeyinin en önemli göstergelerinden birisidir. Bir toplumda bir yılda canlı doğan ve bir yaşını tamamlamadan ölen bebek sayısının aynı toplumda aynı yıl içerisinde canlı doğan bebek sayısına oranının 1.000 ile çarpımı sonucu elde edilir. Bu araştırmada Türkiye'de 2018-2022 yılları arasındaki bebek ölüm hızlarının bölgelere göre değişiminin incelenmesi amaçlanmıştır.Retrospektif tipteki bu araştırmanın verileri T.C. Sağlık Bakanlığı'nın her yıl çıkarttığı Sağlık İstatistik Yıllıklarından elde edilmiştir. Bölgeler İstatistiki Bölge Birimleri Sınıflamasına göre birinci düzey olan 12 bölge şeklinde sınıflanmıştır. Türkiye ortalaması ayrı olarak değerlendirilmiştir. Araştırma kamuya açık veri kaynakları kullanılarak gerçekleştirildiğinden etik kurul onayı alınmamıştır. Her bir bölgenin beş yıllık bebek ölüm hızı değişiminin istatistiksel anlamlılığı tekrarlayan ölçümlerde ANOVA analizi ile değerlendirilmiştir.2018-2022 tarihleri arasında bebek ölüm hızı Güneydoğu Anadolu bölgesinde artış trendi gösterirken diğer 11 bölgede azalma ya da aynı kalma eğilimi gözlenmiştir. Tüm yıllarda en yüksek bebek ölüm hızı Güneydoğu Anadolu bölgesinde izlenmiştir (ortalama: 10,88, en düşük: 10,60, en yüksek: 11,00). İlgili tarih aralığında Türkiye genelindeki bebek ölüm hızı ortalaması 6,62'dir (en düşük: 6,40, en yüksek: 6,80). En düşük ortalama ise 4,40 ile Batı Marmara bölgesindedir (en düşük: 4,10, en yüksek: 4,80). Ülke ortalaması ve tüm 12 bölgenin ayrı ayrı 5 yıllık bebek ölüm hızı değişikliğinin lineer model oluşturularak tekrarlayan ölçümlerde ANOVA testi ile değerlendirilmesinde hiçbir bölge için anlamlı sonuç bulunamamıştır.Türkiye'de bebek ölüm hızı son beş yılda istatistiksel olarak anlamlı bir değişim göstermemiştir. Özellikle Güneydoğu Anadolu bölgesindeki yüksek bebek ölüm hızı varlığı dikkat çekmektedir. Son beş yıl içinde Türkiye'de en yüksek bebek ölüm hızına sahip olan bu bölgede bebek ölümlerinin nedenlerinin saptanarak önlenebilir sebeplere yönelik ve bölgeye özel etkili müdahaleler geliştirilmesi ve ivedilikle uygulamaya konulması gerekmektedir.

REGIONAL CHANGE OF FIVE-YEAR INFANT MORTALITY RATES IN TURKEY

Abstract

Infant mortality rate is one of the most important indicators of the health level of a population. It is obtained by multiplying the ratio of the number of babies born alive in a society in a year and dying before completing one year of age by the number of babies born alive in the same population in the same year by 1,000. In this study, it was aimed to examine the change in infant mortality rates by region between 2018 and 2022 in Turkey.The data of this retrospective study were obtained from the Health Statistical Yearbooks published annually by the Ministry of Health. Regions were classified as 12 regions at the first level according to the Classification of Statistical Regional Units. The average for Turkey was evaluated separately. Since the study was conducted using publicly available data sources, ethics committee approval was not obtained. The statistical significance of the five-year infant mortality rate change in each region was evaluated by repeated measures ANOVA analysis.Between 2018 and 2022, the infant mortality rate showed an increasing trend in the Southeastern Anatolia region, while in the other 11 regions it tended to decrease or remain the same. In all years, the highest infant mortality rate was observed in Southeast Anatolia (mean: 10.88, lowest: 10.60, highest: 11.00). The average infant mortality rate in Turkey was 6.62 (lowest: 6.40, highest: 6.80). The lowest average was 4.40 in the West Marmara region (lowest: 4.10, highest: 4.80).No significant results were found for any region in the evaluation of the 5-year infant mortality rate changes for the national average and for all 12 regions separately with the repeated measures ANOVA test by creating a linear model.The infant mortality rate in Turkey has not shown a statistically significant change in the last five years. The high infant mortality rate in the Southeastern Anatolia region is particularly noteworthy. It is necessary to determine the causes of infant mortality in this region, which has the highest infant mortality rate in Turkey in the last five years, and to develop effective region-specific interventions for preventable causes and to implement them urgently.

GİRİŞ

Bebek ölüm hızı, belirli bir yılda her 1.000 canlı doğumda bir yaşın altındaki bebeklerin ölüm sayısı olarak tanımlanmaktadır (1). Bu oran, doğum öncesi bakımın kalitesini, sağlık hizmetlerine erişimi ve bebek sağlığını etkileyen sosyal ve ekonomik faktörleri yansıtan, bir nüfusun genel sağlık ve refahının önemli bir göstergesidir.Bebek ölüm oranlarının anlaşılması birkaç nedenden dolayı çok önemlidir. Her şeyden önce, sağlık sistemlerinin toplumun en savunmasız üyelerinin ihtiyaçlarını karşılamadaki etkinliği hakkında fikir verir. Yüksek bebek ölüm oranları genellikle sağlık hizmetlerine yetersiz erişim, yoksulluk ve ele alınması gereken sistemik eşitsizlikler gibi altta yatan sorunlara işaret etmektedir (2). Ayrıca, bebek ölüm oranları halk sağlığı politikalarını ve müdahalelerini şekillendirmek için önemli bir ölçüttür. Politika yapıcılar, bebek ölüm oranlarının yüksek olduğu coğrafi bölgeleri belirleyerek, bu topluluklarda anne ve çocuk sağlığını iyileştirmek için kaynakları ve girişimleri hedefleyebilirler. Bu, bakıma daha adil erişim, bebek sağlığı ve güvenliği konusunda daha iyi eğitim ve nihayetinde önlenebilir bebek ölümlerinde azalma sağlayabilir.Coğrafi bölgeler arasındaki bebek ölümü eşitsizliklerinin ele alınması, hedefe yönelik müdahaleleri, sağlık altyapısında iyileştirmeleri ve toplum temelli girişimleri kapsayan çok yönlü bir yaklaşım gerektirir. Bu konuya kapsamlı bir yaklaşım getirerek, coğrafi konumlarından bağımsız olarak tüm bebeklerin sağlıklı yaşama fırsatına sahip olduğu bir gelecek yaratılabilir.

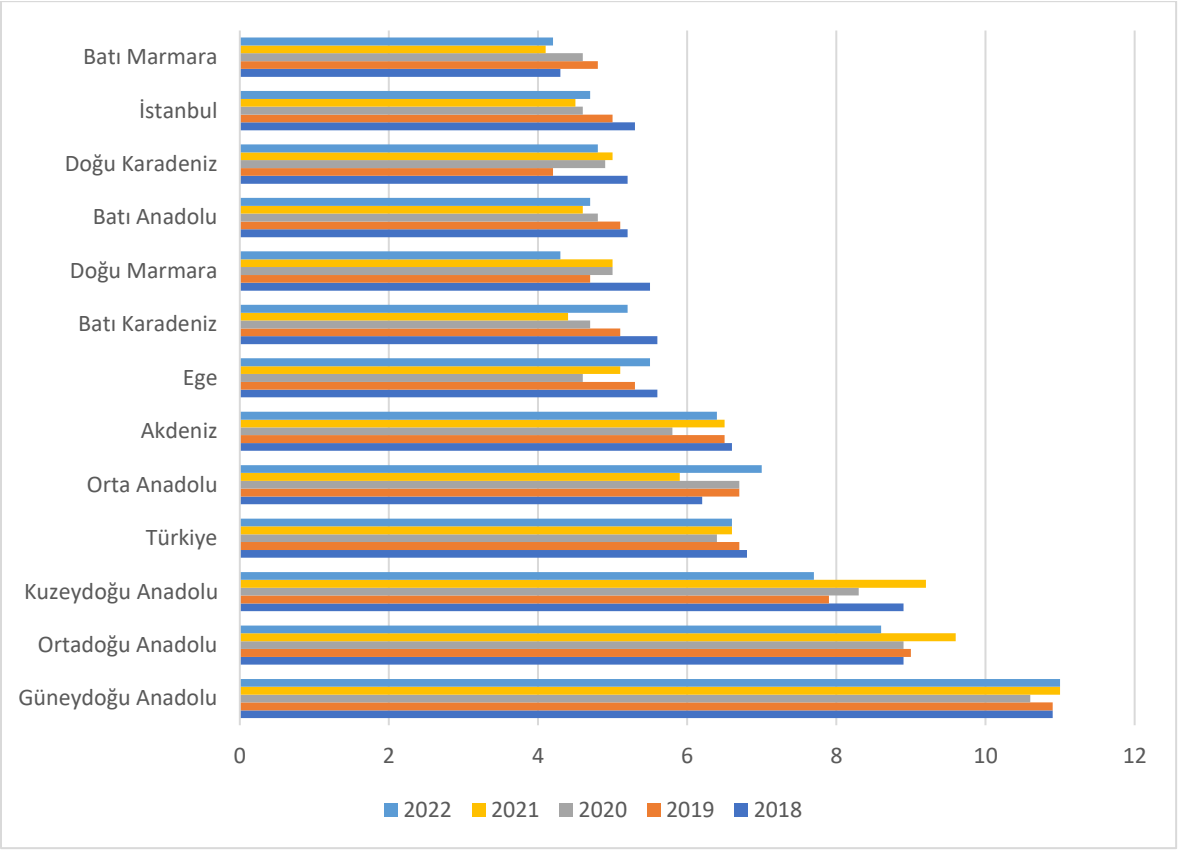
Bu araştırmanın amacı Türkiye'de son beş yıl içinde hesaplanan bebek ölüm hızlarındaki değişimlerim bölgelere göre incelenmesi ve karşılaştırılmasıdır.

GELİŞME

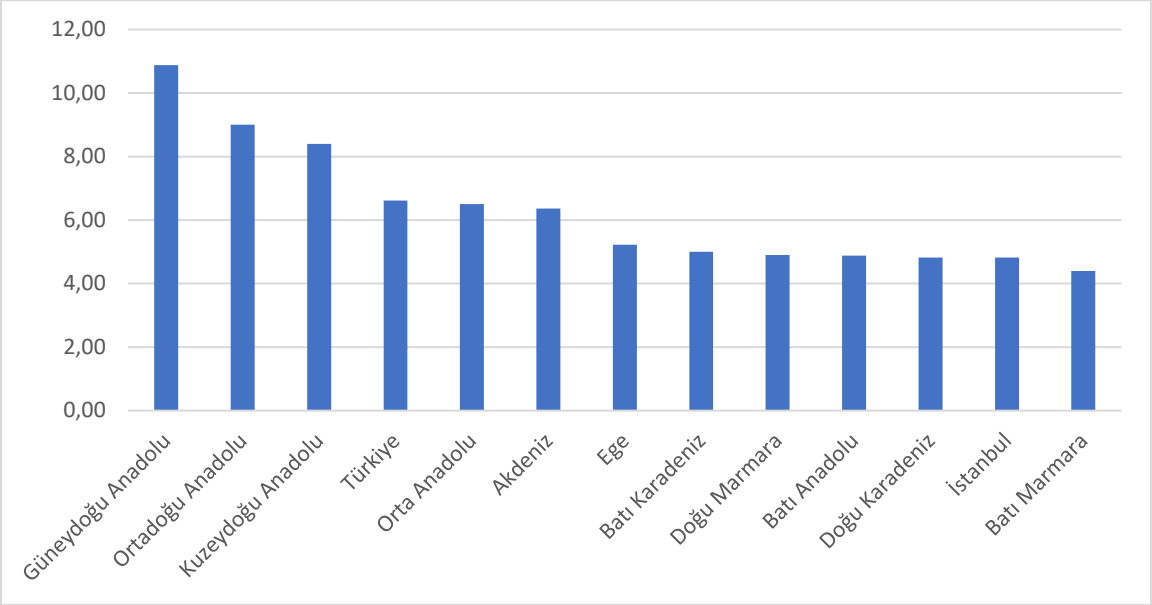
Retrospektif tipteki bu araştırmanın verileri T.C. Sağlık Bakanlığı'nın her yıl çıkarttığı Sağlık İstatistik Yıllıklarından elde edilmiştir. Türkiye'deki bölgelerin belirlenmesinde İstatistiki Bölge Birimleri Sınıflaması (İBBS) kullanılmıştır. İBBS'ye göre birinci düzey olan 12 bölge şeklindeki sınıflama ile değerlendirmeler yapılmıştır. Birinci düzey İBBS bölgeleri İstanbul, Batı Marmara, Ege, Doğu Marmara, Batı Anadolu, Akdeniz, Orta Anadolu, Batı Karadeniz, Doğu Karadeniz, Kuzeydoğu Anadolu, Ortadoğu Anadolu ve Güneydoğu Anadolu'dur. Türkiye ortalaması ayrı olarak değerlendirilmiştir. Araştırma kamuya açık veri kaynakları kullanılarak gerçekleştirildiğinden etik kurul onayı alınmamıştır. Her bir bölgenin beş yıllık bebek ölüm hızı değişiminin istatistiksel anlamlılığı tekrarlayan ölçümlerde ANOVA analizi ile değerlendirilmiştir. Kamuya açık veriler kullanıldığından araştırma için etik kurul onayı alınmasına gerek bulunmamaktadır.2018-

2022 tarihleri arasında bebek ölüm hızı Güneydoğu Anadolu bölgesinde artış trendi gösterirken diğer 11 bölgede azalma ya da aynı kalma eğilimi gözlenmiştir (Şekil 1). Tüm yıllarda en yüksek bebek ölüm hızı Güneydoğu Anadolu bölgesinde izlenmiştir (ortalama: 10,88, en düşük: 10,60, en yüksek: 11,00). İlgili tarih aralığında Türkiye genelindeki bebek ölüm hızı ortalaması 6,62'dir (en düşük: 6,40, en yüksek: 6,80). En düşük ortalama ise 4,40 ile Batı Marmara bölgesindedir (en düşük: 4,10, en yüksek: 4,80) (Şekil 2).

Ülke ortalaması ve tüm 12 bölgenin ayrı ayrı 5 yıllık bebek ölüm hızı değişikliğinin lineer model oluşturularak tekrarlayan ölçümlerde ANOVA testi ile değerlendirilmesinde hiçbir bölge için anlamlı sonuç bulunamamıştır.



Şekil 1. Bölgelere göre 5 yıllık bebek ölüm hızı



Şekil 2. Bölgelere göre 5 yıllık bebek ölüm hızı ortalamaları

SONUÇ

Bebek ölüm hızları, Türkiye'de de coğrafi bölgelere göre farklılık göstermektedir (3). Bu farklılıkların ele alınması için bazı önemli adımlar atılabilir. Öncelikle, risk altındaki annelere ve ailelere destek sağlayan programlar ve sağlık hizmetlerinin iyileştirilmesi, coğrafi olarak dezavantajlı bölgelere odaklanması gerekmektedir. Ayrıca, düşük gelirli ailelere yönelik kaynakların artırılması ve bebek sağlığı konusunda eğitim ve bilinçlendirme çalışmaları da bu farklılıkları azaltmada önemli bir rol oynamaktadır. Bebek ölüm hızlarındaki bu bölgesel farklılıkların ele alınması, Türkiye'nin genel sağlık ve refah seviyesinin geliştirilmesi için kritik bir adımdır. Coğrafi bölgelere göre bebek ölüm hızlarındaki farklılıkların azaltılması, her bebeğin sağlıklı bir şekilde büyüyebileceği bir gelecek için önemlidir (4). Bu doğrultuda, coğrafi bölgelere göre bebek ölüm hızlarındaki farklılıkların azaltılması için bütüncül bir yaklaşım benimsenmelidir. Bu yaklaşım, hedefli müdahaleler, sağlık altyapısının iyileştirilmesi ve topluluk temelli girişimleri içermelidir.Bebek ölüm oranlarını azaltmanın en önemli unsurlarından biri, hedefe yönelik halk sağlığı politikalarının uygulanması ve geleceğe yönelik planlamadır (5). Bu politikalar, bebek ölümlerindeki eşitsizliklerin temel nedenlerini ele almaya ve genel anne ve çocuk sağlığı sonuçlarını iyileştirmeye odaklanmalıdır. Başlangıç olarak, risk altındaki anne ve ailelere kapsamlı destek sağlamak için güçlü anne ve çocuk sağlığı programları geliştirilmeli ve uygulanmalıdır (6). Bu programlar doğum öncesi bakım, doğum sonrası destek ve bebek sağlığı ve güvenliği uygulamalarını teşvik etmeyi amaçlayan eğitim girişimlerini kapsamalıdır. Ayrıca, yetersiz hizmet alan bölgelerdeki sağlık altyapısına ve kaynaklarına

yatırım yapmak çok önemlidir. Bu, kaliteli doğum öncesi ve sonrası bakıma, pediatrik hizmetlere ve aile planlaması kaynaklarına erişimin sağlanmasını içerir. Bu bölgelerdeki sağlık hizmetlerini güçlendirerek bebek ölüm oranlarındaki eşitsizlikleri azaltmak ve toplumun genel refahını artırmak mümkündür.Önleyici bakım ve sağlık eğitimi yoluyla uzun vadeli sürdürülebilirlik yaratmak esastır. Bu, emzirmenin teşvik edilmesi, aşılama programları ve güvenli uyku uygulamalarına ilişkin bilgilerin yaygınlaştırılması gibi girişimleri içerir. Önleyici bakımın vurgulanması sadece bebek sağlığı komplikasyonlarının olasılığını azaltmakla kalmaz, aynı zamanda daha sağlıklı bir gelecek nesil oluşturulmasına da katkıda bulunur (7). Proaktif gelecek planlaması, bebek ölüm eğilimlerinin sürekli olarak izlenmesini ve değerlendirilmesini içermeli ve gelişen ihtiyaçlara göre politika ve müdahalelerin uyarlanmasını sağlamalıdır (8). Bebek ölümü eşitsizliklerinin ele alınmasının, kalıcı iyileşmeler sağlamak için sürekli taahhüt ve uyarlanabilir stratejiler gerektiren devam eden bir çaba olduğunu kabul etmek çok önemlidir.Sonuç olarak, bebek ölümlerini azaltmayı hedefleyen sağlam halk sağlığı politikalarının oluşturulması ve uygulanması, ileriye dönük planlama ile birleştiğinde, her çocuğun sağlıklı ve tatmin edici bir yaşam sürme fırsatına sahip olduğu bir geleceği teşvik etmek için gereklidir.

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ÇOCUKLAR İÇİN TERMAL OLARAK KONFORLU OYUN ALANLARI NASIL TASARLANMALIDIR?

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ÖZET
Oyun alanları, kentlerde çocukların fiziksel ve sosyal gelişimini destekleyen önemli açık mekânlardır. Yaz aylarında ultraviyole ve radyan ısıya maruz kalmanın yanında yapay malzemelerin özelliklerine bağlı olarak sıcak yüzeylere temas nedeniyle termal olarak güvensiz mekânlara dönüşebilirler. Dünya'nın pek çok bölgesinde dış mekân termal konforu ile ilgili pek çok çalışma yapılsa da oyun alanlarının biyoklimatik koşulları ile ilgili yapılan çalışma sınırlıdır. Ayrıca dış mekân termal konfor çalışmaları genelde yetişkinler üzerine odaklanmıştır. Oysa çocuklar sıcak ortamlara ve ısı kaynaklı hastalıklara karşı yetişkinlerden daha savunmasızdır. Oyun alanlarının güvenliği, kalitesi, kullanılabilirliği vb. özellikleri ile ilgili pek çok standart geliştirme çalışması olsa da iklim değişikliği etkilerinin giderek daha belirgin hale geldiği günümüz kentlerinde termal olarak konforlu oyun alanlarının yaratılması ile ilgili standartlar henüz birçok kentin gündeminde yoktur. Bu sebeple, termal olarak konforlu oyun alanlarının planlanması ve tasarlanması giderek daha önemli bir hale gelmiştir. Daha uzun ve daha aktif oyunun sağlık ve sosyal faydaları düşünüldüğünde, özellikle yaz aylarında aşırı sıcak dönemlerde, oyun alanlarının yıl boyunca termal olarak güvenli olacak şekilde tasarlanması önemli bir husustur. Bu nedenle bu çalışmada, oyun alanlarındaki tehlikeli termal koşullar hakkında farkındalık yaratılması ve Dünya'nın farklı bölgelerinden örnekler üzerinden oyun alanlarında termal konforu iyileştirmeye yönelik geliştirilen politika ve tasarımların incelenerek ülkemizde yapılacak çalışmalara bir altlık oluşturulması amaçlanmıştır.
Anahtar Kelimeler: İklim değişikliği, dış mekân termal konforu, çocuk oyun alanları.

HOW TO DESIGN THERMALLY COMFORTABLE PLAYGROUNDS FOR CHILDREN?

ABSTRACT
Playgrounds are important open spaces in cities that support children's physical and social development. In addition to exposure to ultraviolet and radiant heat in summer, they can turn into thermally unsafe spaces due to contact with hot surfaces depending on the properties of artificial materials. Although there are many studies on outdoor thermal comfort in many parts of the world, studies on the bioclimatic conditions of playgrounds are limited. In addition, outdoor thermal comfort studies have generally focused on adults. However, children are more vulnerable to hot environments and heat-related diseases than adults. Although there are many standard development studies on the safety, quality, usability, etc. of playgrounds, standards for the creation of thermally comfortable playgrounds in today's cities, where the effects of climate change are becoming increasingly evident, are not yet on the agenda of many cities. Therefore, planning and designing thermally comfortable playgrounds has become increasingly important. Considering the health and social benefits of longer and more active play, it is important to design playgrounds to be thermally safe throughout the year, especially during extremely hot periods in summer. Therefore, this study aims to raise awareness about hazardous thermal conditions in playgrounds and to provide a background for future studies in our country by examining the policies and designs developed to improve thermal comfort in playgrounds through examples from different parts of the world.
Keywords: Climate change, outdoor thermal comfort, playgrounds.

GİRİŞ

Çocuklara yönelik açık oyun alanları, çocukların dış mekanda daha fazla zaman geçirmesi, sosyalleşmesi vb. açılardan son derece önemli bir unsurdur. Fakat çocukların, değişen sıcaklıklara karşı potansiyel olarak daha fazla maruz kalması ve gelişmekte olan bağışıklık sistemleri ile iklim değişikliği nedeniyle ortaya çıkan sağlık risklerine karşı daha savunmasızlardır (Ebi ve Paulson, 2010). Geleneksel yaklaşımlarda oyun alanı güvenliğine ilişkin yüzey sıcaklıkları ve ultraviyole radyasyonuna maruz kalma gibi birçok önemli sağlık hususu ihmal edilmektedir (He vd., 2023). Bu ihmal, çocukların dış mekânla ilişkisinde farklı olumsuzluklarla karşı karşıya kalmaları anlamına gelmektedir. Çocuklara yönelik olası olumsuz sağlık sonuçları göz önüne alındığında oyun alanlarındaki çevresel koşullara daha fazla dikkat edilmesi gerekmektedir. Oyun alanı tasarımı ve güvenliğine daha bütünsel bir bakış açısı ile yaklaşmak, hipertermi, termal yanıklar, güneş yanıkları ve solunum yolu hastalıklarının önlenmesinde, çocuk sağlığı açısından hayati önem taşımaktadır. Oyun alanı ekipmanlarını ve mekânlarını oyunun her mevsimi termal olarak konforlu ve güvenli hale getirmek, çocukların dışarıya çıkabilmesine, oynayabilmesine ve daha uzun süre aktif olabilmesine yardımcı olacaktır. Ancak yapılan incelemeler sonucunda, çocukların dış mekân termal konforu ile ilgili yeterli çalışma yapılmadığı görülmüştür. Bu doğrultuda, çalışmanın amacı, çocukların dış mekânda en fazla zaman geçirdikleri yerler olan oyun alanlarının termal konforu ile ilgili kuramsal bilgi sunmaktır. Aynı zamanda, her mevsim oyun için güvenli ve konforlu oyun alanlarının yaratılmasında uygulanabilir tasarım örnekleri incelenmiştir.

DIŞ MEKÂN TERMAL KONFORU

Termal konfor, mekânlardaki memnuniyeti yansıtan zihinsel bir durumdur ve maruz kalma, hava değişimleri, nem ve sıcaklık gibi etkenlerin yanı sıra giysi ve fiziksel aktivitelerin davranışsal faktörlerine bağlı olarak oluşan bir gerçekliği ifade eder. Ayrıca, deneyimler, beklentiler ve maruz kalma zamanı gibi psikolojik ögeleri de kapsamaktadır (Nikolopoulou ve Steemers 2003; Adıgüzel, 2018). Bu çalışmanın da odaklandığı dış mekânlardaki termal konfor ise, sıcaklık, nem, güneş radyasyonu, rüzgâr hızı ve meteorolojik unsurlar gibi birçok faktörden etkilenmektedir. Bunların yanında, adaptasyon, termal tercih, cinsiyet, mevsim ve günün saati gibi meteorolojik olmayan durumlar da aynı ölçüde öneme sahiptir (Jin vd., 2020). Dolayısıyla, dış mekânların kalitesini etkileyen birçok unsur arasında dış mekân mikro iklimi önemli bir konudur. Bu nedenle, termal açıdan konforlu bir dış mekân, iyi tasarlanmış ve iyi kullanılan bir mekânın temelini oluşturmaktadır (Brown, 2010).

Dış mekân termal konforu, bireylerin sokaklar, plazalar, oyun alanları, kent parkları vb. yerlerde açık hava aktivitelerini etkileyen faktörlerden biridir. Söz konusu aktivitelerin miktarı ve yoğunluğu, dış mekânlardaki iklim koşullarına bağlı olarak insanların ısıya maruz kaldıklarında ortaya çıkan rahatsızlık düzeyini etkilemektedir. Dolayısıyla, açık havada güneşe maruz kalan insanların termal rahatsızlığı, onların dış çevreyle bağlantısının azalmasına neden olmaktadır. Bu durum ise, gölgeli dış mekânların halk tarafından daha fazla kullanılmasına yol açmaktadır (Givoni vd., 2003). Nüfus yoğunluğunun fazla olduğu şehirlerde, yaşam kalitesinin kritik bir konu olmasıyla, kentsel dış mekânlardaki termal konfor daha önemli bir konu haline gelmiştir. Bu nedenle, dış mekân tasarımında konforlu koşulların desteklenmesi için gerekli eylemler titizlikle incelenmelidir (Lin vd., 2013).

İKLİM DEĞİŞİKLİĞİ VE ÇOCUK SAĞLIĞI

İklim değişikliği, özelliklede dış mekân termal koşullarının bozulması, kentlerde artan sağlık riskleri ve genel yaşam kalitesinin azalması gibi sonuçlarla yakından ilişkilidir (Chen ve Ng, 2012). Bu ilişkide, duyarlılık ve uyum sağlama becerilerindeki farklılıklar nedeniyle çocuklar ele alınması gereken yaş grupları arasında ayrı bir öneme sahiptir (Luber ve McGeehin, 2008; Vanos vd., 2014).Kent yaşamındaki çocuklar, iklim değişikliği ile ilgili çevre sağlığı çalışmalarında hassas olan popülasyonlar olarak tanımlanmaktadır (Perera, 2008). Ulusal Sağlık İstatistikleri Raporu'nda Amerika Birleşik Devletleri genelinde 2006-2010 yılları arasında ısıya bağlı ölümlerin 147'sinin küçük çocuklarda (≤4 yaş), 86'sının bebeklerde ve 28'inin 5-14 yaş arası çocuklarda meydana geldiği belirtilmiştir (Berko ve Ingram, 2014). Fakat, genel ölüm oranları ile karşılaştırıldığında, iklimle ilişkili çocuk ölümlerinin diğer yaş gruplarına (özellikle de yaşlılara) oranla daha seyrek olduğu ifade edilmektedir. Benzer şekilde çocukların hassasiyetini ele alan pek çok çalışma; onların ısıya karşı hassasiyetleri nedeniyle ölüm yerine hastalık riskinin daha yüksek olduğunu ileri sürmektedir (Rhea vd., 2012). Ayrıca çalışmalar, sıcaklığın artmasıyla birlikte çocuklarda ortalama vücut sıcaklığı veya ısı depolaması gibi etkenlerin yetişkinlere oranla daha yüksek oluğunu belirtmektedir (Delmarche vd., 1990). Dolayısıyla, aşırı sıcaklıklar veya yüksek radyasyon seviyeleri çocukların sağlığını yetişkinlere kıyasla daha çok etkilemektedir (Kennedy vd., 2019). Isı stresi gibi kısa süreli sorunlar, ileriki dönemlerde ortaya çıkabilecek uzun vadeli kronik hastalıklara yol açabilmekte ve yüksek radyasyona maruz kalma durumu cilt hastalıklarına neden olabilmektedir (Dennis vd., 2008). Nitekim, yetişkinlikte ortaya çıkan cilt kanserinin kökeni, genel olarak, çocukluk döneminde güneşe maruz kalınmasına dayanmaktadır (Dennis vd., 2008; American Cancer Society 2013). Örneğin, beş ya da daha

fazla güneş yanığı geçiren çocukların yaşamlarının ileriki dönemlerinde melanom riskinin iki katına çıktığı tahmin edilmektedir (Canadian Canser Society, 2017). Çünkü, uyum sağlama kapasitelerinin az olması (bilgi ve güneş kremi kullanımı gibi), yüksek derecede maruziyet yaşamaları ve hassas ciltlerinden dolayı güneş yanıklarına karşı daha yüksek tepki vermeleri onları daha savunmasız yapmaktadır (Oliveria vd., 2006).Fakat bugüne kadar, olumsuz termal koşulların çocukların sağlığını nasıl etkilediği ya da oyun alanlarının tasarlanmasında ve kullanılan malzemelerin belirlenmesinde ısıya bağlı hastalıkların nasıl önlenebileceği hususunda kapsamlı çalışmalar yapılmamıştır. Bu yüzden, ultraviyole radyasyonuna ve aşırı sıcaklığa karşı maruz kalmayı engellemek ve yeterli aktivite için güvenli dış mekân ortamı sağlamak, çocukların sağlığını korumak ve bahsedilen riskleri azaltmak bakımından hayati önem taşımaktadır (USDHHS, 2014).

ÇOCUK TERMAL KONFORU

Termal konfor kavramı 1970'li yıllarda ortaya çıkmış bir terim olmasına rağmen, kavramın çocuklar üzerinden ele alındığı çalışmalar oldukça azdır (Antoniadis vd., 2020). Nitekim, çocuklar, ısı, sağlık, çevre sağlığı ve iklim değişikliği araştırma literatüründe savunmasız bir nüfus olarak tanımlanmaktadır. Bu nedenle, özellikle son dönemlerde, çocuklar ve termal konfor ilişkisini inceleyen araştırmalar yaygınlık kazanmaya başlamıştır (Huang vd., 2021). Çocukların açık alan kullanımının teşvik edilmesi ve bu alanlarda onların fiziksel aktivitelerde bulunması çocuk sağlığı açısından oldukça önemlidir. Çünkü, çevre sağlığı risk değerlendirmeleri incelendiğinde, açık alanlarda çocukların daha savunmasız olduğu ortaya koyulmuştur (Vanos, 2015). Bunun nedeni ise, çocukların yetişkinlere göre açık alanlarda fazla vakit geçirmeleri ve kötü hava olaylarına daha çok maruz kalmalarıdır (Sheffield ve Landrigan, 2010). Genel olarak bakıldığında, bireylerin, termal konforunu tahmin etmeye yönelik geliştirilmiş olan termal konfor modelleri, kapalı bir ortamda yetişkin bir erkek için oluşturulmuş ve ayarlanmıştır (Teli vd., 2012). Fakat, bir çocuğun oyun alanındaki termal konforunu tahmin etmeye çalışmak, birçok fizyolojik ve psikolojik faktörden dolayı yetişkinlerden farklılık göstermektedir. Bunlar arasında; yüksek metabolizma hızı, daha düşük ter üretimi, ısı stresiyle başa çıkma konusundaki deneyimsizlikler, güneş koruyucu kullanıma ilişkin daha az bilgi sahibi olma çocukların savunmasız olmalarındaki temel etkenlerdendir (Fabbri, 2013; Gomes vd., 2013; Kennedy vd., 2019). Bu nedenle, modellerin dış mekânlarda çocuklara güvenle uygulanabileceğine dair net bir şey söylemek oldukça zordur (Teli vd., 2012). Yine de yapılacak olan çalışmalarda, çocukların termal konfor ve hava kalitesi risklerini titizlikle ele almak ve uygun modellerle birlikte çevresel bilgileri

gerçek zamanlı işlemek çalışmaların güvenilirliğini arttırma konusunda önem arz etmektedir (Tarpani vd., 2023).Han Gu vd. (2022)'nin Çin'in sıcak ve kurak iklime sahip olan Chongqing kentinin yüksek yoğunluklu kentsel yerleşim bölgesinde yer alan bir çocuk aktivite alanında yaptıkları çalışmada; peyzaj özelliklerinin ve aktivite-cinsiyet farklılıklarının çocukların dış mekân termal konforunu etkilediğini belirtmişlerdir. Güneş radyasyonu ve hava sıcaklığının, çocukların termal duyularını etkileyen başlıca meteorolojik faktörler olduğu saptanmıştır. Aynı zamanda, yüksek yoğunluklu kentsel yerleşim bölgelerinde, çocukların aktivite alanlarının dış mekân termal konforu açısından daha kötü olduğu sonucuna varılmıştır.Termal konfor üzerine yapılan çalışmalar genel olarak aşırı sıcakların etkilerinin azaltılması üzerine yoğunlaşırken (Li vd., 2022), soğuk bölgelerin termal konforunun iyileştirilmesi çok az ilgi görmüştür (Brown, 2011). Fakat, özellikle de donma riskinin yüksek olduğu soğuk iklim bölgelerinde çocukların ciddi sağlık problemleri ile karşı karşıya olduğu görülmektedir (Ikaheimo, 2018). Boze Huang vd. (2021), çocukların dış mekân termal konforunu etkileyen faktörleri araştırmak için Çin'in soğuk bir kenti olan Xi'de yaptıkları çalışmada, bağıl nem, rüzgâr hızı, güneş radyasyonu, küre sıcaklığı ve yüzey sıcaklığını ölçmüşlerdir. Çalışmanın sonucunda, küre sıcaklığı ve hava sıcaklığı çocukların termal konforunu etkileyen başlıca meteorolojik faktörler olarak saptanmıştır. Park alanında kullanılan asfalt, tuğlalar, ahşap zemin ve ahşap bankların sıcaklık değerlerinin yüksek olduğu ve çocukların termal güvenliğini tehdit ettiği belirtilmiştir. Gölge alanlarda ise, bu değerlerin daha düşük olduğu ve ısı riski olmadığı görülmüştür. Benzer şekilde, Xiaoyun He vd. (2023)'nin, yine Çin'in soğuk bir kenti olan Harbin'de bir açık oyun alanında yaptıkları çalışmada, mikroiklim parametrelerinin mevsimsel farklılıklara göre çocukların termal algısını etkilediğini belirtmişlerdir. Ölçülen parametrelere göre, çocukların UTCI'yi (Evrensel Termal İklim İndeksi) yaza göre kış aylarında daha iyi tolere ettikleri belirlenmiştir. Açık alanda yapılan ölçümlerde ise, güneş radyasyonu ve küre sıcaklığının ciddi farklılık gösterdiği, sıcaklık ve bağıl nem ölçümlerinde ise önemli bir farklılık olmadığı ortaya koyulmuştur.

Neticede, çocukların vücutları ve bağışıklık sistemleri gelişmeye devam ettiği için, çocuklar daha fazla sağlık riskiyle karşı karşıya kalmaktadır (Watss vd., 2019). Bu nedenle, mimarların ve tasarımcıların çocuklar için özellikle de az gelişmiş ve gelişmekte olan ülkelerdeki kentlerdeki oyun alanlarında mikro iklim koşullarını iyileştirme stratejilerini dikkate alarak planlama/tasarım yapmaları gerekmektedir. Çünkü, bu açık oyun alanları, çocukların doğaya düzenli erişebildikleri sınırlı yerler olarak görülmektedir (Tarpani vd.,

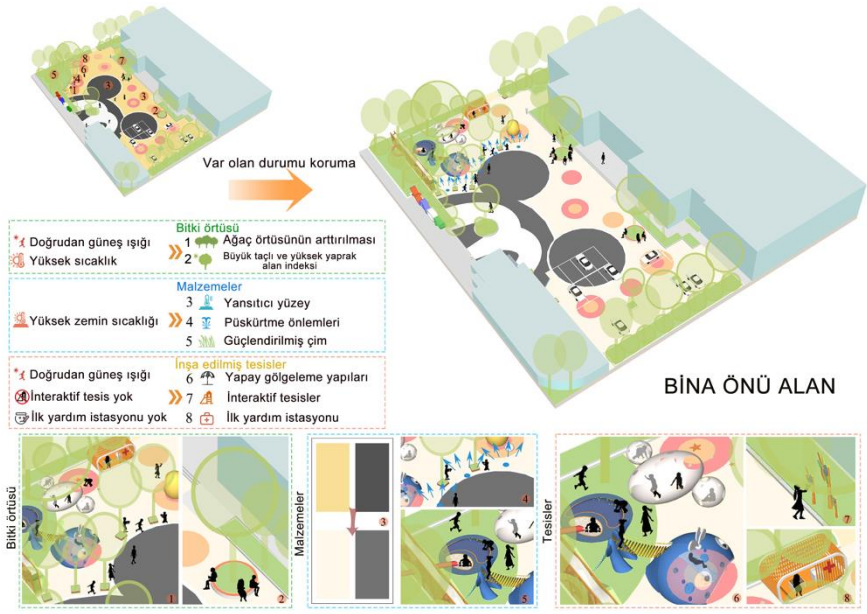
2023). Ayrıca incelenen çalışmalar sonucunda, farklı iklime sahip şehirlerin farklı dış mekân termal konfor koşulları geliştirdiği fakat yapılan çalışmaların kısıtlı olduğu görülmektedir. Bu nedenle, çocukların fiziksel aktivitelerinin devamlılığı ve sağlıklı ve konforlu ortamda oynamaları için ideal açık alan tasarımları mecburi hale gelmektedir.

ÇOCUKLAR İÇİN TERMAL KONFORLU OYUN ALANI TASARIMLARI

Oyun, çocukların fiziksel ve psikolojik gelişimleri bakımından oldukça önemlidir. Özellikle, açık alanlarda oynamak, temiz hava ve doğayla bağlantı kurmalarını sağlarken güneşe maruz kalma, uzun vadede sağlık risklerini de beraberinde getirmektedir. Bu nedenle, çocukların oyun alanları tasarlanırken güvenli, termal açıdan konforlu, işlevsel ve erişilebilir olmasına dikkat edilmelidir. Bunun yanı sıra, halihazırda bulunan bir oyun alanının iklime duyarlı olarak yeniden tasarlanması kolay bir hadise değildir. Tam da bu noktada, alanın yenilenmesinde etkin ve işlevsel termal konfor çözümlerinin sağlanması oldukça önemlidir (Kennedy vd., 2019). Diğer yandan, her oyun alanı, insan yapımı ve doğal faktörlere (sıcaklık, rüzgâr, güneş radyasyonu, nem, gölge, bitki örtüsü vb.) bağlı olarak kendine özgü bir mikro iklime sahiptir. Dolayısıyla, bir oyun alanında çocukların aktivite düzeyleri ve alan kullanımları arasında önemli bir ilişki söz konusudur. Özellikle artan sıcaklıklar ile birlikte bazı kentlerde oyun saatlerinin azalması, çocuklar için olumsuz sonuçlar doğurmaktadır. Örneğin, hava sıcaklığının artmasıyla, Kaliforniya'nın El Cajon kentinde 1999'dan bu yana gündüz oyun saatleri %10 oranında düşmüştür. Phoenix'te ise 1973'ten bu yana oyun süresi %6 azalmıştır. Bu durumu normale dönüştürmek ise ancak alanın iklim türüne ve mevsimine bağlı olarak doğru bir tasarımla mümkündür (Kennedy vd., 2019). İklim değişikliğinin etkilerinden biri olan sıcaklığın bu denli artış göstermesi, ısınmanın daha fazla hissedildiği sıcak iklimlerde yapılacak tasarımların önemini ortaya koymaktadır. Çocuk oyun alanlarındaki termal maruziyet, termal konforla yakından ilgili bir konudur. Sıcak iklim bölgelerinde oyun alanları yaz günlerinde aşırı ısınmaya eğilimlidir. Oyun alanları için güvenli bir tasarım arzulanırken, doğal ve yapay çeşitli yüzeyler ve gölgeleme çözümleriyle farklı termal koşullar dikkate alınmalıdır (Lehnert vd., 2024). Bu bakımdan, ilk olarak, oyun alanları, trafiğe bağlı kirliliklerin yüksek olduğu ana yollara bitişik olmayacak şekilde tasarlanmalıdır. Çünkü, çocukların yüksek bir solunum hızı vardır ve yüksek sıcaklıkla birlikte solunum yolu rahatsızlıklarını çok daha şiddetli yaşayabilirler (Karl vd., 2009). Bunun yanı sıra oyun alanları, güneşe maruz kalmayı azaltmak ve gölgenin yönünü doğru kullanabilmek için mevcut binaların kuzeyine yerleştirilmelidir. Güney güneşini azaltmak için de ağaçlar uygun şekilde yönlendirilmelidir (Kennedy vd., 2019). Çünkü, Parsons vd.

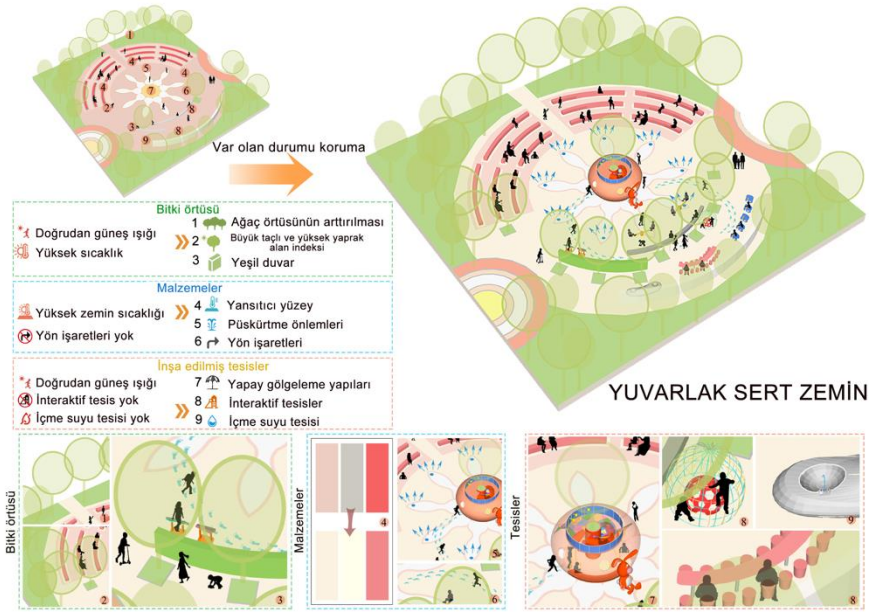
(1998), etkili UV korumasının çoğunlukla gölgede edinildiğini hem yatay hem de dikey yüzeylerle bu maruziyetin ortadan kaldırılabildiğini belirmiştir (Downs ve Parisi, 2008).
Bu noktada, gölgeleme ve serinletme açısından farklı ağaç türleri alanın mikro iklimine göre seçilmelidir (Kantor vd., 2018). İğne yapraklı ağaçlar sene boyunca gölge sağlarken, yaprak döken ağaçlar gölgelemeyi sadece yaz döneminde yapabilir. Bu durumda, yıl boyu oyun kullanımına katılım için mikro iklime (sıcaklığın azaltılması, rüzgârın hafifletilmesi vb.) göre hangi ağaç türünün seçileceği tasarımcılar tarafından belirlenmelidir (Kennedy vd., 2019). Benzer şekilde, gölge yelkenleri, oyun alanlarının termal ortamına, malzemelerine, renklerine, alanın geometrisine dikkat edilerek seçilmeli ve bu yönde konumlandırılmalıdır (Antoniadis vd., 2020). İklime uygun bitkilerin ortaya çıkarabileceği polen, alerjenler, böcekler gibi olumsuz faktörlerin önlenmesi amacıyla da gölge yelkenlerinin kullanılması tasarım ve çocukların sağlığı açısından olumlu bir sonuç doğuracaktır (Lehnert vd., 2024).Çocuk oyun alanları tasarlanırken bir diğer önemli nokta, yapay yüzeylerin doğru seçilmesidir. Gün boyunca, güneşe maruz kalan çocukların, yanlış malzeme tercihi ve konumlandırmadan dolayı yüzeylere temasları halinde ciltlerinde yanıklar oluşabilmektedir. Radyasyonu yüksek ölçüde emen ve cilde iletkenliği yüksek olan bu yüzeyler (plastik, kauçuk, metal, suni çim vb.) güneşin geliş açısına göre belirlenen gölgeliklere ve binaların kuzey tarafına yerleştirilmelidir (Kennedy vd., 2019). Diğer yandan, süs havuzları, göletler vb. su ögeleri, hava ve vücut ısısının düşmesini sağlayarak çocukların aktif katılımını ve konfor seviyelerini arttırabilir (Kennedy vd., 2019). Ancak, termal konfor açısından doğru su elemanını seçmek önemlidir. Örneğin, küçük su havuzlarının, bazı oyun alanlarında, radyasyonun açısına ve belli dönemlerdeki hava koşullarına bağlı olarak doğrudan olumlu bir etkisinin olmadığı görülmüştür (Lehnert vd., 2021). Dolayısıyla, sıcak iklimlerde ve sıcak sezonlarda, ağaçların gölgelemesi, gölge yelkenleri, yüzey malzemelerinin ve su ögelerinin doğru seçimi çocukların sağlığı ve termal konforu açısından temel etkenler olarak düşünülmelidir.Soğuk mevsimlerde ve sezonlarda ise, mikro iklim açısından iki önemli husus söz konusudur. Bunlar, radyasyon ve rüzgardır. Fakat, buradaki tasarım yaz mevsiminin tersi şeklinde uygulanmalıdır. Yani, kış mevsiminde, konforlu bir oyun alanı oluşturmak için rüzgârın azaltılması ve radyasyonun arttırılması hedeflenmelidir. Bu konuda, örneğin, yazın gölgeye kışın ise güneşe izin vermek için yaprak döken ağaçlar kullanılmalıdır (Kennedy vd., 2019). Belirtilen tasarım stratejileri, her ne kadar mevsime göre, oyun alanlarının mikro iklimlerini iyileştirmek için ortaya konmuş olsa da aslında bir genellemedir. Çünkü, her oyun alanı birbirinden farklı mikro iklim koşullarına sahiptir. Bu

nedenle, oyun alanları, çocukların sağlığı ve aktif oyuna katılımları için kendi mikro iklimine uygun doğru modellemeler kullanılarak tasarımları iyileştirilmeli veya ona göre dizayn edilmelidir.Son zamanlarda yapılan çalışmalarda çocuklar için dış mekân termal konforunu iyileştirmek amacıyla çeşitli biyoiklimsel tasarım önerileri geliştirilmiştir. Boze Huang vd. (2021)'nin bir oyun parkının içerisindeki 4 farklı bölgede yaptıkları çalışmada, yaz aylarındaki ısı stresini azaltmak için bitki örtüsü, yüzey malzemeleri ve tesislerin doğru kullanımını içeren stratejiler üretmişlerdir.Bina önü alan olarak tanımlanan alanda, öğleden sonra daha yüksek sıcaklıklar ölçüldüğü için geniş yapraklı bitkiler (örneğin, *Sophora japonica L.*, *Ailanthus altissima* ve *Aesculus hippocastanum*) önerilmiştir. Gökyüzü görüş faktörünü azaltmak ve gölgelik alanları artırmak içinse bina önü alanın, doğu ve güneydoğu taraflarında geniş yapraklı bitkilerin kullanımına işaret edilmiştir (Şekil 1).



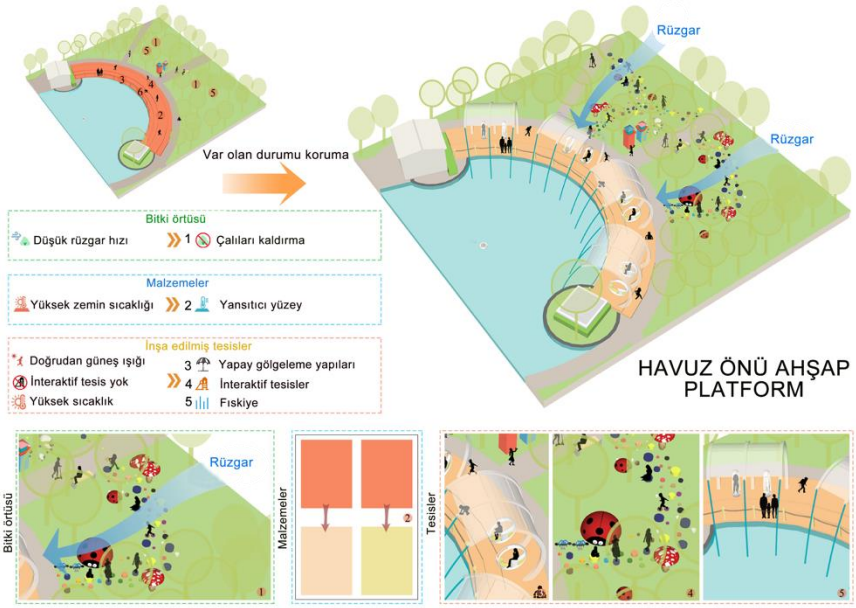
Şekil 1: Bina önü alanın biyoklimatik tasarımı

Bina önü alandakine benzer şekilde, yuvarlak sert zeminde, öğleden sonra daha yüksek sıcaklıklar ölçüldüğü için geniş yapraklı bitkiler önerilmiştir (Şekil 2).



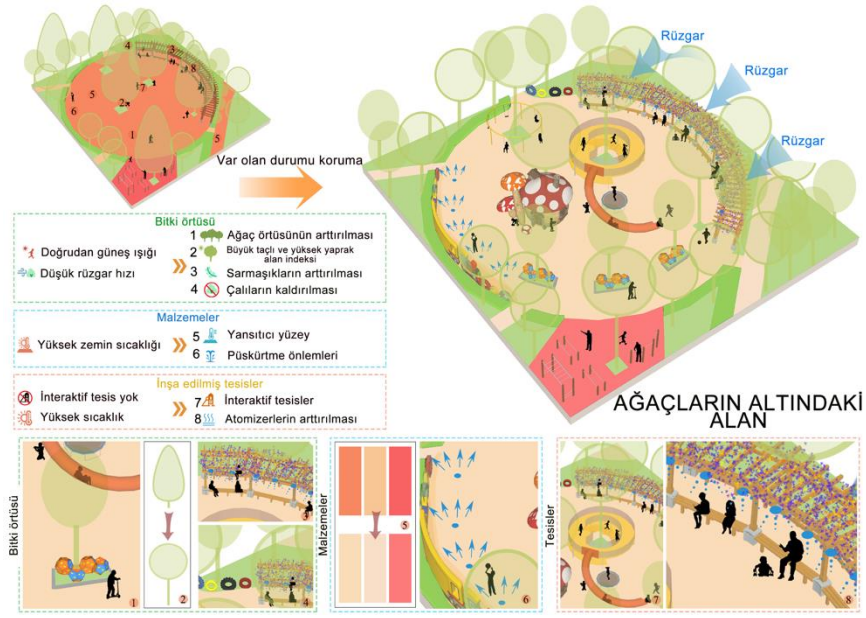
Şekil 2: Yuvarlak sert zeminin biyoklimatik tasarımı

Havuz önü ahşap platformda hava akışını hızlandırmak ve termal rahatsızlığı azaltmak için hâkim rüzgâr yönündeki çalıların kaldırılması gerektiği belirtilmiştir (Şekil 3).



Şekil 3: Havuz önü ahşap platformun biyoklimatik tasarımı

Ağaçların altındaki alandaysa, gökyüzü görüş faktörünü azaltmak ve gölgelik alanı arttırmak için sarmaşıklar ön plana çıkarılmıştır (Şekil 4).

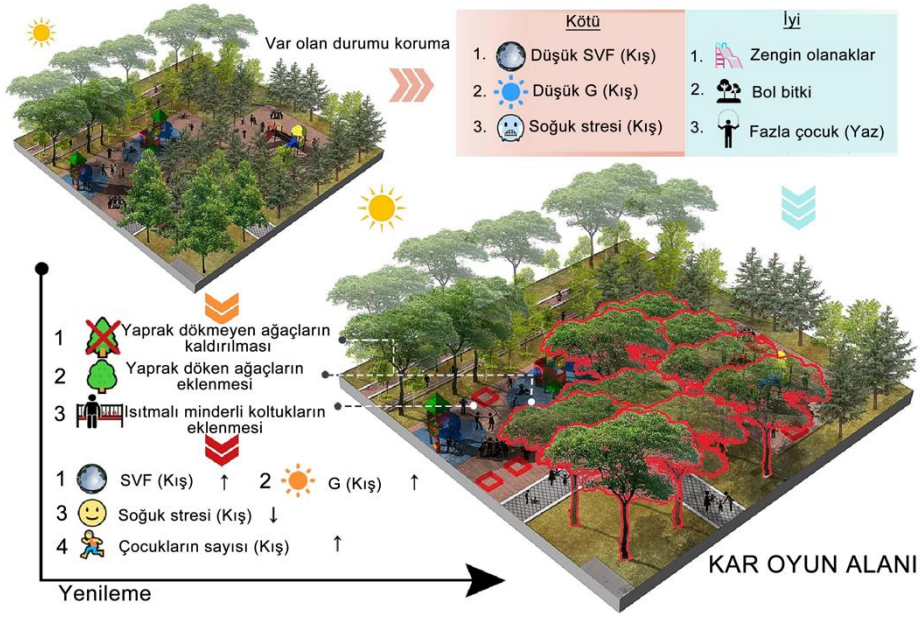


Şekil 4: Ağaçların altındaki alanın biyoklimatik tasarımı

Diğer yandan, oyun alanındaki tüm yüzeylerin yanma eşiğini aştığı saptanmıştır. Yüzey sıcaklıklarını azaltmak için, her mekânın zemini kızılötesi boyalar ile boyanmıştır. Aynı zamanda, bina önü alanda, bazı yeşil alanların monokültür çimlere dönüştürülmesi gerektiği belirtilmiştir. Çocukların güvenliğinin ve termal adaptasyonlarının sağlanmasında, tesislerin gölgeli alanlara yerleştirilmesi, içme suyu tesislerinin inşa edilmesi ve yaralanma durumunda tıbbi müdahale yapılabilmesi için ilk yardım istasyonu kurulması önerilmiştir.

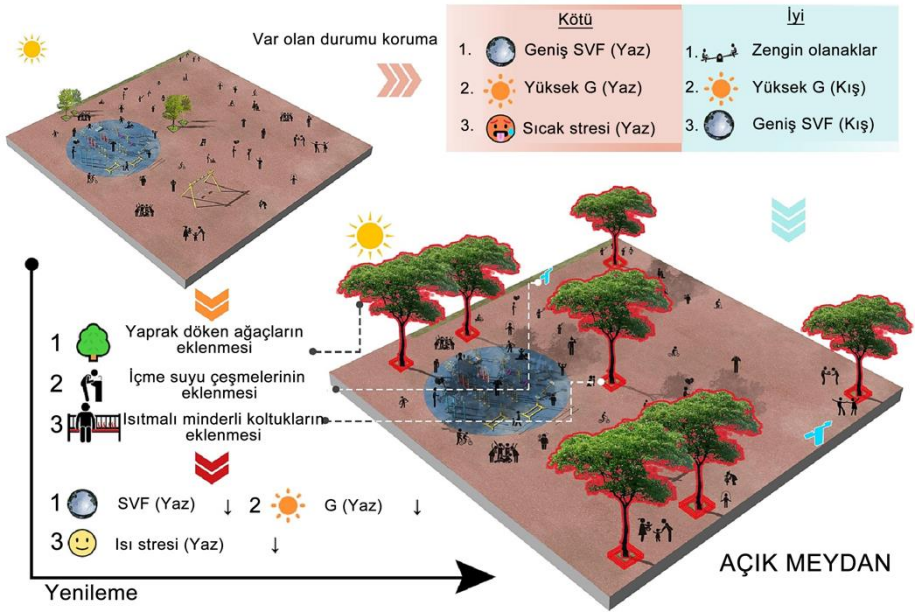
Xiaoyun He vd. (2023)'nin yaptıkları çalışmada ise, seçilen oyun alanında termal konforun arttırılmasına yönelik bir peyzaj yenileme projesi geliştirmiştir. Çalışmaya göre, çocukların kış döneminde karşılaştıkları soğuk stresinin daha ciddi olduğu bölümlerde rüzgârın azaltılması ve güneş ışığının arttırılmasının termal konfor oranını yükseltebileceği ifade edilmiştir.

Yapılan çalışma kapsamında Kar oyun alanı olarak tanımlanan alanda, kışın gölge veren yaprak dökmeyen ağaçların yerine, aynı büyüklükte yaprak döken ağaçlar önerilmiştir. Bu durum, orijinal peyzajın korumasına ve daha fazla güneş ışığına olanak sağlayacaktır (Şekil 5).



Şekil 5: Kar oyun alanının biyoklimatik tasarımı

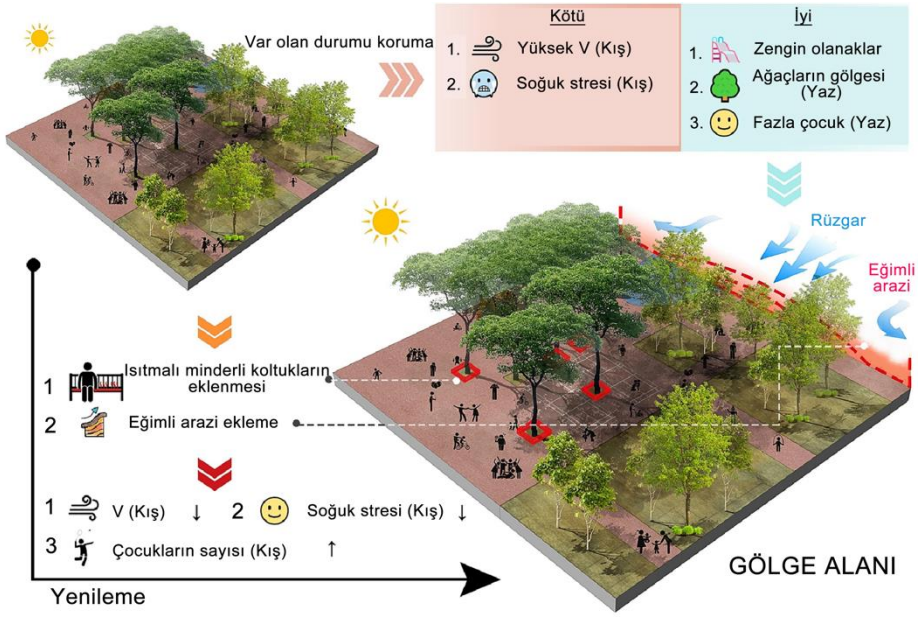
Açık meydan ve buz pateni pistinin güneş etkilerine açık olması nedeniyle, yaz aylarında termal konfor yeterli düzeyde sağlanamamaktadır. Yine de açık meydanın kış döneminde çocuklar için yeterli güneş ışığına sahip olduğu görülmüştür. Bu sebeple, kış ayındaki konfor durumu göz ardı edilmeden, bu alana yönelik yaz dönemine ilişkin geniş gölge sağlayan ve yaprak döken ağaçlar önerilmiştir (Şekil 6).



Şekil 6: Açık meydanın biyoklimatik tasarımı

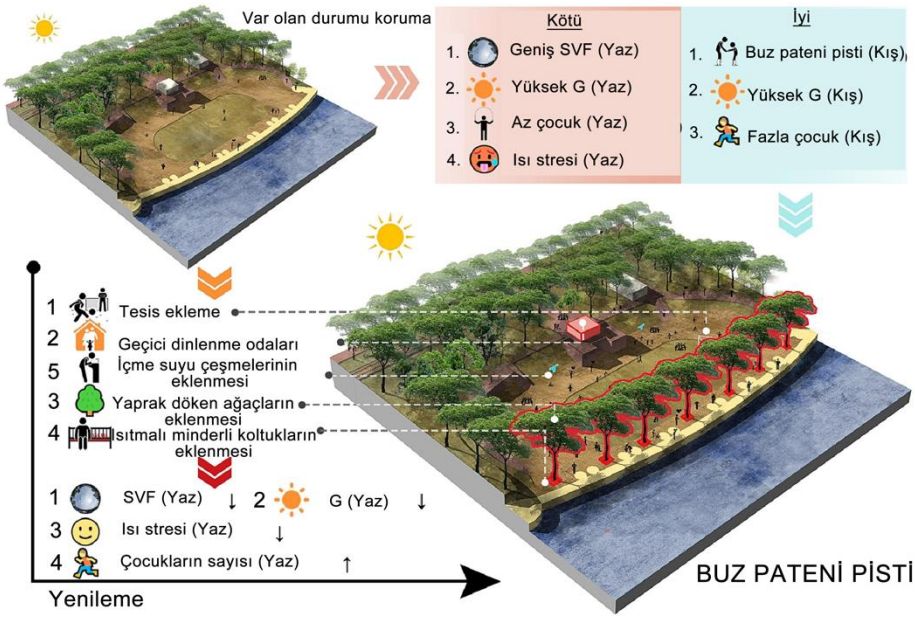
Gölge alanının çevresi, diğer alanlara göre daha açık olduğu için rüzgârı daha şiddetli aldığı ve kış stresinden daha çok etkilendiği tespit edilmiştir. Bu alanda, tümsek arazi oluşturularak

rüzgâr hızının yavaşlatılabileceği düşünülmektedir. Ancak, tümsek arazinin eğimi minimum gölge yaratacak şekilde ayarlanmıştır (Şekil 7).



Şekil 7: Gölge alanının biyoklimatik tasarımı

Buz pateni pisti, kış döneminde çocuklar için işlevsel olmasına rağmen, yaz döneminde aşırı güneş radyasyonuna maruz kalması ve dinlenme tesisinin bulunmaması nedeniyle termal açıdan konforlu bulunmamıştır. Dolayısıyla, buz pateni için kullanılan sahanın suya bakan tarafına söğüt (*Salix babylonica*) gibi gölgelik alan sağlayan bitkiler önerilmiştir. Diğer yandan, soğuk stresi daha az olmasına rağmen alanın taşıdığı özel işlevler açısından, yani çocukların giysilerini değiştirmeleri, dinlenmeleri, vücut ısılarını toparlamaları, yaralanma durumunda ilk yardım desteği almaları için kapalı bir mekân önerilmektedir. Ayrıca, düşük sıcaklıkların kaydedildiği bu alanlarda termal konforu artırmak için dört alanın oturma elemanlarına ısıtma yastıkları eklenmiştir (Şekil 8).



Resim 8: Buz pateni pistinin biyoklimatik tasarımı

Kısacası, yapılan çalışmalarda, sıcak mevsimlerde dış mekân termal konforunun sağlanması için güneş radyasyonu ve gökyüzü görüş faktörünün azaltılması ve rüzgârın arttırılması amaçlanmış, soğuk kış mevsimlerinde ise bu durumun tam tersi stratejiler geliştirilmiştir. Termal konforun sağlanmasında mevsimsel özellikler ön plana çıksa da yine de her oyun alanının kendine özgü bir mikroiklime sahip olduğu göz ardı edilmemelidir. Bu nedenle, oyun alanlarının kendi mikroiklimine yönelik uygun çözüm önerileri getirilmelidir.

SONUÇ

Oyun alanları, çocukların zihinsel ve bedensel sağlığı açısından büyük öneme sahiptir. Fakat günümüz oyun alanlarının çoğu çocuk sağlığı açısından güneş çarpması, yanıklar ve birbiriyle bağlantılı uzun vadeli olumsuz sonuçlar doğuracak şekilde tasarlanmaktadır (Vanos, 2015). Bir oyun alanındaki termal konfor hem oyun sırasındaki aktivite seviyelerini hem de orada geçirilen zamanın süresini belirlemektedir. Oyun alanları veya parkların rahatsız edici olarak algılanmaları durumunda oyun deneyimi genellikle kısalmakta veya çocuklar ziyaretleri sırasında daha az fiziksel aktivitede bulunmaktadır (Vanos vd., 2017; Kennedy vd., 2019).Oyun alanı tasarımı doğru yapıldığı taktirde hipertermi, termal yanıklar, güneş yanıkları ve astım semptomları gibi hastalık oranlarının azalmasına imkân sağlanabilir (Winquist vd., 2016). Ayrıca, aktif oyuna daha elverişli alanların tasarlanması, yüksek düzeyde fiziksel aktivitenin teşvik edilmesini de beraberinde getirmektedir (Cosco vd., 2014). Bir parkın zihinsel ve fiziksel olarak sağlığa ve güvenliğe katkısına ilişkin bütünsel bir bakış açısı, doğal ve yapay unsurları içermelidir. Fakat, ortaya konan pek çok açık alan tasarımı, çoğunlukla doğal unsurlardan yoksundur. Oyun alanları tasarımları, aslında mevcut

güvenlik yönergelerine uygun olmalarına rağmen, yine de güneş radyasyonu, sıcaklık ve kirliliğe maruz kalma gibi güvenli olmayan termal koşullar ile sonuçlanmaktadır (Vanos, 2015). Daha uzun ve daha aktif oyunun sağlık ve sosyal faydaları düşünüldüğünde, oyun alanlarının yıl boyunca termal olarak konforlu olacak şekilde tasarlanması önemli bir tasarım problemi haline gelmiştir. Bu nedenle oyun alanlarındaki tehlikeli termal koşullar hakkında daha fazla çalışma yapılması ve bu konunun özellikle yerel yönetimler ve politika yapıcılar tarafından gündeme alınması sağlanmalıdır.

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DEĞİŞEN İKLİM VE İNSAN SAĞLIĞI

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ÖZET
Sağlık ve iklim ayrılmaz bir şekilde birbirine bağlıdır ve günümüzde milyonlarca insanın sağlığı iklim krizi nedeniyle tehdit altındadır. İklim değişikliği; artan aşırı hava olayları, orman yangınları, azalan gıda, su ve hava kalitesi ve sivrisinek ve kene gibi hastalık taşıyıcılar tarafından bulaşan hastalıklar da dahil olmak üzere insan sağlığını birçok yönden tehdit etmektedir. Dolayısıyla iklim değişikliği değişen hava sıcaklıkları, hava ve su kalitesi gibi çeşitli faktörlere bağlı olarak mevcut sağlık tehditlerini şiddetlendirebildiği gibi, çeşitli yollarla yeni halk sağlığı sorunları yaratmaktadır. Ayrıca doğal çevreyi, yaban hayatı ve iklimsel koşulları değiştirerek, gelecek nesillerin doğal sistemleri bugünden çok daha farklı şekillerde deneyimlemesine neden olacaktır.İklim değişikliği etkilerinin önümüzdeki yüzyılda dünya genelinde belirgin şekilde artacağı tahmin edildiğinden, bu değişikliklerin insan sağlığını nasıl etkileyeceği küresel bir sorun haline gelmiştir. Fakat iklim değişikliğine maruz kalma yollarına bağlı olarak, farklı ülke ve coğrafyalarda farklı insan grupları farklı derecelerde etkilenebilmektedir. Bu doğrultuda iklim değişikliği etkilerinin belirgin şekilde görüldüğü ülkemizde halk sağlığını korumak ve iklim değişikliği etkilerine karşı kırılganlıkları azaltmak için iklim ve sağlık temelinde yapılan çalışma sayısı arttırılmalıdır. Bu amaçla bu çalışmada ülkemizde gerçekleştirilecek ileriki çalışmalara da bir çıkış noktası oluşturacak şekilde iklim ve sağlık odaklı detaylı bir literatür taraması yapılmış olup, Dünya'nın farklı bölgelerinde bu konuda yapılan çalışmalar incelenmiştir.
Anahtar Kelimeler: İklim değişikliği, insan sağlığı, iklim kaynaklı hastalıklar.

CLIMATE CHANGE AND HUMAN HEALTH

ABSTRACT
Health and climate are inextricably linked and the health of millions of people today is threatened by the climate crisis. Climate change threatens human health in many ways, including increased extreme weather events, forest fires, reduced food, water and air quality, and diseases transmitted by disease vectors such as mosquitoes and ticks. Climate change can therefore exacerbate existing health threats due to various factors such as changing temperatures, air and water quality, and create new public health problems in various ways. It will also change the natural environment, wildlife and climatic conditions, causing future generations to experience natural systems in very different ways than today.As the impacts of climate change are projected to increase significantly worldwide over the next century, how these changes will affect human health has become a global issue. However, depending on the ways of exposure to climate change, different groups of people in different countries and geographies may be affected to different degrees. In this direction, the number of climate and health-based studies should be increased in order to protect public health and reduce vulnerabilities to the effects of climate change in our country where the effects of climate change are clearly seen. For this purpose, in this study, a detailed literature review focused on climate and health has been conducted in order to provide a starting point for future studies to be carried out in our country, and studies conducted in different regions of the world on this subject have been examined.
Keywords: Climate change, human health, climate-related diseases.

GİRİŞ

1850'lerde araştırmacılar, atmosferdeki karbondioksit ve diğer doğal olarak oluşan sera gazlarının (nitröz oksit (N_2O), metan (CH_4) ve ozon (O_3) vb.), dünya yüzeyinden yansıyan ısının bir kısmının uzaya dönmesini engellediğini belirtmiş ve bunu sera etkisi olarak tanımlamışlardır. Bununla birlikte, 19. yüzyılın sonlarından bu yana, insanlar fosil yakıt kullanarak ve ormansızlaşma, arazi kullanımı değişikliği vb. yollarla atmosfere artan miktarda sera gazı salmıştır. Sonuç olarak, insan kaynaklı ısınmaya en büyük katkıda bulunan atmosferik karbondioksit konsantrasyonu, sanayi çağında yaklaşık %40 oranında artmıştır (Kaçmaz, 2021; NCA, 2024). Bu değişiklik doğal sera etkisini yoğunlaştırmış ve dünyanın yüzey sıcaklığının ortalama 1.1 °C artmasına neden olmuştur. Bu değişiklik kulağa çok büyük gibi gelmese de bu artışa bağlı olarak dünyanın pek çok farklı bölgesinde binlerce farklı iklim kaynaklı felaket kaydedilmiştir. Son yıllarda yapılan birçok iklim modeli, sera gazı seviyelerinin mevcut seviyelerde yükselmeye devam etmesi durumunda, Dünya'nın ortalama yüzey sıcaklığının 21. yüzyıl sonunda 4°C daha artacağını tahmin etmektedir. Sera gazı emisyonlarını azaltmak için hızlı bir şekilde harekete geçilmezse, modeller küresel ortalama yüzey sıcaklıklarını 1.5-2.0 °C artışında tutmanın artık mümkün olmayabileceğini öngörmektedir (URL-1).Ayrıca iklim tahminlerine göre, önümüzdeki 50 yılda günlük sıcaklıklarda aşırı artışlar, daha uzun sıcak dönemler daha yoğun sıcak hava dalgalarıyla birlikte güçlü bir sıcaklık artış eğilimi beklenmektedir (Kaçmaz Akkurt ve Şemsiyeci, 2024).İklim değişikliği halk sağlığı için önemli bir tehdittir ve insan kaynaklı iklim değişikliğinin etkileri dünya çapında giderek artmaktadır. İklim değişikliği etkileri, gıda ve su kaynaklarımızı, soluduğumuz havayı, yapılı ve doğal çevrelerle etkileşimlerimizi etkileyerek sağlığımızı tehdit etmektedir. İklim değişmeye devam ettikçe, insan sağlığına yönelik riskler de artmaya devam edecektir (GCRP, 2024). Bu noktada iklim değişikliğinin halihazırda insan sağlığını nasıl etkilediği ve gelecekte meydana gelebilecek değişikliklere bağlı olarak insanları hangi risklerin beklediği bugün çalışılması gereken önemli konuların başında gelmektedir.

İKLİM DEĞİŞİKLİĞİ VE SAĞLIK İLİŞKİSİ

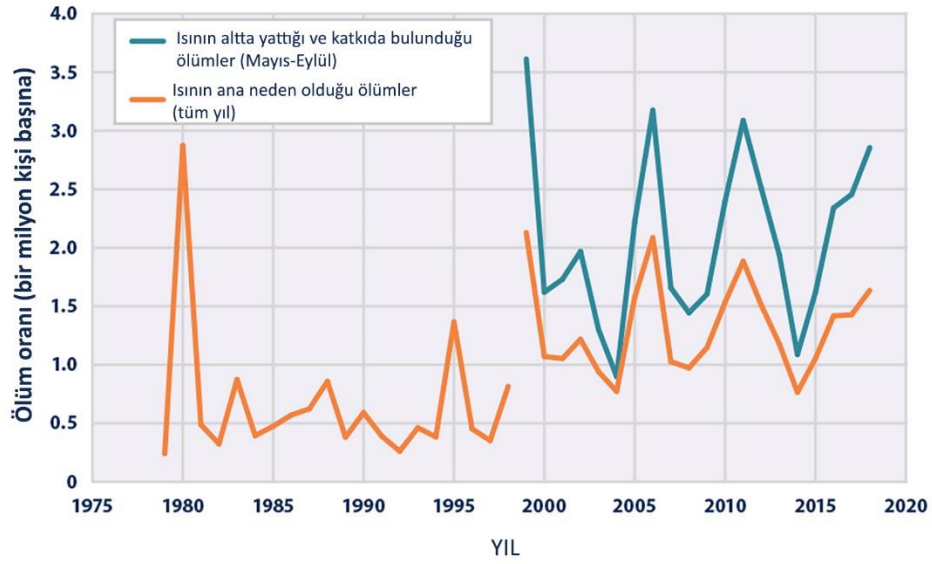
İklim değişikliği, sıcak hava dalgaları, fırtınalar ve seller gibi giderek daha sık görülen aşırı hava olaylarından ölüm ve hastalıklara yol açmak, gıda sistemlerinin bozulması, zoonozlarda ve gıda, su ve vektör kaynaklı hastalıklarda artışlar ve zihinsel sağlık sorunları da dahil olmak üzere sağlığı sayısız şekilde etkilemektedir (WHO, 2023). Dolayısıyla dünyanın farklı bölgelerinde pek çok insan, iklim değişikliğiyle ilişkili sağlık riskiyle karşı

karşıyadır. Ancak bazı insanlar, maruz kaldıkları tehlikeler, bu tehlikelere karşı duyarlılıkları ve uyum sağlama becerilerindeki farklılıklar nedeniyle diğerlerine göre daha yüksek risklerle karşı karşıyadır. Bu nedenle, farklı yerlerde yaşayan ve çevreleriyle farklı şekillerde etkileşime giren her yaştan insanı temsil eden grupları içeren "endişe verici nüfusları" tanımlayabilmek önemlidir. Örneğin çocuklar, düşük vücut ağırlıkları, daha yüksek fiziksel aktivite seviyeleri ve henüz gelişmekte olan akciğerleri nedeniyle solunum yolu tehlikelerine karşı yetişkinlerden daha hassastır. Benzer şekilde engelli bireyler ise, aşırı hava olaylarına hazırlanma ve tepki verme konusunda zorluklarla karşılaşmaktadır. Örneğin, acil durum veya tahliye talimatları genellikle öğrenme, işitme veya görme engelli kişiler için erişilebilir değildir (EPA, 2024a).Ayrıca Hükümetler arası İklim Değişikliği Paneli'nin (IPCC) Altıncı Değerlendirme Raporu (AR6), 3,6 milyar insanın halihazırda iklim değişikliğine son derece duyarlı bölgelerde yaşadığını ileri sürmektedir. Küresel emisyonlara asgari düzeyde katkıda bulunmalarına rağmen, düşük gelirli ülkeler ve gelişmekte olan küçük ada devletleri en sert sağlık riskleri ile karşı karşıyadır. Savunmasız bölgelerde, son on yılda aşırı hava olaylarından kaynaklanan ölüm oranı, daha az savunmasız olanlara göre 15 kat daha fazladır (WHO, 2023).

Sıcaklığa Bağlı Hastalık ve Ölümler

İklim değişikliğinin fiziksel sağlık üzerindeki en doğrudan etkileri yüksek sıcaklıklar ve aşırı hava olaylarından kaynaklanmaktadır. Daha yüksek sıcaklıklar ve daha sık, yoğun ısı dalgaları, sıcak çarpması, bitkinlik, kramplar ve kızarıklıklar gibi ısıya bağlı hastalıklara yol açmaktadır. Bu koşullar şiddetli ve hatta bazen ölümcül olabilmektedir. Bebekler, küçük çocuklar, yaşlı yetişkinler, açık havada çalışanlar ve mevcut tıbbi durumları olan kişiler ısı etkilerine karşı özellikle savunmasızdır. Ancak ısı dalgaları, vücudu sıcaklık düzenleme sınırlarının ötesine iterek herkese zarar verebilmektedir. İklim değişikliği hızlandıkça, ısıya bağlı hastaneye yatışların ve ölümlerin artacağı tahmin edilmektedir (Oneearth, 2024). Örneğin; Amerika Birleşik Devletleri'nin 50 eyaletinde 1979-2018 yılları arasında kayıt altına alınan verilere göre ısıya bağlı ölümlerin oranı son 25 yıllık periyotta giderek artmıştır (Şekil 1). Bu grafikte (Şekil 1) turuncu çizgi, ısının ana neden olarak listelendiği ölümleri gösterirken, mavi çizgi 1999'da kullanıma sunulan daha geniş bir veri kümesine dayanarak mayıstan eylüle kadar olan aylarda ısının altta yattığı veya katkıda bulunduğu ölümleri göstermektedir. İki kaydın örtüştüğü yıllarda (1999-2018), ısının katkıda bulunduğu ölüm oranlarının da hesaba katılması ile ortaya çıkan oranların, ısının ana neden olarak listelendiği

ölüm oranlarından yüksek olduğu, hatta bazı yıllar için neredeyse iki katı olduğu açıkça görülmektedir (EPA, 2024b).



Şekil 1. Amerika Birleşik Devletleri'nde 1979-2018 yılları arasında ısıya bağlı ölüm oranları (EPA, 2024b).

Hava Kalitesine Bağlı Hastalık ve Ölümler

İklim değişikliği hava kalitesini etkilemekte ve bu da olumsuz sağlık sonuçlarına yol açmaktadır. Hava koşullarındaki bozulmalar, yer seviyesindeki ozon (O_3), ince partiküller, orman yangını dumanı ve toz gibi hava kirleticilerini artırarak ve dağıtarak hava kalitemizi etkilemektedir. Ayrıca mevsimlerdeki değişimler ve erken bahar, havadaki alerjenlerin üretimini, dağılımını ve şiddetini de etkileyebilmektedir (URL-2). İster dış mekânda ister içeride olsun, kötü hava kalitesi, insan solunum ve kardiyovasküler sistemlerini olumsuz etkilemektedir. Daha yüksek seviyelerde yer seviyesinde ozona maruz kalan kişilerde erken ölüm veya solunum problemleri nedeniyle hastaneye yatırılma riski daha yüksektir (GCRP, 2024). Artan hava sıcaklıkları ve artan atmosferik CO_2 konsantrasyonları, havadaki alerjen mevsimselliğini, üretimi ve atmosferik konsantrasyonunu, alerjenliğini ve coğrafi dağılımını etkilemektedir. Bu etkiler, alerjen maruziyetinde değişikliklere neden olarak, hem hastalık gelişimi hem de semptomlar için önemli sonuçlar doğurmaktadır. Alerjik solunum yolu hastalıkları birçok ülke ve bölgede zaten ciddi halk sağlığı sorunlarıdır. Örneğin, astım dünya çapında 350 milyondan fazla insanı etkilemektedir ve Avrupa'da en az 30 milyon

çocuk ve genç yetişkini etkileyen, çocuklarda en sık görülen kronik hastalıktır (Beggs vd., 2023).

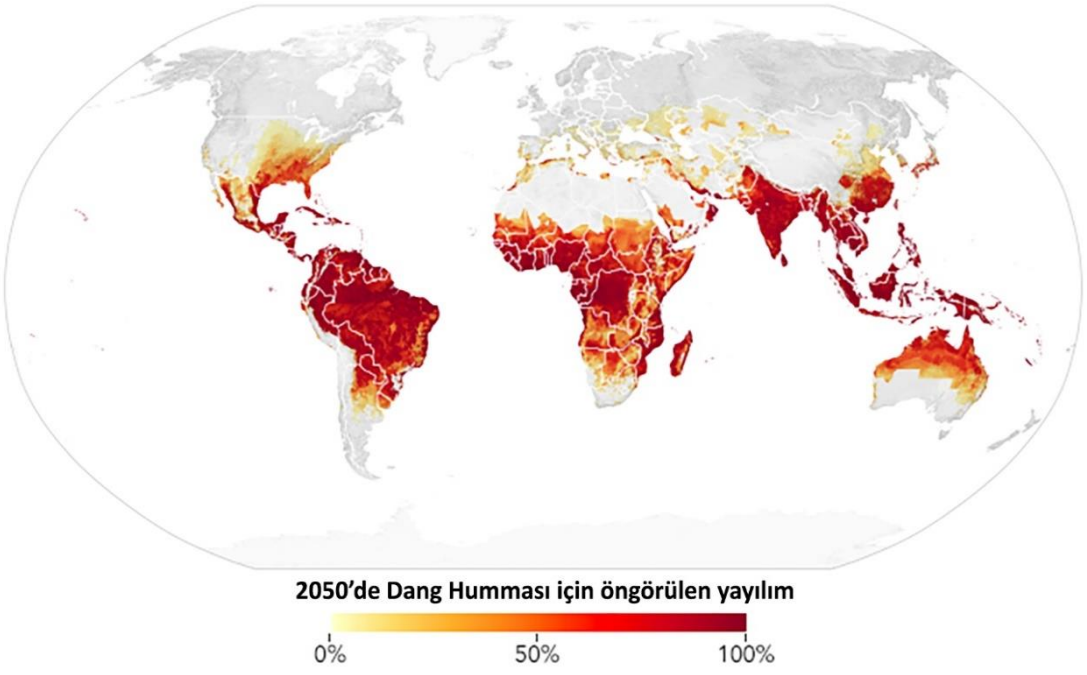
Yakın zamanda Rauer vd. (2021)'nin deneysel olarak gerçekleştirdikleri çalışmalarında yüksek CO_2 altında yetiştirilen yakupotu *(Ambrosia psilostachya)* bitkilerinden elde edilen polenlerin *in vivo* ve *in vitro* ortamda daha güçlü bir alerjik yanıt ortaya çıkardıkları ileri sürülmüştür. Ayrıca yakın zamanda Gentili vd. (2019), yakup otunun artan sıcaklığa tepkisini deneysel olarak incelemişler ve polen alerjenitesinin sıcaklığa duyarlı bir özellik olduğunu ve polen alerjenitesinin sıcaklıkla birlikte arttığını bulmuşlardır.

Ekstrem Hava Olaylarına Bağlı Hastalık ve Ölümler

Aşırı hava olayları halk sağlığı için bir tehdittir. Olayın fiziksel gücü kaçmaya çalışırken yaralanmayı ve hatta bir selde boğulma gibi hava olayının kendisinin neden olduğu ölümü içermektedir. Ayrıca aşırı hava olaylarının sonuçları ölümcül de olabilen bulaşıcı hastalıklara yol açabilmekte (URL-3; Hashim ve Hashim, 2016), zihinsel sağlık bozukluklarına, mülklere ve altyapılara verilen zararlara ve su kirlenmelerine yol açabilmektedir (Weilnhammer vd., 2021).Hükümetlerarası İklim Değişikliği Paneli'nin (IPCC) Altıncı Değerlendirme Raporu'na göre, 2022 yılında Avrupa'da rekor kıran en az beş sıcak hava dalgası meydana gelmiş, yaz sıcaklıkları 47 °C'ye ulaşarak 16.000'den fazla kişinin ölümüne yol açmıştır. Afrika'da ise kuraklık 88,9 milyon kişiyi etkilemiştir. Sadece Ian Kasırgası Amerika kıtasında 100 milyar ABD dolarına mal olan hasara yol açmıştır. Aşırı hava olaylarının halk sağlığı üzerindeki etkisinin uzak bir endişe değil, yakın ve acil bir tehdit olduğu açıktır (URL-4).Dünya Ekonomik Formu (2024)'na göre seller, iklim kaynaklı ölümler açısından en yüksek akut riski oluşturmaktadır. Yayınladıkları rapora göre, seller 2050 yılına kadar 8,5 milyon insanın hayatını kaybetmesine sebep olabilme potansiyeline sahiptir. İkinci en yüksek ölüm nedeni ise kuraklık olarak belirlenmiştir ve 2050 yılına kadar 3,2 milyon ölüme neden olması beklenmektedir. Kuraklıklar, daha çok 40 milyon insanın etkilerine maruz kaldığı Afrika gibi bölgelerle ilişkilendirilse de dünyanın daha ılıman bölgelerinde de giderek daha fazla hissedilmektedir. ABD anakarasının %40'ına yakını ve Avrupa'daki insanların yaklaşık beşte biri kuraklıkla karşı karşıyadır. Kuraklık için gelecekteki yüksek riskli bölgeler ABD'nin batısı, Güney Amerika, Akdeniz bölgesi ve güneybatı Afrika'dır. Ulusal Okyanus ve Atmosfer Birliği'nin (NOAA) Kuraklık Bilgi Sistemine göre ise, bu bölgelerin çoğu zaten kötüleşen yağışlar ve daha düşük yeraltı suyu seviyeleri yaşamaktadır.

Vektör Kaynaklı Hastalıklar

Vektör kaynaklı hastalıklar, sivrisinekler, keneler ve pireler gibi hastalık vektörleri tarafından bulaşan hastalıklardır. Bu vektörler, virüsler, bakteriler ve protozoalar gibi bulaşıcı patojenleri hayvanlardan insanlara taşıyabilirler (EPA, 2024c). Sıcaklık, yağış ve aşırı olaylardaki değişiklikler, hastalık taşıyan organizmaların hayatta kalmak için ihtiyaç duydukları yaşam alanlarını genişletebilir ve yılın başlarında ortaya çıkmalarına sebep olabilirler. Örneğin, Lyme hastalığını taşıyan keneler artık Kanada'nın, kısa bir süre önce kenelerin hayatta kalması için çok kuzeyde olduğu düşünülen bölgelerinde bulunmaktadır (URL-1). Ayrıca iklim değişikliği bazı hastalıkların bulaşma mevsimini uzatmış ve sıtma ve dang humması gibi birçok hastalığın coğrafi aralığını genişletmiştir. Örneğin, dang humması bulaşma koşullarının dünya genelinde önemli ölçüde genişlemesi muhtemeldir (Şekil 2) (United Nations Climate Change, 2024). Yapılan iklim projeksiyonlarına göre sıcaklıklar arttıkça 2050 yılına kadar, güneydoğu ABD, orta Meksika, orta ve Güney Afrika, kıyı Çin ve Japonya'nın büyük bölümünün dang humması için elverişli ortamlar haline geleceği ve hastalığın Dünya'nın büyük bölümüne yayılacağı ön görülmektedir (URL-1).



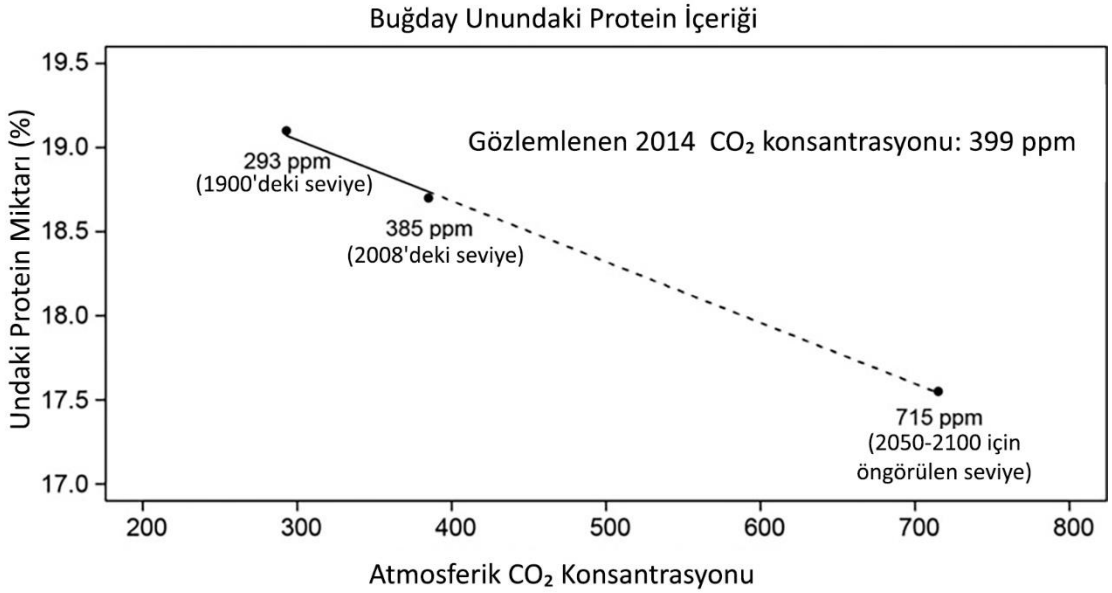
Şekil 2. Dang hummasının bulaşmasından sorumlu olan *Aedes aegypti* sivrisineği için öngörülen 2050 habitatı (NASA Earth Observatory, 2024).

Suya Bağlı Hastalık ve Ölümler

Kirlenmiş içme veya kullanma suyuna maruz kalan insanlar hastalanabilir. İklim değişikliği, artan sıcaklıklar, daha sık görülen şiddetli yağmurlar ve yüzey akışları ve fırtınaların etkileri yoluyla hastalık riskini artırmaktadır. Sağlık üzerindeki etkileri arasında ishal gibi gastrointestinal hastalıklar, vücudun sinir ve solunum sistemleri üzerindeki etkiler veya karaciğer ve böbrek hasarı sayılabilmektedir (EPA, 2024c). Ayrıca yüksek su sıcaklıkları, Vibrio türleri gibi içme suyu ve kullanma/rekreasyonel su maruziyetine bağlı olarak hastalık yapan patojenlerin büyüme hızını artırmaktadır. Vibrio enfeksiyonları, kontamine deniz ürünlerinin tüketilmesi veya kıyı sularında bulunan Vibrio türlerine doğrudan maruz kalan yaraların enfeksiyon kapması yoluyla mide iltihabına neden olabilmektedir. Vibrio enfeksiyonları halk sağlığı açısından büyük bir endişe kaynağıdır ve bu yara enfeksiyonları potansiyel olarak ciddi olup septisemi ve ölümle sonuçlanabilir (Climate ADAPT, 2024). Suyun yetersiz olduğu yerlerde, suyla bulaşan hastalıklar ortaya çıkabilir. Bu durum, su eksikliğinin ve kronik su kıtlığının, kötü atık bertarafından kaynaklanan sineklerle birlikte, bağırsak ve göz enfeksiyonlarının bulaşmasına izin verebileceği çöl bölgelerinde görülebilir. Ayrıca, uzun vadede su kaynaklı hastalıkların sağlık üzerindeki etkileri, diğer su sorunlarıyla da (örneğin, kıtlık, sel, ekonomi, deniz seviyesinin yükselmesi ve savaş) ilişkilendirilebilir (Nichols vd., 2018).

Gıda Güvenliği, Beslenme ve Dağıtıma Bağlı Hastalık ve Ölümler

İklim değişikliğinin gıda güvenliği tehditlerinin oluşumu ve şiddeti üzerinde çok yönlü etkileri vardır. Sıcaklık, nem, yağış düzenleri ve aşırı hava olaylarının sıklığındaki uzun vadeli değişiklikler halihazırda tarım uygulamalarını, mahsul üretimini ve gıda ürünlerinin besin kalitesini etkilemektedir. Örneğin; artan CO_2 bitki büyümesini ve karbonhidrat üretimini teşvik etse de çoğu gıda ürününün besin değerini (protein ve mineraller) azaltmaktadır. Artan CO_2'in ürünlerin besin değeri üzerindeki bu doğrudan etkisi, insan sağlığı için potansiyel bir tehdit oluşturmaktadır (GCRP, 2024; EFSA, 2024). ABD'de 1900 yılından bu yana küresel atmosferik CO_2 konsantrasyonunda gözlemlenen artışı simüle eden laboratuvar koşullarında yapılan çalışmalarda, birden fazla buğday çeşidinden elde edilen buğday ununun protein seviyelerinde belirgin düşüş tespit edilmiştir (Şekil 3). Arpa, buğday, pirinç ve patates gibi başlıca gıda ürünlerinin de 2100 yılı için öngörülen CO_2 seviyelerinde yetiştirildiğinde, mevcut ortam seviyelerine göre %6 ila %15 daha düşük protein konsantrasyonlarına sahip olacakları hesaplanmıştır (GCRP, 2024).



Şekil 3. Atmosferik CO_2 artışının buğday unundaki protein konsantrasyonları üzerindeki etkisi (GCRP, 2024).Mikropların, potansiyel olarak toksin üreten mikroorganizmaların ve diğer zararlıların iklim faktörlerine karşı hassasiyeti, iklim değişikliğinin gıda kaynaklı bazı hastalıkların oluşumunu ve yoğunluğunu etkileme potansiyeline de sahip olduğunu göstermektedir. Ayrıca, değişen koşullar bitki ve hayvan sağlığına zararlı istilacı yabancı türlerin yerleşmesini de destekleyebilmektedir. Deniz suyunun ısınması ve besin girdisinin artması, toksin üreten alglerin çoğalmasına yol açarak deniz ürünleri kirliliği salgınlarına neden olmaktadır (Mukherjee vd., 2022; EFSA, 2024).Ayrıca iklim değişikliğinin bir sonucu olarak 2050 yılına kadar yaklaşık 25 milyon çocuğun daha yetersiz besleneceği tahmin edilmektedir. İklim değişikliğinin ayrıca gıda güvenliği ve daha önce tartışılan ishalli hastalıklar üzerindeki etkileri yoluyla dolaylı olarak yetersiz beslenmeye katkıda bulunması beklenmektedir. Dünya Sağlık Örgütü'ne göre, güvenli olmayan gıda, ishal ve yetersiz beslenme kısır döngüsü yaratarak en savunmasız kişilerin beslenme durumunu tehdit etmektedir. Gıda kaynaklarının güvensiz olduğu yerlerde, insanlar daha az sağlıklı diyetlere geçme ve kimyasal, mikrobiyolojik ve diğer tehlikelerin sağlığa risk oluşturduğu daha fazla "güvensiz gıda" tüketme eğilimindedir (GCHA, 2024).

Ruh Sağlığı ve Esenliğine Yönelik Tehditler

İklim değişikliğinin hem anlık hem de uzun vadeli etkileri depresyon, anksiyete ve travma sonrası stres bozukluğu gibi ruh sağlığı sorunlarına katkıda bulunabilir. IPCC 6. Değerlendirme Raporu (2022)'na göre iklim değişikliğinin özellikle savunmasız bireyler ve topluluklar için dünya çapında ruh sağlığı sonuçlarını kötüleştirmesi beklenmektedir. Örneğin, iklimle ilgili doğal afetler özellikle çocuklar için travmatik olabilmektedir.İklim

değişikliğinin ruh sağlığı üzerindeki etkileri, fiziksel sağlık üzerindeki etkilerine kıyasla henüz büyük ölçüde keşfedilmemiş durumdadır. İklimle ilgili herhangi bir felaketten kaynaklanan psikolojik travma vakaları, fiziksel yaralanmalardan 40 kat daha yüksek olabileceğinden, gelecek yüzyılda özellikle insanların sıcak hava dalgalarına, sellere veya orman yangınlarına daha fazla maruz kalacağı düşünüldüğünde bu durum oldukça endişe vericidir. Buna ek olarak, iklim değişikliğinin ruh sağlığı üzerindeki en belirgin etkileri, sosyal açıdan savunmasız topluluklarda daha fazla görülmektedir (Climate ADAPT, 2024).Doğal afetler insanın hayatını, içinde yaşadığı topluluğu ve bazen de evini ya da mülkünü kaybetmesine yol açabilmektedir. Sel felaketi yaşayan haneler, bazen yıllar sonra bile daha yüksek düzeyde anksiyete ve depresyon yaşadıklarını belirtmişlerdir. Örneğin, Andrew Kasırgası'ndan üç ay sonra, güney Florida'nın etkilenen bölgelerinde yaşayan çocukların %38'inde (8 ila 12 yaş arası), travma sonrası stres bozukluğunun olası semptomları görülmüştür. Felaketten 10 ay sonra bu oran yaklaşık %18'e düştüğü, ancak yine de afet olayından kaynaklanan ciddi ruh sağlığı sorunları olan önemli sayıda birey olduğu tespit edilmiştir (GCRP, 2024).Doğal afetler ve kuraklık aynı zamanda daha fazla tütün ve alkol kullanımının yanı sıra aile içi şiddete de yol açabilmektedir. Buna ek olarak, genel olarak sıcaklığa bağlı olarak şiddet olaylarında da artışlar görülmektedir (EPA, 2024c).

SONUÇ

İklim değişikliğinin etkileri özellikle gelişmekte olan ülkelerde daha ağır hissedilse de dünyanın her yerinde insan sağlığını çeşitli şekillerde etkileme potansiyeline sahiptir. Fiziksel çevrenin yanı sıra sosyal ve ekonomik koşullar ve sağlık sistemlerinin işleyişi de dahil olmak üzere hem doğal hem de beşeri sistemlerin tüm yönlerini etkilemetedir. Bu nedenle, onlarca yıllık sağlık ilerlemesini baltalayan ve potansiyel olarak tersine çeviren bir tehdit çarpanıdır. İklim koşulları değiştikçe, fırtınalar, aşırı sıcaklar, seller, kuraklıklar ve orman yangınları dahil olmak üzere daha sık ve yoğunlaşan hava ve iklim olayları gözlemlenmektedir. Bu hava ve iklim tehlikeleri, sağlığı hem doğrudan hem de dolaylı olarak etkileyerek ölüm riskini, kronik hastalıkları, bulaşıcı hastalıkların ortaya çıkmasını, yayılmasını ve sağlıkla ilgili acil durumları artırmaktadır (WHO, 2023).Bu değişikliklere hazırlanmak ve uyum sağlamak için; örneğin sıcak hava dalgaları ve diğer aşırı olaylar için erken uyarı sistemleri kurmak, endişe verici popülasyonlar arasındaki kırılganlıkları azaltmak için adımlar atmak, sağlık profesyonelleri arasında farkındalık yaratmak ve iklimde gelecekte beklenen değişikliklere uyum sağlamak için altyapının inşa edilmesini sağlamak gibi yapabileceğimiz pek çok şey vardır. Ayrıca iklim değişikliğinin insan sağlığı için

oluşturduğu tehditleri anlamak, riskleri azaltmak ve hazırlıklı olmak için birlikte çalışmanın ilk adımıdır (EPA, 2024c). Bu doğrultuda özellikle ülkemiz gibi gelişmekte olan ülkelerde iklim değişikliğinin halihazırda insan sağlığını nasıl etkilediği ve gelecekte meydana gelebilecek değişikliklere bağlı olarak insanları hangi risklerin beklediği bugün çalışılması gereken önemli konuların başında gelmektedir. Bu amaçla ülkemizde öncelikle kırılgan popülasyon ve hassas ekosistemler belirlenerek, iklim değişikliğinin oluşturduğu sağlık riskleri ortaya konmalıdır. Ayrıca iklim değişikliğinin bir halk sağlığı acil durumu olarak ilan edilmesi ve yerel sağlık departmanlarına rehberlik edilmesi gerekmektedir.

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SÜRDÜRÜLEBİLİR TURİZM VE KALKINMA İÇİN EKOKÖY MODELLERİ: SAPACA KÖYÜ ÖRNEĞİ

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ÖZET
Ekoköyler, sürdürülebilir tarım ve doğal kaynakların korunmasıyla ilgili yenilikçi yaklaşımların önemli bir parçası haline gelmiştir. Bu bildiri, bilimsel temellere dayanan ekoköy kavramının, turizm ve sürdürülebilir kalkınma üzerindeki etkisini incelemektedir. Özellikle, Türkiye'nin Kuzeydoğu Anadolu Bölgesi'nde bulunan Sapaca Köyü'nün örneği üzerinden ekoköylerin potansiyeli ve etkisi ele alınmaktadır. Ekoköy kavramı, sürdürülebilir tarım ve permakültür ilkelerine dayanır. Bill Mollison'un tanımıyla, permakültür doğal ekosistemlerin tasarımı ve bakımıyla ilgilenirken, ekoköyler ise sürdürülebilir insan yerleşimlerinin tasarımını hedefler. Bu kavramlar, çeşitli toplulukların kalkınması ve ekonomik faaliyetlerin çeşitlendirilmesinde önemli bir rol oynamaktadır. Kuzeydoğu Anadolu Bölgesi'nin turizm stratejisi ve eylem planında yer alan "Ekoturizm ve Agroturizmin Geliştirilmesi" başlığı altında, Sapaca Köyü'nün ekoköy modeli için seçilmesi kararlaştırılmıştır. Köy, coğrafi ve ekolojik özellikleriyle ekoturizmin gelişmesine olanak sağlayan bir konumda bulunmaktadır. Sapaca Köyü'nün ekoköy kavramıyla uyumlu bir şekilde tarım ve turizm faaliyetlerini bir araya getirebilme potansiyeli yüksektir. Yapılan değerlendirmeler, köydeki yerel yöneticilerin ve köylülerin kalkınma çabalarına aktif katılım sağladığını ve yeniliklere açık olduklarını göstermektedir. Ayrıca, köydeki tarım ve ormancılık faaliyetlerinin ekoköy prensiplerine uyumlu olduğu ve turizm faaliyetlerini destekleyecek doğal ve kültürel zenginliklerin bulunduğu belirlenmiştir. Sapaca Köyü'nün ekoköy modelinin, sürdürülebilir turizm ve kalkınma açısından önemli bir örnek teşkil ettiği sonucuna varılmıştır. Bu bağlamda, köydeki ekoköy uygulamalarının yaygınlaştırılması ve benzer projelerin bölgesel kalkınmaya katkı sağlaması önerilmektedir. Bu bildiri, Sapaca Köyü'nün ekoköy modelinin turizm ve sürdürülebilir kalkınma üzerindeki etkilerini vurgulayarak, benzer bölgelerde uygulanabilecek stratejilerin tartışılmasına katkıda bulunmayı amaçlamaktadır. Ekoköylerin, doğal ve kültürel kaynakların korunmasıyla birlikte turizm ve ekonomik gelişme için önemli bir potansiyele sahip olduğu vurgulanmaktadır.

Anahtar Kelimeler: Sürdürülebilir Turizm, Sürdürülebilir Kalkınma Hedefleri (SKH), Ekoköyler, Cittaslow Uzundere, Sapaca

ECOVILLAGE MODELS FOR SUSTAINABLE TOURISM AND DEVELOPMENT: THE CASE OF SAPACA VILLAGE

ABSTRACT
Ecovillages have become an important part of innovative approaches to sustainable agriculture and conservation of natural resources. This paper examines the impact of the scientifically based ecovillage concept on tourism and sustainable development. In particular, the potential and impact of ecovillages are discussed through the example of Sapaca Village in the Northeastern Anatolia Region of Turkey. The ecovillage concept is based on the principles of sustainable agriculture and permaculture. As defined by Bill Mollison, permaculture is concerned with the design and maintenance of natural ecosystems, while ecovillages aim to design sustainable human settlements. These concepts play an important role in the development of various communities and diversification of economic activities. Under the heading of "Development of Ecotourism and Agrotourism" in the tourism strategy and action plan of the Northeastern Anatolia Region, it was decided to select Sapaca Village for the ecovillage model. The village has geographical and ecological characteristics that allow for the development of ecotourism. Sapaca Village has a high potential to combine agriculture and tourism activities in line with the ecovillage concept. Assessments show that local administrators and villagers in the village actively participate in development efforts and are open to innovations. In addition, agricultural and forestry activities in the village are in line with ecovillage principles and there are natural and cultural riches to support tourism activities. It is concluded that the ecovillage model of Sapaca Village sets an important example for sustainable tourism and development. In this context, it is recommended that ecovillage practices in the village should be expanded and similar projects should contribute to regional development. This paper aims to contribute to the discussion of strategies that can be applied in similar regions by emphasizing the effects of the ecovillage model of Sapaca Village on tourism and sustainable development. It is emphasized that ecovillages have a significant potential for tourism and economic development with the protection of natural and cultural resources.
Keywords: Sustainable Tourism, Sustainable Development Goals (SDGs), Ecovillages, Cittaslow Uzundere, Sapaca

GİRİŞ

Günümüzde, sürdürülebilir turizm ve kalkınma hedeflerine ulaşma çabaları, çevresel ve sosyal sürdürülebilirlik ilkelerine dayalı yenilikçi yaklaşımları gerektirmektedir (Hall 2021). Bu bağlamda, ekoköyler sürdürülebilir turizmin geliştirilmesi ve sürdürülebilir kalkınmanın desteklenmesi için önemli bir potansiyele sahiptir (Gesota 2008; Zeybek ve Arslan 2015; Doğan 2019; Ece 2019; González Arnedo vd 2022). Sürdürülebilir turizm, çevresel, ekonomik ve sosyal etkileri dengede tutarak doğal ve kültürel kaynakları koruyan ve yerel toplulukların refahını artıran bir turizm modelidir (Muhanna 2006; Hunter 2012). Sürdürülebilir kalkınma hedefleri (SKH) çerçevesinde, sürdürülebilir turizm, özellikle yerel ekonomik kalkınma, kültürel mirasın korunması ve çevresel sürdürülebilirlik açısından önemli bir rol oynamaktadır (Girard ve Nijkamp 2009; Nocca 2017; Amerta 2018).Ekoköyler, çevresel etkiyi en aza indirerek doğal kaynakları koruyan ve topluluk yaşamını destekleyen yerleşimlerdir (Litfin 2014). Bu köyler genellikle alternatif enerji kaynakları kullanır, organik tarım uygular ve yerel kültürü korur (Litfin 2012; Miller 2018). Ekoköyler, sürdürülebilir turizm için ideal bir ortam sunmakta ve ziyaretçilere çevresel ve sosyal açıdan sorumlu bir seyahat deneyimi sağlamaktadır (Bulatović ve Rajović 2016; González Arnedo vd 2022; Xhexhi 2023).Ekoköyler, sürdürülebilir turizm açısından çeşitli katkılar sağlar. Bunlar arasında doğal ve kültürel mirasın korunması, yerel ekonominin desteklenmesi, yerel toplulukların güçlendirilmesi ve çevresel duyarlılığın artırılması yer almaktadır. Ekoköyler, sürdürülebilir turizm projelerinin merkezi olabilir ve bu sayede yerel ekonomiye katkı sağlayabilir (Gesota 2008; Litfin 2012; Litfin 2014; Zeybek ve Arslan 2015; Bulatović ve Rajović 2016; Nocca 2017; Amerta 2018; Miller 2018; Doğan 2019; Ece 2019; González Arnedo vd 2022; Xhexhi 2023).Bu çalışma, ekoköylerin sürdürülebilir turizm ve kalkınma hedeflerine ulaşmada nasıl bir rol oynadığını incelemiş ve vurgulamıştır. Ekoköyler, çevresel ve sosyal sürdürülebilirlik ilkelerine dayalı olarak turizmin geliştirilmesi ve yerel kalkınmanın desteklenmesi için önemli bir potansiyele sahiptir. Bu nedenle, ekoköylerin sürdürülebilir turizm projelerinde daha fazla kullanılması ve desteklenmesi önemlidir.Bu araştırmanın amacı, sürdürülebilir turizm ve kalkınma hedeflerine ulaşmada ekoköylerin rolünü incelemek ve bu bağlamda ekoköylerin sürdürülebilir turizm ve kalkınma stratejilerine nasıl katkı sağlayabileceğini anlamaktır. Bu çalışmanın sonucunda, ekoköylerin sürdürülebilir turizm ve kalkınma açısından potansiyel katkılarını değerlendirmek ve bu bilgiyi sürdürülebilir turizm projelerinin ve yerel kalkınma

stratejilerinin sakinşehir Uzundere özelinde geliştirilmesi için kullanılabilir hale getirmek amaçlanmaktadır.

ÇALIŞMA ALANI

Çalışma, Uzundere ilçesinde 2012'de Kuzeydoğu Anadolu Kalkınma Ajansı (KUDAKA) tarafından İnovasyona Dayalı Turizm Stratejisi ve Eylem Planında TRA1 bölgesi için geliştirilmesi öngörülen 3 ekoköyden biri olan Sapaca'da gerçekleştirilmiştir (Şekil 1). Uzundere, Tortum Çayı Vadisi'nde yer almakta olup Çoruh Havzası'nı oluşturan birçok vadiden biridir. Bu havza, Uluslararası Koruma Birliği (IUCN) tarafından dünyanın 200 önemli ve 34 sıcak noktasından biri olarak kabul edilen Kafkasya Ekolojik Bölgesi'nin batı bölümünü içermektedir. Uzundere, doğal (flora-fauna), kültürel, tarihi ve rekreasyonel açıdan zengin bir potansiyele sahiptir ve Çoruh Havzası'nın önemli bir merkezidir.





Şekil 1. Çalışma alanı Sapaca köyünün lokasyon haritası ve derin vadi sisteminin oluşturduğu peyzaj

BULGULAR

Kuzeydoğu Anadolu Kalkınma Ajansı (KUDAKA) tarafından 2011 yılı içerisinde yaklaşık 1 yıllık sürede ve çok sayıda geniş katılımlı toplantı (KUDAKA uzmanlarının moderatörlüğünde 'Tecnopolis' isimli danışmanlık kuruluşunun uzmanları, sektör ve yerel sivil toplum kuruluşu temsilcilerinin, yerel halktan ilgililerin katılımları ile) süreçleri sonucunda hazırlanan Kuzeydoğu Anadolu Bölgesi (Erzurum – Erzincan – Bayburt) 'İnovasyona Dayalı Turizm Stratejisi ve Eylem Planı 2012 – 2023' belgesinde, Kuzeydoğu Anadolu Turizminin Gelişimi için Stratejik Yönelimler başlığı ve '5. EKOTURİZM ve AGROTURİZMİN GELİŞTİRİLMESİ' alt başlığında 'Kuzeydoğu Anadolu Model Eko – Agroturizm Köylerinin Oluşturulması' kararlaştırılmıştır. Bu çerçevede, her üç ilden seçilen üç köyde kısa vadede eko–agroturizm için örnek uygulamaların gerçekleştirileceği modeller oluşturulacağı belirtilmiş ve bu amaçla Erzurum'da Sapaca, Erzincan'da Yalınca ve Bayburt'ta Bayraktar köyleri tespit edilmiştir. Strateji Belgesinde Sapaca Köyü ile ilgili olarak 'Sapaca Vadisi boyunca dağınık yerleşim gösteren köy ve köyün bulunduğu vadi, tüm ekonomik faaliyetlerin vadi boyunca yayıldığı ekoturizmin 'niş'lerinin geliştirilebileceği bir konuma sahiptir (Şekil 2; 3). Vadi'nin coğrafi ve ekolojik üstünlüğü; yollarının eski rota ve durumunu koruması ile yöredeki turizm alanları içinde eko–agroturizm faaliyetlerinin yapılabilmesi açısından avantajlı durumdadır' açıklamalarına yer verilmektedir.

Yapılan saha incelemeleri, köy yönetimi, yerel kuruluş yetkilileri ve köylülerden alınan görüşlere bakıldığında ana hatları ile şu değerlendirmeleri yapmanın mümkün olduğu görülmektedir.

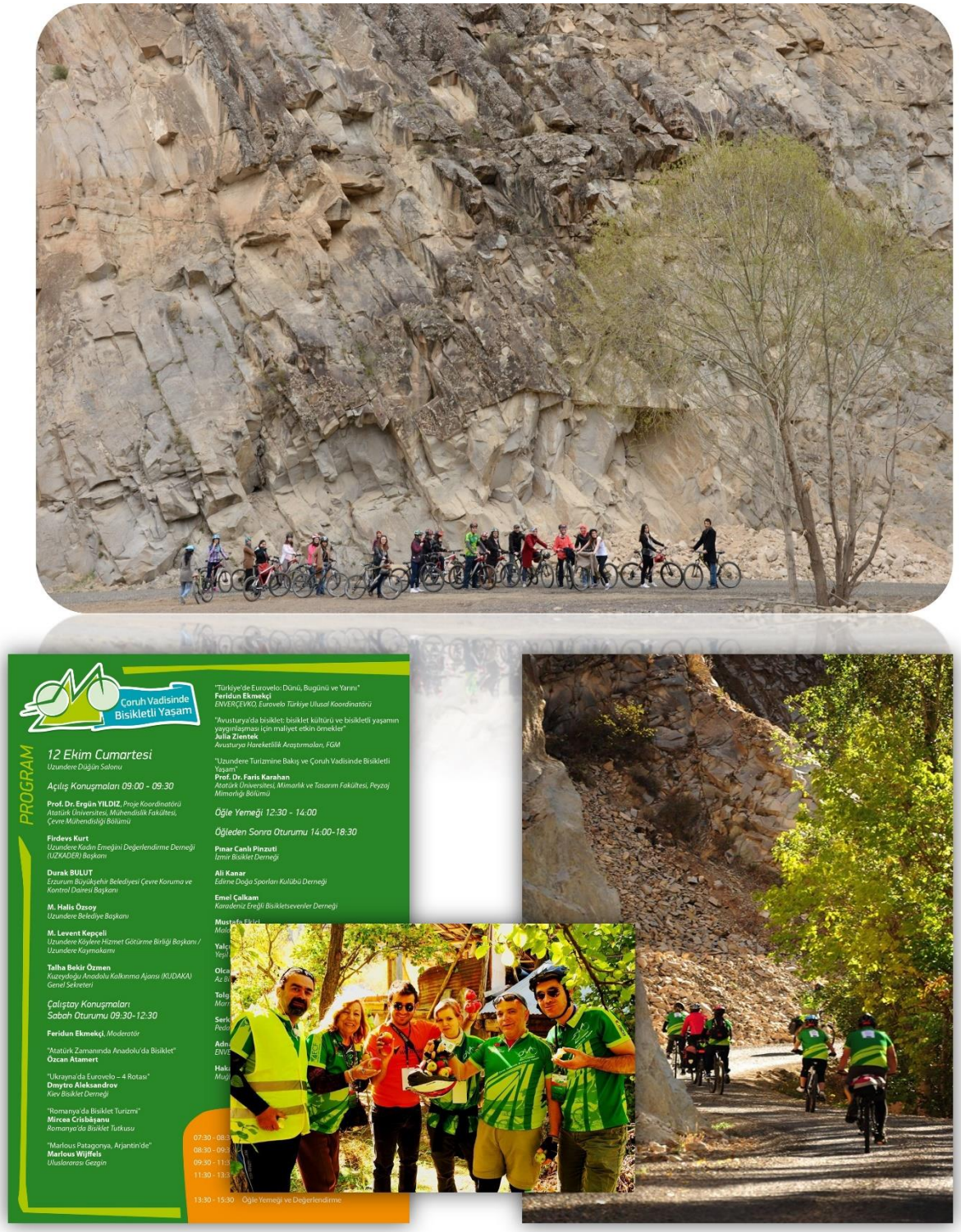
- Köyün bilimsel 'Ekoköy' kavramı ile geliştirilebilecek bir potansiyele sahip olduğu ve KUDAKA turizm stratejisinde yer almasının isabetli bir karar olduğu,
- Bununla beraber hâlihazırda kış mevsiminde ziyaret gerçekleştirildiğinden diğer mevsimler ile ilgili değerlendirmeye de ayrıca ihtiyaç olduğu (özellikle bağ-bahçe tarımı, seracılık ile yaylacılık faaliyetlerinin anlaşılması bakımından),
- Yerel yöneticilerin (kaymakam, belediye başkanı) genel anlamda kalkınma çabalarını desteklediğini ve proje ya da aktivitelere aktif biçimde katılım sağladıkları,
- Köylülerin proje fikir ve uygulamalarına son 20 yılda uyum sağladıkları ve yeniliğe açık oldukları,



Şekil 2. Sapaca köyünün ekoköy potansiyelini destekleyen bazı özellikleri

- Köylülerin proje desteği olsun ya da olmasın girişimcilik kapasitelerinin yüksek olduğu,
- Doğu Anadolu Turizmi Geliştirme Projesi, Çağlayan Bilim Kültür ve Sanat Derneği, UDOSK ve ERTÜEL faaliyetlerine aktif katılım sağladıkları ve bu faaliyetlerden elde ettikleri tecrübeleri ev pansiyonculuğu ve günübirlik tesis işletmeciliği yönünde değerlendirdikleri ya da bu yönde niyetleri olduğu,
- Hem Uzundere'den hem de Sapaca köyünden KUDAKA'nın 2011 yılı boyunca hazırlığını yaptığı Turizm Stratejisi ve Eylem Planına aktif katılım sağlandığı ve bu stratejide yer alan bazı eylemlerin yer almasına bizzat görüş belirterek katkı sundukları,

- Sapaca Köyü'nün ulusal ve uluslararası kuruluşlarla kendi vadilerinde proje uygulama fikirlerine açık oldukları ve bu konuda yararlanabilecekleri fonların da arayışı içerisinde oldukları,



Şekil 3. Sapaca köyünün ekoköy potansiyelini destekleyen bazı yenilikçi uygulamalar ve özellikle bisiklet kullanımını teşvik eden girişimler

- Köydeki tarım ve ormancılık faaliyetlerinin 'Ekoköy' tanımında ve sınıflandırılmasında kullanılan yöntemlere adaptasyonunun kolay olduğu ve uyumlaştırılabileceğinin açık olduğu,
- Turunçgil, incir ve muz dışında ülkemizde yetişen meyve türlerinin büyük çoğunluğunun cins ya da tür bazında vadide bulunduğu ve bunlardan ceviz, dut ve kızılcığın ekonomik önem arz ettiği,
- Sapaca Vadisi boyunca pek çok yabani bitki türünün bulunduğu ve bunlardan kapari, kuşburnu, yaban eriği (salur), altınçilek ve çaşırın doğal olarak yetiştiği ve köy ekonomisine katkı sağladığı,
- 'Ekoköy Kavramı'nın sürdürülebilir tarım ve turizmin gelişmesinde tek başına kullanılmasının yeterli olmayacağı bilinmekle birlikte Uzundere'nin sahip olduğu Tortum Gölü, Tortum Şelalesi, Uzunburun Yarımadası, Yedigöller, Tortum Çayı, Öşvank Manastırı gibi doğal ve tarihi değerlerin ve bunlarla ilgili fikir ve projelerin çok güçlü bir yön olduğu ve bu kavramı destekleyeceği,
- Sapaca'nın da içinde bulunduğu bölgede iklimin vejetasyon süresini uzatması ve Mart sonundan Kasım ayı ortasına kadar tarımsal ve turistik faaliyetlerin sürekliliğinin sağlanabiliyor olma potansiyeli, Erzurum'dan 1 – 1,5 ay önce baharın erken ve yine benzer bir zaman diliminde de kış mevsiminin geç geliyor olması,
- Köyün kendine özgü masal, oyunlar, inanışlar gibi folklorik değerlerinin bulunduğu ve bunların araştırmaya ve belgelenmeye ihtiyaç duyduğu,
- Erzurum cazibe merkezinin gelişen kış, tarih-kültür, termal turizm potansiyelini bütünleştirecek ve sağlamlaştıracak ayağının Çoruh Vadisi'nde olması,
- Sapaca Köyü ve Uzundere'nin bu noktaya gelmesinde DAP Bölge Kalkınma İdaresi, KUDAKA, Türkiye Kalkınma Vakfı (TKV), SÜRKAL, UNDP, AB Fonları konusunda deneyimli olmaları ve iyi uygulama örneklerinin varlığı (seracılık, alabalık yetiştiriciliği, süs bitkileri üretimi, fidancılık v.b.)

SONUÇ ve ÖNERİLER

Bu saha incelemesi, Sapaca Köyü'nün ekoköy potansiyelini ve sürdürülebilir turizm açısından değerini ortaya koymaktadır. Köyün ekoköy kavramıyla uyumlu bir şekilde geliştirilebilecek bir potansiyele sahip olduğu, özellikle KUDAKA turizm stratejisi içinde yer almasının isabetli bir karar olduğu belirlenmiştir. Ancak, kış mevsiminde gerçekleştirilen ziyaretler dışında diğer mevsimlerin değerlendirilmesi için ek çalışmalara ihtiyaç olduğu ortaya çıkmıştır.Köydeki yerel yöneticilerin ve köylülerin kalkınma çabalarını desteklediği,

yeniliklere açık oldukları ve girişimcilik kapasitelerinin yüksek olduğu gözlemlenmiştir. Ayrıca, köyün ulusal ve uluslararası kuruluşlarla iş birliği yapma isteği ve proje uygulama fikirlerine açık olması, sürdürülebilir turizm ve tarım alanlarında potansiyel sağlamaktadır.Sapaca Vadisi'ndeki tarım ve ormancılık faaliyetlerinin ekoköy tanımıyla uyumlu olduğu ve çeşitli meyve türlerinin bulunduğu, doğal bitki çeşitliliğinin köy ekonomisine katkı sağladığı belirlenmiştir. Bunların yanı sıra, bölgedeki doğal ve tarihi zenginliklerin, ekoköy kavramını destekleyerek turizm potansiyelini güçlendireceği vurgulanmıştır.

Sonuç olarak, Sapaca Köyü'nün ekoköy olma potansiyeli ve sürdürülebilir turizm ilkeleriyle bağlantılı olarak geliştirilmesi önemli bir fırsattır. Bu süreçte, yerel yöneticilerin ve köylülerin katılımıyla, doğal ve kültürel varlıkların korunması ve turizm faaliyetlerinin sürdürülebilirliği gözetilmelidir. Ayrıca, köyün folklorik değerlerinin belgelenmesi ve turizm potansiyelinin artırılması için çeşitli projelerin hayata geçirilmesi gerekmektedir. Bu sayede, Sapaca Köyü'nün sürdürülebilir turizm alanında örnek bir model olabileceği düşünülmektedir.

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TIBBI AROMATIK BITKI OLARAK KULLANILAN *RUSCUS HYPOGLOSSUM* L.VE *RUSCUS ACULEATUS* L. TÜRLERININ SÜS BITKISI OLARAK PEYZAJ DÜZENLEMELERINDE KULLANIMININ İNCELENMESI

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Özet
Ruscus spp. ülkemizde yörelere bağlı olarak tavşan kirazı, fare dikeni, sıçan dikeni, farekulağı, süpürge dikeni, at dili, yabani mersin, tavşanmemesi, tavşan topuğu ve diken kökü gibi farklı isimlerle bilinmektedir. Çok yıllık, herdem yeşil ve odunsu gövdesi sert bir çalıdır. Doğal floramızda yer alan *R.aculeatus* bitkisinden kurutulan meyveleri idrar artırıcı kum dökücü iştah açıcı, ateş düşürücü, meyveleri kahve olarak kullanılmakta ve bitkinin kökünden de siyah boya elde edilmektedir. *Ruscus* cinsi sıcak iklimlerde peyzajda kullanılabilir, iç mekânda yetiştirilebilir ve çiçek aranjmanlarında kullanılmak üzere kesilmiş yaprakları popüler saplar üretebilen bir bitkidir. *Ruscus aculeatus* ve *Ruscus hypoglossum* türleri süs bitkileri sektöründe kesme yeşillik ve aranjman ürünü olarak yaygın bir şekilde kullanılmaktadır. Bu çalışmada Ülkemizde başta Marmara Bölgesi olmak üzere Karadeniz ve Akdeniz sahillerimizin tamamında yetişen *Ruscus hypoglossum* L. ve *Ruscus aculeatus* L. bitkisinin genel özellikleri ve peyzaj çalışmalarında kullanım esasları değerlendirilmiştir.
Anahtar Kelimeler: *Ruscus* spp., Süs bitkisi, Kesme yeşillik

INVESTIGATION OF THE USE OF *RUSCUS HYPOGLOSSUM* L. AND *RUSCUS ACULEATUS* L. SPECIES USED AS MEDICINAL AROMATIC PLANTS IN LANDSCAPING AS ORNAMENTAL PLANTS

Abstract
Ruscus spp. are known by different names such as rabbit cherry, mouse thorn, rat thorn, mouse ear, broom thorn, horse tongue, wild myrtle, rabbit udder, rabbit heel and thorn root depending on the region in our country. It is a perennial, evergreen shrub with a hard woody stem. The dried fruits of *R. aculeatus* plant, which is found in our natural flora, are used as urine enhancer, sand pourer, appetite stimulant, fever reducer, fruits are used as coffee and black dye is obtained from the root of the plant. The genus Ruscus can be used in landscaping in warm climates, can be grown indoors, and is a plant whose cut leaves can produce popular stems for use in flower arrangements. *Ruscus aculeatus* and *Ruscus hypoglossum* species are widely used in the ornamental plants sector as cut foliage and arrangement products.In this study, the general characteristics of *Ruscus hypoglossum* L. and *Ruscus aculeatus* L., which grow in Turkey, especially in the Marmara Region, Black Sea and Mediterranean coasts, and the principles of their use in landscape studies were evaluated.
Keywords: *Ruscus* spp., Ornamental plant, Cut foliage

GİRİŞ

Ruscus hypoglossum, yaygın olarak "tavşan kirazı", "tavşan memesi", "at dili", "dere kirazı", "gelin küpesi", "yalova mercanı" olarak da bilinen bir bitki türüdür. Bu tür genellikle Liliaceae familyasına bağlıdır (Marhold ve Hindák, 1998), ancak bazı araştırıcılar onu yakından ilişkili Asparagaceae familyası, Ruscoideae alt familyası içinde sınıflandırmıştır (Komar, 1985; Satarova, 1990; Halada ve Erdelska, 2005). *Ruscus hypoglossum*, özellikle Güneydoğu Avrupa'da ve Orta Avrupa'nın doğu kısmında (Yeo, 1968) yayılış göstermekte ve batıda İtalya'dan doğuda Türkiye'nin kuzeyine kadar ve Kırım'da yayılış göstermektedir (Halada ve Erdelska, 2005). Genellikle 35 ila 50 cm uzunluğunda, yavaş büyüyen, yarı çalı formunda bir bitkidir. Yaprakları genellikle yassı, sert ve parlak yeşil renktedir. Bitkinin çiçekleri oldukça küçük ve yeşilimsi-beyaz renkte olup, yaprakların tabanında yer almaktadır. Doğal yaşam alanları arasında ormanlık alanlar, çalıklar ve kayalık yamaçlar bulunmaktadır (Anonim, 2024a). *Ruscus hypoglossum*, erkek ve dişi çiçekler farklı bitkilerde bulunmakta olup iki evcikli bir türdür (Halada ve Erdelska, 2005).

Ruscus aculeatus ise, yörelere bağlı olarak fare dikeni, sıçan dikeni, farekulağı, süpürge dikeni, tavşanmemesi, tavşan topuğu, diken kökü ve tavşan kirazı gibi farklı isimlerle bilinmektedir. *Ruscus aculeatus* L.'un Güney Avrupa ve Kuzey Afrika doğal yayılış alanlarıdır (Payne 2006; Yılmaz 2012). İki ana alt türü *Ruscus aculeatus* subsp. aculeatus ve *Ruscus aculeatus* subsp. Arenarius'tur. *Ruscus aculeatus;* 20-50 cm boyunda herdem yeşil, rizom köklü, çok yıllık ve yavaş büyüyen bir çalıdır. Yaprakları, aslında gövdelerinin üzerine düzleştirilmiş, uç kısımları dikenli yaprak benzeri dallara sahiptir. Çiçekleri oldukça küçüktür ve yapraksı gövdelerin ortasında kırmızımsı-mor renkli küçük kümeler halinde bulunmaktadır (Davis 1984; İlçim 2013). *Ruscus aculeatus'*un erkek ve dişi çiçekleri farklı bitkiler üzerinde olup eylül-nisan ayları arasında çiçek açmaktadır. Meyveler ise Ekim ayı sonunda olgunlaşarak kırmızı renk almaktadır. Tozlanmadan meyve oluşumuna kadar geçen süre 7-8 aydır (Martínez ve Aronné 1999; Yılmaz 2012) (Tablo 1).

Tablo 1. *Ruscus* spp. yıl içerisinde sahip olduğu dendrolojik özellikleri

	Yapraklı dönem	Çiçeklenme dönemi	Meyve etkisi
1 ay			
2 ay			
3 ay			
4 ay			
5 ay			
6 ay			
7 ay			
8 ay			
9 ay			
10 ay			
11 ay			
12 ay			

TIBBI YÖNÜYLE KULLANIMI

Tıbbi açıdan, *Ruscus hypoglossum'un* kökleri ve yaprakları geleneksel olarak bazı sağlık sorunlarının tedavisinde kullanılmıştır. *Ruscus hypoglossum'un* tıbbi kullanımı özellikle geleneksel tıpta yaygındır. Geleneksel olarak meyvelerinin kaynatılması çıban ve siğillerde haricen uygulanmaktadır (Tuzlacı ve Aymaz, 2001). Türkiye'de taze yaprakları soğuk algınlığına ve mastitise karşı hayvancılıkta kullanılmaktadır (Kültür, 2007; Hadžifejzović ve ark., 2013).*Ruscus aculeatus*'un tıbbi özellikleri ile dolaşım sistemi sağlığı üzerinde önemli etkileri bulunmaktadır. *R. aculeatus* L. ekstraktlarının venöz yetmezlik, ödem, ortostatik hipotansiyon ve inflamasyon gibi dolaşım problemlerine karşı etkili olmaktadır (Bassil vd, 2012; Karakaya 2021)Bitkinin kökleri ve yaprakları geleneksel olarak tıbbi amaçlarla kullanılmıştır. Bitkinin kökleri idrar arttırıcı, kum dökücü, iştah açıcı, ateş düşürücü ve terletici etkilere sahip olduğu belirtilmektedir (Baytop 1999; İlçim 2013). Ayrıca bacaklarda ağrı, sızı, gece krampları şişme gibi kronik toplardamar rahatsızlıklarına ve basura karşı oldukça etkili olduğu yapılan araştırmalarla ifade edilmiştir (Sanchez ve ark. 2012; İlçim 2013). *Ruscus hypoglossum*'un ve *Ruscus aculeatus*'un tıbbi kullanımları genellikle bitkinin kök ve yapraklarının ekstraktları veya tentürleri şeklinde gerçekleşmektedir. Ancak, bitkinin tıbbi kullanımlarıyla ilgili daha fazla araştırmaya ihtiyaç vardır ve bitkinin etkinliği ve güvenliği konusunda daha fazla kanıt gerekmektedir. Bu nedenle, tıbbi amaçlarla kullanılmadan önce bir sağlık uzmanına danışmak önemlidir.

EKOLOJIK AÇIDAN ÖNEMİ

Ruscus hypoglossum'un ve *Ruscus aculeatus*'un ekosistemdeki rolü ve diğer bitki ve hayvan türleriyle olan etkileşimleri oldukça önemlidir. Özellikle çalılıklar, ormanlık alanlar ve kayalık yamaçlar gibi habitatlarda yetişmektedir (Yılmaz, 2012). Bu bitki, çeşitli böcek türlerine, özellikle de arılara, kelebeklere ve diğer polinatörlere ev sahipliği yapmaktadır. *Ruscus hypoglossum*'un ve *Ruscus aculeatus*'un meyveleri ve tohumları, bazı kuş türleri ve diğer küçük memeliler için besin kaynağı olmaktadır. Bu bitkinin meyveleri bazı kuşların ve tohumları ise bazı kemirgenlerin beslenmesine katkı sağlamaktadır. *Ruscus hypoglossum*'un ve *Ruscus aculeatus*'un kökleri, toprak erozyonunu önlemeye yardımcı olmaktadır. Bitkinin kökleri, toprağı sıkıca tutmakta ve erozyona karşı dirençli bir tabaka oluşturmaktadır. Özellikle eğimli yamaçlarda ve kayalık bölgelerde toprak erozyonunu azaltmaktadır. *Ruscus hypoglossum* ve *Ruscus aculeatus* çeşitli bitki ve hayvan türleriyle etkileşim içindedir. Diğer bitki türleriyle rekabet edebilmekte veya ortak yaşam alanlarını paylaşabilmektedir. Ayrıca, bu bitki bazı böcek türlerinin yaşam alanı olmakta ve bu böcekler de bitkinin çiçeklerini ziyaret ederek polinasyonunu sağlayabilmektedir.

SÜS BİTKİSİ OLARAK PEYZAJ DÜZENLEMELERİNDE KULLANIMI

Ruscus hypoglossum ve *Ruscus aculeatus*, özellikle kesme yeşillik olarak kullanılabilmesinin yanısıra park ve bahçelerde peyzaj düzenlemelerinde kullanılabilecek dayanıklı ve dekoratif süs bitkileridir (Baytop 1997; Yılmaz 2012). Gölgeli ve yarı gölgeli alanlarda yetişebilme özelliğiyle peyzaj düzenlemelerinde sıklıkla tercih edilmektedir. Herdem yeşil olan Ruscus'un yaprakları kalın, sert ve dikenli (*Ruscus aculeatus* L.) görünüme sahiptir. Bu özellikle, peyzajda dokusal çeşitlilik ve dikenli yapısı nedeniyle bariyer bitkisi olarak kullanılmaktadır. Aynı zamanda *Smilax excels* L. (dikenucu) meyveleri ile Ruscus dalları kombine edilerek "kokina" adı ile süs bitkisi olarak çiçekçilerde satılmaktadır (Anonim 2024b).



Şekil 1. *Ruscus aculeatus* L. ait görseller (URL-1)



Şekil 2. *Ruscus hypoglossum'*a ait görseller (URL-2)

Kullanım Alanları: Ruscus, genellikle bahçe yolları, sınırlar ve yamaçlar gibi bölgelerde kullanılmaktadır. Ayrıca, peyzaj düzenlemelerinde gölge alanları doldurmak için dolgu bitkisi olarak da kullanılabilir (Tablo 2).

Tablo 2. Kullanım amacına göre değerlendirilmesi

Kullanım Amacı		**Kullanım Amacı**	
Vurgu amacıyla kullanımı	**	Bordür bitkisi olarak kullanımı	***
Dolgu amacıyla kullanım	**	Grup şeklinde kullanımı	***
Rüzgâr kırma amacıyla kullanım	***	Soliter olarak kullanımı	*
Gürültü engellemek	**	Kesme yeşillik olarak kullanımı	***

***: Çok iyi **: İyi *Yetersiz

Gölgeli Alanlar İçin İdeal: Ruscus, gölgeye dayanıklıdır ve hatta kısmi gölge koşullarında da iyi gelişebilmektedir. Bu nedenle, peyzaj düzenlemelerinde gölgeye ve rüzgâra dayanıklı olduğu için tercih edilmektedir.Düşük bakım gereksinimi: Ruscus, düşük bakım gereksinimlerine sahip bir bitkidir. Yeterli su ve toprak drenajı sağlandığında, genellikle sorunsuz bir şekilde büyümektedir.

Dekoratif kullanım: Ruscus'un kırmızı veya siyah meyveleri, bitkiyi daha da dekoratif hale getirmektedir. Bu meyveler genellikle sonbaharda ortaya çıkmakta ve peyzaja ek bir renk katma potansiyeline sahiptir.

Grup şeklinde kullanım: Ruscus, diğer peyzaj bitkileriyle iyi kombine edilmektedir. Özellikle, çiçekli bitkilerle birlikte kullanıldığında, peyzaja görsel derinlik ve çeşitlilik katmaktadır.

SONUÇ

Ülkemiz doğal florasında bulunan Ruscus, hem kesme yeşillik olarak çiçek aranjmanlarında hem de park ve bahçelerin peyzaj düzenlemelerinde gölge, yarı gölge alanlarda dolgu, rüzgâr kırıcı ve bariyer bitkisi olarak kullanılabilmesi ile önemli bir süs bitkisidir.Kesme yeşillik olarak kullanılan Ruscus bitkisi, çiçek düzenlemelerinin dayanıklılığını ve uzun ömürlülüğünü artırması ile böylece aranjmanlar daha uzun süre taze ve çekici kalabilmektedir. Bu nedenlerle, pek çok çiçekçi ve etkinlik düzenleyicisi aranjmanlarında kullanmaktadır.Ruscus bitkisi, peyzaj düzenlemelerinde de önemli bir rol oynamaktadır. Özellikle görsel çekicilik, dayanıklılık ve düşük bakım gereksinimleri gibi bir dizi avantaja sahiptir. Soğuk iklimlerde biraz daha fazla bakım gerektirse de, her ortama getirdiği güzellik ve zarafet, ile ön plana çıkmaktadır. Bu nedenle, peyzaj mimarları ve bahçe sahipleri tarafından sıklıkla tercih edilmektedir. Sonuç olarak; koyu yeşil yapraklarıyla Ruscus, herdem yeşil olmasıyla bahçelerde ve çevre düzenlemelerinde yıl boyu çarpıcı bir görünüm oluşturmaktadır. Ayrıca sonbaharda oluşan parlak kırmızı meyveleri de ortama canlılık ve çekicilik katmaktadır.

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SÜRDÜRÜLEBİLİR YEREL KALKINMA İÇİN TARIMSAL TERAS PEYZAJLARININ DEĞERLENDİRİLMESİ DUT BAHÇELERİ

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ÖZET
Tarımsal teras peyzajları, sürdürülebilir yerel kalkınma açısından önemli bir potansiyele sahiptir. Bu bildiri, tarımsal terasların özellikle dut bahçeleri üzerindeki etkilerini değerlendirmeyi amaçlamaktadır. Dut bahçelerinin, sürdürülebilir tarım ve yerel ekonomi üzerindeki rolü incelenerek, bu peyzajların yerel kalkınma stratejilerinde nasıl değerlendirilebileceği üzerine odaklanmaktadır. Dut, ekonomik değeri yüksek bir meyve türü olup, geniş bir iklim ve toprak yelpazesinde yetiştirilebilmektedir. Ayrıca, dut ağaçları erozyon kontrolü sağlayarak tarımsal terasların stabilitesini artırabilir ve biyoçeşitliliği destekleyebilir. Dut bahçeleri, yerel ekonomiye katkı sağlayarak yerel ürün pazarlarının oluşturulmasına da yardımcı olmaktadır. Tarımsal teras peyzajlarının değerlendirilmesinde, ekolojik, ekonomik ve sosyal faktörler dikkate alınmalıdır. Bu bağlamda, dut bahçelerinin tarımsal teraslara entegrasyonu, toprak erozyonunu azaltma, su kaynaklarını koruma ve biyoçeşitliliği artırma gibi ekolojik faydalar sağlayabilir. Ekonomik olarak ise, dut üretiminin artması yerel ekonomiye canlılık katabilir ve gelir kaynaklarını çeşitlendirebilir. Ayrıca, dut bahçelerinin turizm potansiyeli de göz önünde bulundurulmalıdır. Dut bahçelerinin tarımsal teraslara entegrasyonu, yerel kalkınma stratejilerinin önemli bir parçası olabilir. Bu stratejiler, çiftçilere ek gelir sağlama ve tarım alanlarının verimliliğini artırma fırsatları sunabilir. Ayrıca, turizm sektörü için de çekici bir cazibe merkezi olabilirler. Gelecekte, tarımsal teras peyzajlarının sürdürülebilir kalkınma açısından daha fazla önem kazanması beklenmektedir. Dut bahçelerinin tarımsal teraslara entegrasyonu, sürdürülebilir yerel kalkınma için önemli bir strateji olabilir. Bu bağlamda, çeşitli paydaşlar arasında işbirliğini teşvik etmek, teknik destek ve eğitim sağlamak, yerel pazarlama ve turizm faaliyetlerini desteklemek gibi politika ve programlar geliştirilmelidir. Bu bildiri, Çoruh vadisinin önemli kırsal turizm destinasyonlarından olan ve 2016'da sakin şehir ilan edilen Uzundere ilçesinin tarımsal teras peyzajlarının değerlendirilmesi ve mevcut dut bahçelerinin yerel kalkınma üzerindeki potansiyel etkileri üzerine bir odaklanma sunarak, sürdürülebilir tarım ve yerel ekonomi alanında gelecek çalışmalara ışık tutmayı amaçlamaktadır. Dut bahçelerinin tarımsal teraslara entegrasyonunun, yerel toplulukların refahı ve doğal kaynakların korunması açısından önemli bir adım olabileceği ve bu kapsamda Gölbaşı köyünde Uzundere Belediyesi tarafından oluşturulan 40 dönümlük dut bahçesinin önemi vurgulanmaktadır..

Anahtar Kelimeler: Sürdürülebilir Kalkınma Hedefleri (SKH), Tarımsal Teras Peyzajları, Dut Bahçeleri, Cittaslow Uzundere

EVALUATION OF AGRICULTURAL TERRACE LANDSCAPES FOR SUSTAINABLE LOCAL DEVELOPMENT: MULBERRY ORCHARDS

ABSTRACT

Agricultural terrace landscapes have an important potential for sustainable local development. This paper aims to evaluate the impacts of agricultural terraces on mulberry orchards in particular. By analysing the role of mulberry orchards on sustainable agriculture and local economy, it focuses on how these landscapes can be utilised in local development strategies. Mulberry is a fruit species with high economic value and can be grown in a wide range of climates and soils. In addition, mulberry trees can provide erosion control, increase the stability of agricultural terraces and support biodiversity. Mulberry orchards also contribute to the local economy and help to create local product markets. Ecological, economic and social factors should be taken into account in the evaluation of agricultural terrace landscapes. In this context, the integration of mulberry orchards into agricultural terraces can provide ecological benefits such as reducing soil erosion, protecting water resources and increasing biodiversity. Economically, increased mulberry production can revitalise the local economy and diversify income sources. In addition, the tourism potential of mulberry orchards should also be considered. Integration of mulberry orchards into agricultural terraces can be an important part of local development strategies. These strategies can provide opportunities for farmers to generate additional income and increase the productivity of agricultural land. They can also be an attractive attraction for the tourism sector. In the future, agricultural terrace landscapes are expected to become more important for sustainable development. Integration of mulberry orchards into agricultural terraces can be an important strategy for sustainable local development. In this context, policies and programmes such as encouraging cooperation among various stakeholders, providing technical support and training, supporting local marketing and tourism activities should be developed. This paper aims to shed light on future studies in the field of sustainable agriculture and local economy by providing a focus on the assessment of agricultural terrace landscapes of Uzundere district, which is one of the important rural tourism destinations of the Çoruh valley and was declared a calm city in 2016, and the potential impacts of existing mulberry orchards on local development. It is emphasised that the integration of mulberry orchards into agricultural terraces can be an important step in terms of the well-being of local communities and the conservation of natural resources, and in this context, the importance of the 40-acre mulberry orchard created by Uzundere Municipality in Gölbaşı village is emphasised.

Keywords: Sustainable Development Goals (SDGs), Agricultural Terrace Landscapes, Mulberry Orchards, Cittaslow Uzundere

GİRİŞ

Günümüzde, küresel ölçekte sürdürülebilir kalkınma hedeflerine ulaşmak, yerel düzeydeki çabaların ve stratejilerin önemli bir parçasını oluşturmaktadır (D'Adamo vd 2021; Hajian and Kashani 2021; Labadi vd 2021; Hickmann vd 2023). Bu bağlamda, tarımsal teras peyzajları ve dut bahçeleri gibi doğal kaynakları kullanma ve yönetme pratikleri, sürdürülebilir kalkınma perspektifinde giderek artan bir ilgi görmektedir (Reijntjes vd 1992; Vella 2010). Özellikle, sürdürülebilir kalkınma hedeflerinin gerçekleştirilmesinde tarımsal teras peyzajlarının rolü (Yurui vd 2021; Zhang vd 2024) incelenecektir. Tarımsal teraslar, toprak erozyonunu önleme, su kaynaklarını koruma ve biyoçeşitliliği destekleme gibi çeşitli ekolojik faydalar sağlayarak sürdürülebilir tarım uygulamalarının temelini oluşturmaktadır (Wei vd 2016; Socci vd 2019; Tarolli ve Straffelini 2020; Cicinelli vd 2021). Bu nedenle, bu çalışma, teraslı tarımın sürdürülebilir kalkınma hedeflerine nasıl katkı sağlayabileceğini anlamak için bir fırsat olarak değerlendirilmektedir.

Bununla birlikte, dut bahçeleri gibi biyoçeşitlilik açısından zengin tarımsal alanların da sürdürülebilir kalkınma yaklaşımı ile önemi büyüktür (Giuliani vd 2011; Rohela vd 2020; Mushtaq vd 2023; Zhou vd 2023; Bhat 2024). Dut ağaçları, hem gıda üretimi hem de ekosistem hizmetleri sağlama potansiyeline sahiptir (Lu vd 2009; Hurley ve Emery 2018; Tang vd 2024). Bu çalışma, Uzundere'deki tarımsal teras peyzajları ve dut bahçelerinin yerel kalkınma üzerindeki etkilerini değerlendirerek, bu tür yerel toplulukların sürdürülebilir kalkınma hedeflerine ulaşmada nasıl bir model oluşturabileceğini araştırmaktadır. Bu bağlamda, araştırmanın sonuçları, sürdürülebilir tarım uygulamalarının teşvik edilmesi ve yerel ekonomik kalkınmanın desteklenmesi için politika yapıcılar ve yerel topluluklar için önemli bir kaynak olacaktır. Bu çalışmanın amacı, bu unsurların yerel kalkınma süreçlerine olan potansiyel katkılarını incelemek ve anlamaktır. Bu çalışma, aynı zamanda dut bahçelerinin ekonomik ve ekolojik açıdan nasıl değerlendirilebileceğini ve sürdürülebilir kalkınma hedeflerine nasıl katkı sağlayabileceğini analiz etmektedir.

ÇALIŞMA ALANI

Çalışma, Uzundere ilçesinde bulunan tarımsal teraslar üzerinde gerçekleştirilmiştir (Şekil 1). Uzundere, Tortum Çayı Vadisi'nde yer almakta olup Çoruh Havzası'nı oluşturan birçok vadiden biridir. Bu havza, Uluslararası Koruma Birliği (IUCN) tarafından dünyanın 200 önemli ve 34 sıcak noktasından biri olarak kabul edilen Kafkasya Ekolojik Bölgesi'nin batı bölümünü içermektedir. Uzundere, doğal (flora-fauna), kültürel, tarihi ve rekreasyonel açıdan zengin bir potansiyele sahiptir ve Çoruh Havzası'nın önemli bir merkezidir.

BULGULAR

Bu bildiri, Çoruh vadisinin önemli kırsal turizm destinasyonlarından olan ve 2016'da sakin şehir ilan edilen Uzundere ilçesinin tarımsal teras peyzajlarının değerlendirilmesi ve mevcut dut bahçelerinin yerel kalkınma üzerindeki potansiyel etkileri üzerine bir odaklanma sunarak, sürdürülebilir tarım ve yerel ekonomi alanında gelecek çalışmalara ışık tutmayı amaçlamaktadır. Dut bahçelerinin tarımsal teraslara entegrasyonunun, yerel toplulukların refahı ve doğal kaynakların korunması açısından önemli bir adım olabileceği ve bu kapsamda Gölbaşı köyünde Uzundere Belediyesi tarafından oluşturulan 40 dönümlük dut bahçesinin önemi vurgulanmaktadır (Şekil 2; 3; 4; 5).



Şekil 1. Çalışma alanına ait konum haritası



Şekil 2. Terkedilmiş bazı tarımsal teras örnekleri



Şekil 3. Dar ve uzun formlu teraslar üzerinde yerleşik dut bahçelerine örnekler









Şekil 4. Uzundere ilçesinde dutun farklı değerlendirme biçimlerine örnekler



Şekil 5. Yerel yönetim girişimi ile Gölbaşı köyünde oluşturulan dut bahçesi örneği

SONUÇ ve ÖNERİLER

Bu çalışma, ekonomik yapının ve tarımsal üretim anlayışının değişimi ile ortaya çıkan alan kullanımlarının tarımsal terasların yeniden değerlendirilmesine olan etkilerini incelemiştir. Araştırma sonuçları, bu değişimlerin tarımsal terasların önemini ve potansiyelini artırdığını göstermektedir. Ekonomik yapının değişmesi, tarım sektöründe çeşitlenmeyi ve daha sürdürülebilir üretim modellerine geçişi teşvik etmektedir. Aynı zamanda, tarımsal üretim anlayışının değişime uğraması, üretim, bakım ve alan kullanımları yönünden daha verimli ve çevre dostu tarım yöntemlerinin kullanımını gerektirmektedir. Son 40 yılda meydana gelen alan kullanımındaki değişimler ise tarımsal terasların farklı amaçlarla kullanılmasına

olanak sağlamaktadır, bu da tarımsal terasların çok yönlü değerlendirilmesini desteklemektedir. Sonuç olarak, tarımsal terasların yeniden değerlendirilmesi, hem ekonomik hem de çevresel açıdan önemli fırsatlar sunmaktadır ve bu, sürdürülebilir tarımın teşvik edilmesi ve kırsal alanların kalkınması için önemli bir adımdır.

Uzundere ilçesi kapsamında terkedilen tarımsal terasların yeniden değerlendirilmesine yönelik bazı öneriler aşağıda sıralanmıştır.

- Bölgedeki geleneksel teras bahçelerin tespit edilmesi ve haritalandırılması,

-Tahrip olmuş teras bahçelerin yerel malzeme ve orijinal tasarım şekillerine bağlı kalarak yeniden inşası veya iyileştirilmesi,

-Teraslardaki bakımsız ve verimden düşmüş olan bitkilere gerekli bakımın yapılması ve terasların bitkisel yönden rehabilite edilmesi ve

-Geleneksel terasların yerel yönetimler öncülüğünde, uygun işletim modeli ile yerel ekonomiye kazandırılmasının onların sürdürülebilirliğinin sağlanması açısından yararlı olacağı değerlendirilmektedir.

Dut bahçelerinin tarımsal teraslara entegrasyonu, toprak erozyonunu azaltma, su kaynaklarını koruma ve biyoçeşitliliği artırma gibi ekolojik faydalar sağlayabilir. Ekonomik olarak ise, dut üretiminin artması yerel ekonomiye canlılık katabilir ve gelir kaynaklarını çeşitlendirebilir. Ayrıca, dut bahçelerinin turizm potansiyeli de göz önünde bulundurulmalıdır. Dut bahçelerinin tarımsal teraslara entegrasyonu, yerel kalkınma stratejilerinin önemli bir parçası olabilir. Bu stratejiler, çiftçilere ek gelir sağlama ve tarım alanlarının verimliliğini artırma fırsatları sunabilir. Ayrıca, turizm sektörü için de çekici bir cazibe merkezi olabilirler. Gelecekte, tarımsal teras peyzajlarının sürdürülebilir kalkınma açısından daha fazla önem kazanması beklenmektedir. Dut bahçelerinin tarımsal teraslara entegrasyonu, sürdürülebilir yerel kalkınma için önemli bir strateji olabilir. Bu bağlamda, çeşitli paydaşlar arasında işbirliğini teşvik etmek, teknik destek ve eğitim sağlamak, yerel pazarlama ve turizm faaliyetlerini desteklemek gibi politika ve programlar geliştirilmelidir.

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İLKEL TELEFERİKLE ODUN TAŞINMASI ESNASINDA GERÇEKLEŞEN NADİR BİR TRAVMATİK ÖLÜMÜN ADLİ TIP AÇISINDAN DEĞERLENDİRİLMESİ; OLGU SUNUMU

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Özet
Yerli halkın kendi hane ihtiyaçlarını karşılamak üzere yürüttükleri odunculuk faaliyetleri esnasında çeşitli yaralanmalar meydana gelebilmektedir. Kesilen ağacın altında kalma, ağaçtan düşme, yamaçtan yuvarlanma gibi kazalar sonucunda ölümler de meydana gelebilmektedir. Kesilen odunların taşınması engebeli ve dik coğrafi özellikler barındıran Doğu Karadeniz Bölgesi'nde yaygın biçimde ilkel teleferiklerle de yapılmaktadır. Teleferik, birbirinden uzak iki yer arasında, havada gerilmiş olan bir ya da birkaç çelik halat üzerinde bağlanarak yol alan asılı taşıta verilen genel isimdir. Bölgede sayıları yaklaşık yirmi bin olan teleferikler odun taşınması esnasında ölümle sonuçlanan iş kazalarına neden olabilmektedir.
Anahtar Kelimeler: İlkel teleferik, odunculuk, otopsi

FORENSIC EVALUATION OF A RARE TRAUMATIC DEATH DURING WOOD TRANSPORTATION BY A PRIMITIVE CABLE CAR; CASE REPORT

ABSTRACT
Various injuries may occur during logging activities carried out by local people to meet their own household needs. Deaths can also occur as a result of accidents such as falling under a cut tree, falling from a tree, or rolling down a slope. Transportation of cut wood is commonly done by primitive cable cars in the Eastern Black Sea Region, which has rugged and steep geographical features. Cable car is the general name given to a suspended vehicle that travels between two places far from each other by being connected to one or more steel ropes stretched in the air. The cable cars, which number approximately twenty thousand in the region, can cause fatal occupational accidents during the transportation of wood.
Keywords: Primitive cable car, woodcutting, autopsy

Giriş: Doğu Karadeniz Bölgesi, tarım alanlarının yanı sıra yoğun bir bitki örtüsüne sahip ormanlık alanları da ihtiva etmektedir. Bu coğrafi bölge içerisinde, daha çok kamu kurumlarının denetiminde gerçekleştirilen kontrollü ormancılık faaliyetlerinin yanında, bölgede yaşayan insanlar tarafından bireysel odunculuk çalışmaları da yaygın şekilde yapılmaktadır. Yerli halkın gerek yakacak odun ihtiyacının gerekse küçük çaplı inşaat malzemelerinin temini için yaptıkları bu odunculuk faaliyetleri esnasında çeşitli travmatik yaralanmalar ve ölümler meydana gelebilmektedir. Bu yaralanmalar kesim esnasında devrilen ağacın ya da dallarının altında kalma, ağaçtan düşme, ağaç kesme amacıyla kullanılan motorlu ya da diğer kesici/ezici aletlerle yaralanma, yamaçtan yuvarlanma hatta elektrik çarpması sonucunda meydana gelebilmektedir. Ağaç kesme ve kesilen ağacı işleme aşamaları belli plan ve donanımla İl Tarım ve Orman Müdürlükleri'nce eğitimli işçiler tarafından devlet eliyle planlı olarak yapılmakta iken herhangi eğitimi olmayan bireyler tarafından da amatörce yapılabilmektedir. Eğitimli insanlarca yapılan bu faaliyetlerde kaza sayıları nispeten az olabilse de yerli halkın koruyucu ekipman ve diğer önlemlere karşı daha duyarsız davranabileceği düşünülmektedir. Eğitim almaksızın; geleneksel, yerel görgü ve tecrübelerle yapılan ve daha ziyade mevsimsel bir uğraşı haline gelen bu faaliyetler, yerel ve ulusal basında da sıklıkla yer alan, önlenebilir nitelikte, ciddi halk sağlığı sorunları arasındadır.

Sosyal Güvenlik Kurumu açısından, işyerinde meydana gelen ve işçiyi zarara uğratan her türden olay iş kazasıdır (1). Öğretide ise iş kazası, sigortalının, işverenin otoritesi altında bulunduğu bir sırada gördüğü iş veya işin gereği dolayısıyla aniden ve dıştan meydana gelen bir etkenle onu bedence ya da ruhça zarara uğratan bir olay olarak tanımlanır (2). İş Sağlığı ve Güvenliği Kanunu'nda ise iş kazası iş yerinde veya işin yürütümü nedeniyle meydana gelen, ölüme sebebiyet veren veya vücut bütünlüğünü ruhen ya da bedenen özüre uğratan olay olarak tanımlanmaktadır (3).

Literatürde, Doğu Karadeniz Bölgesi verileri ile yörede gerçekleşen işçi ölümlerine dair bilimsel araştırmaların yer aldığı görülmektedir (4,5). Ayrıca Türkiye dışında da, ormancılık faaliyetlerinde artan kaza sıklığı nedeniyle, kaza analizleri üzerine kısıtlı da olsa bazı çalışmaların yapılmasını sağlamıştır, Ormancılık faaliyetlerinde basit yaralanmalardan ölümle sonuçlan ciddi travmalara kadar birçok yaralanma görülebilmektedir. İşçi ölümlerini inceleyen Kanada'daki bir çalışmada; ormancılık faaliyetindeki en sık yaralanmanın ağaçtan düşme ya da kesilen ağacın devrilmesi sırasında meydana geldiği belirtilmektedir (6-8). Yerli halk tarafından gerçekleştirilen odunculuk faaliyetinin önemli bir ayağını da kesilen ve ürün haline getirilen ürünlerin nakliyesi oluşturmaktadır. Ağır olmayan dalların taşınması nispeten kolay olsa da

bölgede hakim olan eğimli arazi ve yağmurlu iklim bu ürünlerin transfer sürecini daha da zorlaştırabilmektedir. Ayrıca kesimi yapılan ağaçların bulunduğu alan genellikle sık bitki örtüsü nedeniyle daha da güçleşen şartların oluşmasına zemin hazırlamaktadır. Bu ve benzer engeller bölge insanını yeni çözümler üretmek zorunda bırakmıştır. Bunlardan biri de ilkel teleferiklerdir. Teleferik, birbirinden uzak iki yer arasında, havada gerilmiş olan bir ya da birkaç çelik halat üzerinde bağlanarak yol alan asılı taşıta verilen genel isimdir. Teleferikler, asansör prensibiyle çalışırlar ancak özellikle vadi geçişlerinde yer zemininden oldukça yüksek noktalara çıkabilirler (1).

Teleferik, ulaşımı güç yükseklikler arasında kurulur. Bir deniz ya da boğaz üzerinde mevcut olanları da vardır. Teleferiklerin kurulduğu yerler kara, demir ve deniz yoluyla ulaşımı çok zor ya da çok pahalı olan bölgelerdir. Böylesi bölgelerde belirli iki nokta arasında kurulan teleferik, insan ya da malzeme iletiminin gerçekleştirilmesinde kullanılır. İnsanların taşındığı teleferikler çelik halatlara asılı yolcu kabinlerinden oluşur. Genelde tek yöne ve tek halat dolaşımlı olan teleferik sistemleri iki ve daha fazla çelik halat ile de tasarlanmaktadır. Burada bir halat çekici diğer halat taşıyıcı görevi görmektedir. Yapılan çalışmalarda bölgede yaklaşık 20 bin ilkel teleferik olduğu, bunların çoğunluğunun kişilerin kendi imkânları ile yapılmış olduğu ve gelişi güzel kurulan bu teleferiklerin herhangi bir standardının olmadığı ifade edilmektedir.

Doğu Karadeniz Bölgesi'nde, başta çay tarımı ile ilgili olmak üzere, özellikle tarımsal ürünlerin ve bunun yanında gündelik ihtiyaçların taşınmasında ve yer yer insanların ulaşımında ilkel teleferikler kullanılabilmektedir. Bu teleferikler tarımsal ürünlerin taşınmasında kolaylık sağlarken, insanların ulaşımında ise zaman zaman kazalara neden olabilmekte ve bunun sonucunda maddi hasar veya ölümler meydana gelebilmektedir. Kazalar yüklerin veya teleferiğin insana çarpması sonucunda da oluşabilmekte ve basit yaralanmalarla birlikte ölümlere de neden olabilmektedir (4).

Amaç; Çalışmada; insan, tarım ürünü, kumanya, yakacak, hayvan yemi, gübre, inşaat malzemesi gibi, yörede yaşamını sürdüren insanlar için bölgesel bir ulaşım ve transfer aracı olarak yaygın biçimde kullanılan bir ilkel teleferiğe yüklenen odunları taşıyan kasada bulunan kalın odunlardan birinin, hareket halinde iken dengesi kaybolan kasadan düşüp savrularak, kasanın varacağı yerde yükü bekleyen kişiye çarpması ile neden olduğu yaralanma ve ölümün, olay yeri bulguları ve otopsisinden elde edilen verilerin ışığında adli tıbbi perspektif ve literatür eşliğinde tartışılması amaçlanmıştır.

Gereç ve Yöntem: Meydana gelen künt travmatik yaralanma nedeni ile adli nitelik kazanan ve adli otopsisi yapılan olguya ait tüm olay yeri inceleme tutanakları, olay yerine ait görüntüler,

görgü tanıklarına ait ifade tutanakları, olay yerinden elde edilen diğer deliller, ölü muayene bulguları, otopsi bulguları, otopsiden elde edilen biyolojik örneklerden elde edilen laboratuvar sonuçları, ölüm nedeni, olayın öyküsü ve ölüme neden olduğu düşünülen predispozan faktörler göz önünde bulundurularak, adli dosyasından elde edilen veriler ışığında değerlendirilmiş ve literatüre katkı sunması amacıyla olgu sunumu olarak paylaşılmıştır.

Olgu: Köy mahallinde, evinin önündeki arazide, ilkel teleferik düzeneğinin alt ucundaki sabitleme noktasında (teleferik kasasının aşağıdaki varış noktasında) yaralanan 65 yaşında kadın olgunun hikayesinde; yakınlarında alınan ifadede; yukarıdaki dağlık araziden odunculuk sonrasında elde edilen kesilmiş odunları ve bir miktar gübreyi taşıyan ilkel teleferik kasasının ölen şahsın da bulunduğu noktaya varmak üzere iken kasasındaki odunların hareket ettiği, bunu fark edenlerin yüksek sesle uyarmalarına rağmen ölen şahsın kaçamadığı ve ağaç parçasının kişinin kafasına çarptığı, yakınları aracılığı ile ambulansla hastaneye kaldırılan hastanın hastaneye ölü giriş yaptığı kayıtlıdır. Metal çerçeve ile sabitlenen teleferik kasasının tahta ile sarılı bir düzenek olduğu, teleferikte akasya ve ıhlamur odunlarının olduğu, ölen şahısa çarpan odunun ağız içinde ne başında kanamaya neden olduğu, kanın boşaltılmasına rağmen hastanın daha da kötüleştiği, adli nitelik kazanan olguya ait olay yeri incelemeleri ile kaldırıldığı hastanede ölü muayenesi işlemi yapıldığı, adli olgu olması nedeniyle otopsisi yapılmak üzere cesedin Adli Tıp Kurumuna gönderildiği bildirilmiştir. Cesedin 175 cm boyunda, 85 kilogram ağırlığında olduğu, yüzünde kan bulaşıkları, ekimoze alanlar olduğu, sağ dış kulak yolunda kanama, yüz kemiklerinde palpasyonda kırıklar olduğu, kemiklerin kafatasında zygomatik, maksiller, frontal ve temporal kemiklerde yer yer çökme tarzında lokalize olduğu, sağ zygoma üzerinde 20 cm lik düzensiz kenarlı laserasyon ve kanama (künt travma) olduğu kayıtlıdır. Otopsi raporunda ise; yüzün ve saçlı bölgenin kan ile bulaşık olduğu, sağ frontotemporal bölgeden inferomediale hafifçe oblik seyreden 20 cm uzunluk ve yer yer 3 cm genişlikte kanamalı lasere alan, bu alanın altında çok parçalı çökme kırığı ve açıklık içerisinde lasere bayin parankimi olduğu, kişinin ölümünün kafatası kemiklerinin yaygın kırıkları ile birlikte gelişen bayin kanaması ve benin doku harabiyeti olduğu kayıtlıdır. Ayrıca kazayı kolaylaştırabilecek, dikkat dağınıklığına neden olabilecek herhangi madde (alkol, uyuşturucu, uyutucu madde, ilaç…) kullanımı olup olmadığının teyidi için cesetten kan, idrar ve göz içi sıvısı alındı. Yapılan kimyasal ve toksikolojik incelemelerde herhangi pozitif bulgu tespit edilmediği kayıtlıdır.

Tartışma ve Sonuç: Bölgeye özgü gereksinimler ve kısıtlılıklar insan hayatının devamı için gerekli olan unsurların yapısını ve işleyişini şekillendirir. Zorlu doğa şartlarında temel yaşamsal

ihtiyaçlardan olan tarım ve yakacak elde etme zorunluluğu da kırsal bölgeler için elzemdir. Bu gibi nedenlerle ilkel teleferikler Doğu Karadeniz Bölgesinde yaygın biçimde kullanılmakta ve sayılarının yirmi bin kadar olduğu tahmin edilmektedir. Herhangi kayıt, denetleme ya da ruhsatlandırmaya tabi olmayan ve elektrik ya da itici/çekici su motorları ile çalıştırılan bu düzenekler istenme de yöre insanı için gündelik hayatın yardımcı bir parçasıdır. Bu derece yaygın kullanım ve on binlere ulaşan sayıları ile ilkel teleferiklerin kullanımına bağlı yaralanmalar ve ölümler kaçınılmaz olarak karşımıza çıkmaktadır. Önlenebilir bir bölgesel halk sağlığı sorunu da olan bu problemin çözümü için yaralanmalardan alınacak geri bildirimlerin yanı sıra teleferiklerin standardizasyonu, kullanıcı eğitimi ve teleferiklerin periyodik bakımlarının yaptırılması önleyici etkiler yaratabilir.

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TÜRKİYE'DE ORGANİK TARIMIN ÖNEMİ VE ORGANİK BİTKİSEL ÜRETİMİN YILLARA GÖRE MEVCUT DURUMU

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ÖZET
Organik tarım, doğal kaynakların aşırı tüketimi, girdilerin yoğun kullanımı sonucu oluşan tehditleri ortadan kaldırmak için uygulamaya başlanan bir tarımsal üretim şeklidir. Organik tarım, gelişmiş ülkelerde iç talebe yönelik gündeme gelmiş, Türkiye'de ise 1980'li yılların ortasında ithalatçı firmaların istekleri doğrultusunda ortaya çıkmıştır. Türkiye'de iyi tarım uygulamaları 2007'de başlamasına rağmen, özellikle 2013'ten sonra büyük gelişme göstermiştir. Türkiye'nin toprak ve su gibidoğal kaynaklarının henüz çok fazla kirlenmemiş olması ve uygun ekolojiye sahip olması organik tarım açısından avantaj sağlamaktadır. Ülkemiz üreticileri bu avantajları değerlendirerek hem üretim alanında hem de üretim miktarında her geçen yıl artış kaydetmiştir.
Anahtar Kelimeler: Organik tarım,organik tarımda bitkisel üretim verileri

THE IMPORTANCE OF ORGANIC FARMING IN TURKEY AND THE CURRENT SITUATION OF ORGANIC CROP PRODUCTION BY YEARS

ABSTRACT
Organic agriculture is a form of agricultural production that has been introduced in order to eliminate the threats posed by the excessive consumption of natural resources and the intensive use of inputs. Organic agriculture was introduced in developed countries for domestic demand, while in Turkey it emerged in the mid-1980s in line with the demands of importing companies. Although good agricultural practices in Turkey started in 2007, they have shown great progress especially after 2013. The fact that Turkey's natural resources such as soil and water have not yet been polluted too much and that it has a suitable ecology provides advantages for organic agriculture. By utilizing these advantages, the producers of our country have increased both the production area and the amount of production every year.
Keywords: Organic agriculture, crop production data in organic agriculture,

1.GİRİŞ

Dünya nüfusu hızla artmaktadır. Artan nüfusun beslenme gereksinimi, insanoğlunu tarımda birim alandan daha fazla ürün almaya yöneltmiş, zaman içerisinde de bu amaca yönelik teknoloji ve yöntemler geliştirilmiştir (kimyasal gübre ve ilaçlar, hibrit teknolojisi). Önceleri, her gün bir yenisi bulunan sentetik kimyasal gübreler ve mücadele ilaçları bilinçsizce ve çok miktarda kullanılarak verim artışı elde edilmeye çalışılmıştır. Bu bilinçsiz kullanım tarımı, özellikle de modern üretim yöntemlerini çevre kirliliğinin bir nedeni haline getirmiştir. Buna ilaveten yine değişen zaman içerisinde, genetik biliminin tüm teknolojileri kullanılmaya başlanılmıştır. Melezleme ve hibrit teknolojileri uygulanmıştır. Bütün bu sürecin sonucu olarak ekolojik denge bozulmakta, gıdaların doğal aromaları değişmekte, kullanılan sentetik kimyasal maddeler canlılar üzerinde kalıtsal bir takım tahribat ve hastalıklara yol açabilmektedir. Tarım dışı kaynaklardan yayılan zararlı maddeler su, toprak ve havayı kirletmekte ve bunun sonucunda kültürü yapılan tarım ürünlerinin yanı sıra toplum sağlığı da olumsuz etkilere maruz kalmaktadır (Karakoç 2004; Kodaş ve Er 2012).

Bu nedenle ön plana çıkan organik tarım, neredeyse dünyadaki tüm ülkelerde uygulanırken, üretim alanı ve üretici sayısı da giderek artmaktadır. Ayrıca dünya organik ürün pazarı da giderek büyümekte ve neredeyse tamamını ABD ve AB ülkeleri oluşturmaktadır. Ancak bu ülkelerde yetişmeyen veya yeteri kadar temin edilemeyen organik ürünlerin çoğu, gelişmekte olan ülkelerden ithal edilmekte ve hızla gelişen dünya organik ürün ve gıda pazarından pay alabilmek için çabalamaktadırlar. (Demiryürek 2004), Bu çerçevede sürdürülebilir tarımın da temel hareket noktalarından olan organik tarım üretimin her aşamasında göz önünde bulundurulması gerekmektedir. Özellikle çevre ve sağlığın neredeyse çoğu sektörün üretimlerinde göz ardı edemediği bir ortamda, insan yaşamı için temel ihtiyaçlardan olan gıda üretiminde çevrenin ve sağlığın göz ardı edilmesi mümkün değildir.

Türkiye'de kabul edilen yasal ismiyle ''Organik Tarım''; ekolojik sistemde yanlış uygulamalar sonucu kaybolan doğal dengeyi yeniden kurmaya yönelik, insana ve çevreye dost üretim sistemlerini içermekte olup, esas olarak kimyasal tarım ilaçları, hormonlar ve kimyasal gübrelerin kullanımının yasaklanması yanında, organik ve yeşil gübreleme, münavebe, toprağın muhafazası, bitkinin direncini arttırma, doğal düşmanlardan faydalanmayı tavsiye eden, bütün bunların kapalı bir sistemde oluşturulmasını öneren, üretimde sadece miktar artışının değil aynı zamanda ürün kalitesinin de yükselmesini amaçlayan alternatif bir üretim şeklidir (Aksoy ve Altındişli 1996; Yanmaz 2003). Bir diğer tanımlamaya göre de organik tarım, yapay gübrelerin, zararlılarla mücadelede kullanılan kimyasal ilaçların (pestisitlerin), genetik olarak müdahale

edilmiş ırkların ve tohumların, koruyucu kimyasalların, katkı maddelerinin ve bunlar gibi "doğal olmayan" her şeyin kullanımını kaldırarak, hem doğal ürünler elde etmeyi hem de çevreye yabancı maddelerin girmesini engellemeyi hedefleyen bir üretim sistemidir (Candaş 2003).

Organik tarım, üretim kararının verilmesi süreciyle başlayıp pazarlama aşamasına kadar kendine özgü prensipleri bulunan sürdürülebilir ve kontrollü bir tarım şeklidir. Geleneksel tarım uygulamaları artan gıda talebini karşılayabilmek için yoğun girdi kullanımı yoluyla maksimum ürün elde etmeyi amaçlarken, organik tarım sistemi üretimde sürdürülebilirliği esas almaktadır (Yorgancılar, 2016).

Organik tarım, sürdürülebilir tarımda gıda ve beslenme güvenliğine katkıda bulunabilen yaklaşımlardan biridir (MaggieandAjuruchukwu 2014). Küresel talebin artmasıyla birlikte organik tarım son yıllarda hızla büyümüştür (Willer ve ark. 2009; MaggieandAjuruchukwu 2014). Organik gıda üretimi, olabildiğince az tarımsal girdi kullanarak ekolojik çeşitliliğin korunmasını ve iyileştirilmesini esas alan insan ve çevre odaklı bir üretim anlayışıdır. Tüketici ve çevre odaklı yaklaşımlar tüketicileri daha fazla organik gıda tüketmeye, üreticileri ise daha fazla organik gıda üretmeye sevk etmektedir (Ustaahmetoğlu ve Toklu 2015).

Türkiye'de organik tarım faaliyeti 1980'li yıllarda Avrupa'lı ithalatçıların ülkemizden organik ürün talep etmesiyle gelişmeye başlamıştır (Adanacıoğlu ve ark., 2012). Türkiye'de organik tarım üreticilerle Avrupalı ithalatçılar arasında yapılan sözleşmelerle 1984-1985 döneminde başlamıştır. Organik tarımsal üretimde ilk olarak geleneksel ürün olan kuru üzüm ve incir ihracatı yapılmış, 1990 yılına kadar organik tarımı yapılan ürün sayısı sekiz olmuştur (Rehber,2011). Türkiye'de organik tarım yasal açıdan üç farklı dönemde incelenebilir. 1984-1993 döneminde bir ulusal hukuki düzenleme bulunmamaktadır. Bu dönemde organik üretim ithalatçı ülkelerin yönetmeliklerine göre yürütülmüştür.1994-2002 döneminde yönetmelik düzeyinde yasal düzenlemeler yapılmış faaliyetler komiteler aracılığıyla yürütülmüştür. Bu dönemde organik üretim faaliyetleri Ege Bölgesinde gelişmeye devam etmiştir. 2003--Bu dönemde organik üretim yasal dayanağa kavuşmuştur. 3 Aralık 2004 'de Organik Tarım Kanunu çıkmış, 10 Haziran 2005'te ise Organik Tarımın Esasları ve Uygulanmasına İlişkin Yönetmelik yürürlüğe girmiştir. (İlbaş,2009).

Ülkemizde 2016 yılında 523 778 hektarlık alanda, 67 878 üretici tarafından yaklaşık 2.5 milyon ton organik ürün üretimi yapılmıştır (Anonim, 2017a). Türkiye organik ürün üreticisi sayısı bakımından dünyada ilk 10 ülke arasındadır (Anonymous, 2015). Türkiye'de organik tarım hızla gelişmekte olup 2002 yılı ile 2016 yılları arasında organik tarım yapılan alanlarda

yaklaşık 10 kat artış olduğu, organik tarımsal üretim miktarının ise aynı dönemde 300 000 tondan yaklaşık 2.5 milyon tona çıktığı tespit edilmiştir (Anonim, 2017a). Ülkemizdeki organik ürün üretimi, yurtdışından taleplerin artması, Tarım Bakanlığının organik üretimi desteklemesi, üniversiteler, araştırma kuruluşları, sivil toplum kuruluşları, yerli tüketicilerin ve kamuoyunun konuya ilgi göstermesi, iç pazarın oluşumu vb. gelişmeler sonucu hızla artmaktadır (Demiryürek, 2011).

Bu çalışmanın amacı; Türkiye'de organik tarımın önemi ve organik bitkisel üretimin yıllara göre mevcut durumunu ortaya koymak ve gelişimi için öneriler getirmektir.

2. LİTARATÜR TARAMASI

Makale konusu ile ilgili olarak daha önce yürütülen bazı araştırmalara ilişkin bulgular aşağıda verilmiştir.

Akbay ve Usal (2000); bildirilerinde, geleneksel tarım metodunda kullanılmakta olan kimyasal girdilerde yüksek seyreden fiyatlarının ürünlerde maliyetleri artırıcı bir etken olduğunu, ekolojik tarım sayesinde elde edilen kazancın geleneksel yöntemle yapılan tarım faaliyetlerine göre daha iyi düzeydebulunduğunu söylemişlerdir.Öte yandan geleneksel tarımda gübre,hormon kullanımının çevreyeve sağlığa yaptığı negatif etkileri de göz önünde bulundurulduğunda ekolojik tarımsal faaliyetlerin topluma yararı artı bir gelir olacaktır sonucuna ulaşmışlardır.

Demirci,Erkuş ve Tanrıvermiş (2002); çalışmasında, organik tarımla geleneksel tarımı ürün verimliliği bakımından karşılaştırarak organik yöntemle yapılan tarımda dekar başına düşen karın gelenekseltarımla yapılanüretimdençokdahayüksek düzeyde bulunduğu kanaatine varılmıştır.

Sayın (2002); çalışmasında Türkiye'nin neredeyse kuru meyvelerle sınırlı olan organik yöntemle üretilmiş ürünlerin ihracının çeşitliliği arttırılmış bir düzeye ulaştırılması için plan yapmanın gerekli olduğunu söylemektedir.

Vatansever (2007); çalışmasında Türkiye'de organik üretimin denetim ve belgelendirme kapsamına alınmadığı için ürünlerin organik ürün niteliğinde pazarlanmasının zorluğu üzerinde durmuştur. Türkiye'nin organik şartları, zengin biyolojik yapısı, geniş ürün çeşitliliği ve doğal kaynaklarında henüz kirlenme olmadığı için organik tarımla ilgili birçok avantaja sahip olduğunu vurgulamıştır.

Er ve Başalma (2008); çalışmasında organik üretim fikrinin ilk önce bitki kökenli ürünlerde uygulandığını, bu konularda bazı çalışmalar yapıldığını, yapılan faaliyetlerden beklenen sonuca ulaşılmasından sonra aynı görüşün farklı sahalarda da tatbik edilme fırsatı yakalandığını

belirtmiştir. **Gök(2008);**çalışmasındagenetiğiileoynanmışgıdalarınsonyıllardasürekli artarak pazara sürülmesi gıdaların güvenirliği konusunda artan endişelerle birlikte genetik medifikasyonun tümüyle reddeden organik üretimin önemini bildirmiştir.

İlbaş(2009); çalışmasında organik ürünlerin pazarlamasını yapacak olanların her dönem yeteri kadar ve aynı nitelikte ürünler bulundurmasına, üretici, toptancı ve perakendeci üçgeninde iyi bir pazarlama ağı oluşturmasını önemini bildirmiştir.

Durmaz (2010); tarafından yapılan çalışmada Türkiye'de organik tarım faaliyetlerin epeyce pahalı ve karmaşık işlemler gerektirdiği için hak ettiği düzeyde ilgi görmediği, yapılan üretimin ise ihracata yönelik üretilmiş olduğu bildirilmiştir.

Özbağ (2010); tarafından yapılan doktora tezi çalışmasında Türkiye'nin küresel piyasalarda yer alabilmesi için işlenmiş tarım ürünleriyle piyasaya girmesiyle rekabet ortamında avantaj sağlayacağını ifade etmektedir. Bu alanda birçok avantajları olan Türkiye'nin organik ürün pazarında bir şansa sahip olmasıiçintüketici ve üreticilerinbilinçlendirilmesi,bu alanın teşvik edilmesinin önemi üzerinde durulmuştur.

Rehber (2011); çalışmasında organik tarımsal sektörde üretici ile tüketici arasındaki bütün kademelerde çözülmesi gereken birçok sorun ortaya çıkarmıştır.Organik tarımla ilgili üretim, pazarlama, pazarlama kanalları, tüketici eğilimleri ve fiyatlandırma, belgelendirme konularında bilgilendirme yapılarak aşılması mümkün sorunlar tartışılmış ve bunlarla ilgili çözüm önerileri ortaya konulmuştur.

Çetinkaya ve ark,(2012);yaptıkları çalışmada Güneydoğu Anadolu Bölgesinin toprağın çok az işlendiği, bir çok alanda çiftlik gübresinin kullanıldığı ve kimyasalların neredeyse hiç kullanılmadığı alanlarla kaplı olduğu gibi, hala bir çok alanı ham ve ekolojik tarım açısından yüksek potansiyele sahip olan ve keşfedilmeyi bekleyen bir bölgemizdir. Bu bölgeye has olarak yetiştirilen birçok ürün organik tarım açısından önemli potansiyel oluşturduğunu bildirmişlerdir.

Merdan(2014);yaptığı çalışmada organik tarım alanında önemli bir gelişim süreci yakalayabilmek amacıyla yasal düzenlemelere gidilerek yeni hedefler belirlenmeye, organik tarımsal ürünlere olan taleplerin karşılanmasına gayret edilmektedir. Çoğu hükümetin organik tarımla ilgili girişimleri desteklemesiyle beraber daha nitelikli ve daha güvenilir besin üretimiyle ilgili konularda kamu kurumlarının ve tüketici kitlesinin organik ürünlere artan ilgileri organik tarım alanında görülen hızlı gelişme sürecinde önemli etken olduğu yönünde bulgular elde etmiştir.

Kılıçaslan(2015);yaptığı çalışmada Ülkemizde ekonomik ve sosyal alanda yaşanan gelişmeler ve küresel iklim değişiklikleri, organik tarımsal üretimi önemli ölçüde etkilemekte olup, tüketicilerin gıda güvenilirliğine ilişkin taleplerinin artması, üretimden tüketime kadar geçen tüm sürecin izlenmesini zorunlu kılmaktadır. Bu durum, belgelendirmeyi yapan kuruluşların yeterliliklerinin uluslararası standartlara göre değerlendirilerek onaylanmasını sağlayacak bir akreditasyonu da gündeme getirmektedir. Bu çalışmada; Organik Tarım başta olmak üzere; İyi Tarım Uygulamaları ve Küresel İyi Tarım Uygulamaları (GLOBAL G.A.P.) da dahil ülkemiz tarım sektöründe yürütülen belgelendirme programları kapsamında Türkiye'de organik tarım ürünlerinin belgelendirmesi faaliyetleri ve bu faaliyetlerin akreditasyonu, uluslararası standartlar açısından değerlendirilmiş, Türkiye'de ve Avrupa Birliği'nde organik tarım mevzuatında yaşanan son gelişmelere değinilmiş ve Türkiye'de organik tarım mevzuatının, mevcut mevzuatın uygulanabilirliğinin ülke koşulları da dikkate alınarak AB Organik Tarım mevzuatı ile önemli ölçüde uyumlu olduğu kanaatine varmıştır.

Eryılmaz ve ark,(2019); Dünya nüfusuna paralel olarak artan tarım ürünleri ihtiyacı, yoğun kimyasal girdi uygulamalarıyla verimde artış sağlanarak karşılanmaya çalışılmıştır. Ancak tarımsal faaliyetlerde gereğinden fazla kullanılan girdilerin, insan sağlığı ve çevre üzerindeki olumsuz etkileri zamanla artan oranda hissedilmeye başlanmıştır. Bunun sonucu olarak, sadece verim artışını değil, aynı zamanda insan sağlığını ve çevreyi korumayı esas alan sürdürülebilir tarım sistemleri önem kazanmıştır. Organik tarım, gelişmiş ülkelerde iç talebe yönelik gündeme gelmiş, Türkiye'de ise 1980'li yılların ortasında ithalatçı firmaların istekleri doğrultusunda ortaya çıkmıştır. Türkiye'de iyi tarım uygulamaları 2007'de başlamasına rağmen, özellikle 2013'ten sonra büyük gelişme göstermiştir. Organik tarım alanı, 2007'den 2016'ya gelindiğinde 3 kat, iyi tarım uygulamaları alanı ise 88 kat artmıştır. Ekonomik ve sosyal yönden sürdürülebilir tarımın sağlanmasında, daha çok yerel ölçekli ve işletme odaklı uygulamaların ele alınmasına, çevresel sürdürülebilirliğin sağlanmasında ise makro düzeyde ve uzun vadeli politikalara ihtiyaç vardır. Bu çalışmada, Türkiye'de sürdürülebilir tarımın gelişmesini sağlayan organik tarım ve iyi tarım uygulamaları ekonomik, sosyal ve çevresel yönleriyle değerlendirilmiştir.

3. MATERYAL ve YÖNTEM

Bu çalışma literatüre dayalı olarak hazırlanmıştır. Bu bağlamda, Türkiye'de organik tarımın önemi ve organik bitkisel üretimin yıllara göre mevcut durumu konusu internet kaynaklarından ve veri tabanlarından yararlanılarak araştırılmıştır. Çalışma yöntemi ise 2 aşamada gerçekleştirilmiştir. Birinci aşamada, konu ile ilgili olarak literatür taraması yapılmıştır. İkinci

aşamada ise incelenen literatür kaynaklarının çeşitli açılardan değerlendirilmesi, yorumlanması ve sentezlenmesi yapılarak Türkiye'de organik tarımın önemi ve organik bitkisel üretimin yıllara göre mevcut durumu incelenmesi amaçlanmıştır.

4.BULGULAR ve TARTIŞMA

Organik ve Geçiş Süreci Ürünü Bitkisel Üretim Verileri Türkiye'de tablo 1'de verilmiştir.

Tablo 1; Organik tarım geçiş süreci üretim verileri

ORGANİK TARIM ÜRETİM VERİLERİ(Geçiş Süreci Dahil)

Yıllar	Ürün Sayısı*	Çiftçi sayısı	Yetiştiricilik Yapılan Alan(ha)	Doğal Toplama Alanı(ha)	Toplam Üretim Alanı(ha)**	Üretim Miktarı(ton)
2002	150	12.428	57.365	32.462	89.827	310.125
2003	179	14.798	73.368	40.253	113.621	323.981
2004	174	12.751	108.598	100.975	209.573	377.616
2005	205	14.401	93.134	110.677	203.811	421.934
2006	203	14.256	100.275	92.514	192.789	458.095
2007	201	16.276	124.263	50.020	174.283	568.128
2008	247	14.926	109.387	57.496	166.883	530.224
2009	212	35.565	325.831	175.810	501.641	983.715
2010	216	42.097	383.782	126.251	510.033	1.343.737
2011	225	42.460	442.581	172.037	614.618	1.659.543
2012	204	54.635	523.627	179.282	702.909	1.750.127
2013	213	60.797	461.395	307.619	769.014	1.620.387
2014	208	71.472	491.977	350.239	842.216	1.642.235
2015	197	69.967	486.069	29.199	515.268	1.829.291
2016	225	67.878	489.671	34.106	523.778	2.473.600
2017	214	75.067	520.885	22.148	543.033	2.406.606
2018	213	79.563	540.000	86.885	626.885	2.371.612
2019	213	74.545	505.140	33.283	545.870	2.030.465
2020***	248	52.330	352.395	28.882	381.277	1.630.252

Çizelge 1, tarım ve orman bakanlığı.gov.tr

Tablo 1'de 2002-2020 yıllarında Türkiye'deki organik tarım bitkisel üretim verileri verilmiştir.Tabloyu incelediğimizde, 2002 yılında 150 olan ürün sayısı, 2020 yılında 248'e çıkmıştır. Ancak ürün sayısı yıllara göre düzenli bir şekilde artmamıştır. 2008 yılında 247 olan ürün sayısı 2009 yılında 212'ye düşmüştür. 2002 yılında, 12.428 çiftçi organik üretim yaparken 2020 yılında bu sayı 52.330'a çıkmıştır. Yine yıllara göre çiftçi sayılarında da düzenli bir artış yoktur. Bazı yıllar artarken, bazı yıllar azalmıştır. Yıllara göre ürün ve üretici sayılarında olan dalgalanmalar çeşitli faktörlere bağlanabilir. Üreticiler, küçük alanlarda organik üretim yaptığı için kontrol ve sertifikasyon ücretleri maliyetli gelebilir. Üreticiler, organik tarım metotları, organik tarımın amaç ve felsefesi konusunda yeterince bilgi sahibi değillerdir. Üreticiye desteklemelerle sağlanan maddi imkanlar yetersiz olabilir (Bayram,2007).

Tabloda incelendiği gibi üretim alanı ve miktarı da yıllara göre çeşitli nedenlerle değişiklik göstermiştir.

Türkiye'de uygulanan organik tarım standartları, uluslararası standartlarla uyumlu hale getirilmiştir. Türkiye'de tarımsal kalkınmanın önemli bir parçası olan organik tarım, son yıllarda yükselen bir gelişim trendine girmiştir. Türkiye'de 1984-1985 yıllarında kuru incir, kuru üzüm gibi geleneksel ürünlerimizin ihracatı ile başlamış, daha sonraki yıllarda ise, hızla gelişme göstererek 250'nin üzerinde ürün ihraç edilir duruma gelmiştir. Türkiye'de yıllara göre organik bitkisel üretim miktarları, ürün sayısı,üretim alanı ve çiftçi sayısı Çizelge 1'de yer almaktadır. Ege bölgesi organik tarımın Türkiye'de ilk olarak başladığı yöre olarak organik üretim ve ihracatta önemli kalemlerin başında gelen kuru üzüm ve kuru incirin üretim merkezi olması nedenleriyle organik tarımda önemli bir konumundadır. Türkiye genelinde %70,7 alan büyüklüğü ve %54,1 çiftçi yüzdesi ile Doğu Anadolu Bölgesi birinci sırada olup bunu %11,9 alan ve %19,4 çiftçi yüzdesi ile Ege Bölgesi takip etmektedir(Ongun, 2014,s.5).Türkiye'de organik tarım, üretici sayısı ve üretim alanındaki artışa bağlı olarak son yıllarda büyük gelişme göstermiştir. Organik tarım yapan üretici sayısı 2007'den 2016'ya kadarki 10 yılda 4.17 kat, üretim alanı 3 kat artmıştır. İyi tarım uygulamalarında ise, üretici sayısı ve üretim alanı bakımından özellikle 2013'den sonra önemli gelişmeler olmuştur. İyi tarım uygulamaları yapılan alan, 2016'da 2007'ye göre yaklaşık 88 kat artış göstermiştir (Çizelge 1). Çizelge 1'de belirtildiği gibi Türkiye'de organik bitkisel üretim alanı, 2002 yılına oranla %483 oranda artış gerçekleşmiştir (GTHB, 2016).Ülkemizde son yıllarda taze meyve ve sebzeden,baklagiller, pamuk ve buğday gibi çeşitli tarla bitkileri,tıbbi ve aromatik bitkiler ve kurutulmuş meyvelere (elma,fındık, antep fıstığı, kuru incir ve üzüm) kadar üretilen organik ürünler giderek çeşitlenmektedir (Demiryürek,2016). Çizelge1' de belirtildiği üzere 2018 yılı itibariyle Türkiye'de toplamda 626.885 ha alanda organik tarım yapılmaktadır. 79.563 çiftçi 213 organik üründe toplam2.371.612 ton üretim gerçekleştirmiştir (Anonim, 2019b).Türkiye'de organik bitkisel üretim verileri incelendiğinde yıllar içerisinde ürün sayısı, çiftçi sayısı,üretim alanı ve üretim miktarı parametrelerinde bazı yıllarda bir önceki yıla göre düşüş görülse de genel olarak yıllar itibari ile artış söz konusudur. 2018 yılı verilerine bakıldığında 2002 yılı verilerine göre organik ürün sayısında %42, çiftçi sayısında %540, üretim alanında %598 ve üretim miktarında %665 oranında önemli bir artış gerçekleştiği görülmektedir. Ayrıca organik üretim yapan çiftçi sayısının ve toplam üretim alanlarının yıllara göre değişiklik gösterdiği, toplam üretim miktarının ise sürekli arttığı görülmektedir (Çizelge 1).

Tablo 2;Bölgelere göre organik tarım verileri

Çizelge 2. Bölgelere göre organik tarım verileri (2018) (TÜİK, 2019)
Table 2. *Organic farming data by regions (2018) (TÜİK, 2019)*

Bölge Adı	Çiftçi Sayısı	Üretim Alanı (Hektar)	Üretim (Ton)
Batı Marmara	892	7.511	18.409
Ege	23.943	136.961	751.900
Doğu Marmara	1.430	11.910	25.567
Batı Anadolu	814	8.527	74.221
Akdeniz	1.492	21.851	79.164
Orta Anadolu	1.269	73.538	205.473
Batı Karadeniz	7.280	69.297	112.214
Doğu Karadeniz	18.431	19.165	52.791
Kuzeydoğu Anadolu	5.669	89.811	390.782
Ortadoğu Anadolu	8.959	119.046	387.613
Güneydoğu Anadolu	9.362	69.160	272.745

Ülkemizde organik tarımın yogun olarak yapıldığı bölge Ege bölgesidir.Bu bölgede 23.943 çiftçi,136.961 hektar alanda 751 ton üretim gerçekleşmektedir.Ege bölgesinde hem çiftçi hemde üretim alanı bakımından diğer bölgelere göre oldukça önde gelmektedir(Çizelge 2)(TÜİK 2019).

5.SONUÇ ve ÖNERİLER

İnsanoğlu hayatını sürdürebilmek için gerekli gıda ihtiyaçlarını karşılayabilmek amacıyla çevre üzerindeki hakimiyetini hızla artırma yoluna gitmiştir. Tarımda kullanılan birtakım yanlış teknikler ve uygulamalar, sanayi ve teknolojideki hızlı gelişmeler ile artan dünya nüfusunun temel ihtiyaçlarını karşılayabilmek amacıyla birim alandan daha fazla ürün elde edebilmek için yeni yöntemler geliştirilmeye çalışmıştır. Tarımda aşırı gübre, hormon ve sentetik kimyasalların kullanımında artış yaşanması, insanlığın sağlık açısından çeşitli problemler ile karşı karşıya kalmasına ve aynı zamanda toprak, su ve hava gibi çevresel olguların da bundan zarar görmesine neden olmuştur.

Zengin biyolojik çeşitlilik, göreceli olarak temiz ekolojik alanlar, hastalık ve zararlılara dayanıklı bitki çeşitleri ve düşük kimyasal girdi kullanım düzeyi gelişmekte olan ülkelerde olduğu gibi ülkemizde de organik tarımın gelişmesi için başlıca avantajlar arasında yer almaktadır. Bu yüzden, ülkemiz ekolojisi, coğrafi ve topografik yapısı, çeşitli iklim özellikleri nedeniyle birçok ürünü (bazı tropik meyveler hariç) yetiştirmeye imkân tanıyan büyük bir potansiyele sahiptir. Üstelik Türkiye'nin tarımsal üretim sistemi çok geniş bir alana yayılmıştır ve sanayileşmiş ülkelerle karşılaştırıldığında tarımda birim alana kimyasal girdi kullanım oranı çok düşüktür. Bu yüzden, ülkemiz tarım alanlarında yoğun kimyasal kirlilik bulunmamaktadır. Özellikle Türkiye'nin doğusunda organik tarıma geçiş, diğer sanayileşmiş bölgelere oranla daha kolaydır. Bu durumda Türkiye, birçok gelişmiş ülkenin sorunu olan yoğun kimyasal girdili

tarımın yarattığı çevre sorunlarından sakınabilecektir. Diğer taraftan, yüksek katma değerli ve emek yoğun ürünlerin organik olarak üretimini artırma yoluyla kırsal istihdama bir ölçüde yardımda bulunulabilir. Bu yüzden, hükümetin finansal desteği, çiftçi eğitimi, yayım ve araştırma çalışmaları ve özel sektör STK ile işbirliği halinde organik tarımın gelişimi ülkemizde hızlandırılmalıdır.

Türkiye'de organik tarımın geliştirilmesi için ekolojik açıdan organik tarıma daha uygun, geçiş sürecinin daha kısa ve kolay olabileceği ve organik tarımın kırsal kalkınmaya sosyal ve ekonomik açılardan katkı sağlayabileceği yerlerde organik tarımın başlatılması ve yaygınlaştırılması için desteklenme politikalarının uygulanması, araştırma-geliştirme ve yayım çalışmalarının yapılması büyük önem taşımaktadır.

Türkiye'nin toprak ve su gibi doğal kaynaklarının henüz çok fazla kirlenmemiş olması ve uygun ekolojiye sahip olması organik tarım açısından avantaj sağlamaktadır. Ülkemiz üreticileri bu avantajları değerlendirerek hem üretim alanında hem de üretim miktarında her geçen yıl artış kaydetmiştir.Türkiye genelinde 2018 yılında, organik tarım yapılan 626.885 ha alanda 2.371.612 ton organik üretim gerçekleştirilmiştir. Bölgeler bazında bakıldığında 751.900 ton organik üretimle Ege Bölgesi birinci sırada yer almaktadır.

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BAĞ İLAÇLAMA UYGULAMALARI İÇİN BİR DRONE TASARIMI, İMALATI VE PERFORMANSININ BELİRLENMESİ

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ÖZET
Bu çalışmada bağ ilaçlanması için yer araçlarına alternatif olabilecek bir dronun tasarımı, imalatı ve etkinliğinin belirlenmesi amaçlanmıştır. Bu amaç doğrultusunda açık kaynak yazılım programından yararlanarak 6 motorlu ve çoklu rotor sistemine sahip (Hexacopter) bir dron tasarlanarak imalatı tarafımızdan yapılmıştır. Bu drone 20 km menzile ve 10 lt depo kapasitesine sahiptir. GPS Koordinatları verilerek manuel veya otomatik olarak belirtilen tarla, bağ veya farklı alanlarda püskürtme veya ilaçlama yapama özelliğine sahiptir. Araç takibi drone üzerine monte edilen kameradan 640x480 çözünürlükte dijital olarak radyo dalgaları üzerinden kumandaya iletilmektedir. Kumandaya TYPE-C veya Micro USB kablo yardımı ile cep telefonu, tablet, bilgisayar üzerinden canlı olarak görüntü aktarımı sağlanmaktadır. Aracın anlık uçuş verileri; irtifa, hız, yükseklik, batarya bilgisi, kalkış mevkiine olan uzaklığı, gibi genel parametrelerin hesaplanması için tarafımızca bu işe özel olarak kodlanan, açık kaynak kodlu Arducopter yazılımından faydalanılmıştır. Uçuş denemeleri Dicle Üniversitesi Ziraat Fakültesi Bahçe Bitkileri Bölümüne ait bağ alanlarında gerçekleştirilmiştir. Denemelerde iz maddesi ve kalıntı miktarını ölçmek için suya duyarlı kağıtlar ve filtre kağıtlar kullanılmıştır. Denemelere başlanmadan önce bu kağıtlar asmanın üst, orta ve alt kısmına yerleştirilmiştir. Daha sonra püskürtülme denemeleri gerçekleştirilmiştir. Denemeler 0.5 m/s, 1.00 m/s ve 2 m/s uçuş hızında ve 30 cm, 60 cm ve 90 cm gibi farklı yükseklikte ve üç tekerrürlü olarak gerçekleştirilmiştir. Her uçuş denemesi sonucunda asma ağacının farklı noktalarına yerleştirilen kağıtların iz maddesi birikim miktarları spektrofotometre cihazı kullanılarak ölçülmüştür. Suya duyarlı kağıtlar ise tarayıcıdan taratılarak fotoğraf olarak dijital ortama alınması sağlanmıştır. Daha sonra MATLAB programında oluşturulan görüntü işleme yazılımı yardımıyla bu fotoğraflar analiz edilmiş, damlaların filtre kâğıtlarında kapladığı alan ölçülerek elde edilen değer % orana dönüştürülerek kaplama oranı değerleri bulunmuştur. Uçuş denemelerinin sonuçlarına göre iz maddesi birikim miktarları bitkinin üst bölgelerinde daha fazla bulunmuş olup, alt bölgelere inildikçe birikim miktarları azalış göstermiştir. Genel olarak bütün ilerleme hızlarında en iyi iz maddesi birikim miktarı 30 cm uçuş yüksekliğinde elde edilmiştir. 0.5 m/s uçuş hızında bitki içindeki birikim miktarı 24-25 μgcm^{-2} iken bu değer 60 cm yükseklikte 20-21 μgcm^{-2} ve 90 cm uçuş yüksekliğinde 20 μgcm^{-2} ‘e düşmüştür. Dolaysıyla 0.5 m/s ilerleme hızında elde edilen en düşük birikim miktarı ise 90 cm yükseklikten yapılan denemelerde gerçekleşmiştir. Kalıntı birikim miktarım 2 m/s’lik uçuş hızında ve 90 cm yükseklikteki değeri 0.5 m/s’lik hıza göre yarıya düşmüştür. Tüm uçuş hızlarında ve yüksekliklerinde en fazla kalıntı miktarı asmanın üst kısımda oluşurken alt bölgeye doğru bu oran azalmıştır. Püskürtme yüksekliğinin artmasının, damlacıkların bitki içine penetrasyonunu da olumsuz anlamda etkilediği sonucuna varılmıştır. Düşük hızlarda birikim miktarının daha iyi olduğu, hız arttıkça bitki içi birikim miktarının pervanelerin yarattığı hava akımından dolayı azaldığı görülmüştür.
Anahtar Kelimeler: Drone, Tasarım, İmalat, İlaçlama, Bağcılık, Hassas Tarım,

DESIGNING AND MANIFACTURING OF DRONE FOR VINEYARD SPRAYING APPLICATIONS AND DETERMINING IT'S PERFORMANCE

ABSTRACT

In this study, it is aimed to design, manufacture and determine the performance of a drone that can pesticide spray in vineyard areas where ground vehicles cannot easily enter from the air. For this purpose, a drone with 6 motors and a multi-rotor system (Hexacopter) was designed and manufactured by using open source software program. After the main body of the drone, which was laser cut according to technical dimensions, was formed, the necessary organs for flight and spraying were assembled on this body, and the manufacturing process was completed and it became ready for flight. This drone has a range of 20 km and a storage capacity of 10 liters. It has the feature of spraying or spraying in fields, vineyards or different areas specified manually or automatically by giving GPS coordinates. Vehicle tracking is transmitted from the camera mounted on the drone to the controller digitally at 640x480 resolution via radio waves. With the help of TYPE-C or Micro USB cable to the remote, live image transmission is provided via mobile phone, tablet, computer. Instant flight data of the vehicle; In order to calculate general parameters such as altitude, speed, altitude, battery information, distance to the take-off site, open source Arducopter software, specially coded for this work, was used. Flight trials were carried out in the vineyard areas of Dicle University, Faculty of Agriculture, Department of Horticulture. In the experiments, water sensitive papers and filter papers were used to measure the amount of trace substance and residue. These papers were placed in the upper, middle and lower parts of the vine before the trials were started. Spraying experiments were then carried out. The trials were carried out at 0.5 m/s, 1.00 m/s and 2 m/s flight speeds and at different heights such as 30 cm, 60 cm and 90 cm and with three replications. As a result of each flight trial, the amount of trace matter accumulation of the papers placed at different points of the vine tree was measured using a spectrophotometer device. Water sensitive papers were scanned from the scanner and transferred to digital media as photographs. Then, these photographs were analyzed with the help of the image processing software created in the MATLAB program, and the coverage ratio values were found by converting the value obtained by measuring the area occupied by the drops on the filter papers to %. According to the results of the flight trials, the accumulation amounts of trace material were found to be higher in the upper regions of the plant, and the accumulation amounts decreased as the lower regions descended. In general, the best amount of trace material deposition at all travel speeds was obtained at 30 cm flight altitude. While the amount of accumulation in the plant at 0.5 m/s flight speed was 24-25 μgcm^{-2}, this value decreased to 20-21 μgcm^{-2} at 60 cm height and 20 μgcm^{-2} at 90 cm flight height. Therefore, the lowest accumulation amount obtained at 0.5 m/s feed rate was realized in the trials made from a height of 90 cm. The amount of residue accumulation was halved at a flight speed of 2 m/s and at an altitude of 90 cm compared to a speed of 0.5 m/s. At all flight speeds and heights, the highest amount of residue was formed in the upper part of the vine, while this ratio decreased towards the lower region. It was concluded that the increase in the spray height also negatively affected the penetration of the droplets into the plant. It has been observed that the amount of accumulation is better at low speeds, and as the speed increases, the amount of accumulation in the plant decreases due to the air flow created by the propellers.

Keywords; Drones, vineyard, uav, spray, fertisiler, autonom.

GİRİŞ

Bağcılık; neolitik çağlardan günümüze kadar Yukarı Mezopotamya'nın coğrafyasında yer alan Güneydoğu Anadolu Bölgesi için önemli tarımsal faaliyet olmuştur. Bölgenin toprak ve iklim koşullarının bağcılık için uygun olması nedeniyle hemen hemen bölgede yer alan tüm ilerde bağcılık yapılmaktadır. Ancak, bağcılık faaliyetlerinin ve üzüm üretimin en yoğun yapıldığı il Diyarbakır'dır. Diyarbakır ili bağ üretim alanları bakımından yıllara göre dalgalanmalar göstermekle birlikte genellikle Türkiye'de yedinci sırada yer almaktadır. TÜİK (2019) yılı verilerine göre toplam 196.939 dekar (da) bağ alanı mevcuttur.

Sürekli artan, dünya nüfusunu beslemenin anahtarı bilgi ve iletişim teknolojisinin tarımsal amaçlı kullanılmasıdır. Nitekim son dönemlerde klasik tarımsal uygulamalara alternatif olan hassas tarım olarak adlandırılan bilişim teknolojisinin tarımın farklı alanlarındaki uygulamaları gittikçe yaygınlaşmaktadır (Mattese, 2020). Hassas tarım uygulamalarının en yenisi ve en teknolojik olanı drone uygulamalarının tarımsal amaçlı kullanılmasıdır. İnsansız hava araçlarıyla (İHA) toprağın veya bitkinin ihtiyaç duyduğu gübre, ilaç ve suyun zamanında, istenilen miktarda ve doğru yöntemlerle sağlanabilmektedir. Bununla aşırı kullanılan gübre, ilaç ve su miktarının azaldığından hem üretim maliyetleri azalmakta hem de çevrenin zarar görmesi engellenmektedir. Bu yaklaşım arazideki bazı yerlerin fazla, bazı yerlerin ise daha az girdi almasına neden olmaktadır. Bu noktada dronlar devreye girerek tarlanın hangi bölgesinde ne kadar ilaca ne kadar gübreye ihtiyacı olduğunu tespit edip, ihtiyacı kadarıyla bu işlemi gerçekleştirmektedir. Türkiye'de ve bölgemizde bağ alanlarında mantari hastalık, Bağ Mildiyusu ve Bağ Küllemesi, salkım güvesi, küf vb. uygulamalar için pestisit kullanılmaktadır. Pestisit uygulamak için genellikle bağ-bahçe pülverizatörü, tarla pülverizatörleri ve atomizörler kullanılmaktadır. Yer araçlarının rahatlıkla giremediği bağ alanlarında her ilaçlama dönemi için ilacın sarfiyatını azaltarak daha ekonomik, kontrolü, ihtiyaç kadarıyla bitkiye ve çevreye zarar vermeden etkin bir ilaçlamanın yapılması gerekmektedir. Bu noktada Dronlar devreye girerek tarlanın hangi bölgesinde ne kadar ilaçlamaya ne kadar gübreye ihtiyacı olduğunu tespit edip, ihtiyacı kadarıyla bu işlemi gerçekleştirmektedir.

Freeman ve ark.(2015) insansız hava araçlarının tarımda kullanılabilme potansiyelinin yüksek olmasına karşın, halihazırda tarımsal uygulamalarda kullanılan İHA'ların çalışma menzilleri, uçuş süreleri ve taşıma yükleri, gelişmiş askeri amaçlı kullanan dronlardan çok daha az olduğunu bildirmiştir. Yani bireysel İHA'nın kendisi ve taşıdığı sensörler için ağırlık, boyut ve enerji tüketimi açısından yetersizdirler. Ayrıca, çevresel faktörlerden kolayca etkilenirler; İHA ile ilaçlamanın yapılması ve yapılan püskürtme genellikle damlacık sürüklenmesine neden

olurlar. Dolaysıyla pestisitlerin uygulanması sırasında dozajın bir kısmı hedef alana ulaşmadığından damlacık kayması meydana gelmektedir (Kirk, 2000). Bu yüzden, dronla kimyasal uygulama sonrası tarlanın bazı alanlarında yüksek hız, ani rüzgar değişikliği, püskürtme sırasındaki rüzgarın şiddeti ve yönü gibi hava koşulları tüm ilaçlanacak alanın düz olmaması gibi nedenlerden dolayı yeterli etkinlik sağlanmamaktadır. Bununla birlikte, özellikle düşük ekipman maliyeti, açık kaynaklı yazılımı, uçuş kontrol zekası ve uydu tabanlı navigasyon kontrolü ile umut vaat ettiğini bildirilmektedir. Tarımsal ilaçlama için drone kullanım olanaklarını ve püskürtme için performanslarına yönelik benzer çalışmalar Giles ve Billing (2014), Berner ve Chojnacıl (2017) tarafından yapılmıştır. Benzer şekilde Lou ve ark. (2018), pamuk ilaçlamasında hava araçlarını yer araçlarıyla ilaçlama etkinlikleri bakımından karşılaştırmalar yapmışlardır. Hava aracının damla düzgünlüğü ve kalıntı oranı yer aracına göre daha tatmin edici sonuçlar verdiğini ifade etmişlerdir. Yine Anonymous (2019), Aeracoop (2019-İspanya) Dronecoria adını verdikleri bir drone imal edip, bu drone üzerine monte edilen 8 kg'lık depoya sahip bir drone imal etmişlerdir. Yangınlarda yok olan orman alanlarına tohum atma ve meyilli alanlarda karşı kullanabilme olanaklarını araştırmışlardır. Orman yangınları sebebiyle, yok olan ve kara taşıtlarıyla ulaşılması zor olan ormanlık alanlara; bu drone yardımı ile metrekareye 5 adet granül şeklinde tohumları serpmişlerdir.

Bu tür olası sorunları azaltmanın bir yolu birden fazla araç kullanarak yukarıda belirtilen denetimleri gerçekleştirmektir (Hilz ve Vermeer, 2013; Doering ve ark.,2014). Benzer durum Koç (2017) tarafından ifade edilmiştir. Araştırıcı, 5 litre kapasiteli bir ilaçlama yapan drone tasarlamıştır, bu drone saha ve laboratuvar ortamında testlerini başarıyla gerçekleştirmiş olup, maliyet açısından ucuz ama çalışma kapasitesi düşük olduğundan üretilen araç fazla verimli olmadığını, daha büyük kapasiteli olanlarla daha verimli olacağını ifade etmiştir. Ochs (2021) göre öngörülemeyen hava koşulları ve iklim değişikliğinin etkileri, bağların en büyük sorunlarını çözmek için teknolojiye yönelmesine neden olduğu ve günümüzde üzüm bağları için ortaya çıkan en umut verici teknolojik çözümlerden birinin de insansız hava araçları olduğunu ifade etmiştir. Dronla ilaçlama ile ilgili çok sayıda benzer çalışma Zhu ve ark (2010), Şahin ve Yıldırım (2011), Comba ve ark. (2015), Giles ve Billing (2015), Kale ve ark. (2015), Rokhmana(2018), Huang ve ark. (2015), Xue ve ark. (2016), Çolak ve ark. (2016), Wang ark. (2016), Teke ve ark (2016), Wang ve ark. (2017), Zheng ve ark. (2017), Chen ve ark. (2017), Xu et al. (2017), Lou ve ark (2018), Yallappa ve ark. (2017), Spoorthi ve ark. (2017), Berner ve Chojnack (2017), Kulbacki ve ark. (2018), Mogili ve Deepak (2018), Baraniuk (2018), Wu ve ark. (2019), Zalavadiya ve Vasoya (2020), Inoue (2020), Ochs (2021) tarafından

yürütülmüştür. Yürütülen bu çalışmalarda çiftçilerin her gün büyük alanlardaki üzüm bağlarının kontrolünün sağlamasının zor olduğunu ve bu yüzden dron teknolojisinin üreticilere çekici geldiğini ve özellikle yetiştirilen üzümlerin kalitesini belirlenmesi, üzümlerin hasat olgunluğunu belirlenmesi, ve birim alandan ne kadar üzüm alınabileceğine dair tahminlerin dron kullanılarak yapılabilmesi bakımından birçok fayda sağladığını bildirmişlerdir. Genel olarak, dronlar bağ sahiplerine bağda neler olup bittiğine dair daha net bir resim vermeye yardımcı olabilmektedir. Bağ sahipleri, drone teknolojisi ile bağ hastalığına veya zararlısına uygulanan ilacın nereye püskürtüldüğünü izleyebilmektedir. Ancak, küçük ve orta büyüklükteki birçok bağcının drone teknolojisine yatırım yapması için çok büyük satın alma maliyeti vardır. Bu olumsuz özellikleriyle birlikte günümüzde, küçük üretim alanlarında bitki hastalık ve zararlı mücadelesinde, katı, sıvı gübre uygulamalarında kullanılan dronların bataryaları ve motor güçleri sınırlı olsa da tarımın farklı alanlarında yer araçlarına alternatif olabilecek şekilde kullanımını sağlamak için çaba harcanmaktadır.

Hastalık ve zararlılara karşı mücadelede dronların kullanımının avantajları arasında operasyonun gerçekleştirileceği yere hızlı bir şekilde ulaşma imkanı ve kısa sürede performans göstermesinin yanı sıra toprağın sıkışması veya bitkilerin buruşması ile ilgili problemleri ortadan kaldırılması olarak gösterilebilir. Ayrıca, sırt veya traktörle çalışan ilaçlama makinalarının yerine kullanacağından ilaçlama yapan kişilerin zehirlenmesi riski düşüktür. Buna karşın hastalık ve zararlıya etkili püskürtme için yer ekipmanlarına göre nispeten yüksek bir maliyete sahip olması, motor gücünün sınırlı olması, depo kapasitelerinin düşük olması ve kısa uçuş mesafelerinden dolayı işin kalitesini etkileyebilmesi dezavantaj olarak gösterilebilmektedir. Ancak, mevcut olanları veya yeni tasarımlarla bu olumsuzluklar ortadan kaldırılabilir.

Son yıllarda ürüne zarar vermemesi, eğimli arazilerde rahat hareket edebilmesi ve hassas tarıma yönelik sahip olduğu veri depolama ve gönderme özelliklerinden dolayı insansız hava araçlarının pestisit uygulamalarında kullanımı gittikçe yaygınlaşmaktadır. Yer araçlarıyla ilaçlamanın zorlukları göz önüne alındığında Türkiye'de de hastalık ve zararlılara karşı bu teknolojinin kullanımının yaygınlaştırılması gereği ortaya çıkmıştır.

Bu gereksinim doğrultusunda yapılan bu çalışmada üzüm bağlarının ilaçlanmasını havadan yapabilecek bir dronun tasarımını ve imalatını gerçekleştirmek ve farklı yükseklik, hız, ilaçlama normlarında performansının belirlenmesi amaçlanmıştır.

3. MATERYAL VE METOT

Bu çalışmada açık kaynaktan genel taslağı temin edilen ve tarafımızdan tasarlanıp imal edilen drone 6 motorlu bir çoklu rotor (Hexacopter) tasarlanmışve imal edilmiştir. Teknik ölülere göre lazer kesimi yapılan dronun ana gövdesini oluşturulduktan sonra bu gövde üzerine uçuş ve ilaçlama için gerekli organların montajını yapılarak imalat süreci tamamlanmış olup uçuşa hazır hale getirilerek denemeler yapılmıştır. Yapım ve montaj aşamasında aşağıda verilen materyaller ve yöntemler kullanılmıştır.

3.1. Materyal

3.1.1. Huş Kontrplak Malzeme ve Lazer Kesimi

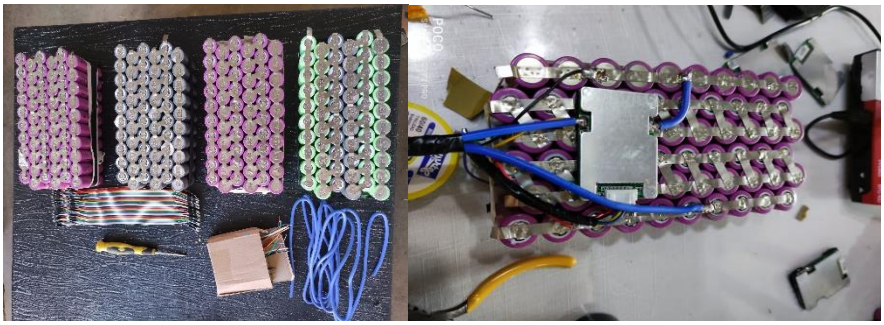
Dronun ana gövdesini imalatı için 60x40 cm ebatlarında ve 6 mm kalınlığa sahip huş ağacından yapılmış 12 adet kontrplak malzeme kullanılmıştır (Şekil 3.1). Gövde malzemesi olarak kullanılan huş malzemesinin ucuz ve dayanıklı olması nedeniyle bu drone için tercih edilmiştir. Gövdenin CNC lazer ile kesimini yapmak için AutoCAD uygulamasında çizilen drone gövdesi, DXF formatında çıktı alınmıştır. CNC lazer kesim makinasına yüklenen DXF formatıyla ölçeklendirme yapıldıktan sonra lazer kesimi yapılarak dronun ana gövdesinin imalatı gerçekleştirilmiştir (Şekil 3.2). Kesim işleminden sonra dronu oluşturan tüm organlar bu gövde üzerinde monte edilerek imalat süreci tamamlanmıştır (Şekil 3.1).



Şekil 3.1. Huş kontrplak malzeme ve CNC lazer ile kesimi

3.1.2. Batarya

Çalışmada dronun uçuş ihtiyacı olan 50V gerilim ve 20000 mAh kapasiteyi karşılamak için Şekil 3.6 ‘da görülen Samsung ICR18650-30A şarj edilebilir 120 adet pil kullanılmıştır. Piller 10 adet gruplar halinde birbirleriyle seri şekilde nikel şerit ile puntolayarak 6 adet 10’lu pil grubu elde edilmiştir. Bu şekilde iki pil grubu üretilerek sistemin düzenli çalışması için gerekli olan 50-52 volt arası bir gerilim elde edilmiştir. Gerilim volt metre ile ölçülmüştür.



Şekil 3.12. Samsung ICR18650-30A tipi şarjlı pil.

3.1.3. Uçuş Kontrol Kartı (Pixhawk)

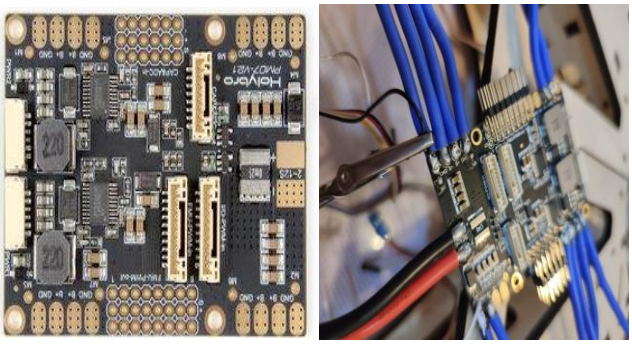
Bu çalışmada dronun uçuş kontrol kartı olarak; Holybro üretimi, uçuş kontrol kartlarının son güncellemesi olan Pixhawk 4 model uçuş kartı kullanılmıştır (Şekil 3.13).



Şekil 3.13. Uçuş Kontrol Kartı (Pixhawk 4)

3.1.4. Güç Dağıtım Kartı

Şekil 3.14'de güç dağıtım kartı ve kartın motora bağlantıları verilmiştir. Bu kartın çalışma aralığı 7 V ile 55 V arası olup, çekebileceği maksimum akım 120 Amperdir. Motor bağlantı kabloları ve sinyal kablolarının güç dağıtım kartına M1,M2,M3,M4,M5,M6 olacak şekilde sırasıyla karta lehimlemiştir.



Şekil 3.14. Güç dağıtım kartı ve motora bağlantısı

3.1.5. GPS Konumlama Sistemi

Bu çalışmada Şekil… 'de görülen Neo-M8N tipi GPS sensörü kullanılmıştır.



Şekil 3.15. GPS konumlama modülü

3.1.6. Motor Sürücü Modülü (ESC)

Drone üzerindeki motorları kontrol eden motor sürücü modülleri Şekil…de verilmiştir. Dronda kullanılan ESC doğru akım enerji sistemini alternatif akıma çevirerek, motorların hızını kontrol etmektedir.



Şekil 3.16. Motor sürücü modülü (ESC)

3.1.7 Radyo kumanda alıcı ve verici modülü

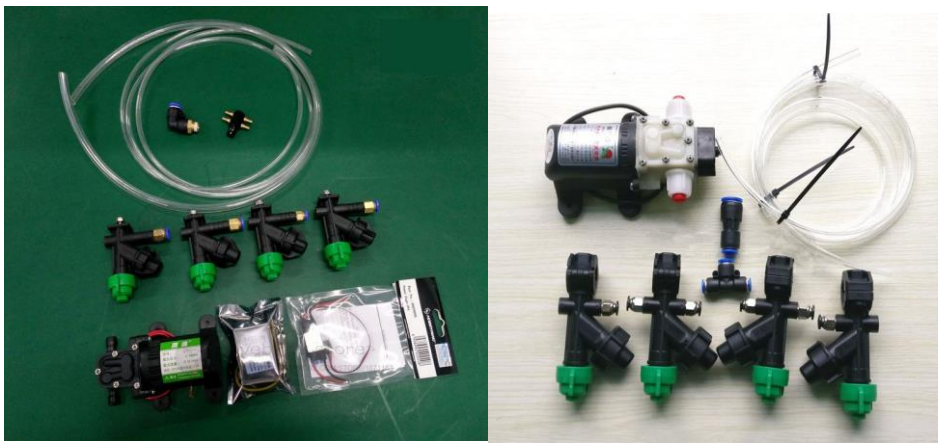
Bu çalışmada dronu uzaktan kontrol etmeyi sağlayan SKYDROID T12 model, 12 kanallı radyo alıcı kullanılmıştır (Şekil 3.17). Skydroid radyo alıcısı veri alışverişi bağlantısı ve yer istasyonuna bilgi aktarması için uçuş kontrol kartına bağlanmıştır (Şekil..). Bu modül ayrıca dronu kontrol kabiliyeti dışında, uçuş kontrol kartında kaydolan anlık uçuş verilerini de bluetooth üzerinden kullanıcı ara yüzüne aktarmaya yaramaktadır. Böylelikle kullanıcının herhangi bir android tabanlı cep telefonu veya tablet yardımı ile kumandaya Bluetooth protokolü ile bağlanılıp, anlık uçuş verilerini takip etmesine yardımcı olmaktadır.



Şekil 3.17. Radyo kumanda alıcı ve verici modülü ile Skydroid T12 model, 12 kanallı radyo alıcı

3.1.8. İlaçlama Pompası ve Püskürtme Memeleri

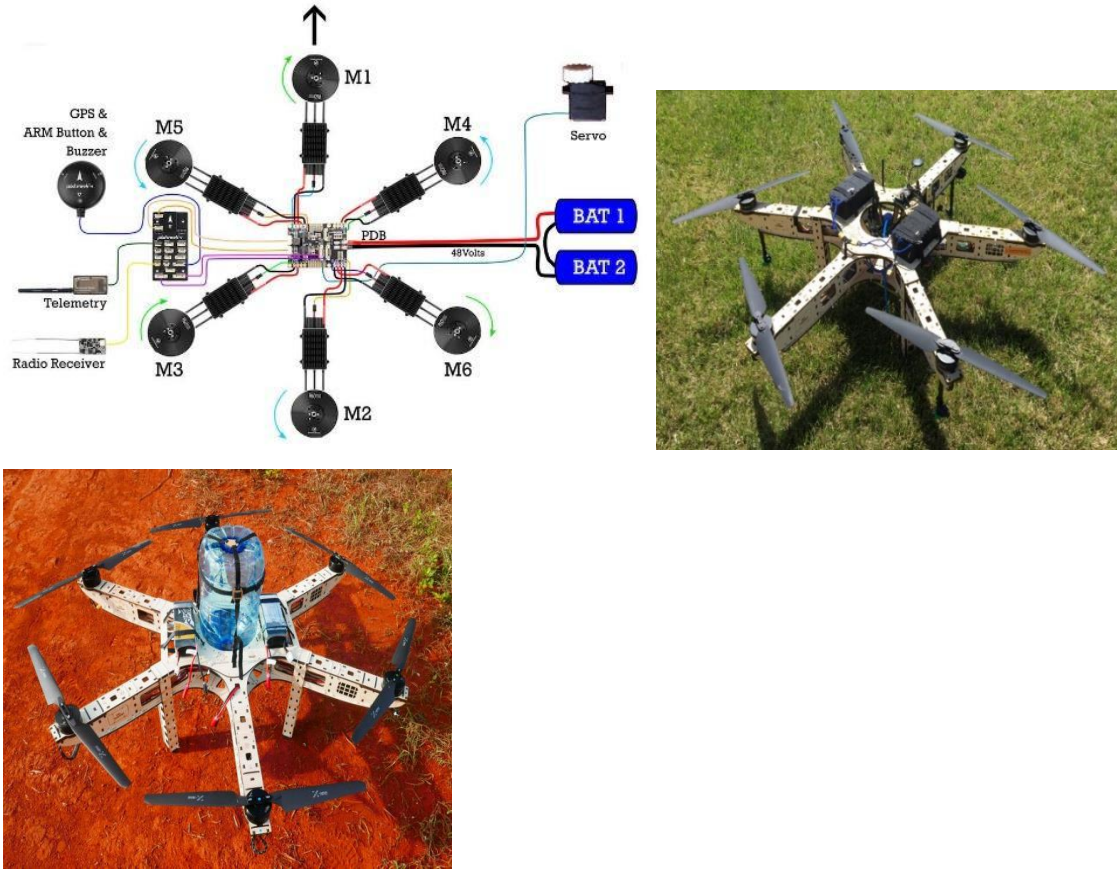
Dronun ilaçlama ve püskürtme görevi için akış şiddeti ayarlanabilen 12V - 48V gerilim değerleri arasında çalışabilen bir pompa ve püskürtme işlemi için 4 adet püskürtme memesi kullanılmıştır (Şekil 3.14.).



Şekil 3.20. İlaçlama pompası ve püskürtme memeleri

3.1.9. Elektronik Sistemin Dizilimi

Dronun temel elektronik bileşenlerinin bağlantı şeması Şekil 3.15'te montajı tamamlanmış gövdenin resmi Şekil 3.16'de ve montajı ve elektronik bağlantıları yapılmış dronun uçuşa hazır hali ise Şekil 3.17'de verilmiştir. 6S olarak imal edilen her iki pil birbirlerine seri bağlanarak 12S pil grubu elde edilmiştir. Bataryalardan elde edilen güç, dağıtım kartının besleme uçlarına bağlantısı sağlanmıştır. Sırasıyla her bir motor, motor sürücülerine şekilde görüldüğü gibi istenilen dönüş yönlerine doğru gerilimi vererek hareket sağlanmıştır. Motor sürücüleri kendileri için programlanan güç dağıtım kartı üzerindeki yerlerine lehimlemiştir. Uçuş kartını beslemesi ve çalıştırması için güç dağıtım kartı üzerinde yer alan POWER bağlantı ucundan PIXHAWK uçuş kartı üzerinde yer alan POWER1 girişine bağlantısı sağlanarak sistem çalışılır hale getirilmiştir. Uçuş kontrol kartına sırasıyla, GPS, Radyo verici bağlantıları sağlanarak dronun uçuşu için gereken elektronik bileşenlerin bağlantısı tamamlanmıştır.



Şekil 3.21. Drone üzerinde yer alan elektronik bileşenlerin bağlantı diyagramı ile Montajı ve elektronik bağlantıları yapılmış uçuşa hazır dronun genel görünümü

3.2. Metot

Bu drone 20 km menzile sahip olacak olacak şekilde tasarlanıp imal edilmiştir. Teknik ölçülere göre lazer kesimi yapılan dronun anan gövdesi oluşturulduktan sonra dronun ana organları bu gövde üzerinde montajını yapılarak imalat süreci tamamlanmış olup uçuşa hazır hale gelmiştir. 10 Litre ilaçlama sıvısı taşıma kapasitesine sahip olan bu dron ister kullanıcı yardımı ile ister otonom şekilde GPS Koordinatları verilerek, belirtilen tarla, bağ veya farklı alanlarda püskürtme, ilaçlama görevini tamamlayarak kalktığı yere otomatik olarak inme kabiliyetine sahiptir. Araç takibi drone üzerine monte edilen kameradan 640x480 çözünürlükte dijital olarak radyo dalgaları üzerinden kumandaya iletilmektedir. Kumandaya TYPE-C veya Micro USB kablo yardımı ile cep telefonu, tablet, bilgisayar üzerinden canlı olarak görüntü aktarımı sağlanmaktadır. Aracın anlık uçuş verileri; irtifa, hız, yükseklik, batarya bilgisi, kalkış mevkiine olan uzaklığı, gibi genel parametrelerin hesaplanması için tarafımızca bu işe özel olarak kodlanan, açık kaynak kodlu Arducopter yazılımından faydalanılmıştır. Bu yazılım ile belirtilen tüm veriler 20 km menzil kapasitesine sahip olup aynı şekilde bilgisayar, Android tabanlı cep telefonu, tablet gibi cihazları yer istasyonu olarak kullanımına olanak sağlamaktadır.

Bu özellik hayatında hiç insansız hava aracı kullanmayan kişiler için bile temel bir eğitimden sonra otonom bir şekilde bu aracı uçurmayı ve verilen görevleri yerine getirmeye fayda sağlamaktadır. Bu araç uçuş görevini; 6 adet 180KV 6205 tipi motor ve bu motorlara bağlı olan 23 inç karbon malzemesinden üretilmiş pervaneler (kanat) yardımı ile sağlamaktadır (Şekil 3.18). Bu motorlardan 3 adet saat yönüne doğru itme gücü geriye kalan 3 adet ise saat yönünün tersi yönüne hareket ederek araca itme gücü sağlamaktadır. Dronun güç sistemi 120 adet 18650 Lithium-İon tipi yüksek deşarj kapasitesine sahip pillerden oluşmaktadır. Bu piller iki hücre olarak, 10 paralel ve bu paralel üniteleri 6'lı gruplar halinde birbirine seri bağlayarak 6S10P olarak 2 adet batarya grubu elde edilmiştir. Motor fabrika verileri gereğince 12S=44.4 V istenildiği için üretmiş olduğumuz iki adet 6S10P pil grupları birbirlerine seri bağlanılarak ortaya 12S10P kapasiteye sahip pil grubu elde edilmiştir. Toplam voltaj değeri 50.2 volt olup kapasite değeri ise 20000 mAh'dir.

Uçuş denemeleri hem Şekil 19'da görülen bağ Dicle Üniversitesi Ziraat Fakültesi Bahçe Bitkileri Bölümüne ait bağ alanlarında gerçekleştirilmiştir (Şekil 3.19). Denemelerde iz maddesi ve kalıntı miktarını ölçmek için suya duyarlı kağıtlar ve filtre kağıtlar kullanılmıştır. Denemelere başlanmadan önce bu kağıtlar asmanın üst, orta ve alt kısmına yerleştirerek püskürtülme işlemi gerçekleştirilmiştir (Şekil 3.25).



Şekil 3.25. Deneme alanı ve yerleştirilen kağıtların görünümü

Püskürtme denemeleri 0.5 m/s, 1.00 m/s ve 2 m/s uçuş hızında ve üç farklı yükseklikte (30 cm, 60 cm ve 90 cm) ve üç tekerrürlü yapılmıştır (Şekil 3.26).



Şekil 3.26. Çalışma esnasındaki görüntüler

Her deneme sonunda bitki üzerinde farklı noktalara yerleştirilen kâğıtlar toplanıp plastik kaplara (Şekil 3.27) konularak ağızları kapatılmıştır. Daha sonra bu kaplar laboratuvara getirilmiş ve filtre kağıtlarının bulunduğu kaplara 50 ml saf su ilave edilerek kapların çalkalayıcıda (Şekil 3.27) çalkalanması sağlanmıştır. Elde edilen örneklerin iz maddesi birikim miktarları Şekil 3.27'de görülen spektrofotometre cihazı kullanılarak ölçülmüştür. Suya duyarlı kağıtlar ise tarayıcıdan taratılarak fotoğraf olarak dijital ortama alınması sağlanmıştır. Daha sonra MATLAB programında oluşturulan görüntü işleme yazılımı yardımıyla bu fotoğraflar analiz edilmiş, damlaların filtrekağıtlarında kapladığı alan ölçülerek elde edilen değer % orana dönüştürülerek kaplama oranı değerleri bulunmuştur.

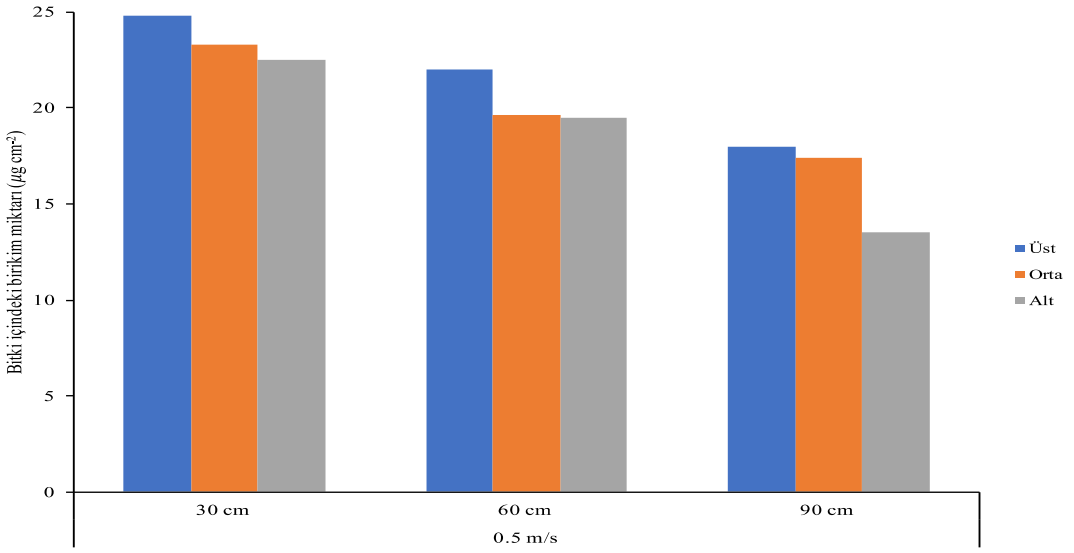


Şekil 3.27. Plastik kaplar, spektrofotometre ve çalkalayıcı

4. BULGULAR VE TARTIŞMA

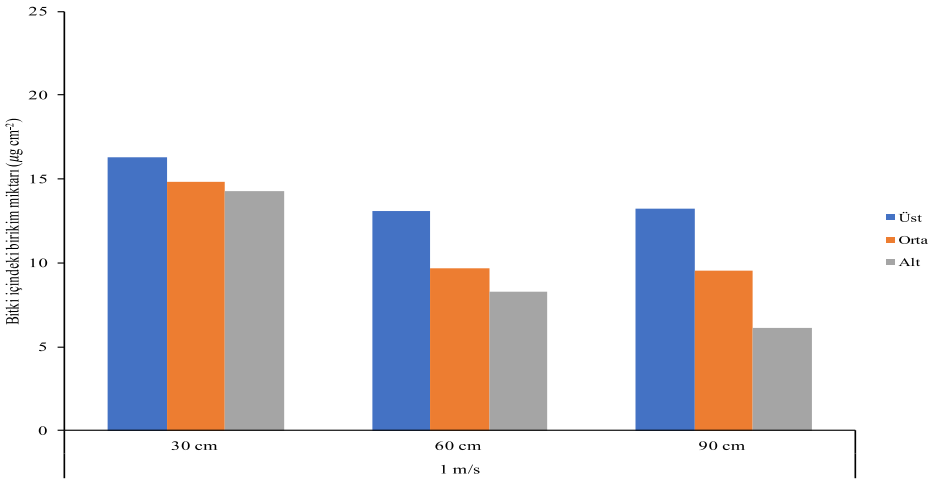
0.5 m/s ilerleme hızında, 30 cm, 60 cm ve 90 cm yüksekliklerden yapılan püskürtme denemelerinde, bitki içindeki örnekleme noktalarından elde edilen iz maddesi birikim miktarları Şekil 4.1'de verilmiştir. Söz konusu hızda genel olarak bitkinin üst bölgelerinde daha fazla birikim miktarı bulunmuş olup, alt bölgelere inildikçe birikim miktarları da azalış göstermiştir. Özellikle 30 cm yükseklikten yapılan denemelerde iz maddesi birikim miktarları diğer yüksekliklere göre daha yüksek bulunmuştur. 0.5 m/s uçuş hızında bitki içindeki birikim miktarı 24-25 μgcm^{-2} iken bu değer 60 cm yükseklikte 20-21 μgcm^{-2} ve 90 cm uçuş yüksekliğinde 20 μgcm^{-2} 'e düşmüştür. Dolaysıyla 0.5 m/s ilerleme hızında elde edilen en düşük

birikim miktarı ise 90 cm yükseklikten yapılan denemelerde gerçekleşmiştir. Tüm uçuş yüksekliklerinde en fazla kalıntı miktarı üste kısımda oluşurken alt bölgeye doğru bu oran azalmıştır. Bunun nedeni, püskürtme memesi ile hedef yüzey arasındaki mesafenin daha fazla olması şeklinde açıklanabilir.



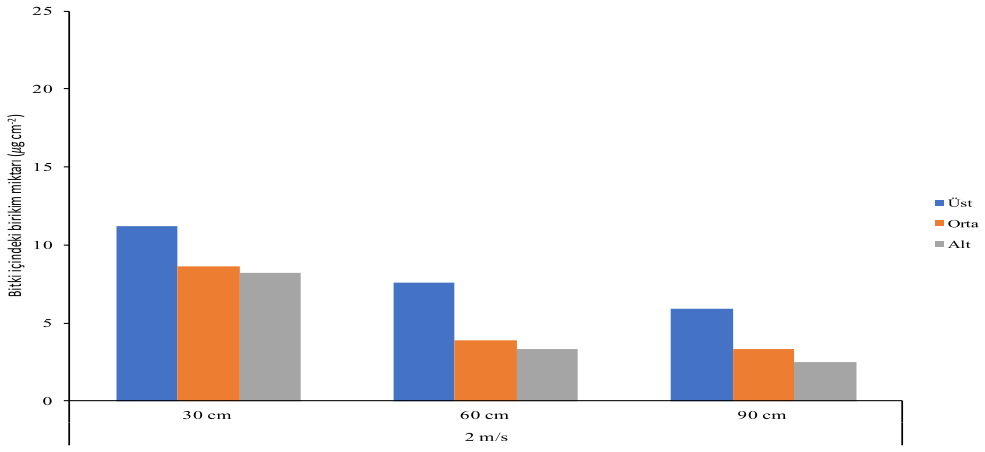
Şekil 4.1. 0.5 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen iz maddesi birikim miktarları

Şekil 4.2'de, 1 m/s ilerleme hızında ve farklı yüksekliklerde bitki içindeki örnekleme noktalarındaki iz maddesi birikim miktarları verilmiştir. Belirtilen ilerleme hızında genel olarak elde edilen iz maddesi birikim miktarı değerleri, 0.5 m/s ilerleme hızındaki değerlere göre daha düşük gerçekleşmiştir. Ayrıca 60 cm ve 90 cm yükseklikten yapılan püskürtme denemelerinde bitkinin üst bölgelerinde bulunan iz maddesi birikim miktarı diğer bölgelere göre daha fazlayken, 30 cm yükseklikten yapılan denemelerde bitki üst bölgesinde elde edilen birikim miktarı değeri diğer örnekleme bölgelerindeki iz maddesi birikim miktarı değerlerine daha yakın bulunmuştur.



Şekil 4.2 1 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen iz maddesi birikim miktarları

2 m/s ilerleme hızı, farklı yükseklik ve bitki içi örnekleme noktalarında elde edilen iz maddesi birikim miktarı değerleri Şekil 4.3'te verilmiştir. Genel olarak söz konusu ilerleme hızında bulunan birikim miktarı değerleri diğer iki hızda gerçekleşen değerlere göre daha düşük olmuştur. Tüm yüksekliklerde yapılan uygulamalarda bitki üst bölgelerindeki birikim miktarı daha fazla bulunmuştur. Ayrıca 60 ve 90 cm yüksekliklerde orta ve alt bölgelere ait birikim miktarı üst bölgedeki birikim miktarından çok daha düşük gerçekleşmiştir. Bunun nedeni ilerleme hızının yüksek ve hedef yüzeylerin daha uzak oluşuna bağlı olarak püskürtülen damlaların söz konusu yüzeylere ulaşmaması olarak açıklanabilir.



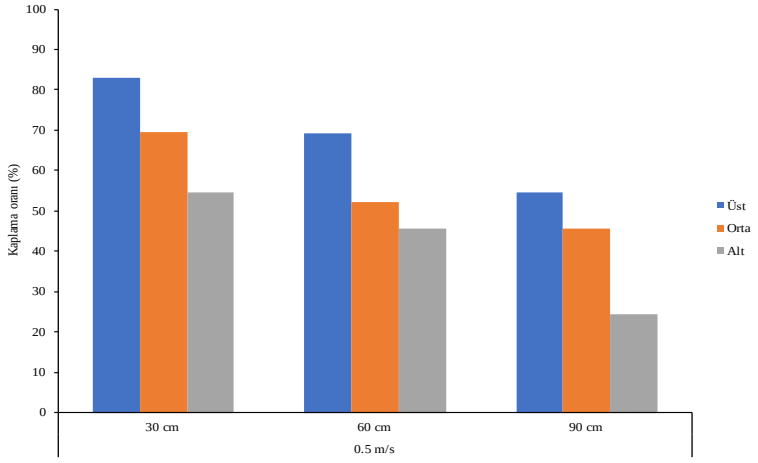
Şekil 4.3. 2 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen iz maddesi birikim miktarları

Genel olarak bütün ilerleme hızlarında en iyi iz maddesi birikim miktarı sonuçları 30 cm yüksekliklerde elde edilmiştir. Ayrıca bu yükseklikte yapılan püskürtme denemeleri diğer yüksekliklerde yapılan denemelerle karşılaştırıldığında bitki içi farklı örnekleme noktalarındaki

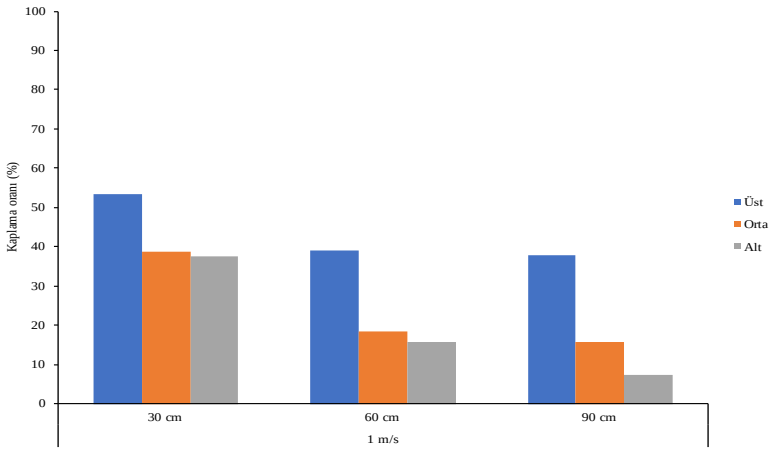
iz maddesi birikim miktarları birbirine daha yakın bulunmuştur. Bu da söz konusu yükseklikte yapılan püskürtme denemelerinin uygulama etkinliği açısından da olumlu etkileri olduğunu ortaya koymaktadır. Ek olarak püskürtme yüksekliğinin artmasının, damlacıkların bitki içine penetrasyonunu da olumsuz anlamda etkilediği sonucuna varılmıştır. Bunun nedeni olarak hem hedef yüzeyden uzaklaşılması hem de püskürtme yüksekliği arttıkça pervanelerin yarattığı hava akımının bitkiye yeteri kadar ulaşmadığından dolayı bitkinin iç bölgelerindeki birikim miktarlarının üst bölgelere göre daha düşük miktarlarda gerçekleştiği düşünülmektedir.

İlerleme hızları açısından incelenecek olursa, düşük hızlarda daha iyi birikim miktarı sonuçları alındığı, hız arttıkça bitki içi birikim miktarının azaldığı görülmektedir. Her ne kadar ilerleme hızı arttıkça pervanelerin yarattığı hava akımı artsa da, püskürtülen damlacıkların buna rağmen yüksek hızdan dolayı özellikle bitki iç bölgelerine yeteri kadar girişim yapmadığı tespit edilmiştir. Wang ark. (2016), İnsansız Hava Aracı olan bir dron kullanarak uçuş yüksekliğinin ve rüzgar hızının damlacık ve akış dağılımı üzerindeki etkisini incelemişlerdir. Farklı testler uygulayarak pestisit kalıtım miktarını ölçmüşlerdir. Yükseklik ve rüzgar hızı artıkça ilaç dağılım düzgünlüğünün bozulduğu ve sürüklenmenin artığını bildirmişlerdir.

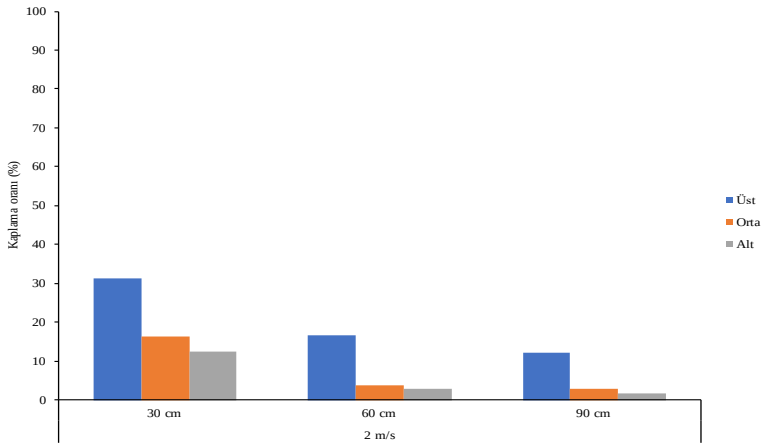
Püskürtme denemeleri yapılan farklı hız, yükseklik ve bitki içi bölgelerdeki kaplama oranı değerleri Şekil 4.4, 4.5 ve 4.6'da verilmiştir. Şekillerden de görüleceği gibi en yüksek kaplama oranı değerleri 0.5 m/s ilerleme hızında, en düşük kaplama oranı değerleri ise 2 m/s ilerleme hızında elde edilmiştir. Püskürtme yüksekliği göz önüne alınacak olursa, tüm ilerleme hızları için en iyi kaplama oranı değerleri sırasıyla 30 cm, 60 cm ve 90cm yükseklikte gerçekleşmiştir.



Şekil 4.4. 0.5 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen kaplama oranı değerleri



Şekil 4.5. 1 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen kaplama oranı değerleri



Şekil 4.6. 2 m/s hızda ve farklı yüksekliklerde (30 cm, 60 cm, 90 cm) asma bitkisi içindeki üst, orta ve alt bölgelerde ölçülen kaplama oranı değerleri

TEŞEKKÜR

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5. SONUÇ VE ÖNERİLER

0.5, 1.00 ve 2.00 m/s ilerleme hızında, 30 cm, 60 cm ve 90 cm yüksekliklerden yapılan püskürtme denemelerinde, bitki içindeki örnekleme noktalarından elde edilen iz maddesi birikim miktarlarına göre genel olarak bitkinin üst bölgelerinde daha fazla birikim miktarı

bulunmuş olup, alt bölgelere inildikçe birikim miktarları da azalış göstermiştir. Özellikle 30 cm yükseklikten yapılan denemelerde iz maddesi birikim miktarları diğer yüksekliklere göre daha yüksek bulunmuştur. 0.5 m/s ilerleme hızında elde edilen en düşük birikim miktarı ise 90 cm yükseklikten yapılan denemelerde gerçekleşmiştir.

1 m/s ilerleme hızında genel olarak elde edilen iz maddesi birikim miktarı değerleri, 0.5 m/s ilerleme hızındaki değerlere göre daha düşük gerçekleşmiştir. Ayrıca 60 cm ve 90 cm yükseklikten yapılan püskürtme denemelerinde bitkinin üst bölgelerinde bulunan iz maddesi birikim miktarı diğer bölgelere göre daha fazlayken, 30 cm yükseklikten yapılan denemelerde bitki üst bölgesinde elde edilen birikim miktarı değeri diğer örnekleme bölgelerindeki iz maddesi birikim miktarı değerlerine daha yakın bulunmuştur.

2 m/s ilerleme hızı, farklı yükseklik ve bitki içi örnekleme noktalarında elde edilen iz maddesi birikim miktarı değerleri genel olarak söz konusu ilerleme hızında bulunan birikim miktarı değerleri diğer iki hızda gerçekleşen değerlere göre daha düşük olmuştur. Tüm yüksekliklerde yapılan uygulamalarda bitki üst bölgelerindeki birikim miktarı daha fazla bulunmuştur. Ayrıca 60 ve 90 cm yüksekliklerde orta ve alt bölgelere ait birikim miktarı üst bölgedeki birikim miktarından çok daha düşük gerçekleşmiştir

Genel olarak bütün ilerleme hızlarında en iyi iz maddesi birikim miktarı sonuçları 30 cm yüksekliklerde elde edilmiştir. Ayrıca bu yükseklikte yapılan püskürtme denemeleri diğer yüksekliklerde yapılan denemelerle karşılaştırıldığında bitki içi farklı örnekleme noktalarındaki iz maddesi birikim miktarları birbirine daha yakın bulunmuştur. Bu da söz konusu yükseklikte yapılan püskürtme denemelerinin uygulama etkinliği açısından da olumlu etkileri olduğunu ortaya koymaktadır. Ek olarak püskürtme yüksekliğinin artmasının, damlacıkların bitki içine penetrasyonunu da olumsuz anlamda etkilediği sonucuna varılmıştır. Bunun nedeni olarak hem hedef yüzeyden uzaklaşılması hem de püskürtme yüksekliği arttıkça pervanelerin yarattığı hava akımının bitkiye yeteri kadar ulaşmadığından dolayı bitkinin iç bölgelerindeki birikim miktarlarının üst bölgelere göre daha düşük miktarlarda gerçekleştiği düşünülmektedir.

İlerleme hızları açısından incelenecek olursa, düşük hızlarda daha iyi birikim miktarı sonuçları alındığı, hız arttıkça bitki içi birikim miktarının azaldığı görülmektedir. Her ne kadar ilerleme hızı arttıkça pervanelerin yarattığı hava akımı artsa da, püskürtülen damlacıkların buna rağmen yüksek hızdan dolayı özellikle bitki iç bölgelerine yeteri kadar girişim yapmadığı tespit edilmiştir.

Püskürtme yüksekliği göz önüne alınacak olursa, tüm ilerleme hızları için en iyi kaplama oranı değerleri 30 cm yükseklikte gerçekleşmiştir.

Sonuç olarak; açık yazılım programı kullanılarak tasarımı ve imalatı tarafımızdan gerçekleştirilen bu insansız hava aracı olan drone'nin ithal edilenlerden daha ekonomik olduğu görülmüştür. Bu dron daha da geliştirilerek yerli olarak üretim yapılabileceği ve tarımsal mekanizasyon sektörünün gelişmesine katkı yapabileceği görülmüştür. Ayrıca, bu araçla uygulamalar esnasında kontrol operatörde olduğundan insan İş gücünü azaltacak, uygulama yanlışlıkları azalacak, bitkiye uygulanan ilacın uygulama dozajı zamanında ve ihtiyacı kadar uygulanacaktır. Bu araç ile yapılan ilaçlamada çevreye olan olumsuz etki ve maliyet azalacağı gibi, ayrıca buna bağlı olarak kalıntılar azaltacaktır. Bağlarda etkin bir ilaçlama uygulanacağından üzüm ve üzümden elde edilen ürünlerin kalitesi artmış olacaktır. İnsan ile uygulanan ilacın teması neredeyse olmadığından uygulanan ilacın insan sağlığına olan olumsuz etkileri ortadan kalkacaktır. Buda hem ürünün katma değerini artıracaktır hemde insan sağlığını etkileyen olumsuzlukları ortadan kaldıracaktır. Dolayısıyla bölgede bağ alanlarında zor ve yorucu olan, insanların ve geleneksel makinaların rahatlıkla giremediği alanlara hassas tarımın yaygınlaşması konusunda ciddi katkılar sağlayacağı görülmüştür.

Sonuç olarak; açık yazılım programı kullanılarak tasarımı ve imalatı tarafımızdan gerçekleştirilen bu insansız hava aracı olan drone'nin ithal edilenlerden daha ekonomik olduğu ve bu dron daha da geliştirilerek yerli olarak üretimin yapılabileceği ve tarımsal mekanizasyon sektörünün gelişmesine katkı yapabileceği görülmüştür. Dolaysıyla, başta bağ alanları olmak üzere geleneksel makinaların rahatlıkla giremediği tarımsal alanların ilaçlanmasında dronların rahatlıkla kullanılabileceği sonucuna varılmıştır. Buda hassas tarımın ülkemizde yaygınlaşması konusunda ciddi katkılar sağlayacağı görülmüştür.

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URBAN TRANSFORMATION IN 19TH AND 20TH CENTURY IN OPORTO SOCIAL CHALLENGES AND THE WORKING-CLASS STRUGGLE

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ABSTRACT

During the 19th century, the city of Porto, in Portugal, witnessed a significant transformation in its urban landscape and housing conditions, especially for the working class. Before the emergence of the so-called "islands," the historic center was filled with overcrowded and unsanitary dwellings known as "Casas de Malta" and the "Colmeias Humanas." These precarious housing structures were often built under unfavorable conditions, with cramped spaces and a lack of basic sanitation, contributing to the spread of contagious diseases and the deterioration of residents' health. The lack of government intervention and real estate speculation further exacerbated these unfavorable conditions. The "islands" emerged as an alternative for the working class, offering minimal housing conditions, albeit still precarious. These clusters of houses were often constructed using low-quality materials and lacked adequate infrastructure, such as sewage systems and clean water supply. However, for many workers, the "islands" represented an opportunity to have a roof over their heads, albeit in difficult conditions. Industrial and population growth drove a shift in the social structure of Porto, with the working class concentrating in the "islands" and older areas, while the bourgeoisie moved to the outskirts. This change was accompanied by the spread of contagious diseases and the double exploitation faced by island inhabitants, with low wages and high rents. The stigma attached to the working class also hindered improvements in living conditions, with many considering island residents as second-class citizens. During the Estado Novo period in Portugal, the Casas Económicas emerged as one of the main initiatives to address housing issues for the lower classes. These houses were designed to offer affordable housing for low-income families, aiming to provide them with basic housing conditions. The Casas Económicas were categorized according to the incomes of prospective residents, divided into categories from A to D, with different cost limits. However, the strict selection of beneficiaries reflected a repressive approach by the state to control the population and maintain a social hierarchy in housing complexes. Although the Casas Económicas represented an initial attempt to address housing problems during the Estado Novo, they also revealed inequalities and inadequacies within the system. Often, these houses lacked adequate infrastructure and urban planning, leading to the segregation of lower classes and a lack of integration into the city. Additionally, rents for Casas Económicas could vary significantly between different categories, resulting in socio-economic disparities within the housing complexes themselves. After the Revolution on April 25, 1974, which marked the end of the dictatorial regime of the Estado Novo, the democratic government faced the challenge of addressing a severe housing shortage in Portugal. In this context, the Serviço de Apoio Ambulatório Local (SAAL) was created as part of the Housing Development Fund. The SAAL aimed to support initiatives for poorly housed populations, promoting self-management and neighborhood transformation with active involvement from communities and local authorities. Unlike the previous regime, the SAAL adopted a decentralized approach, valuing community participation and autonomy in project management. In Porto, various projects were proposed to address housing shortages, including

the redevelopment of housing "islands" by the SAAL. Despite criticisms and challenges faced, the SAAL was responsible for initiating the construction of thousands of housing units across the country, representing a significant step forward in the pursuit of decent housing for all Portuguese citizens.
Keywords: Stigma, Social Housing, Identity, Precariousness.

INTRODUCTION

Housing is an indispensable refuge, as important as food or clothing (Gros, 1982). When reduced to its essentials, housing is nothing more than a collection of spaces for sleeping, relaxing, cooking, and eating, along with all their respective annexes. However, beyond that, housing ensures the production of social relations, serving as an element of prosperity and individualization. The "habitat and family (as 'space' and 'subject of space')" are understood, considering the family institution as a dual articulating hinge of individual life that unfolds within the family and collective life that connects families (Portas, 2004).

Most islands built in the 19th century and social housing neighborhoods built in the 20th century are associated with a negative social image: "a fundamental mediation between individual actions and behaviors and the diverse expressions that sociocultural structures assume there, inducing and being the stage for interactions and appropriations that outline characteristic profiles."(Gonçalves & Pinto, 2001). In this sense, islands and social housing neighborhoods "enhance processes of disaffiliation and social exclusion, being simultaneously the result of stigmatization and social exclusion due to the image they convey."(Santos, 2015). A person's social position is often associated with the spaces they inhabit. Just as society praises quality housing and consequently its inhabitants, it also criticizes those who do not possess such conditions, often stigmatizing them for not meeting imposed social standards. Thus, it is possible to observe that architecture can alter an individual's social condition, as its dilapidated or preserved state establishes a dichotomy with the social position of its inhabitants and how they are perceived and accepted in society. In this sense, this dissertation will question the rehabilitation processes used in the project, and how its users, both direct and indirect, relate to the spaces and methodologies.

The introduction of new ideals into the concept of social housing includes not only demystifying the physical space as a precarious place but also diluting the concept of social housing, which is implanted in a place distant from its original context, accommodating inhabitants in situations of financial need. Therefore, architectural rehabilitation may not only reformulate the physical conditions of the space but also rethink the concepts and ideologies that led to its conception in the first place. Similarly, the reformulation of these concepts, which establish a dichotomy with the origin of the stigma, will alter the social perception of this space and its inhabitants.

Following this line of thought, it is possible to assert that architecture is a means to dissipate social stigmas, which mostly affect individuals in financially debilitated conditions, considering that improving an individual's housing conditions changes their social perception of them. It is

understood that rehabilitation is a means of improving the housing conditions of a space and, therefore, architecture serves as a social equalizer.

It is understood, therefore, that a comprehensive intervention in the face of precarious housing conditions is possible through various singular cases, where success largely depends on the "competence of each sectoral intervention" and the "synergies generated by the integration of perspectives, resources, and experiences that will allow qualitatively superior levels of response."(Guerra, 2001). From this concept, the need for "proximity to resident citizens through the consolidation of a new contract or social pact sustained by the principles of commitment to participation and collective action where the subject is recognized for their ability to act on the situations of their life and the problems that affect them"(Guerra, 2001) is understood.

RESEARCH AND FINDINGS

In the 19th century, housing in Porto served as a marker of the distinct realities within the city. On the one hand, the bourgeoisie and nobility displayed their wealth through grand facades along the streets, showcasing their economic power. On the other hand, behind these facades or on the city outskirts, the housing of the working class was often precarious and lacked dignity. This division between the affluent and the working class in Porto can be traced back to the 14th century with the construction of the "Fernandina Wall" for protection and fortification of the "Portucale Locus"(Gros, 1982). Additionally, the presence of the "Swabian Wall"(Gros, 1982) in Penaventosa predates this division.

This duality between the upper and lower city has persisted over time, shaping the city's morphology and growth, which still influences its current state. The affluent areas were typically located near the Sé Cathedral, while the lower areas, close to the river, were hubs of commercial activity. The promotion of social housing in Porto, from the 19th century to the present day, has paralleled efforts to improve sanitation and dignify housing as a constitutional right for its inhabitants. Housing was seen not only as shelter but also as a means for social interaction and integration into society. However, despite Porto's industrialization in the 19th century, poverty persisted, particularly in the inner city areas.

The Industrial Revolution brought about significant changes in the morphology, organization, concept, and location of social housing in Porto. Before the emergence of the "Ilha" housing model, the historic center of Porto was filled with "Malta Houses" and traditional "human beehive" dwellings (Pereira, 2011). These dwellings, characterized by overcrowding and poor sanitation, led to the spread of infectious diseases, prompting the need for alternative housing

solutions. The "Ilhas" began to emerge within the city blocks left vacant by urbanization efforts, offering a horizontal housing option behind bourgeois houses. However, these were also characterized by poor hygienic and spatial conditions. Additionally, rural accommodations were found on the outskirts of Porto, serving as lodging for single workers during the week, while they returned to their homes in the countryside on weekends (Pinto, (DepA, 2022)2007). As Porto experienced demographic growth and industrial expansion, the demand for housing increased, leading to the construction of more Ilhas. These housing solutions, while affordable for the working class, lacked basic amenities and were often overcrowded. The spread of Ilhas throughout Porto's various parishes accompanied the city's industrialization but also contributed to unsanitary living conditions and the spread of diseases. Despite efforts to improve housing conditions, such as sanitary measures implemented in the late 19th century, significant challenges persisted. The stigma associated with the working class and their living conditions perpetuated social inequalities and hindered effective policy interventions.

Throughout the 19th century, Porto's bourgeois houses changed design and morphology, reflecting societal shifts. However, the working class continued to reside in Ilhas, facing exploitation through low wages and high rents, despite poor living conditions. Overall, Porto's housing landscape in the 19th century was marked by stark contrasts between the affluent and working-class areas, with efforts to improve social housing conditions facing persistent challenges of sanitation and social stigma. During the fascist regime in Portugal, housing policies were implemented to improve the living conditions of the lower classes. Initiatives such as the "Casas Económicas" were created, establishing categories of housing based on the income of the inhabitants and resulting in a social hierarchy of housing complexes (Gros, 1982). The rigorous selection of beneficiaries, considering criteria such as moral behavior, age, and family salaries, reflected a repressive approach by the State to control the population.

However, attempts to adapt to modern ideals, inspired by the Athens Charter, resulted in a lack of homogeneity in the urban structure, generating discontinuity in the city and a lack of social interaction among the inhabitants of the new complexes. These policies, although aimed at improving living conditions, resulted in the segregation of the lower classes, moving them away from the urban center and relocating them to peripheral areas (Gros, 1982). The construction of new neighborhoods and economic houses did not consider the continuity of social relations and neighborhoods present in the previous communities, leading to the breakdown of community life and difficulty in creating social bonds among residents.

The transition to democracy after the April 25th Revolution marked a crucial change in Portugal, especially regarding housing issues. The emergence of the Local Ambulatory Support Service (SAAL) represented a radical break with the housing ideals of the previous regime, prioritizing community participation in the transformation of their neighborhoods. Introducing innovative principles such as the decentralization of housing promotion and autonomy in project management, SAAL sought to guarantee the constitutional right to decent housing for all inhabitants, challenging the idea of centralized power (Fernandes, 2011).

However, SAAL faced significant challenges, including opposition among different parties involved and delays in implementation, resulting in delays and even stagnation of some projects. Despite criticisms and limitations, SAAL marked an essential transformation in the housing approach in Portugal, leaving a legacy in attempting to address the issues of decent housing for the population and influencing subsequent housing initiatives (Bandeirinha, 2011). For example, the Special Rehousing Program (PER) focused on relocating families in precarious conditions, playing a fundamental role in building housing and social integration. This evolution shows a paradigm shift, moving from repressive and segregationist housing policies to more participatory and inclusive approaches, aiming to guarantee the right to decent housing for all citizens. Despite facing challenges and criticisms, these initiatives represented important steps in building a more just and egalitarian society in Portugal.

Since the Revolution on April 25, 1974, Portugal emerged from four decades of fascist rule to embrace freedom, inaugurating a democratic era. However, the transition to democracy brought forth a series of challenges, especially regarding housing. The country faced a massive shortage of adequate housing, with about 25% of the population living in precarious conditions, including homes lacking security, comfort, or sanitation. Shortly after the inauguration of the First Provisional Government on May 15, 1974, the Priority Action Program for the Housing Development Fund was announced, which later gave rise to the Local Ambulatory Support Service (SAAL). SAAL was an initiative aimed at empowering poorly housed populations, allowing them to organize into associations or cooperatives and actively participate in the transformation of their neighborhoods. Instead of imposing a centralized housing plan, SAAL adopted a decentralized approach, with local authorities playing a key role in coordinating operations. This collaborative approach represented a significant break from the housing ideals of the previous fascist regime, emphasizing six fundamental principles such as the social organization of demand, preference for maintaining existing locations, and autonomy in project

management. The goal was to ensure the constitutional right to decent housing for all citizens, rejecting social segregation and promoting community participation.

In Porto, several initiatives were taken to address the housing crisis, with an emphasis on preserving urban identity and revitalizing traditional neighborhoods. The architects involved in SAAL recognized the importance of urban "islands" as an integral part of the city's structure and sought to redesign them according to local needs and specificities. However, despite visible efforts, the SAAL process was criticized for its slowness and opposition between different stakeholders, resulting in delays in project implementation. Nevertheless, even with these challenges, SAAL managed to initiate the construction of 2,259 housing units, significantly contributing to addressing the housing crisis. Over the years, various public and private initiatives have been launched to address the housing issue in Portugal. The Special Relocation Program (PER) stood out as an important policy for relocating families in precarious conditions, significantly increasing the country's housing stock. PER emphasized the integration of relocated families, allowing them to choose their new location and promoting continuity within their familiar urban environments. (Antunes, 2016).

After the end of the SAAL, housing issues persisted, highlighting the complexity of the topic. The idea of social housing as an autonomous specialty proved to be a misconception, as housing is inherently social, being a constant presence in cities. During the decades following the April 25th Revolution, social housing policies stagnated, becoming a distant memory of the 90s due to the economic crisis from 2008 to 2012, which resulted in drastic cuts in housing financing and other social sectors. This led many inhabitants to live in precarious conditions, with no prospects for improvement or ability to pay loans or rents, resulting even in the loss of the right to housing. Social neighborhoods, conceived with a megalomaniac approach and focused on maximizing housing capacity, ended up reinforcing segregation and ghettoization of communities, compromising social cohesion. Precarious housing and lack of housing conditions continue to significantly affect part of the population, reflecting not only physical problems but also deeper social and economic issues.

From the 1980s onwards, the concept of urban sustainability emerged, emphasizing the importance of social justice, sustainable economy, and environmental preservation for the proper functioning of cities. The increase in crime after the end of the dictatorial regime in Portugal highlighted the need for urban security policies and community interventions to promote social cohesion and mitigate problems of exclusion and marginalization. However, the policies implemented by the government since 1988, although aimed at combating

marginalization, crime, and housing degradation, have proved insufficient in the face of the growing needs of the population. The economic crisis from 2008 to 2012 further exacerbated the situation, leading to a significant drop in housing licensing and the emergence of new problems such as gentrification and touristicification, which inflated housing prices. To address these challenges, various programs and measures have been implemented, such as the 1st Right Program, the Entry Door Program, and the Affordable Rent Program, among others. However, despite these efforts, structural problems persist in access to housing in Portugal, with many families living in precarious conditions and facing difficulties in finding adequate housing (Antunes, 2016).

After the previous analysis, it can be concluded that housing plays a crucial role in stigmatizing its inhabitants. The aim is to analyze how architectural actions influence stigma positively or negatively. Given the devaluation of some spaces about others, recognition of the territory's value based on economic, social, and political aspects is observed (DepA, 2022). If segregation arises from the discontent of a population with its conditions, altering this condition could involve creating spaces that integrate and provide quality housing to its inhabitants, dignifying them and placing them on an equal footing with the rest of society. This requires combining various areas such as Politics, Economy, Architecture, and Sociology to reconfigure the stigmatized view society has toward lower social classes. Understanding the motivations behind society's different perceptions of these housing complexes and their inhabitants is essential.

There's a relationship between the architectural space of a stigmatized urban context and a specific social class. As seen earlier, the desertification of Porto's center caused by commercial influx occupying ground floors of buildings, making access to upper floors impossible, led much of the needy population to move to the outskirts. This desertification was also linked to the center's increasing popularity, leading to higher rents, making them unaffordable for lower classes. Consequently, a rupture occurred between spaces of "urban continuity and spaces of growth, dispersion, diffusion, or urban eccentricity, largely excluded from the debates of the 'city crisis'." (DepA, 2022). Thus, it's possible to characterize a hierarchy of places within the city based on housing costs. As a result of the 1956-66 Improvement Plan, the population was displaced to the city's periphery where housing costs were lower, in the process of excluding them from the city.

Despite often being demolished and their residents resettled, the islands never faced extinction due to their geographical location, much more advantageous than economically developed neighborhoods, but also due to their low cost (although too high for the inhumane housing

conditions), and the sense of community the island provided. The formation of these places emerged due to the economic expansion of the 19th century, indicating that their formation was not only due to social but also economic deprivation. So, it's possible to trace the path of Porto's lower classes from their entry into the city, resulting from the aspiration for better living conditions, leading to accommodation in unhealthy places due to economic incapacity. The stigmatization of this class arises because the island inhabitant is not well-seen by the rest of society. Finally, there's mobilization to the outskirts, resulting from better housing conditions but also from attempts to "clean up" the center and make the island residents disappear.

Even today, residents without purchasing power are automatically excluded from any housing-related decision and are assigned to live wherever designated. Therefore, there's still a hinge dividing something that will be stigmatized: urban space/housing expresses the symbolic relationship of the individual with society. These communities are isolated from the social and cultural context around them, in peripheral neighborhoods. The way constructions are arranged (closed spaces, physical distance from neighbors, specific architectural characteristics, etc.) can lead to a ghetto situation, which is amplified by the appearance of the constructions.

Currently, Porto's territory can be characterized in terms of its economic organization, social organization, and architectural organization. In the case of economic neighborhoods, housing for insolvent classes can be characterized as having a double facade, firstly as a refuge space, as a home, and secondly as a marginalized space, being distant from social life. Currently, there's a double problem regarding housing: while neighborhoods built during the Estado Novo are in poor condition and need rehabilitation, investment in building new housing that meets the new needs of contemporary families is scarce and much lower than necessary.

The tridirecional act of building, demolishing, and rehabilitating has profound ramifications beyond the mere physical rearrangement of the housing space. Each of these actions directly influences how inhabitants, society, and the architectural space are perceived and experienced.

1. Building: Symbol of Urban and Social Transformation

Building is not only about assembling physical elements to form a habitable whole but also about shaping the symbolic and emotional environment where people will live. A dignified habitation needs to offer not only healthiness and solidity in construction but also functionality and comfort. When these principles are ignored, the quality of life of the inhabitants may be compromised from the outset. Additionally, the location of the habitation plays a crucial role in forming social networks and interacting with society at large.

2. Demolition: A Mark on the Territory, the Inhabitant, and Society

The demolition of precarious housing is one way to deal with the problem, but it carries profound consequences. In addition to affecting displaced inhabitants, demolition can disintegrate communities, disrupt the professional and educational lives of residents, and overload infrastructure in relocation areas. This can lead to a change in the identity of affected communities and reinforce social stigmas, contributing to the marginalization of certain populations. While demolition may seem like a quick solution, it often does not address underlying problems and may even exacerbate them, further highlighting the stigma associated with precarious urban spaces.

3. Rehabilitation: Preservation of Context and Redefinition of Identities

The rehabilitation of housing offers a different approach, focusing on preserving historical and cultural contexts and regenerating community identities. This not only restores the self-esteem of residents and promotes social cohesion but can also have a positive impact on the community at large by valuing local heritage and promoting social integration. Rehabilitation is not limited to the physical improvement of housing but also involves a change in social paradigms and how society perceives and interacts with these spaces. By involving residents and the community in the transformation process, rehabilitation creates a sense of belonging and shared responsibility, making housing spaces not just residences but also places of connection and community.

CONCLUSION

A city's housing policy should centrally focus on the inclusion of diverse social groups, such as the elderly, children, women, youth, and people living in poverty, essential for ensuring the right to housing and combating the destitution affecting many, leading them to be homeless or in precarious conditions. Additionally, it's important to avoid stigmatizing certain peripheral areas of the city and its metropolitan region, seeking the redevelopment of neighborhoods, islands, old houses, and densely populated areas.

The feelings of reclaiming and preserving the rehabilitated space of the island are partly a response to the need to safeguard the improvements achieved. Therefore, architectural rehabilitation is just one component of a broader effort to improve the quality of life and social inclusion of these communities. It's crucial to address economic, educational, and health issues to achieve true social transformation and ensure that rehabilitation is effective and sustainable. To achieve these goals, it's essential to implement municipal and metropolitan policies based on diversified principles, with an inclusive, innovative, participatory, and sustainable program. A housing and social inclusion policy program must be implemented to improve the quality of life for the poorest populations of the city facing housing precariousness. When addressing this

issue, the importance of requalifying and valuing public spaces and collective service infrastructures cannot be overlooked, as they are essential for ensuring the quality of life and social cohesion in the city. By transforming precarious spaces into more dignified, functional, and comfortable environments, rehabilitation not only improves residents' living conditions but also helps eliminate the stigma associated with poverty. Instead of being marginalized and discriminated against due to the conditions of their homes, residents can feel included in society. Rehabilitation thus becomes a powerful tool for promoting social inclusion, allowing residents to integrate into the community, access education and employment opportunities, and build healthier social relationships more fully.

In this improvement, it's important to highlight the crucial role of the social representation of residents in the redevelopment process. Often, in precarious spaces, housing becomes the central element of the identity of the people residing there, defining their lives profoundly. Therefore, residents must be recognized as active protagonists in these transformation processes; they should not be seen as mere extras, passive objects, or distant spectators of decisions that affect their lives. Instead, they should be actively involved in discussions, consultations, and decision-making regarding changes in their communities. Thus, housing rehabilitation not only improves physical conditions but also strengthens residents' sense of belonging and empowerment, allowing them to fully participate in building their future. This is essential for creating resilient and inclusive communities, where every individual has the opportunity to thrive and contribute to the overall well-being of the city. The rehabilitation of housing spaces is much more than just building renovation; it represents an evolution in the concept of living and in the way people live.

To achieve this kind of evolution, it's imperative to conduct direct fieldwork with residents of the affected communities. This means going beyond technical drawings and statistics, delving into the realities and life stories of the people residing in these spaces. It's necessary to understand their anxieties, frustrations, hopes, and desires regarding housing. This sensitive approach allows for active, conscious, critical, organized, and supportive participation by residents in decisions that directly affect them. Community participation is one of the fundamental pillars of this approach. By involving residents from the outset of the rehabilitation process, not only are their needs met, but also a sense of belonging and responsibility towards the housing space is strengthened. Residents come to feel an integral part of the project, not just as beneficiaries but as active agents of transformation in their communities.

Housing rehabilitation also requires close collaboration with various actors, such as local governments, non-governmental organizations, and the private sector. This cooperation can bring financial resources, technical expertise, and diversified knowledge to the process. Through solid partnerships, it's possible to maximize the impact of rehabilitation initiatives, making them more comprehensive and sustainable. There are still numerous issues to be addressed, such as access to basic services, quality education, and employment opportunities. However, by addressing housing rehabilitation comprehensively, focusing on people and social inclusion, we are paving the way for a deeper and more lasting transformation in the lives of vulnerable communities. It's a commitment to building a future where everyone has the opportunity to live with dignity and equality.

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YENİ NESİL MİMARİDE GERİ DÖNÜŞÜ DESTEKLEYEN EKOLOJİK YAKLAŞIMLARIN İNCELENMESİ

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ÖZET
Geçmişten günümüze insanoğlu doğadan ve doğanın sahip olduğu kaynaklardan faydalanmıştır. İnsanoğlu teknolojinin gelişmesi, kontrolsüz kentleşme, artan karayolları ile doğanın tahribini hızlandırmıştır. Yapılan bilinçsiz kullanım ve doğayı tahrip edilmesi sonucunda kaynakların hızlı tüketilmesi, kirlilik, atık üretimi, küresel ısınma ve doğaya yabancılaşma gibi sorunlar ortaya çıkarmaktadır. Bilinçsiz bir şekilde doğayı tüketmenin en görünür sorunlarından birisi küresel ısınmadır ve insanoğlu tahrip ettiği doğanın kendini yenilemesini zaman olmasıdır. Bunun yanı sıra artan nüfus, yoğun çalışma temposu gibi nedenlerle kentlerde konforlu alanlarda azalma ve doğadan uzaklaşmalar meydana gelmektedir. Bu sorunun çözümü olarak doğadan esinlenilen tasarımlar ortaya çıkmaktadır. Yeni nesil mimari denilen olgu, modern tasarımların, ekolojik bir perspektiften değerlendirmesini sağlamaktadır. Yeni nesil mimaride, kullanışlı, sağlıklı ve refah binalar, enerji tasarrufu sağlayan, sera gazı ve karbon salınımının azaltan, kurakçıl peyzaj, yağmur hasadı odaklı çevreci yaklaşımları benimsemektir. Bu çalışmada günümüzde metropolleşmeyle birlikte karma kompleklerin yerine, yüksek katlı, endüstriyel yapılarla geliştirilmiş geri dönüşü destekleyen binaların yaygınlaşması ve dikkat çekmesiyle başlayan apartman balkon bahçeleri ele alınmıştır. Özellikle çevre dostu sistemlerin kullanılmasıyla enerji tüketimi kontrol edilirken, belirli katlarda iklimlendirme alanı olarak düzenlenen yeşil alanlar, yüksek kotta bulunan oturumlarla da doğal ve sıcak bir atmosfer sağlamakta; en yüksek katlarda dahi bahçeli ev ölçeğini ve hissini koruyan alanlar irdelenmiştir. Bu araştırmada örnek kesit üzerinden bahçe tasarımı ele alınmıştır. Tasarımda kurakçıl peyzaj kriterinden faydalanılmıştır.
Anahtar Kelimeler: Bitkisel tasarım, Geri dönüşüm, Villa tasarımı

AN EXAMINATION OF ECOLOGICAL APPROACHES THAT SUPPORT RECYCLING IN NEW GENERATION ARCHITECTURE

ABSTRACT
From the past to the present, People have benefited from nature and its resources. People have accelerated the destruction of nature with the development of technology, uncontrolled urbanization, and increasing highways. As a result of the unconscious use and destruction of nature, problems such as rapid consumption of resources, pollution, waste production, global warming, and alienation from nature arise. One of the most visible problems of consuming nature unconsciously is global warming and the fact that human beings have time to renew themselves. In addition to this, due to reasons such as increasing population, and intense work tempo, there is a decrease in comfortable areas in cities and distancing from nature. Designs inspired by nature are emerging as a solution to this problem. The phenomenon called new generation architecture enables modern designs to be evaluated from an ecological perspective. The new generation architecture is to adopt environmentalist approaches focused on useful, healthy, and welfare buildings, energy saving, greenhouse gas and carbon emission reduction, arid landscaping, and rain harvesting. This study focuses on apartment balcony gardens, which have become widespread and attracted attention due to the widespread use of recycling buildings developed with high-rise, industrial structures instead of mixed complexes with metropolitanization. In particular, energy consumption is controlled through the use of environmentally friendly systems, while green areas organized as air conditioning areas on certain floors provide a natural and warm atmosphere with the sessions located at high elevations; areas that preserve the scale and feel of a house with a garden even on the highest floors have been examined. In this research, garden design is discussed through a sample section. The arid landscape criterion was utilized in the design.
Keywords: Plant design, Recycling, Villa design

GİRİŞ

Mimarlık, insanlığın varoluşundan bu yana yapılaşmaya ve çevre düzenleme ihtiyacını karşılamış ve gelişmesine katkı sunmuş önemli bir meslek disiplindir. Ancak, günümüzde karşılaştığımız aşırı nüfus artışı, çevresel, ekonomik ve sosyal zorluklar mimarlığın yeni nesil uygulamalarına doğru yönelmesini arttırmıştır. Yeni nesil mimaride, sadece binalar inşa etmekle kalmayıp, aynı zamanda sürdürülebilirlik, inovasyon ve toplumsal etki gibi kavramları da merkeze alarak geleceğe yönelik çözümler üretmek gerekmektedir (Ercan, 1988; Hedge ve Dorsey, 2013; Hedge ve ark., 2010). Özellikle sürdürülebilir mimari incelediğinde; geleneksel mimarlık sadece mekanların fiziksel ihtiyaçlarını karşılamaya odaklanırken, yeni nesil mimarlar doğal kaynakları koruma ve gelecek nesiller için yaşanabilir bir çevre bırakma konusunda sorumluluk alınması gerek bir konu olarak karşımıza çıkmaktadır. Sürdürülebilir malzemelerin kullanımı, enerji verimliliği ve yeşil alanların artırılması gibi uygulamalar, mimari projelerin çevresel etkilerini minimize etmeyi amaçlamaktadır (Atıl ve ark., 2009; Gülgün ve ark., 2014). Mimaride inovasyon ise, teknolojinin hızla ilerlemesi, mimarların da tasarım süreçlerinde yenilikçi yaklaşımlar geliştirmesini sağlamaktadır. Yeni malzemelerin keşfi, dijital tasarım araçlarının kullanımı ve akıllı bina teknolojileri, mimarların daha verimli, estetik ve işlevsel yapılar tasarlamasına olanak tanımlanabilmektedir (Üstün ve ark., 2016; Yazar, 2006; Aklanoğlu, 2009). Yeni nesil mimarinin toplumsal alanda da etkisi mevcuttur. Mimarlık sadece fiziksel çevreyi şekillendirmekle kalmaz, aynı zamanda toplumların yaşam kalitesini de etkilemektedir. Bu nedenle yeni nesil mimaride, projeler sadece estetik veya teknik açıdan değil, aynı zamanda toplumsal fayda sağlayacak şekilde tasarlanmaktadır (Gülgün ve ark., 2015; Güneş, 2009; Joshi ve ark., 2015; Yedekçi Arslan, 2014). Engellilerin erişilebilirliği, kentsel dönüşüm projeleri, toplum merkezli konut planlaması, ekolojiye katkı sağlaması gibi unsurlar, mimarlığın toplumsal etkisini artırmada önemli rol oynamaktadır. Yeni nesil mimaride ekolojik tasarım; doğayla uyumlu tasarım, çevresel etkileri en aza indirerek doğal kaynakları korur ve biyolojik çeşitliliği desteklemektedir (Yazici ve Gülgün 2019; Yazici ve Gülgün, 2021; Yaşar ve Düzgüneş,2013). Ekolojik yaklaşımlar, enerji verimliliği, atık yönetimi, su tasarrufu ve çevre dostu malzemelerin kullanımı gibi unsurları içermektedir. Ekolojik yaklaşımın benimsenmesi, sadece mevcut çevresel sorunları çözmekle kalmaz, aynı zamanda gelecek nesiller için daha yaşanabilir bir dünya yaratılmasına da katkı sağlamaktadır. Yeni nesil mimaride ekolojik tasarımlarda bazı uygulamalar ise şöyledir:

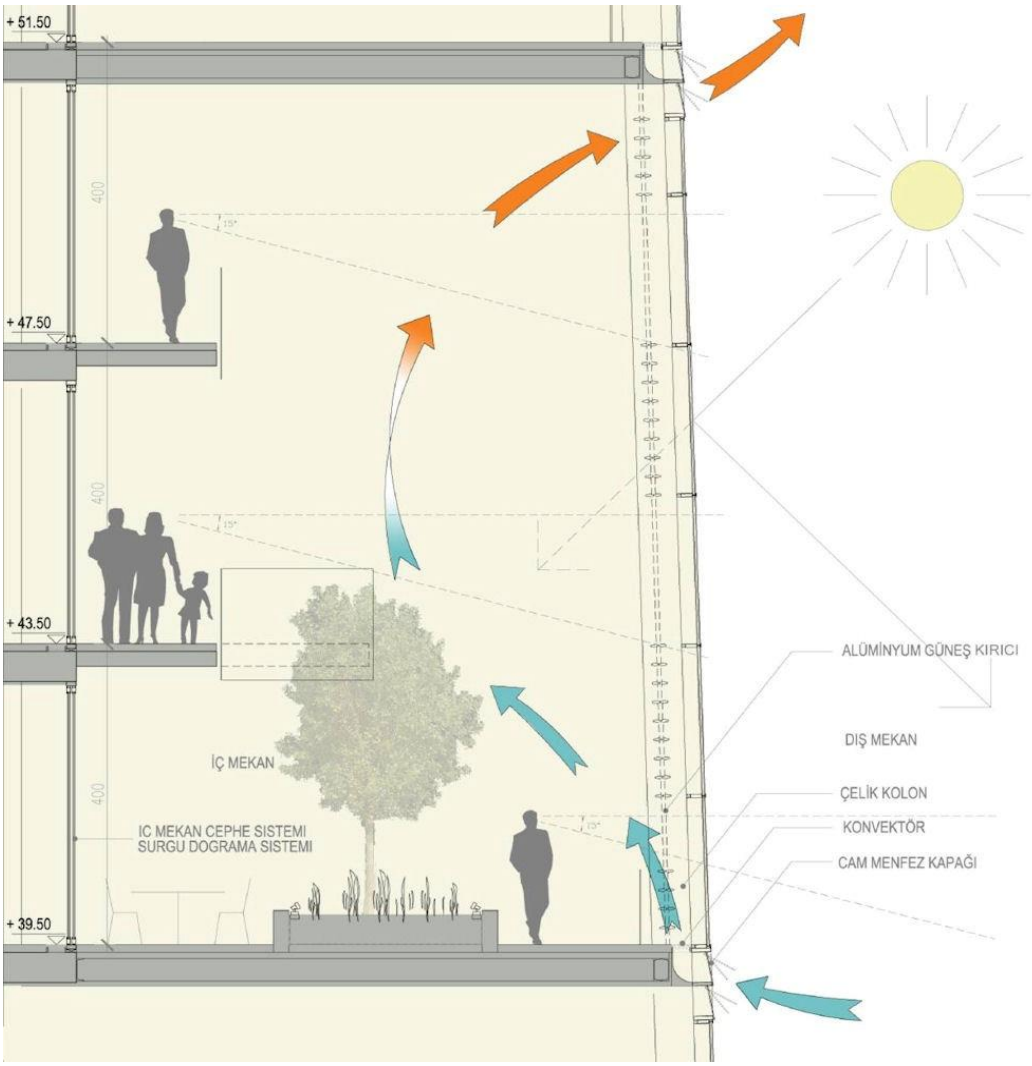
- Pasif Güneş Enerjisi Kullanımı: Binaların güneş ışığını ve ısıyı maksimum düzeyde kullanacak şekilde tasarlanması, enerji tüketimini azaltır ve karbon ayak izini düşürmektedir.
- Yeşil Çatılar ve Duvarlar: Bitkilerin yer aldığı yeşil çatılar ve duvarlar, doğal yalıtım sağlar, yağmur suyu tutar ve kentsel ısınmayı azaltmaktadır.
- Geri Dönüştürülmüş Malzemelerin Kullanımı: Yeniden kullanılan veya geri dönüştürülen malzemelerin yapı tasarımında kullanılması, atık miktarını azaltır ve doğal kaynakların korunmasına katkı sağlamaktadır.
- Biyofilitik Tasarım: Bitki örtüsünün ve doğal peyzajın bina tasarımına entegre edilmesi, insan sağlığına olumlu etkiler sağlar, stresi azaltır ve bağışıklık sistemini güçlendirmektedir.
- Su Yönetimi Sistemleri: Yağmur suyu toplama, gri su geri dönüşümü ve su tasarruflu armatürler gibi sistemler, su kaynaklarının verimli kullanımını teşvik eder ve suyun israfını önlemektedir.

Yeni nesil binalarda doğal kaynakları koruyan, enerji verimliliği sağlayan, çevre dostu malzemeler kullanılarak inşa edilen ve insan sağlığını gözeten yapılar olarak tanımlanabilir (Fabbri, 2013). Bu tür binalar, sürdürülebilirlik prensiplerine dayalı olarak tasarlanır ve çevresel etkileri minimize etmeyi hedefler. İşte çevreci binalarında enerji verimliliği önemlidir. Çevreci binalar, enerji tüketimini azaltmak için çeşitli stratejiler kullanılmaktadır. İyi yalıtım, enerji verimli cihazlar, pasif güneş ısıtma ve soğutma, aydınlatma ve iklimlendirme sistemlerinin optimize edilmesi gibi yöntemler enerji tasarrufu sağlamaktadır. Doğal kaynakların doğru kullanımında ise güneş, rüzgar, yağmur suyu gibi doğal kaynaklardan yararlanmayı amaçlanmaktadır. Güneş paneli ve rüzgar türbini gibi yenilenebilir enerji sistemleri kurularak, binalar kendi enerji ihtiyaçlarının bir kısmını karşılayabilirler. Ayrıca, yağmur suyu toplama sistemleriyle sulama ve temizlik gibi amaçlar için su tüketimi azaltılabilir. Çevre dostu malzemelerin kullanılması; geri dönüşümlü ve yenilenebilir malzemeler tercih edilmelidir. Bu malzemelerin üretimi sırasında çevreye daha az zarar verilir ve atık miktarı azaltılmaktadır. Örneğin, bambu gibi hızlı büyüyen ağaçlar, geri dönüştürülmüş cam ve çelik gibi malzemeler sıkça kullanılmaktadır. Yeni nesil binalarda, iç hava kalitesini artırmak da önemlidir. Zararlı kimyasallar içermeyen boya ve kaplamaların kullanılması, iyi havalandırma sistemlerinin kurulması ve doğal ışık ve havanın iç mekanlara daha fazla girmesi gibi önlemler alınır. Bu, bina kullanıcılarının sağlığını ve konforunu artırmaktadır. Ayrıca yeşil alanların korunması, kentsel ısınmayı azaltan açık ve yeşil alanların artırılması, toplu taşıma imkanlarının yakınlığı

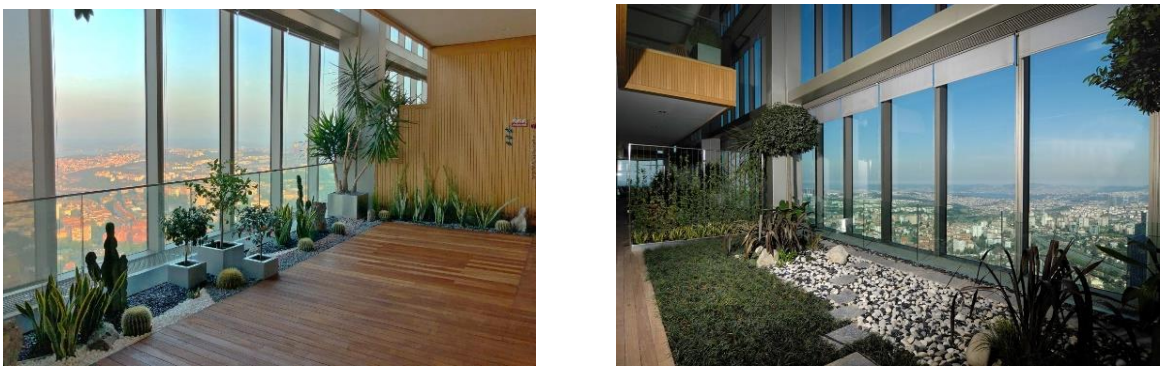
gibi faktörler göz önünde bulundurulmalıdır. Bu çalışmada örnek yapılmış plan üzerinden yeni nesil binalarda alternatif yeşil alanların oluşturulması ele alınmıştır.

BULGULAR TARTIŞMA

Yeni nesil mimari denilen olgu, modern tasarımların, ekolojik bir perspektiften değerlendirmesini sağlamaktadır. Yeni nesil mimaride, kullanışlı, sağlıklı ve refah binalar, enerji tasarrufu sağlayan, sera gazı ve karbon salınımının azaltan, kurakçıl peyzaj, yağmur hasadı odaklı çevreci yaklaşımları benimsemektir. Bu çalışmada günümüzde metropolleşmeyle birlikte karma kompleklerin yerine, yüksek katlı, endüstriyel yapılarla geliştirilmiş geri dönüşü destekleyen binaların yaygınlaşması ve dikkat çekmesiyle başlayan apartman balkon bahçeleri ele alınmıştır. Özellikle çevre dostu sistemlerin kullanılmasıyla enerji tüketimi kontrol edilirken, belirli katlarda iklimlendirme alanı olarak düzenlenen yeşil alanlar, yüksek kotta bulunan oturumlarla da doğal ve sıcak bir atmosfer sağlamakta; en yüksek katlarda dahi bahçeli ev ölçeğini ve hissini koruyan alanlar irdelenmiştir. Bu çalışmada İstanbul'da yer alanIstanbul Sapphire veya Sapphire of Istanbul ya da kısaca Sapphire, 261 metre anten yüksekliğiyle bina incelenmiştir. Bina, dışarıdan bakıldığında yukarıya doğru hafifçe incelmektedir. Dördüncü kattan itibaren aşağı doğru genişleyerek, binanın yüzeyini kaplayan cam örtü yumuşak bir kıvrımla, yatay olarak binanın eteği şeklinde uzayarak cafe, bar, restoran ve dükkânların yer aldığı alanın üzerini, saçağa dönüşerek örtmektedir. Özellikli ve kaliteli marka alışverişine uygun olarak tasarlanan ve doğal ışıktan maksimum yararlanılan bu alan, çok katmanlı, hareketli, havaalanı yolcu salonlarında olduğu gibi tek bir büyük mekân olarak algılanmaktadır. Binanın konut kısımlarında 120 metrekareden 1.100 metrekare'ye kadar değişen, birbirinden farklı büyüklükte 177 adet rezidans birimi yer almaktadır. Residans kısmında 4 konut zonu bulunmakta ve bu zonlar da kendi içerisinde her 3 katta bir gökyüzü bahçesi oluşturmaktadır. Zonlar arasında konumlanan katlarda konut kullanıcıları için çeşitli rekreasyon alanları düşünülmüştür. Rezidansların ortak alanları olarak 970 metrekarelik bir özel sosyal alan (lounge), 1.100 metrekarelik bir golf antrenman sahası ve binanın en son katında bir restoran bar yer almaktadır. Ayrıca kamuya açık olan ve 225 metre yükseklikte yer alan seyir terası da mevcuttur. İç mekan teraslama diyagramı ve teraslarda kurakçıl bitkilendirme çalışmalarına yer verilmiştir.



Şekil 1. İç mekan teraslama diyagramı (Kaynak:www.arkiv.com.tr)



Şekil 2. İç mekan kurakçıl bahçe görselleri (Kaynak:www.arkiv.com.tr)



Şekil 3. İç mekan bahçe kesiti (Kaynak:www.arkiv.com.tr)



Şekil 4. İç mekan kurakçıl bahçe görselleri (Kaynak:www.arkiv.com.tr)

SONUÇ

Yeni nesil mimarlar, sadece binalar inşa etmekle kalmayıp, aynı zamanda çevresel, ekonomik ve toplumsal sürdürülebilirliği sağlayacak çözümler üretmektedirler. Sürdürülebilirlik, inovasyon ve toplumsal etki gibi değerler, mimarlık alanında öncelikli hale gelmiştir. Gelecek için daha yaşanabilir bir dünya inşa etmek adına, yeni nesil mimarların rolü giderek daha da önem kazanmaktadır. Günümüzde, çevresel sorunlar ve iklim değişikliği gibi küresel zorluklar karşısında, mimarlık alanında ekolojik yaklaşımların önemi giderek artmaktadır. Yeni nesil mimarlar, doğayla uyumlu tasarım prensiplerini benimseyerek, yapılarını çevreye dost ve

sürdürülebilir hale getirme konusunda öncü bir rol oynamaktadırlar. Bu çalışmada yeni nesil mimarlıkta ekolojik yaklaşımların önemini ve örnek uygulama üzerinden yeni yaklaşımlar sunulmuştur. Örnek kesitte apartman bahçesinde bazı kurakçıl bitkiler kullanılmıştır. Kurakçıl, suyun sınırlı olduğu bölgelerde veya suyun kıymetli olduğu durumlarda kullanılan bir peyzaj tasarımı ve bakım yaklaşımıdır. Bu yaklaşım, su tasarrufunu teşvik ederken aynı zamanda çevresel sürdürülebilirliği de desteklemektedir.

Ekolojik yaklaşımlarla yapılacak tasarımlarda bitki seçiminin önemi kısaca şöyledir:

- Düşük su tüketimine sahiptirler. Bu neden sulama ve bakımdan tasarruf sağlamaktadır.
- Yerel bitki türleri, doğal olarak bölgenin iklim ve toprak koşullarına uyum sağladığı için kurakçıl peyzajda sıkça tercih edilir. Bu bitkiler, genellikle daha dayanıklı ve bakımı daha kolaydır.
- Toprak verimliliğinin korurlar. Bitkilerin kök sistemleri, toprağı tutar ve erozyonu önler, böylece toprak sağlığını ve verimliliğini artırmaktadır.

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İlgi yazınıza istinaden, Bölümünüz Öğretim Üyesi Doç. Dr. Kübra YAZİCİ'nin İktisadi Kalkınma ve Sosyal Araştırmalar Enstitüsü tarafından 21-22 Nisan 2024 tarihleri arasında Kayseri'de düzenlenecek olan 5. ISPEC Uluslararası Modern Bilimsel Araştırmalar Kongresi'nde Kongre Başkanlığı'na görevlendirilmesi Dekanlığımızca uygun görülmüştür.

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