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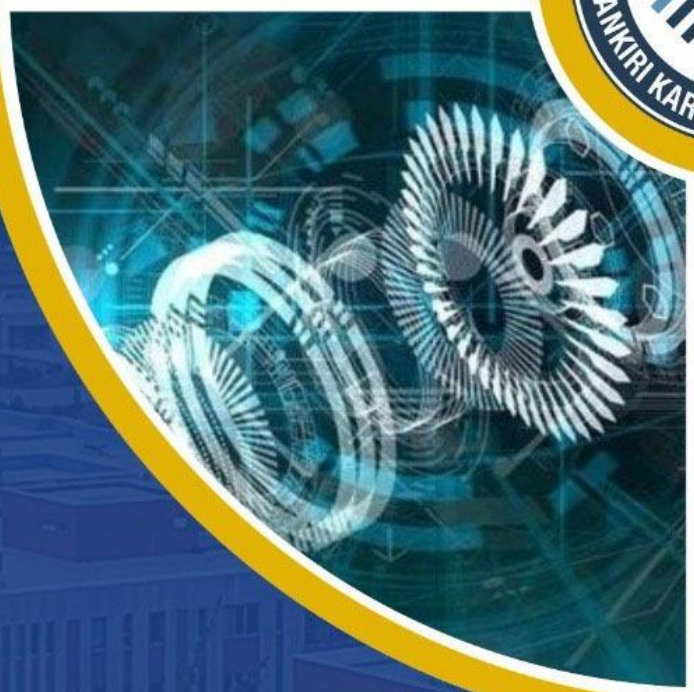
2nd INTERNATIONAL KARATEKIN SCIENCE AND TECHNOLOGY CONFERENCE

21 - 22 DECEMBER 2023

ÇANKIRI, TÜRKİYE



ÇANKIRI KARATEKİN ÜNİVERSİTESİ 2007

Abstract Proceeding Book

Science from Çankırı to the World

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IKSTC2nd

2nd International Karatekin Science and Technology Conference

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December 21-22, 2023 – Çankırı, Turkiye

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ABOUT THE CONFERENCE

CONFERENCE NAME

2nd International Karatekin Science and Technology Conference

DATE AND PLACE

December 21-22, 2023 Çankırı – Turkiye

ORGANIZING AGENCY

ÇAKU – Çankırı Karatekin University

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Prof. Dr. Harun ÇİFTÇİ

GENERAL COORDINATOR

Prof. Dr. Volkan EYÜPOĞLU

OFFICIAL LANGUAGE OF THE CONFERENCE

English

PARTICIPANT COUNTRIES

Algeria, Azerbaijan, Bosnia and Herzegovina, Djibouti, Egypt, Gabon, Iran, Iraq, Jordan, Libyan Arab Jamahiriya, Morocco, Palestine, Pakistan, Saudi Arabia, Spain, Turkiye, Yemen

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Conference Topics

Agricultural Science and Engineering
Biology
Chemical Engineering
Chemistry
Civil Engineering
Combustion and Fuels
Computer Engineering
Electric and Electronics Engineering
Environmental Engineering
Food Engineering
Forest Engineering
Health Sciences
Landscape Architecture
Mathematics
Material Science
Metallurgy and Materials Engineering
Mechanical Engineering
Medicinal Science
Occupational Health and Safety
Physics
Statistics

Dear Participant,

The total number of speakers at "2nd International Karatekin Science and Technology Conference" was 190 together with the invited speakers.

A total of 11 invited speakers, 8 of whom are foreign and 4 of whom are Turkish nationals, made presentations at the conference.

In addition to the invited speakers, 98 foreign speakers from various countries made presentations at the conference. 52% of the 190 speakers in total were foreigners.

Thank you to all the participants who gave generously of their time, especially the speakers who shared their studies and experiences and the institutions who assisted in.

2nd International Karatekin Science
and Technology Conference
Organizing Committee

T.C.
ÇANKIRI KARATEKİN ÜNİVERSİTESİ
Genel Sekreterlik

Sayı : E-52133317-051.02-163281
Konu : Görevlendirme (Akademisyen Temsilcisi)

FEN FAKÜLTESİ DEKANLIĞINA

İlgi : 15.12.2023 tarihli ve E-49144793-903-163203 sayılı yazı.

Üniversitemiz ev sahipliğinde 21-22 Aralık 2023 tarihleri arasında düzenlenecek olan "2ND INTERNATIONAL KARATEKIN SCIENCE AND TECHNOLOGY CONFERENCE" kapsamında, Fen Fakültesi Kimya Bölümü öğretim üyesi Prof. Dr. Şevki ADEM'in "Konferans Akademisyen Temsilcisi" olarak katılım sağlaması Rektörlüğümüzce uygun görülmüştür.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Harun ÇİFTÇİ
Rektör

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THOSE WHO ILLUMINATE THE WAY TO NUCLEAR ENERGY, STOPPING THE WORLD WAR II

Honorable Invited Speaker

Sadık Kakaç
Department of Mechanical Engineering, TOBB University of Economics and Technology, Ankara, Turkiye

Sadık Kakaç was born in 1932 in Çorum, graduated from Istanbul Technical University, Faculty of Machinery in 1955; He received his MSc degrees in Mechanical Engineering from Massachusetts Institute of Technology in 1959, in Nuclear Energy in 1960, and his PhD from University of Manchester in 1965; He was promoted to Associate Professorship at Istanbul Technical University in 1967 and to Professorship at Middle East Technical University in 1971. Sadık Kakaç, who worked at Middle East Technical University between 1960-1982 and 1998-1999, was a visiting professor at Munich Technical University in 1990-1991, and retired from Middle East Technical University in 1999. Sadık Kakaç, who played an important role in the establishment of ITU Nuclear Energy Institute in 1960, was a member of the Atomic Energy Commission between 1970-1978, was elected as a member of the TUBITAK Science Board in 1971 and held this position for two terms. Sadık Kakaç also served as the Deputy Secretary General of TÜBİTAK for a while between 1975-1976. Representing our country in the NATO Science Committee between 1978-1980, Kakaç served as the Secretary General of the Turkish Atomic Energy Commission on the same dates Sadık Kakaç, Honorary Professor of Shang-hai Electric Energy Institute in China, Honorary Consultant of Xian Jiatong University, foreign member of the Russian Federation Academy of Sciences, Principal Member of the Turkish Academy of Sciences “International Journal of Hydrogen Energy”, “International Journal of Heat and Mass Transfer” He is the editor of the scientific journals “International Communications in Heat and Mass Transfer”, "International Journal Experimental Heat Transfer, Thermodynamics and Fluid Mechanics” and “International Journal of Thermal Sciences”. 1989 Alexander von Humboldt Award (Germany), 1994 Turkish-American Association of Scientists Science Award, 1997 American Society of Mechanical Engineers (ASME) Heat Transfer Award, 1997 International Heat and Mass Transfer Center (ICHMT) Service Award, 1999 METU Prof. Dr. Sadık Kakaç, the winner of the Mustafa N. Parlar Education and Research Foundation Service Award, was awarded an Honorary Doctorate by Ovidius University (Romania) in 1998 and by Reims University (France) in 1999. Sadık Kakaç is the recipient of the TÜBİTAK Service Award in 2000. Working at the University of Miami between 1982-2008, Prof. Dr. Sadık Kakaç has been working at TOBB University of Economics and Technology since June 22, 2007.

CLIMATE CHANGE AND CARBON FOOTPRINT

Invited Speaker

Metin Guru*
Gazi University, Faculty of Engineering, Chemical Engineering, Ankara, Turkiye
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Ersin Ercan
Turkish Standard Institute, Enviromental Surveilance Department, Ankara, Turkiye
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ABSTRACT

Climate change refers to global warming and its effects on the Earth's climate system. The planet is giving signals due to climate change. In this context; As deserts expand, heat waves and wildfires become more common. Climate change threatens people with food and water shortages, increased floods, extreme heat, more disease and economic losses. Human migration and conflicts may also be a result.

So what should be done? First of all, it is necessary to realize that what we consume is not money or products, but the planet itself. Therefore, this paper mainly aims to raise awareness about global warming and climate change. In this sense, carbon, water and soil footprints, which has side effects on climate change, have been examined from a methodological perspective and solution suggestions have been presented.

Keywords: Climate, Carbon, Green House Gas, Water, Soil

APPLICATIONS OF INDUSTRIAL ROBOTS IN MANUFACTURING PROCESSES

Invited Speaker

Malik Cabaravdic*
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0009-0008-0302-8216

ABSTRACT

Production technologies are one of the most important areas (in addition to handling and quality control) of application of industrial robots. The application in various types of welding is the most common application of robots in production technologies, and this area is well studied. Here will be discussed the advantages and challenges of using robots in production technologies on the examples of belt grinding and incremental sheet metal forming. These operations use the flexibility of industrial robots and the possibility of their simple reprogramming to process different parts, so that production in smaller batches is possible. It is also possible to process products with complex sculptured surfaces. The main challenges that arise here are the definition of tool paths on the robot arm, as well as the elimination of errors on the geometry and surface of the product after processing. In this presentation, offline programming systems will be presented, with the possibility of graphically defining the path of the robot arm and the principles of online path correction with the aim of increasing the processing quality.

Keywords: Industrial robot application, Belt grinding, Incremental sheet metal forming

CRAFTING MATERIAL SURFACES: ARYL RADICALS IN ACTION

Invited Speaker

Avni Berisha*
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ABSTRACT

The investigation of molecules in their adsorbed state or when attached to surfaces is a topic of significant interest. Aryl diazonium-derived layers have significant potential in the field of material science, with diverse applications in corrosion protection, sensor fabrication, and photovoltaics. These versatile molecules serves as powerful tools for modifying surfaces and have potential in numerous materials, such as insulators, superconductors, bulk materials, powders, and nanostructured materials [1]. Although extensive experimental studies have explored grafted surfaces, including investigations on stability in challenging conditions, analysis of bonds, evaluation of thermal stability, determination of chemical composition, and measurement of layer thickness, there are still significant gaps in our comprehension. It is important to emphasize that the properties observed in these experiments are collective averages, emphasizing the necessity for additional investigation into intrinsic stability, bond strength, and bond characteristics. In order to tackle these aspects, our approach integrates the capabilities of Density Functional Theory (DFT) calculations [2], Molecular Dynamics (MD) simulations, and empirical data. By utilizing Surface-Enhanced Raman Spectroscopy (SERS), we have detected a specific peak at 387 cm^{-1}, which closely corresponds to the predictions made by theoretical calculations [3]. In addition, through the integration of DFT calculations and selective experiments, we have clarified the fundamental mechanism that governs the spontaneous attachment of diazonium salts onto gold surfaces. Consistent with prior research, aryl radicals display reactivity with the gold surface and the initial grafted layers, resulting in the creation of films that are only a few nanometers thick [4].Carbocations also exhibit interactions with gold, albeit with a slower growth rate and thinner films compared to radicals. The Au-(N=N-Ar) bond formed when diazonium cations directly react with gold is significantly less strong compared to the Au-Ar bond. It is important to highlight that aryl radicals produced from diazonium salts form covalent bonds on different surfaces, such as Graphydine, Borophene [5], and the $B_{12}N_{12}$ nanocage cluster [6]. The process exhibits inherent spontaneity, which is further supported by transition state calculations conducted to investigate the bonding of the phenyl radical.

References:

[1] Bélanger, D., & Pinson, J. (2011). Electrografting: a powerful method for surface modification. Chemical Society Reviews, 40(7), 3995–4048. doi:10.1039/C0CS00149J

[2] Berisha, Avni, & Seydou, M. (2022). Grafting of Aryl Radicals onto Surfaces—A DFT Study - Aryl Diazonium Salts and Related Compounds: Surface Chemistry and Applications. In M. M. Chehimi, J. Pinson, & F. Mousli (Eds.) (pp. 121–135). Cham: Springer International Publishing. doi:10.1007/978-3-031-04398-7_6

[3] Berisha, Avni, Combellas, C., Kanoufi, F., Médard, J., Decorse, P., Mangeney, C., Pinson, J. (2018). Alkyl-Modified Gold Surfaces: Characterization of the Au-C Bond. Langmuir, 34(38), 11264–11271. doi:10.1021/ACS.LANGMUIR.8B01584

[4] Berisha, Avni, Combellas, C., Kanoufi, F., Decorse, P., Oturan, N., Médard, J., Pinson, J. (2017). Some Theoretical and Experimental Insights on the Mechanistic Routes Leading to the Spontaneous Grafting of Gold Surfaces by Diazonium Salts. Langmuir, 33(35). doi:10.1021/acs.langmuir.7b01371

[5] Berisha, Avni. (2021). First principles details into the grafting of aryl radicals onto the free-standing and borophene/Ag(1 1 1) surfaces.Chemical Physics, 544. doi:10.1016/j.chemphys.2021.111124

[6] Berisha, Avni. (2023). Unraveling the electronic influence and nature of covalent bonding of aryl and alkyl radicals on the B12N12 nanocage cluster. Scientific Reports 2023 13:1, 13(1), 1–11. doi:10.1038/s41598-023-28055-8

Keywords: Aryl radical, Diazonium salt, Surface modification, DFT, Gold surface

CONSERVATION OF HISTORICAL MANUSCRIPTS

Invited Speaker

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ABSTRACT

Old manuscripts constitute our cultural heritage from the past shed light on many issues are resources that enable us to have some idea. Unfortunately, over time these precious manuscripts is subjected to degradation due to physical, chemical, biological factors, paint and inks [1-3]. In this study, Whatman filter papers were dyed with extracts from safflower (Carthamus tinctorius L.), buckthorn (Rhamnus petiolaris Boiss), turmeric (Curcuma longa L.), and onion peel (Allium cepa L.) plants, as well as cochineal insect (Dactylopius coccus Costa), which are reported to be used in coloring paper in manuscripts." Then, iron gall ink prepared according to the historical recipe was applied on it. Antioxidant and acid removal treatments were applied to the dyed papers to slow down the corrosion that may develop due to the use of iron gall ink. Model papers were subjected to accelerated ageing tests and samples were collected periodically. Changes in pH and optical properties were measured during ageing. This study may provide information to helping conservators to evaluate the effectiveness of treatments.

References:

1. Havlĭnová, B., Katuščák, S., Petrovičová, M., Maková A., & Brezová, V. (2009). A Study of mechanical properties of papers exposed to various methods of accelerated aging. part I: The effect of heat and humidity on original wood-pulp papers. Journal of Cultural Heritage, 10, 222-231.
2. Akyol, E., & and, Pınar, Ç.S. (2023). Dyes Used for Colouring Manuscripts and Their Effect on Cellulose Degradation. Restaurator. International Journal for the Preservation of Library and Archival Material, 44(4), 345-360.
3. Çakar, P., & Akyol, E. (2022). The Effects of Natural Dye and Iron Gall Ink on Degradation Kinetics of Cellulose by Accelerated Ageing. Studies in Conservation 67(6), 381–388.

Keywords: Manuscripts, Iron Gall Ink, Ttreatments, Optical Properties

HOW FAR NATURAL PRODUCT CHEMISTS CONTRIBUTE TO ENVIRONMENT?

Invited Speaker

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ABSTRACT

The broadest definition of Natural product (NP) is anything that is produced by life. Natural products help to reduce chemical pollution, preserve biodiversity, conserve water, minimize packaging waste, support sustainable practices, serve as bioindicators and promote the use of renewable resources. So, natural product chemists play a significant role in helping the environment through their research and development efforts. Here are several examples in which natural product chemists contribute to environmental sustainability by using green extraction methods, green synthetic methods, developing biodegradable materials and products, contribute to environmental monitoring pollutants, explore the potential of natural compounds as alternatives to synthetic chemicals in various industries, contribute to the preservation of ecosystems and the sustainable use of natural resources [1-5].

Herein the author aimed to introduce the ways in which natural product chemists contribute to environment.

References:

[1] Rodrigo Martins, Ana Barbosa, Bárbara Advinha, Hélia Sales, Rita Pontes and João Nunes. (2023). Green Extraction Techniques of Bioactive Compounds: A State-of-the-Art Review. Processes, 11, 2255. https://doi.org/10.3390/pr11082255

[2] Milena Popova1, Vassya Bankova (2023). Contemporary methods for the extraction and isolation of natural products, BMC Chemistry, 17: 68. https://doi.org/10.1186/s13065-023-00960-z

[3] Raya QA Al-Ansi, Abdelhafeez MA Mohammed, Mahmoud M. Ali, Wadie AM Ghalib, Sajan C Ponnappa (2021). Monitoring Heavy Metal Pollution at Al-Buraihi Sewage Station in Taiz, Yemen Using Napier Grass (Pennisetum Purpureum Schumach.) as a Bioindicator, European Journal of Engineering Science and Technology, 4(2): 14-33. https://doi.org /10.33422/ejest.v4i2.433

[4] Raya Q Alansi, Abdelhafeez MA Mohammed, Mahmoud M Ali, Wadie AM Ghalib, Sajan C Ponnappa (2021). Determination of Heavy Metals in Groundwater around Al-Buraihi Sewage Station in Taiz City, Yemen. Journal of Health and Pollution, 11(30), 1-12. https://doi.org/10.5696/2156-9614-11.30.210604

[5] Samaher RE Almisbah, Abdelhafeez MA Mohammed, Abdelaziz Elgamouz, Alaa Bihi, Abdelnasser Kawde (2023). Green synthesis of CuO nanoparticles using Hibiscus sabdariffa L. extract to treat wastewater in Soba Sewage Treatment Plant, Sudan, Water Science & Technology 87(12), 3059 https://doi.org/10.2166/wst.2023.153

Keywords: Natural product chemistry, Green Chemistry, Nanotechnology, Environmental chemistry

COST-EFFECTIVE PATHWAYS FOR DECARBONIZED PRODUCTION OF HYDROGEN FROM NATURAL GAS AND BIOGENIC

Invited Speaker

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ABSTRACT

This talk will address decarbonization of fossil fuel to hydrogen. Two main sectors will be studied; natural gas and biogenic-based feedstocks. The key technical decarbonization pathways are: i) Chemical looping for heat and oxygen supply while capturing CO_2, ii) hydrogen-selective membrane, iii) calcium looping; iv) pyrolysis; v) hydrothermal. The different pathways bring different extents of emission reduction, energy efficiency, and cost performance.

This talk will introduce the different methods and illustrate the different ways of their integration in decarbonization of natural gas and biomass to pure hydrogen, natural gas blended with hydrogen or upgraded biogas. Experimental demonstration studies and techno-economic assessments have been completed for the different concepts showing promising prospects if appropriate frameworks are established for promoting industrial decarbonization.

Keywords: Decarbonization, Chemical looping, Calcium looping, Pyrolysis, Hydrothermal

GEOPOLIMERS BASED ON TECHNOLOGICAL WASTE MATERIALS FROM B&H

Invited Speaker

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ABSTRACT

The biggest global problem today is environmental pollution. The environment is polluted by the release of various gases and small particles into the atmosphere, which are the result of the production of various materials. During the production of 1 ton of cement, approximately 1 ton of CO2 is emitted into the atmosphere. If we consider that the world production of cement is about 4.18 billion tons, then it can be seen that during the production of cement, the same amount of CO2 is released into the atmosphere. Due to the increase in the consumption of concrete, there is also an increase in the production of cement, which results in an increase in environmental pollution and global warming. In addition to all greenhouse gases, carbon dioxide causes 65% of global warming.

Because of the above, solutions are being sought in the production of new materials that would at least partially replace cement. One of such materials is geopolymer.

In this paper, geopolymer samples based on fly ash from the Stanari thermal power plant were tested. Fly ash from the Stanari thermal power plant, 12M NaOH solution and commercial water glass were used as materials. The samples were made with an alkali to fly ash ratio of 1,2. The Na_2SiO_3/NaOH ratio ranged from 2; 2.5 and 3. The samples were thermally treated at geopolymerization temperatures of 60, 70 and 80 °C. After that, the compressive strengths of the samples were tested after 2, 7 and 28 days.

Keywords: fly ash, environmental pollution, compressive strength

HEROMDANALYSIS: FACILITATING GROMACS-BASED MOLECULAR DYNAMICS SIMULATION ANALYSIS

Invited Speaker

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ABSTRACT

Introduction: Molecular dynamics simulations (MD simulations) are computational techniques that are being extensively utilized in molecular biology and drug discovery. One of the most popular and freely available programs used to perform MD simulations is GROMACS which is based on command-line interface. However, chemists or pharmacologists with no background of command-line usage often find its usage difficult, laborious, and error-prone.

Aim & Objectives: Our aim was to create a tool that is user-friendly, even to individuals with no prior experience with command-line interface. This project introduces a remarkable tool named, HeroMDAnalysis that provides simple and fast framework to analyze GROMACS-based MD trajectories.

Method: The tool was written with more than 2300 lines of code in bash shell programming, incorporating a graphical interface powered by the Zenity engine and the code was compiled using Shell Script Compiler. The project is being managed through the web-portal www.heromdanalysis.wordpress.com.

Result: HeroMDAnalysis simplifies a previously intricate task and presents a valuable approach to analyze GROMACS based MD simulation data and generate high-quality image plots. Over the past two years, HeroMDAnalysis has played a pivotal role in assisting numerous researchers across a wide spectrum of projects (freely distributed to 300+ researchers, utilized in 75+ projects and 25+ citations). One of the key features of this project is the convenience it offers through the option to outsource the work.

Summary & Conclusion: HeroMDAnalysis is a user-friendly tool developed to simplify the analysis of GROMACS-based molecular dynamics simulations. Over the past two years, Project HeroMDAnalysis has played a crucial role in assisting numerous researchers, becoming an indispensable asset in the scientific community.

Keywords: GROMACS, molecular dynamic simulation, HeroMDAnalysis, bash shell programming, drug discovery

FUNDAMENTAL PERSPECTIVE OF THE OXIDE GLASS MATERIAL: Mo^{3+} DOPED PHOSPHATE BASED OPTICAL GLASSES FOR PHOTONIC APPLICATIONS

Invited Speaker

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ABSTRACT

Today's advanced electronic-based technologies have begun to provide incredible convenience in the daily life of the individual person. For this purpose, the potential for the use of optical glass materials is rapidly increasing in areas such as intercontinental communication, intercity information exchange and data transmission, modern developments in the health sector and energy sources for space technologies [1,3]. For this reason, new applications are emerging in research on the structural, optical and thermal properties of oxidized glass materials, which have an important place among optical glass materials. Thermal and optical properties are usually determined by considering the Kissinger approximation and JuddOfelt theory [4,5]. Therefore, thermal parameters, production costs, optical and structural properties of oxidized glass materials attract attention, depending on the industrial requirements in their usage areas. In this research, the production, optical and photoluminescence properties of Mo3+ doped phosphate glass materials from a set of oxidized glass materialswere investigated [6,7].

References:

[1] Zschokke I., (1986). Optical Spectroscopy of Glasses. Dordrecht, Holland: D. Reidel Publishing Company,
[2] Wen H., Cheng BM., Tanner PA., (2017). Optical properties of selected 4d and 5d transition metal ion-doped glasses. Royal Society of Chemistry Adv.,7, 26411.
[3] Ghauri, M. A., Siddiqi, S. A., Ashiq, M. G. B. (2014). Band Gap Measurement of ZnO–MoO3–P2O5 Glasses by Photoconductivity. Glass Physics and Chemistry, Vol. 40, No. 2, 151–156.
[4] Kissinger, H.E., (1957). Reaction kinetics in differential thermal analysis. Anal. Chem. 29, 1702–1706.
[5] Sennaroğlu, A., Kabalcı, İ., Kurt, A., Demirbaş, U., Özen, G. (2006). Spectroscopic properties of Tm3+: TeO2–PbF2 glasses. Journal of Luminescence 116, 79-86.
[6] Yuan, J., Yang, Q., Chen, D. D., Qian, Q., Shen, S. X., Zhang, Q. Y., Jiang, Z. H. (2012). Compositional effect of WO3, MoO3, and P2O5 on Raman spectroscopy of tellurite glass for broadband and high gain Raman amplifier. Journal of Applied Physics, 111, 103511.
[7] Naresh, P., Naga Raju G., Srinivas Reddy M., Venkatappa Rao T., Kityk I.V., Veeraiah, N. (2014). Dielectric and spectroscopic features of ZnO–ZnF2–B2O3:MoO3 glass ceramic—a possible material for plasma display panels. Journal of Mater Sci: Mater Electron, 25:4902–4915.

Keywords: Optical glass, Optical fiber, Absorption, Photoluminescence

POLYHERBAL FORMULATION FOR DIABETES AND NANOMATERIAL BASED WOUND DRESSER FOR DIABETIC FOOT ULCERS

Invited Speaker

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ABSTRACT

Diabetes is a widespread problem globally, and common treatments often involve medicines. However, there's a growing interest in exploring natural alternatives. Beyond just controlling blood sugar, research is looking at how herbal extracts, dietary supplements, and plant-based compounds can help manage diabetes and related issues like foot ulcers. These natural approaches have qualities that fight diabetes by affecting sugar metabolism, insulin sensitivity, and inflammation. They also support the natural healing of diabetic foot ulcers. This data underscores the mounting evidence favoring natural products in comprehensive diabetes care, urging continued research and clinical exploration.

Keywords: Diabetes, Natural products, Diabetic foot ulcers, Glucose, Insulin

ULTRAFAST OPERATING REGIMES OF SEMICONDUCTOR LASERS BISTABILITY AND SELF PULSATION

Invited Speaker

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ABSTRACT

GigaHertz and TeraHertz Bistability and Self pulsation are two correlated regimes of operation for semiconductor lasers. With the progress and continuous growth of speed of data communication, the Giga Hertz and Terra hertz signal generation became a must in both data transmission and data reception. Although this crucially important subject of self pulsation and bistability is discovered since more than half a century and occupying a major research branch both experimentally and theoretically till nowadays self pulsation and bistability are neither comprehensively explained nor fully exploited. Consequently, The authors decided to clearly explain the origin of these phenomenon qualitatively and quantitatively in a profound, clear and logic talk. The origin and reason for generaton of these two phenomenon and the influence of semiconductor laser geometrical and physical parameters on bistability and self pulsation will be covered during the talk.

Keywords: Semiconductor lasers, Self pulsation, Ultrafast operating regimes

FUZZY IDEAL OF SEMI GROUP

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. In this review study, we introduce and study SS-π-regular semi-groups, and π-strongly regular LA-semi groups, also we give new properties of anti-fuzzy ideals of semi-groups. Further, we give their basic properties, characterizations, and examples. Moreover, we study the relationships between fuzzy ideals of regular semi-groups, fuzzy bi-ideals of semi-groups, generalized bi-ideals, and idempotent fuzzy ideals of semi-groups. On the other hand, we introduce and study the relations of these concepts with each other [1-5].

References:

[1] Hong, S. M., Jun, Y. B., and Meng, J. (1995). In Fuzzy interior ideals in semi groups. *Indain J. Pure Appl. Math.*, 26(9), 859-863.
[2] Kuroki, N. (1979). Fuzzy bi-ideals in semi groups. *Comment. Math. Univ. St. Pauli*, 27, 17-21.
[3] Rosenfeld, A. (1971). Fuzzy groups. *J. Math. Anal. Appl.*, 35, 512-517.
[4] Shabir, M. and Nawaz, Y. (2009). Semi groups characterized by the properties of their anti fuzzy ideals. *Journal of Advanced Research in Pure Mathematics*, 1(3), 42-59.
[5] Zadeh, L. A. (1965). Fuzzy sets. *Inform. Control*, 8, 338-353.

Keywords: Semigroup fuzzy maximal ideal, Fuzzy duo, Fuzzy ideal, Fuzzy simple

THE STRUCTURES OF THE A4-GRAPHS IN SPECIFIC FINITE SIMPLE GROUPS

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. In this review study, we focus on the connections between two important fields of mathematics: group theory and graph theory. The essential purpose is to analyze the algebraic characteristics of certain finite simple groups by building a graph with vertices that correspond to the elements of the groups. Furthermore, the computational approach is employed in order to attain the required outcome. The purpose is to investigate the alternating group A4 within these simple groups. The disc structure is studied. The diameter, clique number, girth, the collapsed adjacency matrix for the A4-graph as well as the local clustering coefficient of the A4-graph are all determined. A computer technique is being utilized to perform all of the operations related to studying the A4-graph [1-6].

References:

[1] Aubad, A. (2021).A4-Graph of Finite Simple Groups. *Iraqi Journal of Science*, Volume 62, Issue 1, 289–294.
[2] Aubad, A. and Rowley, P. (2021). Commuting Involution Graphs for Certain Exceptional Groups of Lie Type. *Graphs and Combinatorics*, 37, 1345-1355.
[3] Azeez, D. and Aubad, A. (2021). Investigation of Commuting Graphs for Elements of Order 3 in Certain Leech Lattice Groups. *Iraqi Journal of Science*, Volume 62, Issue 2, 2640–2652.
[4] Msheree, Z., Abed, M. and Abid, W. (2021). Studying the A4-Graphs for elements of order 3 in tits group T and Mathieu group M_20. *International Journal of Nonlinear Analysis and Applications*, Volume 12, Issue 2, 1855–1860.
[5] Oudah, A. and Aubad, A. (2021). Computational investigation of A4-graphs for certain leech lattice groups. *MINAR International Journal of Applied Sciences and Technology*, Volume 3, Issue 3, 51–57.
[6] Oudah, A. and Aubad, A. (2021). Analysing the structure of A4-graphs for Mathieu groups. Journal of Discrete Mathematical Sciences and Cryptography, Volume 24, Issue 7, 1907–1913.

Keywords: A4-Graphs, Finite Groups, Simple Groups

ESTIMATION OF STRESS-STRENGTH RELIABILITY FOR TRANSMUTED POWER FUNCTION DISTRIBUTION

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ABSTRACT

This study provides an estimation of the stress-strength reliability for the transmuted power function distribution. We analyzed the transmuted power function distribution and its properties and obtained stress-strength reliability. The maximum likelihood method was used to estimate the transmuted power function distribution parameters. Furthermore, by using the invariance property of the maximum likelihood estimator, we obtained the maximum likelihood estimator of the stress-strength reliability. We designed a comprehensive Monte Carlo simulation study to check whether the maximum likelihood estimator satisfies the estimation procedures in terms of bias and mean square error. The simulation results show that the maximum likelihood estimator of the stress-strength reliability of the transmuted power function distribution satisfies the estimation procedures.

Keywords: Transmuted power function distribution, Maximum likelihood estimation, Stress-strength reliability, Monte Carlo simulation

CURRENT PERSPECTIVES OF FUZZY GRAPH THEORY AND ITS APPLICATIONS

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. The purpose of this study is to address and review previous studies of the fuzzy graph and mention how it developed and benefited from it in various applications of public life, and then highlighting the main concepts that it is important to know about. First, some definitions, theorems, and examples which are prerequisites to understand this study are introduced. Then the importance of fuzzy graphs in solving real life problems are mentioned. Finally, a concise literature review is given. We also review the various applications in all areas such as communications and networking, and in competition in the manufacturing industries, colouring, and other applications [1-7].

References:

[1] Blue, M., Bush, B., Puckett, J. (2002). Unified approach to fuzzy graph problems. *Fuzzy Sets and Systems*, 125(3), 355-668.
[2] Dey, A. and Pal, A. (2013). Fuzzy Graph Coloring Technique to Classify the Accidental Zone of a Traffic Control. *Annals of Pure and Applied Mathematics*, 3(2), 169-178.
[3] Goyal, S. and Grover, S. (2010). Fuzzy and graph theoretic approach for the selection of advanced manufacturing system investments. *Singaporean Journal Scientific Research*, 2(2), 70-74.
[4] Mahapatra, R., Samanta, S. and Pal, M. (2020). Applications of edge colouring of fuzzy graphs. *Informatica*, 31(2), 313-330.
[5] Samanta, S. and Pal, M. (2013). Telecommunication system based on fuzzy graphs. *Journal of Telecommunications System and Management*, 3(1), 1-6.
[6] Sunitha, M.S. and Mathew, S. (2013). Fuzzy graph theory: A survey. *Annals of Pure and Applied Mathematics*, 4(1), 92-110.
[7] Thakur, G.K., Priya, B. and Kumar, S.P. (2019). A novel fuzzy graph theory-based approach for image representation and segmentation via graph coloring. *Journal of Applied Security Research*, 14(1), 74-87.

Keywords: Fuzzy graphs, Fuzzy graph applications, Fuzzy graph colouring applications

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INVESTIGATION ON CYTOTOXIC AND GENOTOXIC EFFECTS OF CAPSANTHIN, THE MAJOR CAROTENOID OF PAPRIKA, ON HUMAN COLON CANCER CELLS

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ABSTRACT

Cancer, one of the leading causes of death worldwide, continues to pose a significant challenge to public health. Nowadays, natural compounds obtained from plants have become important to use for the prevention and treatment of cancer. One of the promising natural compounds is capsanthin, which is a compound found abundantly in paprika and has significant bioactive properties such as antioxidant, anti-inflammation, and anti-cancer. This study explores the diverse biological activities of capsanthin. Employing *in vitro* methodologies, we investigated the cytotoxic and genotoxic effects on the human colon cancer cell line Caco-2, alongside examining the antimicrobial and antioxidant properties of capsanthin. In antimicrobial studies, concentrations ranging from 125 to 1000 µM of capsanthin displayed a significant ($p<0.05$) reduction in the viability of both *E. coli* and *S. aureus*. The antioxidant potential of capsanthin was evaluated through the determination of DPPH radical scavenging, revealing substantial inhibition at concentrations of 750 and 1000 µM. Cytotoxicity assessments on Caco-2 cells using the MTT method demonstrated a concentration-dependent decrease in viability. Furthermore, genotoxic effects were evidenced by a significant increase in DNA damage in Caco-2 cells treated with capsanthin for 24 hours, compared to controls ($p<0.05$). Even though no statistical difference was observed between applied doses, these findings suggest a potential contribution of capsanthin to cell death through DNA damage. In conclusion, capsanthin exhibited promising antimicrobial, antioxidant, cytotoxic, and genotoxic effects in *in vitro* assessments. These findings provide valuable insights into the multifaceted bioactivity of capsanthin, warranting further exploration for potential therapeutic applications.

Acknowledgements: This study was supported by Bartın University, Scientific Research Coordination Unit (Project No: 2019-FEN-A-001).

Keywords: Antimicrobial, Anti-cancer, Anti-oxidant, Caco-2 cell line, Capsanthin, Colon cancer, Cytotoxicity

STUDY ON SOFT b-METRIC SPACE

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. The main objective of this study is to review some properties of a soft b-metric space and introduce important theorems related to this space. In more detail: First, we give the definition of a soft set with some important operations on these sets and explain the difference with a universal set. Then we introduce some properties of usual metric spaces as well as other types of metric spaces such as a semi-metric space, a pseudo metric space, a partial metric space, and a b-metric space. And then, we study a soft metric space with some important definitions of this concept such as a soft open ball, a soft closed ball, the product of soft metric spaces, etc. Moreover, we discuss a sequence of soft elements in a soft metric space. Furthermore, we state some properties of a soft metric space, a soft b-metric space and certain types of soft b-metric sequences. Also we introduce some properties of continuous functions defined on a soft b-metric space and show some important theorems about them. Finally, we give necessary conditions for the existence and uniqueness of the fixed points of functions defined on a soft b-metric space [1-7].

References:

[1] Czerwik, S. (1993). Contraction mappings in b-metric spaces. *Acta. Math. ET. Informatica Universitatis Ostraviensis*, l(1), 5-11.
[2] Das, S. and Samanta, S. K. (2012). Soft real sets, soft real numbers and their properties. *J. Fuzzy Math.*, 20(3), 551-576.
[3] Das, S. and Samanta, S. K. (2013). On soft metric space. *J. Fuzzy Math.*, 21(3), 707-733.
[4] Molodtsov, D. (1999). Soft set theory-First results. *Computer and Mathematics with Applications*, 37(45), 19-31.
[5] Shamshad H. and Shivani K. (2018). A Study of properties of soft set and its applications. *International Research Journal of Engineering and Technology*, 5(1), 363-371.
[6] Swati Agrawal, K. Qureshi and Jyoti Nema. (2016). A Fixed-Point Theorem For b-Metric Space. *International Journal of Pure and Applied Mathematical Sciences*, 9(1), 45-50.
[7] Wadkar B., Bhardwaj R., Mishra V., and Singh B. (2017). Coupled Soft Fixed-Point Theorems in Soft Metric and Soft b- Metric Space. *Ser. A: Appl. Math. Inform. and Mech.*, 9(1), 59-73.

Keywords: Soft set, b-Metric space, Soft b-metric space, b-Soft convergent sequence

HOT MIX ASPHALT DESIGN WITH THE USAGE OF ANDESITE AND LIMESTONE BETWEEN KORGUN-KURŞUNLU DISTRICTS OF ÇANKIRI

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ABSTRACT

Transportation structures generally require large costs and therefore the needs must be controlled meticulously. The construction of road networks must be designed in line with today's needs and future demands to ensure that projects are economical and profitable. Additionally, it should be built with sustainability and environmental awareness in mind. While this approach ensures that costs are kept under control, it also aims to use the transportation infrastructure effectively and efficiently during long time. This combines the principles of cost-effectiveness and sustainability, ensuring that transport projects respond to the needs of society and protect the environment. In the road construction process, selection of aggregates with different properties for different road layers is of great importance, as seen in the example of Korgun-Kurşunlu Road. Here, the combined use of Andesite and Limestone aggregates has been important in terms of balancing supply costs and technical requirements. This decision represents an economically effective solution while ensuring compliance with technical standards. The quality and suitability of the materials used in the design process are determined through a series of experiments and analyses. In this study, sieve analysis, specific gravity and water absorption tests were applied to determine the suitability of andesite and limestone. Additionally, methylene blue peeling and penetration tests were conducted in Los Angeles to measure the durability of the material. The specific gravity of bitumen was also applied and the stability and durability of the material was determined by the Marshall test. These comprehensive tests and experiments were conducted to evaluate the suitability and performance of andesite and limestone for on-road use. The data that achieved after the tests are milestone to determine the quality and suitability of the materials to be used in the road construction process.

Keywords: Flexible pavement design, Andesit, Limestone, Hot mix asphalt

SOME PROPERTIES OF VARIOUS DOMINATION IN GRAPHS

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. Graph theory is considered a new language for all sciences such as medicine, engineering, economics, chemistry, physics, and others. The dominating set and the domination number are currently considered one of the most used concepts in graph theory to find solutions to most real life problems. Therefore, many definitions of this concept appeared, and each definition is an integrated work system that works to find the number of domination under certain conditions imposed by the type of problem. Throughout this study, the Hn-domination is discussed. Moreover, some graphs that have real-life applications are defined. Furthermore, ladder graph, helm graph, tadpole graph, prism graph, sun graph, barbell graph, lollipop graph, triangular snake, double triangular snake and windmill graph and dutch windmill graph, and caterpillar tree are introduced. And then, for each of these graphs, each of the Hn-domination and inverse Hn-domination are determined. Moreover, for the complement of a graph the two domination numbers mentioned above are determined [1-7].

References:

[1] Al'Dzhabri, K. S., Omran, A. A., and Al-Harere, M. N. (2021). DG-domination topology in Digraph. *Journal of Prime Research in Mathematics*, 17(2), 93-100.
[2] Al-Asadi, S. K., Omran, A. A. And Al-Maamori, F. A. (2021). Some properties of Mobius function graph M^{(1)}. *Advanced Mathematical Models and Applications*, Vol.7, No.1, pp.48-54.
[3] Imran, S. A. and Omran, A. A. (2022). The Stability or Instability of Co-Even Domination in Graphs. *Applied Mathematics and Information Sciences*, 16, No. 3, 473-478.
[4] Kulli V. R., and Sigarkanti S.C. (1991). Inverse Domination in Graphs. *National Academy Science Letters, India*, 14, 473-475.
[5] Ahmed A. Omrana, A. A. and Aljanaby, H. (2022). Inverse Hn-domination number in graphs. AIP Conf. Proc., Al-Samawah, Iraq, 2398(1), 060023, 1-9.
[6] Omran, A. A., Al-Harere, M. N. and Kahat, S. S. (2021). Equality co-neighborhood domination in graphs. *Discrete Mathematics, Algorithms and Applications*, 14(01), 2150098.
[7] Omran, A. A. and Ibrahim, T. A., (2021). Fuzzy co-even domination of strong fuzzy graphs. *International Journal of Nonlinear Analysis and Applications*, 12(1), 726-734.

Keywords: Dominating set, Domination number, Inverse domination number, Operations in graphs

RETROSPECTIVE ANALYSIIS OF THE DIAGNOSTIC DILEMMA IN MALIGNANT AND BENIGN LESIONS OF THE MAXILLOFACIAL REGION REVIEW

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ABSTRACT

There are different types of gingival enlargements. It varies according to etiological factors and pathological processes [1]. Definitive diagnosis of the enlargement is important, as some gingival enlargements can cause extensive morbidity and even death. Oral cancers, especially squamous cell carcinomas, differ in the affected areas [2]. Detailed medical history, clinical examination, and radiographic evaluation will help identify the lesion and biopsy will aid in definitive diagnosis [3]. Malignant-benign lesions of the maxillofacial region published as case reports in the last 10 years were scanned in the Pubmed database. 6790 articles were found. Titles and abstracts were reviewed, 127 case reports that were confused as pyogenic granuloma or metastasis in the maxillofacial region were identified. Articles older than 10 years were excluded, 30 case reports (19 men, 11 women) were reviewed. The age range of females and males was 1-78 (49,18). 22 pyogenic granuloma cases with a prediagnosis and 8 metastasis cases with a prediagnosis were determined. The region of lesions, age, gender, habits Statistical analysis was performed with IBM SPSS Statistics 25 program. It should be considered that a newly diagnosed malignancy in the maxillofacial region may metastasize from distant sites and may present signs and symptoms before the primary tumor. The clinical manifestations of oral cancers are similar to benign lesions. Histopathological evaluation is important for early diagnosis. The aim of this study is to evaluate the current literature on misconceptions in the diagnosis of malignant-benign lesions in the maxillofacial region.

References:

[1] Doğan M, Kankaya D, Büyükçelik A, Karataş F, Utkan G, Şencan O, et al. 2009. Gingival Metastasis in Large Celi Lung Carcinoma. Acta Oncologica Turcica. 42(1):30–2.
[2] Ramirez JR, Seoane J, Montero J, Esparza Gómez GC, Cerero R. 2003 Oct. Isolated gingival metastasis from hepatocellular carcinoma mimicking a pyogenic granuloma. J Clin Periodontol. 31;30(10):926–9.
[3] Bilgiç Küçükgüven M, Aktaş A, Ateş Özdemir D. 2019. A Rare Case Of Maxıllary Hepatocellular Carcinoma Metastasis Mimicking Pyogenic Granuloma In A Gerıatrıc Patıent. Turkısh Journal Of Gerıatrıcs-Turk Gerıatrı Dergısı. 22(1):112–6.

Keywords: Benign, Malign, Metastasis, Pyogenic Granuloma

INTRODUCTION TO EDGE-COLORING PROBLEM

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. In this review study, the problem of graph edge coloring which is the coloring the edges of a graph in a way that two distinct adjacent edges are assigned different colors is introduced. The challenge about this problem is to find the minimum number of colors necessary to give a proper edge coloring of a graph. This minimum number of colors is called the chromatic index of a graph. In more detail: First we give the basic but fundamental definitions of graphs, subgraphs, the concept of connectivity of graphs, also the concepts of matchings and factorization of graphs. Then, we prove various important theorems related to finding upper and lower bounds for graph edge coloring, and give multiple ways to interpret the chromatic index, also we introduce the classification problem. Furthermore, we review some types of edge coloring (circular edge coloring, list edge coloring and total coloring). Finally, we review some main results and statements of some important theorems and conjectures about edge colouring problem [1-8].

References:

[1] Bollobas, B and Harris, A. J. (1985). List-colourings of graphs. *Graphs and Combinatorics*, 1, 115–127.
[2] Cao, Y. and Chen, G and Jing, G. and Stiebitz, M. and Toft, B. (2018). Grah edge coloring: A survey. *Graphs and Combinatorics*, 35, 33–66.
[3] Chartrand, G. and Zhang, P. (2019). *Chromatic graph theory* (Secoond Edition). New York: Taylor and Francis Group.
[4] Coffman, W. C. and Hakimi, S. L. and Schmeichel, E. (2003). Bounds for the chromatic number of graphs with partial information. *Discrete Math.*, 263, 47–59.
[5] Formanowicz, P. and Tanas, K. (2012). A survey of graph coloring - its types, methods and applications. *Foundations of Computing and Decision Sciences*, Volume 37, Issue 3, 223–238.
[6] Gupta, R. P. (1966). The chromatic index and the degree of a graph. *Notices Amer. Math. Soc.*, 13, 719.
[7] Haggkvist, R. and Chetwynd, A. G. (1992). Some upper bounds on the total and list chromatic numbers of multigraphs. *J. Graph Theory*, 16, 503–516.
[8] Vizing, V. G. (1965). Critical graphs with given chromatic class. *Metody Diskret. Analiz*, 5, 9–17.

Keywords: Edge Colouring, Chromatic index, Classification problem, Colouring algorithms

HEART DISEASE PREDICTION USING MACHINE LEARNING

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ABSTRACT

Heart disease is a high-risk disease worldwide. Early diagnosis and treatment can improve the chances of survival, but it can be difficult to diagnose heart disease early. Machine learning techniques have the potential to improve the diagnosis of heart disease by providing doctors with more accurate and timely information. In this paper, we propose a comparative study of different ML algorithms for heart disease prediction. We evaluated the performance of Logistic Regression, Random Forest, K-nearest neighbors, and Ensemble learning methods on a publicly available dataset of heart disease patients. We found that the ensemble learning methods, including boosting, bagging, and stacking, achieved the highest accuracy, with accuracies of 96%, 98.4%, and 98.1%, respectively.

Keywords: Heart Disease Prediction, Random Forest, Logistic Regression, KNN, Ensemble Learning.

INTRODUCTION TO VERTEX-COLORING PROBLEM

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ABSTRACT

This study is prepared by using the Master of Science thesis of the first author. The title of this presentation is just the title of the mentioned Master of Science thesis. In this review study, the vertex coloring problem is introduced which is mainly about using the smallest number of colors possible to color the vertices of a graph properly. In more detail: First, we introduce this famous problem by giving its origin and historical development. Then, we give basic definitions and theorems about graphs. And then, we define the chromatic number of a graph, and introduce related results, and present some of its applications such as finding a timeline for solving some real-life problems. Moreover, we look at how to calculate chromatic number of a graph, and determine its upper and lower bounds. Also, we give a greedy coloring algorithm. Finally, after introducing the four-color problem, we review the topic of coloring a graph on a surface, and mention Hajos and Hadwiger conjectures [1-6].

References:

[1] Benjamin, A., Chartrand, G. and Zhang, P. (2015). *The fascinating world of graph theory*. Princeton, New Jersey: Princeton University Press.
[2] Chartrand, G. and Zhang, P. (2019). *Chromatic graph theory* (Secoond Edition). New York: Taylor and Francis Group.
[3] Chartrand, G., Lesniak, L. and Zhang, P. (1996). *Graphs and digraphs*. London: Chapman and Hall.
[4] Diestel, R. (2018). *Graph theory* (Graduate Texts in Mathematics, 173) (Fifth Edition). Berlin: Springer.
[5] Jensen, T. R., and Toft, B. (1995). *Graph Coloring Problems*. New York: Wiley.
[6] Thomassen, C. (2005). Some remarks on Hajos' conjecture. *Journal of Combinatorial Theory, Series B*, Vol 93, 95-105.

Keywords: Vertex colouring, Chromatic number, Chromatic polynomial, Chromatic bounds

OPTIMIZATION OF MACHINING PARAMETERS IN TERMS OF THRUST FORCE AND CHIP FORMATION OF E-GLASS/EPOXY-CARBON NANOTUBE COMPOSITES

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ABSTRACT

Fiber-reinforced polymer composites have become interesting in industrial applications due to their functionality such as light weight, superior mechanical properties and versatile processing techniques [1, 2]. Especially glass fiber reinforced polymer composites have applications in aviation, sports, electronics, transportation and similar fields [3]. In recent years, nano- or micro-sized fillers have been added to matrices in order to improve the existing properties of composites [4]. Carbon nanotubes [5], graphene nanoplates [6], nanofibers [7] and nanoclays [8] are widely used to strengthen the matrix. In this study, the drilling performances of laminated composites containing multi-walled carbon nanotubes at different weight ratios were optimized with the Taguchi method in terms of thrust forces, which is a quality characteristic. Analysis of variance (ANOVA) was performed to determine significance levels. Material, drill bit, cutting speed and feed rate for each five levels were selected as control factors and an L25 vertical array experimental design was designed accordingly. A clamping mold was manufactured for the test samples with dimensions of 150 mm × 25 mm, and the samples placed in this clamping mold were connected to the bench table with a force gauge. Chip formation was examined by means of a digital microscope. It was determined that the carbon nanotube ratio was the most effective factor on the thrust forces with 69.03%, and as the carbon nanotube ratio increased, the thrust forces increased. The effectiveness rates were found to be 21.23% in feed rate, 2.17% in drill tip and 2.12% in cutting speed, respectively. It has been observed that chip formation is mostly affected by changes in feed amount and cutting speed. Although discrete chip formation is frequently observed, it has been observed that chips form in powder form, especially at low feed rate and high cutting speeds. Verification experiments were carried out under optimum conditions determined as a result of optimization. The results measured from these experiments were compared with the results calculated by the mathematical model. It was observed that the model could be used safely with a correlation value of 94.55%.

References:

[1] Mirabedini, A., Ang, A., Nikzad, M., Fox, B., Lau, K.T., & Hameed, N. (2020). Evolving strategies for producing multiscale graphene-enhanced fiber-reinforced polymer composites for smart structural applications. *Advanced Science*, 7(11), 1903501.
[2] Zhao, F., Guo, W., Li, W., Mao, H., Yan, H., & Deng, J. (2022). A study on hot stamping formability of continuous glass fiber reinforced thermoplastic composites. *Polymers*, 14(22), 4935.
[3] Dahiya, A.K., Bhuyan, B.K., & Kumar, S. (2023). Influence of process parameters on delamination of GFRP with abrasive water jet machining. *Materials Today: Proceedings*.
[4] Rao, Y.S., Mohan, N.S., Shetty, N., & Shivamurthy, B. (2019). Drilling and structural property study of multi-layered fiber and fabric reinforced polymer composite-a review. *Materials and Manufacturing Processes*, 34(14), 1549-1579.
[5] Jain, V., Jaiswal, S., Dasgupta, K., & Lahiri, D. (2022). Influence of carbon nanotube on interfacial and mechanical behavior of carbon fiber reinforced epoxy laminated composites. *Polymer Composites*, 43(9), 6344-6354.
[6] Huang, K., Guo, H., Qin, Z., Cao, S., & Chen, Y. (2020). Flutter analysis of laminated composite quadrilateral plates reinforced with graphene nanoplatelets using the element-free IMLS-Ritz method. *Aerospace Science and Technology*, 103, 105915.
[7] Ramezani, H., Kazemirad, S., Shokrieh, M.M., & Mardanshahi, A. (2021). Effects of adding carbon nanofibers on the reduction of matrix cracking in laminated composites: Experimental and analytical approaches. *Polymer Testing*, 94, 106988.
[8] Ebrahimnezhad-Khaljiri, H., Eslami-Farsani, R., & Talebi, S. (2020). Investigating the high velocity impact behavior of the laminated composites of aluminum/jute fibers-epoxy containing nanoclay particles. *Fibers and Polymers*, 21, 2607-2613.

Keywords: Laminated composite, Taguchi method, drilling, thrust force, chip formation

ANTIOXIDANT PROPERTIES OF LYCIUM BARBARUM EXTRACTS

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ABSTRACT

Lycium barbarum (Goji berry) belongs to the Lycium genus. Lycium barbarum is a plant of Asian origin and its fruit has some pharmaceutical features exerting antioxidant and anticancer effects. To this end, the functional components constitute polysaccharides, polyphenols, flavonoids, carotenoids, and their derivatives. These compounds can neutralize free radicals by affecting the maintenance of cellular homeostasis and intracellular signalling pathways. Lycium barbarum is rich in antioxidants that fight free radicals in the body. Therefore, it may help slow the aging process, reduce cellular damage, and sustain overall health. The plant also produces vitamin C which helps strengthen the immune system. GC-MS analysis was performed to determine the content of Lycium barbarum extracts. Activities of the identified molecules against antioxidant proteins, PDB ID: 1HD2, and 4Z8D, were assessed.

Keywords: Antioxidant, GC-MS, Lycium barbarum, Molecular docking

GEOLOGY OF THE EAST EDGE OF SUĞLA LAKE DEPRESSION, KONYA

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ABSTRACT

Suğla Lake region is an interesting province with autochthonous Geyikdağı Unit, allochthonous Bozkır Unit and Neo-Autochthonous Unit. The Neo-Aautochthonous units overlie unconformable basement autochthonous and allochthonous unites. At the Yalıhüyük and its surrounding area, the Geyikdağı Unit starts at the bottom Late Cretaceous aged neritic carbonates (Saytepe formation) including abundant rudistes and foraminifera. Pelagic fossiliferous, clayey, cherty limestone and marls (Alan formation) are seen at the upper parts of the autochthonous unit.

Tectonic slides of the Bozkır Unit comprise the Hatip ophiolitic melange Late Cretaceous in age at the bottom, cherty-clayey cabonates and radiolarites belonging to deep shelf edges of Boyalıtepe unit in Cretaceous in age in the middle and Triassic-Jurassic aged massive neritic carbonates of Gencek formation at the top.

Coarse clastics (Sille formation), lacustrine carbonates and claystones (Ulumuhsine formation), volcano-sediments (Küçükmuhsine formation) and dasities-andasites (Erenlerdağı volcanites) are related to Late Miocene-Early Pliocene lacustrine transgression and volcanic activities. Then alluvial fan sediments foot (Topraklı formation) Late Pliocene-Pleistocene aged and Holocene alluviums are young sediments in the study area.

Keywords: Suğla Lake, geology, Geyikdağı-Bozkır and Neo-Autochthonous units.

MATHEMATICAL MODELLING OF ULTRASOUND PRETREATED KUMQUAT (*CITRUS JAPONICA VAR. MARGARITA*) IN FREEZE DRYER

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ABSTRACT

Kumquat (*Citrus japonica var. margarita*) is a citrus fruit that resembles a tiny orange and is rich in flavonoids. Kumquat, which can be consumed raw and processed, was dried in a freeze dryer with ultrasonic pre-treatment and its mathematical modelling were investigated in this study. Ultrasound pretreatment was applied for 30 and 60 seconds and the drying process was proceeded at -68.6 C and 0.9 Pa for control and pretreated samples. The experimental drying data is fitted into Hendersen & Pabis, Jena & Das, Lewis, and Two-Term Exponential drying models, and the data-model compatibilities were compared. The most suitable model was determined as Jena & Das model with the highest R^2, and the lowest χ^2, and *RMSE*. It was observed that the R^2 values of all the models applied varied between 0.994740 and 0.998673.

References:

[1] Barreca D., Bellocco E., Caristi C., Leuzzi U. & Gattuso G. (2010). Kumquat (Fortunella japonica Swingle) juice: Flavonoid distribution andantioxidant properties, Food Research International, 44, 2190–2197.

[2] Chaverri J., Rodríguez N.C., Ibarra M.O. & Rojas J.M.P (2008). Medicinal properties of mangosteen (Garcinia mangostana), Food and Chemical Toxicology, 46, 3227–3239.

[3] Chaovanalikit, A., Mingmuang, A., Kitbunluewit, T., Choldumrongkool, N., Sondee, J. & Chupratum, S. (2012). Anthocyanin and total phenolics content of mangosteen and effect of processing on the quality of mangosteen products, International Food Research Journal 19, 3, 1047-1053

Keywords: Kumquats, Exotic fruits, Lyophilisation, Ultrasonication

COLUMN-AUTHOR MATCHING IN TURKISH TEXTS USING SVM AND MLP ALGORITHMS

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ABSTRACT

In this study, a column-author matching was performed using columns taken from the website of a newspaper. A data set containing more than 3 thousand data was created by combining the articles written by people who are newspaper writers in different fields, some other information about the articles and the names of the authors. Data pre-processing work was carried out on the created data set and data set optimisation was achieved. By running Zemberek library functions on the optimised data set, morphological analysis was performed, stop words were removed from the text and new attributes were extracted and included in the data set. The data was normalized using the Min-Max Normalization technique and digitised with TF-IDF, Word Bag and Word-Sentence Distribution Vectors. The 67% of the dataset was used to train the machine learning classification algorithms, while the remaining 33% was used to measure the author-artwork matching success of the algorithm. Support Vector Machines (SVM) and Multilayer Perceptrons (MLP) were used in the study and the highest success rate was obtained with the SVM algorithm with 83%.

Keywords: Machine Learning, Natural Language Processing, Text Classification, Zemberek Library

PERIPHERAL GIANT CELL GRANULOMA: A CASE REPORT

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ABSTRACT

Peripheral giant cell granuloma (PGCG); it is a reactive, pathological hyperplasia resulting from abnormal repair rather than a true tumor. Although their etiology is not fully known, they may occur due to reasons that may lead to poor oral hygiene, such as traumatic tooth extractions, poor dental restorations, plaque and tartar [1]. PGCG is believed that its pathogenesis includes an excessive activation of osteoclasts, which is associated with a proliferation of macrophages and can cause significant bone resorption [2]. The purpose of this case report is to present the diagnosis and treatment of PGCG. A 33-year-old female patient presented to our clinic due to the growth on the gingiva of tooth number 21. Her medical history was taken, and a detailed clinical and radiographic evaluation was performed, leading to the indication of excisional biopsy. The lesion was completely excised along with the periosteum, and no growth was observed in the bone. According to the histopathology report of the excised tissue measuring 0.6x0.6x0.5 cm, the diagnosis of giant cell reparative granuloma was made. No recurrence was observed during the 6-month follow-up period. PGCG, which can occur due to factors such as periodontal pockets, ill-fitting prostheses and restorations, dental calculus, dental plaque, food impaction, and estrogen hormone activity, can reach significant sizes if neglected. Clinical and histopathological evaluation is essential for the diagnosis of PGCG. Since histological findings are similar to Brown tumor due to hyperparathyroidism, aneurysmal bone cyst and benign osseous dysplasia, these pathologies should be taken into consideration in the differential diagnosis [3].

References:

[1] Aslan M, Simsek Kaya G, Dayı E, Akkas M, Demirci E. Erken Yasta Görülmüş Periferal Dev Hücreli Granüloma (Vaka Raporu). Atatürk Üniversitesi Diş Hekimliği Fakültesi Dergisi 2006; 16(3): 61-64

[2] Jané-Salas E, Albuquerque R, Font-Muñoz A, González-Navarro B, EstrugoDevesa A, López-López J. Pyogenic granuloma/peripheral giant cell granuloma associated with implants. Int J Dent. 2015; 2015:839032.

[3] Gandara Rey JM, Pacheco JL, Gándara P, Blanco A, García A, Madriñán P, Somoza M.Granuloma periférico de célu¬las gigantes. Revisión de 13 casos clínicos. Medicina Oral. 2002; 7: 254-259

Keywords: Dental plaque, Peripheral giant cell granuloma, Reparative granuloma

ANALYZING POTENTIAL INFLUENCES ON SEISMIC SENSOR VIBRATION SIGNALS FOR ENHANCED DETECTION ACCURACY

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ABSTRACT

In the flied of seismic data collection, several factors influence the quality and accuracy of recorded signals. These factors include the nature of the data collection environment, including the speed of wave propagation and the resulting wave amplitudes. Noise, both from the instrumentation and the target of interest, It is a big challenge in signal fidelity. Additionally, the presence of false signals requesting rigorous data validation. Deploying sensors strategically to match their sensing capabilities is paramount. These considerations collectively shape the integrity and reliability of seismic data, crucial for object detection monitoring. This research delves into elucidating the prevalent factors responsible for signal distortion. It stems from an experimental investigation carried out across four distinct terrains – mud, soil, grass, and asphalt – on a farm setting. Within each of these environments, four distinct target types were identified: human, animal, motorbike, and car. Each target exhibited unique trajectories and movements tailored to its specific environment. This study closely monitored fundamental influences on seismic signal waves, revealing that the surface's elasticity resulted in wave amplitudes approximately as follows when compared to asphalt: (25% grass 90%, soil 40%, and muddy 65%). The variance in these values can be attributed to a multitude of factors that exert an influence on the signal that will explain in detail in this paper.

References:

[1] M. Mirshekari, S. Pan, P. Zhang, and H. Y. Noh, "Characterizing wave propagation to improve indoor step-level person localization using floor vibration," in Sensors and smart structures technologies for civil, mechanical, and aerospace systems 2016, 2016, vol. 9803, pp. 30–40.
[2] A. Brandt, Noise and vibration analysis: signal analysis and experimental procedures. John Wiley & Sons, 2023.
[3] P. P. Fastykovsky, M. A. Glauberman, and Y. I. Lepikh, "Autonomous Seismic Sensor with a New Temporal Method of a Moving Person Detection," in 2021 IEEE 12th International Conference on Electronics and Information Technologies (ELIT), 2021, pp. 14–17.
[4] J. Amutha, S. Sharma, and J. Nagar, "WSN strategies based on sensors, deployment, sensing models, coverage and energy efficiency: Review, approaches and open issues," Wirel. Pers. Commun., vol. 111, pp. 1089–1115, 2020.
[5] K. Bin, J. Lin, X. Tong, X. Zhang, J. Wang, and S. Luo, "Moving target recognition with seismic sensing: A review," Measurement, vol. 181, p. 109584, 2021.
[6] N. Chuku and A. Nasipuri, "RSSI-Based localization schemes for wireless sensor networks using outlier detection," J. Sens. Actuator Networks, vol. 10, no. 1, p. 10, 2021.
[7] B. Earl, "Adafruit 4-Channel ADC Breakouts," Adafruid Ind., 2019.
[8] Y. Zhao, L. Wang, and X. Yan, "The principle and simulation of moving-coil velocity detector," in 2nd International Conference on Electrical and Electronics: Techniques and Applications (EETA), 2017, vol. 20, pp. 407–431.
[9] M. H. Md Khir, A. Kumar, and W. I. Wan Yusoff, "Accelerometer sensor specifications to predict hydrocarbon using passive seismic technique," J. Sensors, vol. 2016, 2016.
[10] Y. Ben-Zion and Y. Huang, "Dynamic rupture on an interface between a compliant fault zone layer and a stiffer surrounding solid," J. Geophys. Res. Solid Earth, vol. 107, no. B2, p. ESE-6, 2002.
[11] E. M. Dupont, C. A. Moore, E. G. Collins, and E. Coyle, "Frequency response method for terrain classification in autonomous ground vehicles," Auton. Robots, vol. 24, pp. 337–347, 2008.
[12] E. M. DuPont, E. Collins, E. J. Coyle, and R. G. Roberts, "Terrain classification using vibration sensors: theory and methods," New Res. Mob. Robot., pp. 1–41, 2008.
[13] L. Li, X. G. Tuo, X. B. Mao, and M. Z. Liu, "The Design of a New Signal Handing Circuit of Seismic Geophone," Adv. Mater. Res., vol. 960, pp. 670–675, 2014.
[14] K. Xing, N. Wang, and W. Wang, "A Ground Moving Target Detection Method for Seismic and Sound Sensor Based on Evolutionary Neural Networks," Appl. Sci., vol. 12, no. 18, p. 9343, 2022.
[15] D. S. Parihar, R. Ghosh, A. Akula, S. Kumar, and H. K. Sardana, "Seismic signal analysis for the characterisation of elephant movements in a forest environment," Ecol. Inform., vol. 64, p. 101329, 2021.
[16] A. C. Nur'aidha, S. Maryanto, and D. R. Santoso, "Implementation of MEMS accelerometer for velocity-based seismic sensor," in 2018 5th International Conference on Electrical Engineering, Computer Science and Informatics (EECSI), 2018, pp. 657–662.
[17] S. J. Sugumar, D. Jeevalakshmi, S. Shreyas, R. Vishnu, M. S. Suryakotikiran, and B. Kushalappa, "Analysis and Testing of Geophone for Different Soil Conditions for Elephant Intrusion Detection," in Innovations in Electronics and Communication Engineering: Proceedings of the 9th ICIECE 2021, Springer, 2022, pp. 145–153.
[18] I. G. A. Poornima and B. Paramasivan, "Anomaly detection in wireless sensor network using machine learning algorithm," Comput. Commun., vol. 151, pp. 331–337, 2020.

Keywords: Deployment of sensors, Environments, Noisy, False Alarms

NUMERICAL STUDY OF FLOW AND HEAT TRANSFER IN A STRAIGHT DUCT CONTAINING A CIRCULAR REGION WITH A PAIR OF FINS

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ABSTRACT

Wavy channels are widely used in many heat transfer devices, especially heat exchangers [1]. Experimental and numerical studies have reported that higher heat transfer rates are achieved in wavy channels compared to straight channels due to the higher heat transfer surface area [2-3]. It is known that fins added into the channel increase thermal enhancement [4-5]. However, wavy channels and fins slightly increase the pressure drop [6]. In this study, a large circular region in a straight duct is considered in order to reduce the pressure drop. Fins are used to improve flow mixing. This study numerically investigates flow and heat transfer characteristics in a straight duct containing a circular region with a pair of fins. Analyzes are carried out with ANSYS Fluent solver. The pressure-velocity connection is handled with the SIMPLE algorithm. There are adiabatic straight sections at the inlet and outlet of the duct. The duct structure contains a circular region near the inlet of the duct, and a pair of fins are installed within the circular region. The walls of the duct before and after the circular region are flat. The circular region and subsequent channel surfaces are kept at a constant temperature of T_s=350K. Nusselt number (Nu), thermal enhancement factor (TEF), pressure drop, friction factor (f), and performance factor (PF) are calculated for different Reynolds numbers. The results of the study are given as a function of dimensionless numbers. The numerical study is compared with previous study results [7]. To observe the effects of the circular region and the pair of fins on the flow and temperature fields, velocity and temperature contours are obtained, and the results are discussed. In addition, the study results are compared to the duct without fins and the straight duct. Numerical results show that the fins in the circular region increased the Nusselt number. However, the presence of fins causes a slight increase in pressure drop.

References:

[1] Alam T, & Kim MH. (2018). A comprehensive review on single phase heat transfer enhancement techniques in heat exchanger applications. *Renewable and Sustainable Energy Reviews*, 81, 813-839.
[2] Kurtulmus N, Sahin B. (2019). A review of hydrodynamics and heat transfer through corrugated channels. *International Communications in Heat and Mass Transfer*, 108, 104307.
[3] Ajarostaghi SSM, Zaboli M, Javadi H, Badenes B, & Urchueguia JF. (2022). A review of recent passive heat transfer enhancement methods. *Energies*, 15, 986.
[4] Modi, Ashish J., & Manish K. Rathod. (2019). Comparative study of heat transfer enhancement and pressure drop for fin-and-circular tube compact heat exchangers with sinusoidal wavy and elliptical curved rectangular winglet vortex. *International Journal of Heat and Mass Transfer*, 141, 310-326.
[5] Nitturi LK, Kapu VK, Gugulothu R, Kaleru A, Vuyyuri V, & Farid A. (2023). Augmentation of heat transfer through passive techniques. *Heat Transfer*, https://doi.org/10.1002/htj.22877
[6] Akçay S. (2023). Numerical analysis of hydraulic and thermal performance of Al_2O_3-water nanofluid in a zigzag channel with central winglets. *Gazi University Journal of Science*, 36 (1), 383-397.
[7] Wang G, Qia C, Liu M, Li C, Yan Yu, & Liang L. (2019). Effect of corrugation pitch on thermo-hydraulic performance of nanofluids in corrugated tubes of heat exchanger system based on exergy efficiency. *Energy Conversion and Management*; 186, 51–65.

Keywords: Circular region, Fins, Straight duct, Heat transfer, Laminar flow, Thermal enhancement

COMPARISON OF CARDIORESPIRATORY FITNESS, RESPIRATORY MUSCLE STRENGTH AND ENDURANCE LEVELS OF INDIVIDUALS WITH METABOLIC SYNDROME WITH HEALTHY INDIVIDUALS

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ABSTRACT

Backgraund and aim: Low levels of CRF have been associated with the constellation of metabolic abnormalities that constitute MetS. Maximal oxygen consumption (VO_{2max}) is the gold standard for objective assessment of CRF(1). This study aimed to compare VO_{2max}, respiratory muscle strength and endurance in individuals with MetS with healthy individuals.
Methods: 37 individuals diagnosed with MetS (50.81±5.31 years) and 20 healthy individuals (50.65±9.96 years) were included in this study. Demographic and clinical characteristics of the individuals were recorded. Respiratory muscle strength [maximal inspiratory pressure (MIP), maximal expiratory pressure (MEP)□] were evaluated using a portable mouth pressure measuring device (MicroRPM; Micromedical, Kent, United Kingdom), respiratory muscle endurance according to the constant workload principle with Power Breathe (HaB International Ltd. Southam, England) and VO_{2max} was measured by cardiopulmonary exercise test (CPET)(2, 3).
Results: The demographic characteristics of the individuals were similar ($p>0.05$). VO_{2max} (kg/ml/min), expected VO_{2max} (%), MIP (cmH2O), MEP (cmH2O) and respiratory muscle endurance (cmH2O*sec) were found to be lower in individuals with MetS than in healthy individuals ($p<0.05$).
Discussion and Conclusion: VO_{2max}, the most important indicator of CRF, decreased in individuals with MetS. It is known that high CRF strengthens anti-inflammation by suppressing pro-inflammation, protects against MetS by increasing insulin sensitivity, glucose metabolism and fatty acid oxidation(4). Respiratory dysfunction is associated with mortality from cardiovascular and other causes of death. Studies have shown that systemic inflammation may cause airway limitation due to the risk factors involved in METS, which is a clinically complicated disease, and an increase in pro-thrombotic and pro-inflammatory tendencies(5). When planning cardiac rehabilitation programs in patients with MetS, determining CRF levels and respiratory functions and determining individual exercise programs to increase these should be taken into consideration in the treatment of MetS.

References:

1. Hassinen M, Lakka TA, Savonen K, Litmanen H, Kiviaho L, Laaksonen DE, et al. Cardiorespiratory fitness as a feature of metabolic syndrome in older men and women: the Dose-Responses to Exercise Training study (DR's EXTRA). Diabetes care. 2008;31(6):1242-7.
2. Laveneziana P, Albuquerque A, Aliverti A, Babb T, Barreiro E, Dres M, et al. ERS statement on respiratory muscle testing at rest and during exercise. European Respiratory Journal. 2019;53(6).
3. Radtke T, Vogiatzis I, Urquhart DS, Laveneziana P, Casaburi R, Hebestreit H. Standardisation of cardiopulmonary exercise testing in chronic lung diseases: summary of key findings from the ERS task force. Eur Respiratory Soc; 2019.
4. Bull FG, S.; Lambert, V.; Pratt, M. . Physical Activity for the Prevention of Cardiometabolic Disease.In: Prabhakaran D, Anand, S., Gaziano, T.A.,, Mbanya JC, Wu, Y., Nugent, R., Eds.; T, editors. In Cardiovascular, Respiratory, and Related Disorders. The World Bank: Washington, DC, USA, 20172017.
5. Baffi CW, Wood L, Winnica D, Strollo Jr PJ, Gladwin MT, Que LG, et al. Metabolic syndrome and the lung. Chest. 2016;149(6):1525-34.

Keywords: Metabolic syndrome, cardiorespiratory fitness, maximal oxygen consumption, respiratory muscle strength.

HIGHLY SELECTIVE POTENTIOMETRIC ELECTRODES FOR THE DETERMINATION OF ZINC(II) IONS IN DRUG SAMPLES

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ABSTRACT

Zinc contributes to many metabolic processes including gene expression, DNA synthesis, enzymatic catalysis, apoptosis, hormonal storage and neurotransmission in the human body [1]. Zinc is widely used in various industries and can pollute the environment. High doses of zinc can cause fever, stomach ache, vomiting, chills, nausea, renal and internal organs failures [2]. Thus, the determination of zinc in different samples is of high importance. Potentiometric ion–selective electrodes have advantages such as wide linear range, low detection limit, high selectivity, fast response time, low cost and high precision in the determination of various ions [3, 4]. In this study, PVC membrane potentiometric ion selective electrodes were prepared for the determination of zinc(II) ions using tetrabutylthiuram disulfide as ionophore. The prepared electrode exhibited a linear behaviour over a wide concentration range, as well as a high selectivity towards Zn(II) ions. Zinc(II)–selective potentiometric electrode had fast response time, good repeatability and high stability. It could work in a wide pH range without being affected by pH changes. Finally, the developed ion–selective electrode was successfully used for the determination of Zn(II) analysis in a drug sample.

References:

[1] Truong-Tran, A. Q., Ho, L. H., Chai, F., & Zalewski, P. D. (2000). Cellular zinc fluxes and the regulation of apoptosis/gene-directed cell death. The Journal of nutrition, 130(5), 1459S-1466S.

[2] Isildak, Ö., Özbek, O., & Yigit, K. M. (2021). Zinc (II)-selective PVC membrane potentiometric sensor for analysis of Zn2+ in drug sample and different environmental samples. International Journal of Environmental Analytical Chemistry, 101(14), 2035-2045.

[3] Özbek, O., Çetin, A., Koç, E., & Isildak, Ö. (2022). Synthesis and sensor properties of a phenol derivative molecule: potentiometric determination of silver (I) ions. Electrocatalysis, 13(4), 486-493.

[4] Özbek, O., & Isildak, Ö. (2022). Potentiometric determination of copper (II) ions based on a porphyrin derivative. Journal of the Chinese Chemical Society, 69(7), 1060-1069.

Keywords: Ion–selective electrodes, potentiometry, zinc(II), sensor

PHYSICAL CHARACTERISTICS OF METALLIC DYAG IN B2 STRUCTURE: A FIRST-PRINCIPLES INVESTIGATION

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ABSTRACT

The structural, elastic, electronic and thermodynamic properties of DyAg were investigated using the first-principles calculations. Presented herein are the outcomes pertaining to fundamental physical parameters, encompassing the lattice constant, bulk modulus, pressure derivative of bulk modulus, Zener anisotropy factor, Poisson's ratio, Young's modulus, and isotropic shear modulus by using generalized density approximation (GGA) method. The thermodynamic properties of DyAg were determined using the quasi-harmonic Debye model a range of 0-60 GPa and temperatures spanning 0-1000 K. The obtained results align with both experimental and theoretical values.

Keywords: Pressure effects, DyAg, Cubic, Thermodynamic properties, Elastic constants.

EXPERIMENTAL AND MODELING INVESTIGATION OF MASS TRANSFER DURING HOT AIR DRYING OF AHLAT PEAR

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ABSTRACT

Drying is an energy-intensive process involving both heat and mass transfer, widely employed as a technique for preserving food [1]. Ahlat pear (Pyrus elaegrifolia L), naturally grown in Turkey and contains C and B vitamins, caroten, pectin, fruit acid, sugar and tannin. It can be consumed in dried or fresh form [2,3]. The main focus of this study is examining the efficacy of a cabinet dryer under diverse air temperatures (45, 55, and 65°C) with a consistent air velocity of 2 m/s in the drying process of Ahlat pears. The initial moisture content of Ahlat pears' samples was successfully reduced from 68.75% to 20 % (wet basis), and a comprehensive analysis was made for their drying characteristics and kinetics. The impact of drying air temperature on drying time is clearly substantiated by the results. Drying curves illustrate a falling-rate period during the drying process without noticing any constant-rate period.

The study further elucidates the effective moisture diffusivity, evaluated via Fick's second law, revealing a range from 3.25×10^{-9} to 7.04×10^{-9} m²/s across the investigated conditions. Activation energy was estimated by a Arrhenius type equation as 35.51 kJ/mol. Five different mathematical models (Alibas, Aghbashlo, Logarithmic, Logistic, Page ve Henderson) were evaluated for moisture ratios using nonlinear regression analysis. The results of regression analysis indicated that the Alibas model is the best model to describe the drying behaviour with the lowest $\chi^2$and RMSE values and highest R^2 values.

References:

[1] Beigi, M. (2016). Energy efficiency and moisture diffusivity of apple slices during convective drying. *Food Science and Technology*, 36(1), 145-150.
[2] Ilhan, M., Akkol, E. K., Taştan, H., Dereli, F. T. G., & Tümen, I. (2019). Efficacy of Pyrus elaeagnifolia subsp. elaeagnifolia in acetic acid–induced colitis model. *Open Chemistry*, 17(1), 13-22.
[3] Yerliturk F.U., Arslan O., Sinan S., Gencer N., Ozensoy O. (2008). Characterization of polyphenoloxidase from wild pear (Pyrus elaegrifolia), *J. Food Biochem.*, 32(3), 368-383.

Keywords: Hot-air drying, Ahlat pear, effective diffusivity, mathematical modelling, Alibas model.

ISOLATION OF LACTIC ACID BACTERIA WITH BACTERIOCIN ACTIVITY AND PRODUCTION OF DIFFERENT BACTERIOCINS

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ABSTRACT

Biopreservation systems in foods are of increasing interest to industry and consumers. Bacteriocin-producing Lactobacillus spp. known as "Generally Recognized as Safe (GRAS)", are used for controlling the rapid growth of pathogens and spoilage microbes in food and feed. Lactobacillus fermentum was isolated from fecal sample using MRS medium. It was defined morphologically by gram staining and colony morphology. Catalase activity was detected biochemically by methyl red, VP (Voges Proskauer) and carbohydrate fermentation tests. Antibiotic resistance screening of Lactobacillus fermentum was confirmed by agar well diffusion method. Molecular characterization and molecular weight of the bacteriocin protein were determined using SDS PAGE. After further characterizations produced bacteriocin proteins will be used as a biopreservative in the food industry in the future.

Keywords: Antimicrobial Activity, Bacteriocin, *Lactobacillus spp.*, SDS PAGE

SALT AND MEAT

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ABSTRACT

Meat and meat products are considered essential components of the human diet, as they are a source of very high quality protein, essential amino acids, B-group vitamins and important minerals such as iron and zinc. Meat and meat products are among the products in which salt is used most intensively. Salt; It is an indispensable additive because it limits microbial growth, forms emulsion by dissolving proteins, increases water holding capacity, and formation of characteristic structure, taste, flavor and odor. On the other hand, excessive salt consumption brings many health risks. For this reason, there has been pressure on the meat industry to produce less salty and/or unsalted products. In this study, the functions and reduction strategies of salt in meat and meat products were evaluated.

Keywords: Meat, Meat products, Salt, Salt reduction, Salt replacement

POLITICAL DISCOURSE IN THE KAZAKH LANGUAGE: A REVIEW OF THE LITERATURE AND THE CREATION OF A TEXT CORPUS

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ABSTRACT

The corpus of political discourse texts is a collection of text documents containing texts related to political topics, debates and discussions. Such texts can be political speeches, laws, political programs, articles, discussions on social networks, news materials, interviews with political figures and much more.
In this article, the results of a study on the review of literature at the world and local level are written, the work of various researchers is analyzed and examples of their work are given.

This article also provides an overview of the analysis of Internet resources devoted to political discourse in the Kazakh language, as well as describes the initial steps to create a corpus of texts for research in this area. The study's significance lies in supporting the concept of a "hearing state" and contributing to scientific and technological development in Kazakhstan.

Keywords: Political discourse, A text corpus, Analysis, Kazakh language, Internet source, Official website of the political party

PRODUCTION CALCULATION IN NON-HAZARDOUS WASTE RECYCLING FACILITY

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ABSTRACT

In this study, packaging waste collection, separation and pressing work is carried out in a business located in Çankırı. Packaging wastes from various productions are first weighed from the scale and discharged into the collection area. Here, the same size is passed through the appropriate number of separation belts. Packaging wastes from the separation belt are collected in prepared boxes. After the collection separation, it goes to the pressing belt. After the pressing process, the packaging waste is sent to the temporary storage area and the recycling facility. It is offered for sale to companies that are in special demand. Packaging waste, which is defined as non-hazardous waste, is used in the facility. Wooden packaging, metallic packaging, composite packaging, glass packaging, textile packaging wastes are also evaluated in the facility. Since heat treatment is not used in the facility, there is no harmful transfer that will cause air emissions. Despite the fact that domestic wastewater is generated at the facility, it is exempted from "wastewater discharge". The annual production amount, press calculation and necessities of the facility were calculated.

Keywords: Packaging waste, Production capacity, Waste collection, Waste separation

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INTERNET BASED DOOR AUTOMATION SYSTEM

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ABSTRACT

The Internet of Things (IoT) has become an application that is included in our daily lives thanks to rapidly developing technology. IoT has an important place in the development of internet-based smart home applications. In this study, it is aimed to control the exterior door of the apartment using a smartphone with the NodeMCU development card integrated into the door automation systems at home. By connecting to the home network with the built-in Wi-Fi receiver on the development board, the automatic exterior door can be controlled via a single-channel relay with the software on the designed circuit board. The development card used in the smart home system was preferred because it was economical and open source. It is thought that the system can be designed by users using simple circuit elements and software code.

Keywords: Internet of Things, IoT, Door, Automation, NodeMCU

THE EFFECT OF MARULA OIL ON THE RELEASE OF MADECASSOSIDE

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ABSTRACT

Specifically, the impact of natural oils on drug release in cream formulations was investigated through UV-Vis Spectrophotometry analysis. Transdermal drug delivery has become increasingly important in the field of medicine, offering an effective method for delivering drugs through the skin to achieve desired therapeutic effects. [1] Among the various approaches used in transdermal applications, topical creams have gained significant attention. [2] The aim of this study was to enhance the drug release from creams, a commonly employed transdermal drug delivery method, by formulating them with marula oil. Specifically, the impact of marula oil on drug release in cream formulations was investigated through UV-Vis Spectrophotometry analysis. The experimental findings clearly indicate that the inclusion of marula oil enhances the drug release in creams. To compare the release profiles, various kinetic models such as zero-order, first-order, Higuchi, and Korsmeyer Peppas were employed. The focus of this study centered on investigating the release of the active ingredient madecassoside, derived from the Centella asiatica plant. Madecassoside is widely recognized in the cosmetic industry for its beneficial properties, including soothing the skin, promoting healing, and combating signs of aging. [3] In conclusion, the inclusion of marula oil in cream formulations was found to increase drug release compared to the base formulation. Release performance in the formulations was observed for 120 minutes. In the cream formulation reinforced with marula oil, it provided 38% permeability by mass at the end of the 120th minute. This study highlights the potential of marula oil as an effective ingredient in transdermal drug delivery, particularly for enhancing the release of madecassoside in topical creams. Further research and optimization of formulations can lead to improved therapeutic outcomes and enhanced patient convenience.

References:

[1] Harneet Marwah, Tarun Garg, Amit K. Goyal, and Goutam Rath. (2016). Permeation enhancer strategies in transdermal drug delivery. Drug Delivery (23), 564-578.
[2] Ansel HC, Popovich NG, Allen LV. (1995). Pharmaceutical dosage forms and drug delivery systems.
[3] Guangtao Jia, Xiuyang Lu. (2008). Enrichment and purification of madecassoside and asiaticoside from Centella asiatica extracts with macroporous resins. Journal of Chromatography A, 1193(1-2), 136-141.

Keywords: Topical Drug Delivery, Madecassoside, Kinetic model, Marula oil

STUDY THE CORRELATION BETWEEN THE FOLIC ACID SUPPLEMENTS AND THE LEVELS OF EACH SERUM HOMOCYSTEINE IN PATIENT WITH CHRONIC KIDNEY DISEASE

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ABSTRACT

This study compared blood homocysteine and other indicators in chronic renal disease patients to healthy individuals. The study also examined how folic acid supplements affect serum homocysteine levels. This study selected 150 blood samples from 35–70-year-old chronic renal failure (CRF) patients. Kirkuk General Hospital patients from September to December 2021 were interviewed using a specially prepared questionnaire to acquire thorough medical history. Diabetes, liver disorders, hypertension, medication dose, and anemia were eliminated from the study. All 50 disease-free patients and healthy individuals gave a 5ml sample. Patients showed a significant increase ($P<0.05$) in urea, creatinine, and homocysteine levels compared to the control group. The new study found a strong association between folate concentration and homocysteine levels after giving folic acid. Chronic renal failure patients' homocysteine levels improved.

Keywords: homocysteine, chronic renal failure, folic acid, kidney function, urea

IMMOBILIZATION OF PROBIOTIC BACTERIA INTO BIOCOMPATIBLE SUPPORT MATERIALS

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ABSTRACT

The study aimed to immobilize breast milk bacteria with desired probiotic properties. Chitosan-polyethylene glycol (PEG) composite was chosen as the immobilization material. This material was expected to preserve its physical properties at low pH and in bile salts, and to allow the biological activities of the probiotic organism. In this direction, the immobilization of the functional groups on the composite surface was decisive. In the study, successful immobilization of probiotic bacteria was achieved and the viability of these bacteria before and after immobilization in chitosan-PEG support material was investigated. High viable counts (~146 cfu/g) were obtained after 48 hours of incubation at 37°C. Bacteria were dissociated from gel beads by various methods. Model digestion conditions were tested and the robustness of immobilized bacteria was investigated. Immobilized cells showed high resistance to low and neutral pH values, and similarly high viable counts were also obtained in the presence of simulated pepsin (~100 cfu/g) and high concentrations of bile salts (~200 cfu/g). In addition, it was determined that immobilized probiotic bacteria showed increased resistance to various antibiotics (such as Vancomycin, Penicillin).

Keywords: Immobilization, Chitosan, Lactic Acid Bacteria, Probiotic

PETROGRAPHIC CHARACTERISTICS OF THE MAFIC ENCLAVES OF NEOGENE LAVA DOME AROUND SAĞLIK AND YATAĞAN AREA, KONYA/TÜRKİYE

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ABSTRACT

To the west of Konya, a widespread lava dome has evolved as a component of Neogene Erenlerdagi volcanism associated with subduction. Its formation involved assimilation-fractional crystallization (AFC) and/or magma mixing processes. The lava is characterized by occurrence well-developed Mafic Microcrystalline Enclaves (MME), which has variable sizes (from a few cm to a few meters) and shapes (ellipse/rounded-angular).

The enclave comprises phenocrysts of plagioclase (10-50%), green amphibole (10-15%), quartz (ocelli) (0-10%), biotite (0-5%), epidote (0-5%), and opaque minerals (5-50%). The matrix consists of plagioclase, chlorite, light green epidote, green amphibole, biotite, and opaque iron ore.

Keywords: Neogene, volcanism, enclave, lava, Konya

INVESTIGATION OF THE ANTIENZYME AND ANTIMICROBIAL PROPERTIES OF THE FRUIT EXTRACTS OF THE OLEASTER (ELAEAGNUS ANGUSTIFOLIA L.) UNDER IN VITRO CONDITIONS

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ABSTRACT

Oleaster fruit, which is a rich source of nutrients, is also an important source of antioxidants. Not only the fruit but also all parts of the plant such as roots, bark, flowers and leaves have medicinal properties. For this reason, this plant is utilized in many sectors such as food, medicine and perfumery. PPO, an enzyme commonly found in fruits and vegetables, causes enzymatic browning, resulting in loss of color, odor, taste, nutritional and economic value of foods. At the same time, it is of great importance to prevent microbiological spoilage that causes food spoilage. In this study, the inhibition effect of the oleaster fruit against the PPO enzyme and its antimicrobial effect against 4 pathogenic bacteria and one yeast cell were investigated by well diffusion technique. At the end of the study, it was observed that there was no inhibition effect and antimicrobial effect of oleaster fruit. As a result, it was determined that the extraction and inhibition method changes the inhibition depending on the enzyme and the effect on the enzyme in anti-enzyme studies. In addition, in antimicrobial studies, it was observed that the extraction method, especially the strain used, affected the antimicrobial study result.

Keywords: Elaeagnus angustifolia L., PPO inhibition, Antibacterial, Antifungal

DETECTION OF 4-METHYL IMIDAZOLE IN DARK SOFT DRINKS

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ABSTRACT

The coloring agent caramel is used in a variety of popular drinks like beers, dark soft drinks another food product. The manufacturing process of these drinks and food product can expose consumers to 4-methylimidazole (4-MEI), and its possible carcinogen [1].

Although a standardized categorization for 4-methylimidazole (4-methylimidazole) has not yet been determined, there are a number of issues regarding the substance's toxicity to humans [2].

the goal of the current study is to determining the 4-methylimidazole levels in soft drinks (Cola) from the local market in IRAQ/Baghdad 2023, fifty soft drink samples(cola) in total were gathered and examined HPLC technique, 20% of samples contain high concentration of (4-methylimidazole) above (250ppm) and its higher than the permissible limits,4-methylimidazole is not a genotoxic carcinogen, according to many Genotoxicity research. Consequently [3].

Keywords: 4-methylimidazole, cola, dark soft drinks, HPLC

ANALYSIS OF STRUCTURAL, ELECTRONIC, MECHANICAL AND THERMODYNAMIC PROPERTIES OF IR3TIC COMPOUND USING DFT

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ABSTRACT

Antiperovskite materials are a class of materials of great interest due to their unique physical, chemical and thermodynamic properties [1]. These materials are electronically inverted perovskites and have emerged as a growing class of versatile materials, thus providing materials scientists with an effective and fruitful area of research. In our study, the compound Ir3TiC, an antiperovskite compound, was theoretically analysed. Our study is a purely theoretical study, no experimental parameters were used. The compound has pm3m space group and has cubic structure [2]. The structural, electronic, mechanical and thermodynamic properties of the compound were analysed by the DFT method using the first principles method. Firstly, the structural parameters were determined using geometrical optics. The lattice constant, Bulk modulus and the first derivative of the Bulk modulus were determined by fitting the Murnaghan equation [3]. They were compared with the theoretical and experimental parameters available in the literature. Elastic constants were obtained by Stress-Strain method. The elastic constants were found to be structurally stable by determining their conformity with Born criteria. Young's modulus, Shear modulus, Bulk modulus, Paugh ratio, Caushy pressure and Poisson's ratio, anisotropy value, melting temperature, Debye temperature were obtained from elastic constants. Pugh ratio, Caushy pressure and Poisson's ratio indicated that the compound has a ductile structure. Electronic band structure calculations are important for understanding the physical properties of the crystal structure. By analysing the electronic properties, information such as the nature of the band gap and carrier density is obtained. Electronic band structure calculations showed that the compound is mechanical in nature. In addition, finally, parameters such as Bulk modulus, volume, Heat capacity were determined by detailed analysis of thermodynamic properties.

References:

[1] Mehmood, M., Nasir Rasul, M., Hussain, A., Amir Rafiq, M. b, Iqbal, F., Manzoor, A., Azhar Khan, M., Investigation of structural, electronic, elastic, magnetic and thermodynamic properties of antiperovskites XCRh3 (X = Cd, Ta, W, Re, Os, Ir, Pt, Au, Hg, Ce, Pr, Nd, Pm, Sm, Eu, Tb), Physica B: Condensed Matter, 649, 414442, 2023.

[2] Cherrad, D.,Selmani, L., Maouche, D. and Maamache, M. First principles calculations on elasticity, electronic structure and bonding properties of antiperovskites ANTi3 (A = Al, in and Tl), Journal of Alloys and Compounds, 509, 12, 4357–4362, 2011.

[3] Birch,F., The effect of pressure upon the elastic parameters of isotropic solids, according to Murnaghan's theory of finite strain, Journal of Applied Physics, 9, 279–288, 1938.

Keywords: Antiperovskite, ductile, thermodynamics

INVESTIGATION OF THERMAL ENHANCEMENT IN A WAVY CHANNEL WITH CIRCULAR CYLINDERS

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ABSTRACT

The combined use of wavy surfaces and vortex generators is a common practice to increase heat transfer improvement [1, 2]. These applications are widely used in many thermal devices, especially in heating and cooling processes [3]. Numerical and experimental works have declared that higher thermal enhancement are obtained in these applications compared to flat channels due to the higher heat transfer area and flow mixing [4-5]. However, wavy channels and vorteks generations slightly increase the pumping power [6]. The present study numerically investigates the flow and thermal enhancement in a circular wavy channel with different positions of circular cylinders. Solutions are conducted using ANSYS Fluent program with standard k-ε turbulence model. The pressure-velocity relation is handled with the SIMPLE algorithm. In the study, three different channel flows are examined: Channel 0 (without cylinder), Channel 1 (with one circular cylinder), and Channel 2 (with two circular cylinder). There are adiabatic flat parts at the inlet and outlet of the channel. The circular wavy surfaces of the channel are kept at a constant temperature of T_s=340K. The working fluid is air. Nusselt number (Nu), pressure drop (????P), friction factor (f), and thermal enhancement factor (TEF) are found for different Reynolds numbers ($2000 \leq Re \leq 8000$). The numerical work is compared with previous study results. To observe the effects of the circular wavy channel and the circular cylinders on the flow and temperature fields, the velocity and temperature contours are obtained, and the results are discussed. In addition, the study results are compared to the flat channel. Numerical results show that the circular wavy channel increased the Nusselt number. However, the presence of circular cylinders causes a slight increase in friction factor. The highest heat transfer was found as Nu = 11.62 in Channel 1 at Re = 8000. The highest-pressure drop was obtained to be ΔP= 20.05 Pa in Channel 1 at Re=8000.

References:

[1] Ajarostaghi SSM, Zaboli M, Javadi H, Badenes B, & Urchueguia JF. (2022). A review of recent passive heat transfer enhancement methods. Energies, 15, 986.
[2] Kurtulmus N, Sahin B. (2019). A review of hydrodynamics and heat transfer through corrugated channels. International Communications in Heat and Mass Transfer, 108, 104307.
[3] Nitturi LK, Kapu VK, Gugulothu R, Kaleru A, Vuyyuri V, & Farid A. (2023). Augmentation of heat transfer through passive techniques. Heat Transfer, https://doi.org/10.1002/htj.22877
[4] Alfellag M A, Ahmed H E, Jehad M G, Farhan A A., 2022. The hydrothermal performance enhancement techniques of corrugated channels: A review. Journal of Thermal Analysis and Calorimetry, 147: 10177-10206.
[5] Akçay S. (2023). Numerical analysis of hydraulic and thermal performance of Al2O3-water nanofluid in a zigzag channel with central winglets. Gazi University Journal of Science, 36 (1), 383-397.
[6] Salami M, Khoshvaght-Aliabadi M, Feizabadi A., 2019. Investigation of corrugated channel performance with different wave shapes. Journal of Thermal Analysis and Calorimetry, 138: 3159-3174.
[7] Choudhary T, Sahu MK, Shende V, & Kumar A. (2022). Computational analysis of a heat transfer characteristic of a wavy and corrugated channel. *Material Today: Proceedings*, 56, 263-273.

Keywords: Circular wavy channel, circular cylinder, Pressure drop, Thermal enhancement, Turbulent flow

OPTIMAL SHEAR WALL HEIGHT FOR LATERAL LOAD RESISTANCE IN WALL-FRAME STRUCTURES

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ABSTRACT

Concrete shear walls are commonly used due to their advantages in reducing lateral displacement and enhancing seismic performance. These walls are subjected to gravity and lateral loads, as well as overturning moments and shear forces. They have a high stiffness that limits the lateral displacement of the building [1, 2]. The height and location of shear walls play a significant role in controlling the building response, reliability, and overall construction cost. Therefore, these walls need to be optimized [3, 4]. This study uses a continuous model to analyze the optimal height of the shear wall in long-walled frame buildings [5]. The model is based on hyperbolic functions that require high computational accuracy for large values of variables. The optimal height is determined by minimizing the top deflection of the structure and avoiding negative moments and shear forces in the wall. The optimal height is always between the inflection point and the zero wall cut-off point in the corresponding full-height wall structure. This result facilitates the search for the optimal height of the wall. The optimal height also corresponds to zero shear force at the top of the wall, which is a simpler criterion for finding the height of the shear wall.

References:

[1] Nollet, M.J., Behaviour of wall-frame structures: a study of the interactive behaviour of continuous and discontinuous wall-frame structures, PhD Thesis, McGill University, Title of Institue, 1991, 252, Montreal, Canada.
[2] Nollet, M. J., & Smith, B. S., (1998). Stiffened-story wall-frame tall building structure. Computers & structures, 66(2-3), 225-240.
[3] Aydin, A.C., & Bayrak, B., (2021). Design and performance parameters of shear walls: a review. Architecture, Civil Engineering, Environment, 14(4), 69-94.
[4] Abualreesh, A.M., Tuken, A., Albidah, A., & Siddiqui, N.A., (2022). Reliability-based optimization of shear walls in RC shear wall-frame buildings subjected to earthquake loading. Case Studies in Construction Materials, 16, p.e00978.
[5] Bhatta, B. D., Vimalanandan, G., & Senthilselvan, S., (2017). Analytical study on effect of curtailed shear wall on seismic performance of high rise building. International Journal of Civil Engineering and Technology, 8(2), 511-519.

Keywords: Dual structural system, Optimal shear wall height, Continuum model

EFFECT OF SMARTPHONE ADDICTION ON SLEEP QUALITY AND VISUAL PERCEPTION AMONG UNIVERSITY STUDENTS: A PILOT STUDY

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ABSTRACT

The development of smartphones in recent years has not only made our daily lives easier, but it can also cause smartphone addiction [1,2]. Studies indicate that smartphone addiction brings negative health consequences [3]. The aim of this study is to examine the relationship of smartphone addiction with sleep quality and visual perception in university students. Seven healty university students were included in the study. After the demographic information of the participants was obtained Smartphone Addiction Scale (SAS) [4], Pittsburg Sleep Quality Index (PSQI) [5] and Motor Free Visual Perception Test-3 (MVPT-3) [6] were administered to the participants. Spearmen Correlation Analysis was used to determine the relationship between the participants' smartphone addiction level and their sleep quality and visual perception level. 7 female university students participated in this pilot study. Their mean age was 20□0.8 years. According to the correlation analysis data, there was a strong negative correlation between the smartphone addiction level and quality of sleep (r=-.954, p=.001). However, there was no relationship between the smartphone addiction level and visual peeception's total score (p>0.05). But, there is a weak and positive relationship between sleep latency, which is the subheading of the Sleep Quality Index, and visual discrimination (r=.778, p=.039) and figure ground (r=.816, p=.025), which are the subheadings of the Motor Free Visual Perception Test-3. According to the results of the study, it is seen that smartphones can affect people's health. Because sleep is one of the basic life activities that affects individuals' quality of life and health [7]. These results may be useful to protect people from smartphone addiction. However, large-scale research is needed to better understand the effects of smartphone addiction on human health.

References:

[1] Lane, H. Y., Chang, C. J., Huang, C. L., & Chang, Y. H. (2021). An investigation into smartphone addiction with personality and sleep quality among university students. International journal of environmental research and public health, 18(14), 7588.
[2] Ghosh, T., Sarkar, D., Sarkar, K., Dalai, C. K., & Ghosal, A. (2021). A study on smartphone addiction and its effects on sleep quality among nursing students in a municipality town of West Bengal. Journal of Family Medicine and Primary Care, 10(1), 378.
[3] Zhang, M. X., & Wu, A. M. (2020). Effects of smartphone addiction on sleep quality among Chinese university students: The mediating role of self-regulation and bedtime procrastination. Addictive Behaviors, 111, 106552.
[4] Kwon, M., Lee, J. Y., Won, W. Y., Park, J. W., Min, J. A., Hahn, C., Gu, X., Choi, J. H., & Kim, D. J. (2013). Development and validation of a smartphone addiction scale (SAS). PloS one, 8(2), e56936.
[5] Buysse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry research, 28(2), 193-213.
[6] Metin, Ş., Aral, N. (2013). Motor Beceriden Bağımsız Görsel Algı Testi-3: Geçerlik Güvenirlik Çalışması. Journal of the Institute of Social Sciences Cankiri Karatekin University, 4(2), 57-72.
[7] Acikgoz, A., Acikgoz, B., & Acikgoz, O. (2022). The effect of internet addiction and smartphone addiction on sleep quality among Turkish adolescents. PeerJ, 10, e12876.

Keywords: Smartphone addiction, Sleep quality, Visual perception

THE IMPACT OF CHEMISTRY ON THE GLOBAL ECONOMY

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ABSTRACT

Chemistry plays an integral role in driving the global economy by providing the fundamental building blocks for various industries and sectors. Its impact is pervasive, influencing everything from the production of energy and materials to the development of pharmaceuticals and agricultural advancements. The chemical industry itself generates substantial economic output, contributing significantly to global GDP and employment. Moreover, advancements in chemistry fuel innovation across other industries, leading to the creation of new products, processes, and services that further stimulate economic growth. Chemistry-using professionals play a significant role in the labor market. In 2019, there were an estimated 275,000 chemistry-using professionals in employment in the UK, up from 272,000 in 2013. The largest shares are in London and the South East, with the North West also acting as an important regional hub. Chemistry-using professionals encompass a wide range of occupations, from academic chemists in universities and professional chemical scientists in industry to chemistry teachers in schools and those in sales and marketing roles. They classified them into four distinct groups: Group 1 includes occupations where chemistry knowledge is of high importance (academics, professional chemists), while Group 4 includes those where chemistry knowledge is less important, but still a significant component of the role (sales, marketing, some engineering and science professionals). They are, overall, a highly qualified cohort, with most occupations classified under Major Groups 2 and 3 (Professional and Associate Professional and Technical occupations) in the Standard Occupational Classification 2010, which generally (but not necessarily) require a first degree or higher to enter [1]. Records have shown that the chemical industry plays a pivotal role in the strength of many developed economies such as that of the United States, Germany, United Kingdom, Belgium, etc., and the advancement of humankind. The many sectors reliant on the United States (U.S.) chemical economy which account for about 25% of the U.S. GDP and support 4.1 million U.S. jobs are worthy of note [2]. The comprehensive situation of the chemical industry in the world, with our primary focus on a few countries; the U.S.A, Germany, China, and Nigeria, and what challenges face the chemicals sector as it moves toward green (sustainable) chemistry. The main attention is also paid to the impact of these chemical industries on the world's economy [3]. Due to modern innovative techniques and recent technological advancements, IP now forms a significant proportion of a company's assets. Compared to other industries, firms in the chemical industry constantly generate IP assets, making IP the driving force for creating value within the industry. With the significant expansion of M&A activity ongoing within the industry, IP continues to drive the industry for growth, strategic change, and consolidation. Besides the increasing M&A activity, a more complicated set of dynamics of high M&A failure rate is at work, particularly within the European Union (EU) chemical industry, where the average failure rate sits at 70-90% [4].

References:

[1] Econometrics, C. Chemistry's Contribution: workforce trends and economic impact.
[2] Udourioh, G. A., Okpo, E. O., & Nweke, P. I. (2023, November). Catalyzıng Sustaınable Economıc Development In Afrıca: The Potentıal Of Chemıcal Scıences And Chemıcal Industrıes. In Proceedıngs.
[3] Titilayo, E. A., & Hanchar, A. I. (2022). The place of the chemical industry in the world.
[4] Adetona, A. (2022). The Effect of Mergers and Acquisitions on the Management of Intellectual Property: A Case of the European Chemical Industry [Online]. Leeds Beckett University.

Keywords: Economy, Impact, Chemistry, Industry

MECHANICAL PROPERTIES OF HYDROTHERMALLY GROWN CARBON REINFORCED POLYPROPYLENE COMPOSITES

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ABSTRACT

This study reports mechanical properties of composites produced by adding certain amounts (10, 15 and 20 wt%) of hydrothermall grown carbon spheres (HTCs) into polypropylene (PP) were investigated. Composites were prepared by means of melt-mixing method. The effect of HTC amounts was also investigated. Scanning electron microscopy (SEM) was employed to study morphological and structural properties of the obtained composites. Thermal stabilities of the composites were studied by thermogravimetric analsysis under nitrogen atmosphere. Mechanical properties of the composited were evaluated by means of tensile tests. Although, PP/HTC composites yielded lower tensile strength compared to pristine PP, they showed improved performance as the HTC content increased, their performance increase as more HTC was added. Addition of HTC caused a remarkable reduction in elongation of PP. Thermal stabilities of the composites were found to be higher than that of pristine PP. MFI values of the composites were shown to increase as more HTC added. This study could be assessed as a means of useful data for future applications of HTC as potential filler in polymer science and technology.

References:

[1] Wang J, Song F, Ding Y, Shao M. The incorporation of graphene to enhance mechanical properties of polypropylene self-reinforced polymer composites. Mater Des 2020;195:109073.
[2] Menyhárd A, Varga J. The effect of compatibilizers on the crystallisation, melting and polymorphic composition of β-nucleated isotactic polypropylene and polyamide 6 blends. Eur Polym J 2006;42:3257–68.
[3] Martínez-Colunga JG, Sánchez-Valdés S, Ramos-Devalle LF, Muñoz-Jiménez L, Ramírez-Vargas E, Ibarra-Alonso MC, et al. Simultaneous polypropylene functionalization and nanoclay dispersion in PP/Clay nanocomposites using ultrasound. J Appl Polym Sci 2014;131:1–8.
[4] Barkoula NM, Alcock B, Cabrera NO, Peijs T. Flame-Retardancy Properties of Intumescent Ammonium Poly(Phosphate) and Mineral Filler Magnesium Hydroxide in Combination with Graphene. Polym Polym Compos 2008;16:101–13.
[5] Papageorgiou DG, Li Z, Liu M, Kinloch IA, Young RJ. Mechanisms of mechanical reinforcement by graphene and carbon nanotubes in polymer nanocomposites. Nanoscale 2020;12:2228–67.
[6] Rao CNR, Sood AK, Subrahmanyam KS, Govindaraj A. Graphene: The New Two-Dimensional Nanomaterial n.d.
[7] Galpaya D, Wang M, Liu M, Motta N, Waclawik E, Yan C. Recent Advances in Fabrication and Characterization of Graphene-Polymer Nanocomposites. Graphene 2012;01:30–49.

Keywords: Hydrothermal carbon, polypropyle, melt-mixing, composite, mechanical properties.

TREATMENT OF EXCESSIVE GINGIVAL DISPLAY AND DIASTEMA CLOSURE: A CASE REPORT

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ABSTRACT

Smile is an important facial expression and affects a person's self-confidence. Excessive gingival display while smiling and the gap between the proximal surfaces of the maxillary incisors are among the most notable aesthetic concerns. In this case report, the gingivectomy procedure and diastema closure were performed on a 23-year-old male patient who applied to our department with the chief complaint of excessive gingival display, short clinical crowns and spacing in the upper front tooth region.

Keywords: diastema, gingivectomy, gummy smile

METAL DOPED ZnO STRUCTURES

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ABSTRACT

Zinc oxide (ZnO) is one of the versatile and technologically interesting semiconducting materials because of its typical properties such as resistivity control over the range of 10^{-3}–10^{-5} Ω.cm [1], transparency in the visible range, high electrochemical stability, direct band gap, absence of toxicity and abundance in nature [2]. ZnO normally occurs in the hexagonal wurtzite crystal structure with a = 0.32488 nm and c = 0.52066 nm in the standard data (JCPDS, 36-1451). High-purity ZnO crystals exhibit strong n-type conductivity and have both good electronic and optical properties because of a stoichiometric deviation due to the existence of intrinsic defects such as O vacancies and Zn interstitials. However, the electrical and optical properties of pure ZnO are unstable due to the adsorption of atmospheric oxygen, and they can not meet the increasing needs of present-day applications. To stabilize them against such changes and enhance the properties of the ZnO, doping is necessary and this purpose was achieved by adding some dopants [3,4]. Moreover, doping leads to an increase in the conductivity of ZnO. ZnO doping was achieved by replacing Zn^{2+} atoms with the atoms of the dopant elements. The efficiency of the dopant element depends on its electronegativity and the difference between its ionic radius and the ionic radius of zinc [5]. Extensive studies have been carried out to modify the properties of ZnO for different applications. This presentation focuses on the electrical and optical properties of different metal-doped ZnO powder and thin film materials.

References:

[1] Chu, S. Y., Yan, T. M., & Chen, S. L. (2000). Analysis of ZnO varistors prepared by the sol±gel method. Ceramics International, 26 (7), 733-737.
[2] Shinde, V. R., Gujar, T. P., Lokhande, C. D., Mane, R. S., & Han, S. H. (2006). Mn doped and undoped ZnO films: A comparative structural, optical and electrical properties study. Materials Chemistry and Physics, 96 (2), 326-330.
[3] Zeng, D. W., Xie, C. S., Zhu, B.L., B. L. Song, & Wang, H. (2003). Synthesis and characteristics of Sb-doped ZnO nanoparticles. Materials Science and Engineering B, 104 (1-2), 68–72.
[4] Maity, R., Kundoo, S., & Chattopadhyay, K. K. (2005). Electrical characterization and Poole–Frenkel effect in sol–gel derived ZnO:Al thin films. Solar Energy Materials & Solar Cells, 86 (2) 217–227.
[5] Nunes, P., Fortunato, E., Vilarinho, P., & Martins, R. (2002). Effect of different dopant elements on the properties of ZnO thin film. Vacuum, 64 (3-4) 281–285.

Keywords: ZnO, Metal doping, Electrical conductivity, Optical properties

GOLGI PROTEIN AND ESTROGEN RECEPTOR IN WOMEN FOR DETECTION OF BREAST CANCER IN BAGHDAD CITY

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ABSTRACT

The aim of this study is to assess the serum levels of Golgi protein and estrogen receptor in women for detection of breast cancer and the correlation between them in Baghdad city. For the age study, there was a statistically significant difference when compared between the age groups and years of the studied groups, with 41–60 years being predominant. While within groups, it was documented that there was a highly significant difference. Within groups, there was a significant difference (Benign tumor: $P = 0.012$, at $P<0.05$) and a highly significant difference ($P = 0.00$, at $P<0.01$) for those under treatment. Eventually, it was proved that there was a similar mean of human Golgi protein 73 assay in the sera of breast cancer patients and their healthy controls with low levels in all the above studies. Furthermore, a non-significant ($P = 0.783$ at $P > 0.05$) when projected results of the estrogen receptor (ER) tumor marker test in sera of breast cancer patients {newly diagnosed: Positive: 36, (85.7%) higher than Negative: 6, (14.3%)} & {under treatment: Positive: 62, (83.8%) bigger than Negative: 12, (16.2%)}. Within groups, there was a highly significant difference ($P = 0.00$, at $P<0.01$) for both newly diagnosed and undertreated patients.

Keywords: Estrogen receptor, Golgi protein 73, Benign tumor, Breast cancer

MOLECULAR DOCKING AND ADMET STUDIES OF PODOPHYLLOTOXINE DERIVATIVES TARGETING RIBOSOMAL PROTEINS IN TRIPLE NEGATIVE BREAST CANCER (TNBC)

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ABSTRACT

Breast cancer is the most prevalent cancer in women worldwide, and Triple-negative breast cancer (TNBC) accounts for ~20% of all its cases [1]. The aim of this study is to treat human TNBC by inhibiting the deregulation of some ribosomal protein targets as an important therapeutic option [2,3]. podophyllotoxin derivatives are found to have beneficial health effects in treating Cancer [4,5] An effort has been made to virtually screen podophyllotoxin derivative inhibitors by molecular docking in the current studies. The best binding scores that have been resulted from the molecular docking analysis were by a Teniposide ligand with RPS9, RPS27, and RPL27A targets which are (-9, -9.1, and -9.1 kcal/mol sequentially), in addition to the highest binding energies of Dihydrotaiwanin, tetrahydrojusticidin B, Cleistantoxin, and Etop ligands with RPL11, RPL14, RPS14, and RPL32 targets respectively which are (-8.7, -8, -9, and -8.5 kcal/mol sequentially) .This study reveals that these podophyllotoxin molecules can be developed as a novel multi-target RPs target inhibitors with greater potential and low toxicity.

References:

[1] Kumar, P.; Aggarwal, R.(2018). *An overview of triple-negative breast cancer*. Arch. Gynecol , *plants journal.* Obstet. , 293, 247–269 .
[2] Chen, J., Qian, X., He, Y., Han, X. and Pan, Y. (2019) *Novel key genes in triple-negative breast cancer identified by weighted gene co-expression network analysis.cancer esearch journal*. J. Cell. Biochem. 120, 16900–16912.
[3] Lin, Z., Peng, R., Sun, Y., Zhang, L. and Zhang, Z. (2021) *Identification of ribosomal protein family in triple-negative breast cancer by bioinformatics analysis.the Biochemical Journal* . Biosci. Rep. 41.
[4] Liu, C., Wang, K., Zhuang, J., Gao, C., Li, H., Liu, L., et al. (2019). *The Modulatory Properties of Astragalus membranaceus Treatment on Triple-Negative Breast Cancer*: An Integrated Pharmacological Method. Front. Pharmacol. *The European Journal of Cancer*. 10:1171.doi: 10.3389/fphar.2019.01171.
[5] Antunez-Mojica, M., Rodriguez-Salarichs, J., Redondo-Horcajo, M., Leon, A.,Barasoain, I., Canales, A., et al. (2021). *Structural and Biochemical Characterization of the Interaction of Tubulin with Potent Natural Analogues of Podophyllotoxin. Biomedicine & Pharmacotherapy journal.* J. Nat. Prod. 79 (8), 2113–2121. doi: 10.1021/acs.jnatprod.6b00428.

Keywords: Keywords: Triple Negative Breast Cancer (TNBC), Ribosomal proteins(RPs), Podophyllotoxine derivatives, molecular docking

RELATIONSHIP BETWEEN AGE AND THE RISK OF DISEASES AFTER CHEMOTHERAPY FOR PATIENTS WITH BREAST CANCER

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ABSTRACT

Breast cancer is a common health problem that attacks women in the World, it is one of the most known malignancies with 23% of all types of cancers, with over one million new cases detected per year Roughly 4.4 million women are living with breast cancer and more than 400,000 died annually from the disease. This disease recorded 14% of all cancer deaths. It is the most common cause of female death in industrialized countries.

Small tumors are more treated successfully by early detection, delayed detection of breast cancer is correlated with danger clinical stages and low survival percentage. Reports in developed countries indicated that the median time to the consultation was 21- 90 days. Delayed detection of breast cancer for more than few months before physician checking can lead to the occurrence of breast cancer mortality rates are higher than in developing countries.

Mortality rates are higher in Africa than in richer world regions and improved access to known effective therapy, efficiently delivered, would, therefore, save lives. They also report that breast cancer also occurs in medium age Libyan women more than in other parts of the world.

Keywords: Keywords: Breast cancer, Risk Factors, Treatment, Age

REVIEW ON COLLAGEN EXTRACTION METHODS

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ABSTRACT

Collagen is a valuable protein with a wide variety of uses. It has wide applications in medicine, medical products, biomedical materials, food supplement, cosmetics and aesthetics. Interest in collagen have been increased in recent years. The most commonly used raw materials for collagen extraction are skin or hides, bones, tendons and cartilages [1]. Most commercial collagens are obtained from byproducts of mammals, especially cattle and pigs. Fish scales are a by-product/waste product containing significant collagen [2].

Moreover, there is a shift towards the use of marine sources for collagen production instead of pork and beef skin&bone which are traditional sources of collagen. Health risks such as bovine spongiform encephalopathy and religious beliefs also have a significant impact on this swift. In addition, studies on collagen extraction from poultry slaughter waste are also available in the literature [3].

Collagen extraction process consist of mainly pretreatments and hydrolysis; acidic hydrolysis, enzymatic hydrolysis and ultrasound supported acidic hydrolysis are commonly used methods. Acetic acid is most preferred source of acid there are also studies with citric acid. Recent studies are focused on ultrasound supported acidic or enzymatic hydrolysis which increases the yield of extraction and decrease the time of extraction. [4] Enzymatic hydrolysis has the advantage of preserving the original helix structure of collagen when compared to aggressive acidic hydrolysis. Extraction of collagen is to be conducted at temperatures below the denaturation temperature of collagen which is usually preferred below 25°C to 4°C. NaOH or Ca(OH)2 solution is used for removal of proteins followed by oil removal via butyl alcohol solution when using fish scales as collagen source. FTIR, UV spectrum, amino acid analysis, X-ray diffraction analysis are widely used for characterization of collagen.

References:

[1] Gómez-Guillén, M. C., Giménez, B., López-Caballero, M. E., Montero, M. P. (2011). Functional and bioactive properties of collagen and gelatin from alternative sources: A review. Food Hydrocoll, 25(8): 1813-1827.

[3] Arumugam, G. K. S., Sharma, D., Balakrishnan, R. M., Ettiyappan, J. B. P. (2018). Extraction, optimization and characterization of collagen from sole fish skin. Sustainable Chem Pharm, 9: 19-26

[2] Liu, D. C., Lin, Y. K., Chen, M. T. (2001). Optimum Condition of Extracting Collagen from Chicken Feet and its

[4] Li, D., Mu, C., Cai, S., Lin, W. (2009). Ultrasonic irradiation in the enzymatic extraction of collagen. Ultrason sonochem, 16(5): 605-609.

Keywords: Collagen, Acidic Hydrolysis, Fish Scales, Extraction, Ultrasound

EVALUATION OF STROKE SURVIVOR QUALITY OF LIFE AND PERCEIVED STRESS

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ABSTRACT

Stroke still kills many people every year, it is the second most common cause of death worldwide [1]. According to the report Iraq, there were 11,205 deaths (6.53%) due to stroke. and to the latest WHO data published in 2020 Stroke Deaths in Iraq reached 20,793 or 14.19% of total deaths [2, 3]. Stroke survivors may experience changes in mood, personality, and cognitive abilities, affecting their overall mental health. This study aimed to evaluate stroke survivor's quality of life and perceived stress. A cross-sectional descriptive study was conducted between 1 April and 30 July 2022 in Iraq. The study sample consisted of 205 patients who agreed to participate in the study at the time of data collection. Personal Information Form the Perceived Stress Scale, and Stroke Survivor Quality of Life were used to collect the data. It was observed that the average age of the participants was 55, 54.1% male and 57.6% married, 36.6% were high school graduates, 29.3% were university graduates and most of them had ischemic stroke. The perceived stress and quality of life were affected by variables such as gender, age, income, educational level, residence, and type of stroke. there is a statistically significant and inverse relationship between the level of psychological stress and several aspects of quality of life such as energy, family role, language, movement, mood, personality, self-care, social role, upper limb function, and work/production ($p<0.01$) There was also an inverse and significant relationship between stroke-specific quality of life and the level of psychological stress ($p<0.01$). The evaluation of stroke survivors' quality of life and perceived stress is a complex process that requires a comprehensive understanding of the physical, mental, and social dimensions of their experiences. Psychosocial support programs and support systems should be tailored to address the unique challenges faced by stroke survivors, promoting not only physical recovery but also emotional well-being and social integration [4,5].

References:

1. Panzeri, A., Rossi Ferrario, S., & Vidotto, G. (2019). Interventions for psychological health of stroke caregivers: a systematic review. Frontiers in psychology, 10, 2045
2. World Health Rankings. (2021). Live Longer Live Better. Iraq Health Profile. https://www.worldlifeexpectancy.com/iraqcoronary-heart-disease
3. Taher, T.M.J., Alfadhul, S.A.L., Shwekh, A.S. & Sarray, F.T.R. (2021). Knowledge and awareness on cardiovascular diseases among the Iraqi population. International Research Journal of Science, Technology, Education, and Management, 1(2), 26-37. https://doi.org/10.5281/zenodo.5726269
4. Carod-Artal, F. J., Egido, J. A., González, J. L., & Varela de Seijas, E. (2000). "Quality of life among stroke survivors evaluated 1 year after stroke: Experience of a stroke unit." Stroke, 31(12), 2995-3000. doi:10.1161/01.STR.31.12.2995
5. Barker-Collo, S., Feigin, V. L., Parag, V., Lawes, C. M., Senior, H., & Auckland Stroke Outcomes Study Group. (2010). Neuropsychological outcomes of Pacific Island patients with stroke in New Zealand: a cross-sectional descriptive study." New Zealand Medical Journal, 123(1318), 48-60

Keywords: Stress, Quality of life, Stroke survivors

STUDYING THE PHYSIOLOGY OF THE INCREASED RISK OF ELECTROMAGNETIC FIELDS (EMF) IN THE CENTRAL NERVOUS SYSTEM (CNS) AND OBSERVING THE ROLE OF TREATMENT AND BEHAVIOUR REGULATION IN PATIENTS

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ABSTRACT

The state of anxiety in rodents can be measured through the two-compartment box test, where the time the mouse remains immobile in the white compartment and the time it remains in the dark side indicate its anxiety. The hippocampus is an important site in the CNS that is involved in the formation of memories, and also plays a general role in information processing and subsequent behaviour regulation.

Keywords: Physiology, electromagnetic fields (EMF), central nervous system (CNS)

PERFORMANCE EVALUATION OF GRAPHENE OXIDE SYNTHESIS FROM GRAPHITE BY HUMMERS METHOD

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ABSTRACT

The purpose of this study was to evaluate how well the use of acetic and propionic acids performed in the Hummers technique of graphene oxide production in place of phosphoric acid. Three trials were conducted using the Hummers method to ascertain the effects under the same conditions and using just phosphoric acid, acetic acid, and propionic acid. Particle size distribution analyses, Zeta Potential, surface area measurement with BET, and structure characterization with FTIR were all used to characterize the effects. Explosions occasionally occurred during the propionic acid experiment due to the fast and exothermic reaction mechanism, which hurt the oxidation mechanism. The effective synthesis of graphene oxide was achieved through controlled oxidation in the presence of phosphoric and acetic acids. Using phosphoric acid and the traditional Hummers TOUR method, the best outcome was achieved between these two compounds. Using the graphite sample as a reference, the recovery rates for surface area, particle size, and zeta potential were found to be -19.72%, 39.95%, and 61.50%, respectively. The FTIR measurements showed that the synthesis of graphene oxide using acetic acid and propionic acid was successful, whereas the synthesis using propionic acid was not successful.

Keywords: Graphene Oxide, Hummers TOUR Method, Acetic Acid, Propionic Acid, Phosporic Acid

HOW TO DETERMINE THE EXTENT OF THE GAS-SOLID REACTIONS VIA EFFLUENT GAS ANALYSIS

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ABSTRACT

In this study, the method used for converting the effluent gas composition data into the extent of the gas-solid reaction was described. Specifically, the "direct reduction" reaction between the iron ore (containing Fe_2O_3) and H_2 gas in a fluidized bed reactor was taken into account. As the first step, the reactive gas (H_2) whose flow rate and composition were adjusted by a mass flow controller, was sent to the empty reactor in the absence of the solid reactant, and the composition of the effluent was recorded with an ABB EL 3020 simultaneous gas analyzer. In this way, a constant "base concentration" line that showed the value of the concentration at the outlet of the reactor in case no reaction occurred, was determined. Afterward, the procedure was repeated with the same H_2 concentration for 5 g of iron ore in the reactor, and the composition of the effluent gas was recorded instantly by the analyzer. But this time, a time-dependent concentration curve -whose initial parts had low values due to the fast consumption of H_2 by the reaction, while the last parts had higher values because of the declining reaction rate-, was obtained. The points constituted that curve corresponded to the "instantaneous unconsumed H_2 " values. By subtracting the unconsumed values from the base values via Microsoft Excel®, the "instantaneous H_2 consumption" curve of the reaction was obtained. Inserting the laboratory temperature, pressure, and the volumetric rate of gas flow rate into the ideal gas law, the curve was updated to show the molar amount of the consumed H_2. As the last step, taking into account the reaction, and the stochiometry between Fe_2O_3 and H_2, the instantaneous molar amount of the oxygen removed from the ore was calculated. As the extent of the direct reduction reaction is mostly defined as the ratio of the oxygen removed from the ore to the total amount of removable oxygen in the ore, the instantaneous reaction extent was calculated considering the oxygen content of the 5 g iron ore. By summing all the calculated instantaneous values, the final reduction degree achieved at the end of the experiment was determined [1,2,3].

References:

[1] Alsalihi E., *Menteş yöresi hematit cevherinin akışkan yatak reaktörde indirgenme kinetiğinin belirlenmesi*, MSc Thesis, Çankırı Karatekin University, Graduate School of Natural and Applied Sciences, 2022, 52 pages, Çankırı.

[2] Dilmaç, N., Yörük, S.,& Gülaboğlu, M.Ş. (2012). Determination of reduction degree of direct reduced iron via FT-IR spectroscopy, *Vibrational Spectroscopy*, 61, 25-29.

[3] Chen, H., Zheng, Z., Chen, Z., Bi, X.T. (2017). Reduction of hematite (Fe_2O_3) to metallic iron (Fe) by CO in a micro fluidized bed reaction analyzer: A multistep kinetics study, *Powder Technology*, 316, 410-420.

Keywords: Effluent gas analysis, Direct reduction, Gas-solid reactions, Iron ore, Hematite.

IN VITRO EFFECTS OF SOME CHEMOTHERAPY DRUGS ON GLUTATHIONE REDUCTASE ENZYME ACTIVITY PURIFIED FROM SHEEP SPLEEN TISSUE

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ABSTRACT

In this study, the in vitro effects of some drugs used in chemotherapy on glutathione reductase (GR; EC 1.8.1.7) enzyme activity purified from sheep spleen tissue were investigated. Purification was carried out using homogenate preparation, 20-70% ammonium sulfate precipitation and 2', 5' ADP-Sepharose 4B gel affinity chromatography steps. In the second stage of the study, the effects of some chemotherapy drugs such as ibandronic acid, oxaliplatin, carboplatin and cisplatin on the activity of the pure enzyme were investigated. As a result of the in vitro studies, the Activity%-[I] graph was drawn for the drug oxaliplatin, which has an inhibitory effect on the enzyme, and the IC_{50} value was calculated as 4.53 mM. In addition, it was detected that the drugs ibandronic acid, carboplatin and cisplatin did not have a significant effect on the enzyme.

Keywords: Glutathione reductase, Ibandronic acid, Oxaliplatin, Carboplatin

ISOLATION OF TRADITIONAL KEFIR YEASTS AND INVESTIGATION OF PROBIOTIC PROPERTIES

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ABSTRACT

Kefir is a mixed fermented product with numerous attributed health benefits due to its complex bacteria and yeast content. This study aimed to isolate and identify yeast strains from three different traditional kefir grains and to establish some potential probiotic traits: growth at human body temperature, tolerance to simulated human gastric juice, hydrophobicity, autoaggregation, antibiotic, and bile salt deconjugation. Currently, an isolate of Kluyveromyces marxianus was isolated and identified by sequencing the B1(S3), ITS1 and ITS2 rRNA gene. B1(S3) has been shown to have most of the probiotic properties. In the future and with new projects, the isolate will be further characterized and the number of the probiotic candidates will be increased.

Keywords: Immunity, Kefir, Mycotoxin, Probiotic, Yeast

ESTIMATION OF SURVIVAL TIMES OF BREAST CANCER PATIENTS THROUGH PENALIZED COX MODEL

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ABSTRACT

Survival data are of main interest in different fields. There are two outcomes in these types of data: event outcome and event times. The traditional Cox model is usually applied in these analyses. Nevertheless, the real data is often more complicated than considered. This needs a more advanced techniques along with variable selection properties. Penalized Cox Models are simultaneous variable selection and parameter estimation methods with the Lasso, Ridge and Elastic net penalties. The purpose of this study is to implement the Penalized Cox Model in the prediction of event times among breast cancer patients. The methods are applied to a well-known METABRIC dataset. The models were evaluated through the concordance index.

Keywords: Lasso, Ridge, Elastic Net regularization, METABRIC dataset, Time-to-event data analysis

GASTRIC DILATATION AND VOLVULUS WITH CONGESTIVE SPLENOMEGALY IN A ALABAI DOG

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ABSTRACT

Gastric dilatation and volvulus (GDV) is an acute, life-threatening condition that primarily affects large and giant breed dogs. In this case report, acute gastric dilatation due to ingested food and displacement of the stomach with congestive splenomegaly were described in a 2-year-old female Alabai dog. At necropsy; when the abdominal cavity was opened, it was observed that the stomach was on the right side of the abdominal cavity and extremely filled with gas, the stomach wall was tense, and large dark red congestive areas were observed through the serosa. When the stomach was opened, excessive gas accumulation in the lumen and occasional haemorrhages and congestion in the mucosa were detected. It was observed that the spleen was 3-4 times larger than normal, V-shaped and curved unlike its normal structure, the capsule was very tense and the sharp edges were blunt. In other parts of the intestine, the mucosa was hyperemic and a watery content was observed in the lumen. A foamy fluid was observed in the lumen of the trachea and bronchus (asphyxia). Costal imprints were also observed on the lung lobes. When the anamnesis and necropsy findings were evaluated, it was concluded that death was caused by acute gastric dilatation due to ingested food and consequent displacement of the stomach and acute passive hyperaemia in the spleen. It was also concluded that respiratory and circulatory disorders caused by the pressure of excessive dilatation of the stomach on the thoracic cavity played an important role in the development of death.

Keywords: Gastric Dilatation-Volvulus, Congestive Splenomegaly, Alabai, Dog

ESTIMATION OF SURVIVAL TIMES OF COVID-19 PATIENTS USING SOME LIFETIME DISTRIBUTIONS

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ABSTRACT

In this study, the survival time (in days) of Covid-19 patients from hospitalization and death were modeled with some known lifetime distributions such as Weibull, transmuted Weibull, exponentiated Weibull, and generalized Lindley distributions. The maximum likelihood method is considered for point estimation. We present four data sets on Covid-19 patients. The goodness of the fitted distribution is evaluated via some selection criteria such as Akaike information criterion, the Bayesian information criterion, the Kolmogorov-Smirnov test statistic, the Anderson Darling statistic, the Cramér von Mises statistic, and the p-value criteria Also, the estimated probabilities of the survival times of Covid-19 patients were calculated via the invariance property of maximum likelihood estimation. In dying Covid-19 patients, the average survival time is estimated approximately 15 days.

Keywords: Covid-19, Lifetime distribution, Maximum likelihood, Point estimation

EVALUATION OF TRADITIONAL WOODEN TOYS AND LASER CUT WOODEN TOYS IN TERMS OF PRODUCTION

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ABSTRACT

Wooden toys have survived from the earliest periods of history to the present day. Toys are involved in many stages of human life, starting from infancy to childhood and adulthood. With the development of materials and production technology, the design and production of toys changed. Wooden toys are preferred today because they are natural materials and are easy to process. Although production tools are changing, traditional production techniques are still used in wooden toys. In addition to traditional workshop-type production, laser-cutting machines can produce more products in less time during the toy design and production stages. This research mentions the advantages and disadvantages of solid wooden toys produced by traditional methods and wood-based toys produced by laser cutting machines.

Keywords: Wooden, Toys, Laser Cut, Traditional, Production

DESIGN AND IMPLEMENTATION OF FUZZY LOGIC-CONTROLLED SMART SOLAR TRACKING SYSTEM

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ABSTRACT

This paper proposes to build a multi-axis, closed-loop smart solar tracking system capable of moving 360° horizontally and 180° vertically with a starting angle of 90° so that the system can know the start angle without the need to know the azimuth angle. In addition to the system being able to protect the photovoltaic cells from damage, it continuously changes the direction of the solar panel by 180° if the solar temperature exceeds 45°C and then returns to track after the temperature drops below that. The fuzzy logic controller will be responsible for controlling and directing all elements of the system and determining the time to move the panels so that they face direct sunlight. and collecting data using a recording unit (SD card) and storing it on a memory card, which may be accessed at any time, to verify the system's efficiency and identify weak points.

The importance of the research is using 8 sensors (LDR) programmed according to a special mathematical algorithm instead of 4. This approach allows the system to effectively handle partial shading and maintain accurate tracking even if one of the sensors malfunctions. As a result, this system exhibits a high level of tracking accuracy. The system employs two motors: a DC motor with a gearbox for horizontal rotation and a servo motor for vertical rotation. The results of this study indicate that employing a fuzzy logic controller yielded superior precision in comparison to alternative software. Additionally, the utilization of 8 LDR sensors, two motors, and a temperature sensor resulted in enhanced practical accuracy for the system, enabling it to achieve maximum photovoltaic energy output over the longest possible period of time.

Keywords: Solar tracking system, LDR sensors, DC motor, Servo motor, Fuzzy Logic

SOME PHYSICAL PROPERTIES OF B2 TYPE AGY INTERMETALLIC COMPOUND FROM AB-INITIO CALCULATIONS

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ABSTRACT

Intermetallics have superior chemical, physical, electrical, magnetic, and mechanical properties than ordinary metals. Due to interesting properties such as high tensile strength, high melting point and stifness, good oxidation resistance , low mass density, these intermetallic compounds are suitable for many applications in engineering. and industry. Among the B2-type intermetallic compounds, there is a theoretical study on the defect properties of YAg . Here, we have studied structural, mechanics, electronic, vibrational. And thermodynamic properties of YAg compound using first-principles methods based on density-functional theory. It can be concluded that YAg in B2 structure are metallic compounds from electronic band structure. YAg is also stable mechanically and dynamically.

Keywords: DFT, B2 structure, electronic properties, elastic, properties, vibrational properties

SYNTHESIS OF $SrFe_2O_4$ NEEDLE-LIKE NANOSTRUCTURES VIA GREEN ROUTE

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ABSTRACT

Nanostructured materials show interesting chemical and physical properties, significantly different from those of bulk materials, due to their small size and large specific surface area [1], [2], [3]. Among the nanostructured materials with different shapes and sizes, spinel ferrite nanostructures have great interest due to their technological applications in the microwave industries, for high-speed digital tape or disk recording, the production of repulsive suspensions for use in levitated railway systems, ferrofluids, and magnetic refrigeration systems.

In this study, Strontium spinel ferrite needle-like nanostructures ($SrFe_2O_4$) were produced via green route. The crystal structure and morphology of the samples were characterized by X-ray diffraction (XRD) and field emission scanning electron microscopy (FESEM). The results of XRD patterns indicated that the ferrite phase was formed. And, the FESEM micrographs showed that the samples have needlelike nanostructures.

References:

[1] Srivastava, M., Ojha, A. K., Chaubey, S., & Materny, A. (2009). Synthesis and optical characterization of nanocrystalline NiFe2O4 structures. Journal of Alloys and Compounds, 481 (1-2), 515-519.
[2] Pannaparayil, T., Marande, R., Komarneni, S., & Sankar, S.G. (1988). A novel low-temperature preparation of several ferrimagnetic spinels and their magnetic and Mössbauer characterization. Journal of Applied Physics, 64 (10), 5641-5643.

Keywords: Nanostructures, Spinels, SrFe2O4, Green synthesis

BODY COMPOSITION ANALYSIS, BLOOD PRESSURE, VIT D3, FERRITIN, IRON, TSH AND CBC IN SERA OF PATIENTS WITH HAIR LOSS

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ABSTRACT

This study was carried out to investigate some biochemical aspects in Iraq patients with hair loss compared to non-hair loss individuals. Recent studies on hair loss are one of the pathological and therapeutic challenges in the world. In the past 10 years, the chemical parameters of vitamin D3, ferritin and blood viscosity in hair loss have played a large role in new research, including in dermatology and especially hair loss. Vitamin D3, serum ferritin, TSH, and blood viscosity in hair loss. A prospective case study includes 50 male patients with hair loss and 50 male person with non-hair loss individuals causes. Aged from 20-40 years old in Iraq / Baghdad. The results showed that the levels of hair loss patients significantly decreased when compared with non-hair loss individuals ($P < 0.05$). in each of the following parameters. Vitamin D3, serum ferritin, and basal metabolic rate. The blood pressure of the hair loss patients also decreased according to the chi-square test, while the levels below increased significantly when compared with those of the non-hair loss individuals ($p < 0.05$). body fat mass and the HCT level in plasma. While HB level in plasma, TSH and serum iron level non significant change occurred when compared with non-hair loss individuals ($P < 0.05$).

Keywords: Hair loss, Vit D3 with hair loss, Iron defetionsy, Diffused hair loss.

INVESTIGATION OF THE EFFECTS OF 16-DEOXYSAIKOGENIN F AND JUGLONE COMPOUNDS ON PANCREATIC CHOLESTEROL ESTERASE ENZYME IN SILICO AND IN VITRO

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ABSTRACT

High blood cholesterol levels are a major problem for blood vessels. High levels cause cardiovascular problems, which are among the leading causes of death in our country. Pancreatic cholesterol esterase plays an important role in the hydrolysis and absorption of dietary cholesterol from the small intestine. This enzyme is considered a therapeutic target to reduce the amount of dietary cholesterol. In this study, we investigated the effects of some natural compounds on the enzyme in vitro. Enzyme activity was measured spectrophotometrically. The inhibition effect on the enzyme was determined in five different concentrations of 16-Deoxysaikogenin F and Juglone compounds. IC50 values were calculated from the % activity-concentration graphs. At the same time, docking studies were performed to understand through which interactions the inhibitory compounds might have prevented the enzyme activity.

Pancreatic esterase enzyme activity was inhibited by 16-Deoxysaikogenin F and Juglone compounds with IC50 values of 61.340 and 173.287, respectively. In the docking study, the affinities of the molecules towards the active site of the enzyme were determined as -102.168 and -56.5749 MOlDock Score, respectively.

Keywords: Pancreatic cholesterol esterase, 16-Deoxysaikogenin F and, Juglone

CYTOPROTECTIVE EFFECT OF MELATONIN ON GONADAL TOXICITY INDUCED BY LOCAL LINURON HERBICIDE IN WISTAR RATS

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ABSTRACT

This study was conducted to evaluate the effectiveness of supplementation of an antioxidant Melatonin on oxidative status (antioxidant defense system) in an animal model Showing pathological lesions induced by a local herbicide: linuron.

Indeed, the administration of [1, 2]. caused pathophysiology which was revealed on the one hand, by the formation of pre-tumoral cells located within the seminiferous tubes and on the other hand by the reduction of glutathione - S - transferase (GST), and a significant decrease in reduced glutathione (GSH) levels, which are biomarkers of oxidative stress.

Melatonin preventive treatment of rats with linuron decreased Significantly the incidence of pre-tumoral lesions, with improved activity of the antioxidant defense status GSH, GST.

This suggests that melatonin can act as an effective chemo-preventive agent against Testicular cancer via the reduction of radical attacks on the testicles [3, 4].

References:

[1] Bai J, Han H, Wang F, Su L, Ding H, Hu X, Hu B, Li H, Zheng W, Li Y (2017) Maternal linuron exposure alters testicular development in male ofspring rats at the whole genome level. Toxicology 389:13–20
[2] Magierowski M, Jasnos K, Pawlik M, Krzysiek-Maczka G, PtakBelowska A, Olszanecki R, Kwiecien S, Korbut R, Brzozowski T (2013) Role of angiotensin-(1–7) in gastroprotection against stress-induced ulcerogenesis. The involvement of mas receptor,nitric oxide, prostaglandins, and sensory neuropeptides. J Pharmacol Exp Ther 347:717–726
[3] Manchester LC, Coto-Montes A, Boga JA, Andersen LPH, Zhou Z,Galano A, Vriend J, Tan DX, Reiter RJ (2015) Melatonin: an ancient molecule that makes oxygen metabolically tolerable. JPineal Res 59(4):403–419
[4] Reiter RJ, Mayo JC, Tan DX, Sainz RM, Alatorre-Jimenez M, Qin L (2016) Melatonin as an antioxidant: under promises but over delivers. J Pineal Res 61(3):253–278

Keywords: Testicles, Melatonin, Linuron, Oxidative stress

SERUM LEVEL OF 25-HYDROXYVITAMIN D IS ASSOCIATED WITH CHRONIC PERIODONTITIS IN HEAD AND NECK CANCER POST-RADIOTHERAPY PATIENTS

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ABSTRACT

Vitamin D plays an essential role in bone metabolism and immunity. Hence, it might affect the development and extent of periodontal disease. This study aimed to assess Vitamin D status in periodontal disease. A total of 150 are participants in the current study, including 50 patients with head and neck cancer who received radiotherapy post-six months (HNC post-RT), 50 chronic periodontitis (CP) patients without HNC, and 50 periodontally healthy (control) enrolled. Clinical Attachment Loss (CAL), Probing Pocket Depth (PPD), Plaque Index (PI), and Gingival Bleeding Index (GBI) were recorded. An electrochemiluminescence immunoassay (eCLIA) was constructed to quantify serum Vitamin D levels. Chronic periodontitis with HNC post-RT patients presented a non-significant proportion of Vitamin D levels compared to chronic periodontitis without HNC($p>0.05$) and patients with CP+HNC post-RT and CP without HNC exhibited significant Vitamin D levels compared to control ($p<0.05$). A significant negative correlation was found between serum Vitamin D levels and CAL, PPD, PI, and GBI in the periodontal disease groups. Moreover, a significant positive correlation was observed between serum Vitamin D levels and hyposalivation. Hyposalivation was increased in patients (CP+HNC post-RT; 0.15 [0.11-0.23] ml/min, *P*=0.001) and (CP without HNC; 0.30 [0.25-0.41] ml/min, *P*=0.001), compared to healthy controls; 0.35 [0.28-0.54] ml/min, *P*=0.001). In this case-control study, Vitamin D deficiency is significantly associated with chronic periodontitis groups. The assessment of vitamin D levels in patients presenting with chronic periodontitis seems advisable, as vitamin D deficiency might be involved in the onset and progression of chronic periodontitis.

This work was approved by the Ethics Committee of Çankırı Karatekın University Scientific Research Evaluation Ethical Committee (No:41, Date:26.09.2022). The study's participants were CP+HNC post-RT (n=50), CP without HNC (n=50), and periodontally healthy as a control (n=50). CP+HNC post-RT patients were selected among those who received radiotherapy and attended to Cancer and Tumors Center/ Anbar Cancer Center (ACC), Iraq. CP without HNC patients was selected from Ramadi Specialized Dental Center (RSDC), Iraq was performed from September 2022 to January 2023. Exclusion and inclusion criteria were enrolled. Patients were diagnosed with HNC by an oncologist at Cancer and Tumors Center according to the National Comprehensive Cancer Network (NCCN)[1]. A single experienced oral hygienist (E. R.) examined clinical periodontal parameters. About (5-7ml) of venous blood was drawn by using a plastic syringe from all cases and control. Then, the sample was placed into a gel tube and left to clot at room temperature for about (15-20 minutes). The specimens were centrifuged at 3000 rpm for 10 minutes. Serum levels of Vitamin D were determined using modern electrochemiluminescence immunoassay technique (eCLIA), Nipigon Health corp, Ontario, Canada. The assay was performed according to the specifications of the manufacturer. When $p<0.05$, differences were deemed statistically significant. Both GraphPad Prism (version 9.5.1, La Jolla, California, USA) and IBM SPSS (version 27, NY, USA) were used to process all of the analyses.

References:

[1] A. D. Colevas et al., "NCCN guidelines insights: head and neck cancers, version 1.2018," Journal of the National Comprehensive Cancer Network, vol. 16, no. 5, pp. 479-490, 2018.

Keywords: Head and Neck Cancer, Chronic periodontitis, Radiotherapy, Vitamin D

ON HORADAM QUATERNIONS: THREE SPECIAL IDENTITIES

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ABSTRACT

This presentation provides three special identities of the well-known Horadam quaternions, i.e., Vajda's identity, Gelin-Cesaro identity, and Honsberger formula, by displaying their detailed proofs.

References:

[1] Horadam, A. F. (1963). Complex Fibonacci numbers and Fibonacci quaternions. The American Mathematical Monthly, 70(3), 289-291.
[2] Iyer, M. R. (1969). A note on Fibonacci quaternions. Fibonacci Quarterly, 7(3), 225-229.
[3] Swamy, M. N. S. (1973). On generalized Fibonacci quaternions. Fibonacci Quarterly, 11(5), 547-550.
[4] Horadam, A. F. (1967). Special properties of the sequence wn(a, b; p, q). Fibonacci Quarterly, 5(5), 424-434.
[5] Catarino, P. (2016). The modified Pell and the modified k-Pell quaternions and octonions. Advances in Applied Clifford Algebras, 26, 577-590.
[6] Szynal-Liana, A., & Włoch, I. (2016). A note on Jacobsthal quaternions. Advances in Applied Clifford Algebras, 26, 441-447.
[7] Daşdemir, A., & Bilgici, G. (2019). Gaussian Mersenne numbers and generalized Mersenne quaternions. Notes on Number Theory and Discrete Mathematics, 25(3), 87-96.

Keywords: Horadam quaternion, Gelin-Cesaro identity, Catalan's identity, Honsberger formula

CORRELATIONS BETWEEN PHYSICAL ACTIVITY LEVEL, COMORBIDITIES, BODY MASS INDEX, AND COGNITIVE FUNCTIONS IN PATIENTS WITH DYSLIPIDEMIA

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ABSTRACT

Introduction: Dyslipidemia is defined as decreasing or rising the concentration of different type of lipid molecules in blood serum. This differentiation of serum lipid concentration causes various cardiac diseases, especially atherosclerosis, and is considered as the primary or most important factor in metabolic diseases. Dyslipidemia-related cardiovascular structure changes are accepted as an important public health problem throughout the world. Medical treatment, changes in diet and physical activity or structured exercise programs should be applied together in the treatment of dyslipidemia.

Methods: Thirty-three participants were enrolled in this study (21 Female/ 12 Male). Inclusion criteria for the study were serum LDL concentration above 100 mg/dL and no insulin using if participant has Diabetes Mellitus. Physical activity level evaluated by International Physical Activity Questionnaire, cognitive functions by Mini Mental Test, comorbidities by Charlson Comorbidity Index.

Results: Mean age of participants were 44.34±12.41 years, 63.6% were women and body mass index (BMI) of 28.2±0.49 kg/m2. Results of our study showed that vigorous physical activity score of IPAQ showed negative relationship with body mass index category (r:-0.362; p:0.045) and age (r:-0.365; p:0.044), and positive relationship with total score of Mini Mental Test (r:0.495; p:0.004). Walking score of IPAQ showed positive relationship with total score of Charlson Comorbidity Index (r:0.375; p:0.038). Physical activity category of IPAQ showed positive relationship with total score of Mini Mental Test (r:0.351; p:0.049).
Conclusions: Results of our study showed that increased physical activity decreases body weight and regulates body composition in patients with dyslipidemia. Increased physical activity, increases and maintains cognitive functions in patients with dyslipidemia. Patients with dyslipidemia who have comorbidities tend to be more physically active, especially choose walking. Increased physical activity may be decreases body mass index, comorbidities and increases cognitive functions in patients with dyslipidemia.

Keywords: Cognitive Function, Dyslipidemia, Physical Activity

COMPARATIVE ANALYSIS OF CUSTOM SCRATCH CNN AND EFFICIENTNETB0 FOR BRAIN TUMOR CLASSIFICATION IN MRI

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ABSTRACT

This paper discusses the classification of brain tumours in magnetic resonance imaging (MRI) images using two approaches: a custom scratch Convolutional Neural Network (CNN) and a pre-trained EfficientNetB0 model. The dataset includes four classes: glioma, meningioma, pituitary, and non-tumour, representing a wide range of brain abnormalities [1].

The initial network is employed a scratch CNN architecture that has been carefully designed to fit the intricacies of the brain tumour classification task. This model was created from scratch, taking into consideration the specific features and complexities associated with brain imaging data [2]. The rationale behind the custom architecture is to investigate the potential advantages of a tailored solution for this particular classification problem. The second network utilises transfer learning by employing the EfficientNetB0 model, which is a state-of-the-art architecture pre-trained on various datasets [3]. Transfer learning aims to apply the knowledge gained from training on extensive datasets to a specific task, potentially enhancing performance and reducing the need for large amounts of task-specific labelled data [4].

Rigorous experiments and evaluations were conducted on a carefully selected dataset using standard metrics, including accuracy, precision, recall, and F1-score, to assess the performance of both models. The results indicate that the EfficientNetB0 model consistently outperforms the scratch CNN on all metrics, demonstrating its superior ability to accurately classify brain tumour images.

This study examines the effectiveness of transfer learning in brain tumour classification and highlights the advantages of using a pre-trained model, such as EfficientNetB0. The results presented in this paper contribute to the ongoing debate on the optimal approach for deep learning-based medical image classification tasks. These findings have the potential to improve diagnostic accuracy and reduce the burden of data annotation efforts.

References:

[1] N. Ullah et al., "An effective approach to detect and identify brain tumors using transfer learning," Applied Sciences, vol. 12, no. 11, p. 5645, 2022.
[2] W. Ayadi, W. Elhamzi, I. Charfi, and M. Atri, "Deep CNN for brain tumor classification," Neural processing letters, vol. 53, pp. 671-700, 2021.
[3] H. A. Shah, F. Saeed, S. Yun, J.-H. Park, A. Paul, and J.-M. Kang, "A robust approach for brain tumor detection in magnetic resonance images using finetuned efficientnet," IEEE Access, vol. 10, pp. 65426-65438, 2022.
[4] R. Mehrotra, M. Ansari, R. Agrawal, and R. Anand, "A transfer learning approach for AI-based classification of brain tumors," Machine Learning with Applications, vol. 2, p. 100003, 2020.

Keywords: Brain Tumor Classification, Convolutional Neural Network (CNN), Transfer Learning, EfficientNetB0, Medical Image Analysis

FOR DEEP LEARNING AIDED DESIGN STUDIES WITH PARAMETRIC DESIGN CREATING AND EDITING A 3D DATASET

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ABSTRACT

In this study, the creation of a structure using the parametric design methodology is explained in detail [1]. More design possibilities lead to more cost-effective structural solutions being found early in the design process, saving money on other stages of the process, including production costs. In view of this, it's critical to present structural analysis to help the designer's decision-making and to generate multiple solutions in order to identify the optimal one [2]. An optimization technique using new methodologies for product design and parametric design is pursued in order to find more design alternatives. With parametric design, you may decide on the fundamental characteristics of your project and make interactive modifications while your model is automatically updated. Additional possibilities and optimize structures with more efficient designs could be found. Delivering components that are stronger, lighter, more efficient, and adapted to the individual demands of structure is the main goal of productive design [3,4]. Among several design options, the optimization aim is to produce a structure with the most ideal mass. This study aims to establish a workflow and explore the potential applications of parametric design and productive design [5]. This research makes it possible to quickly assess a large number of possibilities and choose the best design. In order to provide that a sustainable design a master geometry is created. The steps of the design process and creation of master geometry are described on the basis of an aircraft component, the rotor blade mounting bracket that serves as a structural support for the blade and ensures that the blade remains securely attached to the main structure of the rotor. This optimization scenario may be varied and used to various projects since it is achieved with the aid of the rotor blade mounting bracket. Hence, it is easy to vary the design to generate more data for designing with deep learning methodology in the future.

References:

[1] Schnabel, Marc Aurel. (2012). Learning Parametric Designing. 10.4018/978-1-61350-180-1.ch004.
[2] Shah JJ. Assessment of features technology. Comput-Aided Des 1991;23(5): 331–43.
[3] Iyer N, Jayanti S, Lou K, Kalyanaraman Y, Ramani K. Shape-based searching for product lifecycle applications. Comput-Aided Des 2005;37(13):1435–46.
[4] Jackson C, Buxton M. (2007). The design reuse benchmark report: Seizing the opportunity to shorten product development, Boston, Aberdeen Group
[5] Gebhard R. (2013). ''A resilient modeling strategy'' technical presentation. Solid Edge University

Keywords: Parametric Desing, Master Geometry, Deep Learning, 3D Dataset

PYRUVAT KINASE M2 ISOFORM ENZYME AND ATHEROSECLEROSIS

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ABSTRACT

Atherosclerosis is a chronic inflammatory vascular condition that causes coronary heart disease, and peripheral vascular disease. Which caused plaques in the intima (1). The metabolic risk factors activate endothelial cells (ECs), lead to endothelial dysfunction causes local blood mononuclear cell infiltration (2–4). The recruited monocytes differentiate into macrophages subsequently, which engulf large amounts of oxidized -low density lipoprotein (Ox-LDL), leading to lipid agregation and foam cell formation. Foamy macrophages infiltrate the lipid accumulation into the pathological intima-thickening lesions, inducing their transformation into necrotic cores. In the next step, smooth muscle cells (SMCs) migrate from the medium to the intima, proliferation & migration, plaques ocure. ECs, immune cells, and smooth muscle cells (SMCs) participate in atherosclerotic plaque formation (5) when arterial walls get thickened by fat and fibrous tissue. As the arterial lumen narrows, the plaque hardens and eventually ruptures (6,7). According to recent studies, PKM2-dependent glycolysis promotes the proliferation and migration of vascular smooth muscle cells (VSMCs), gamma interferon (IFN-γ) induces reversible metabolic reprogramming to sustain proinflammatory activity, and Homocysteinemia activates the glycolysis-lipogenic pathway in $CD4^+$ T cells via PKM2 (8–10). Herein that pyruvate kinase M2 isoform enzyme depended glycolysis play critical role in atherosclerosis progression and treatment.

References:

1. Kobiyama K, Ley K. Atherosclerosis. Circ Res [Internet]. 2018 Oct 26 [cited 2023 Dec 16];123(10):1118–20. Available from: https://www.ahajournals.org/doi/abs/10.1161/CIRCRESAHA.118.313816
2. Libby P. Inflammation in atherosclerosis. Arterioscler Thromb Vasc Biol [Internet]. 2012 Sep [cited 2023 Dec 16];32(9):2045–51. Available from: https://pubmed.ncbi.nlm.nih.gov/22895665/
3. Lu H, Daugherty A. Atherosclerosis. Arterioscler Thromb Vasc Biol. 2015 Mar 1;35(3):485–91.
4. Libby P, Buring JE, Badimon L, Hansson GK, Deanfield J, Bittencourt MS, et al. Atherosclerosis. Nature Reviews Disease Primers 2019 5:1 [Internet]. 2019 Aug 16 [cited 2023 Dec 16];5(1):1–18. Available from: https://www.nature.com/articles/s41572-019-0106-z
5. Johnson JL. Emerging regulators of vascular smooth muscle cell function in the development and progression of atherosclerosis. Cardiovasc Res [Internet]. 2014 Sep 1 [cited 2023 Dec 16];103(4):452–60. Available from: https://dx.doi.org/10.1093/cvr/cvu171
6. Ahmadi A, Leipsic J, Blankstein R, Taylor C, Hecht H, Stone GW, et al. Do Plaques Rapidly Progress Prior to Myocardial Infarction? Circ Res [Internet]. 2015 Jun 19 [cited 2023 Dec 16];117(1):99–104. Available from: https://www.ahajournals.org/doi/abs/10.1161/circresaha.117.305637
7. Qiao JH, Walts AE, Fishbein MC. The severity of atherosclerosis at sites of plaque rupture with occlusive thrombosis in saphenous vein coronary artery bypass grafts. Am Heart J. 1991 Oct 1;122(4):955–8.
8. Zhao X, Tan F, Cao X, Cao Z, Li B, Shen Z, et al. PKM2-dependent glycolysis promotes the proliferation and migration of vascular smooth muscle cells during atherosclerosis. Acta Biochim Biophys Sin (Shanghai) [Internet]. 2019 Jan 3 [cited 2023 Dec 16];52(1):9–17. Available from: https://www.sciengine.com/10.1093/abbs/gmz135
9. Yang Q, Xu J, Ma Q, Liu Z, Sudhahar V, Cao Y, et al. PRKAA1/AMPKα1-driven glycolysis in endothelial cells exposed to disturbed flow protects against atherosclerosis. Nat Commun [Internet]. 2018 Nov 7 [cited 2023 Dec 16];9(1):4667–4667. Available from: https://europepmc.org/articles/PMC6220207

Keywords: Atheroseclerosis, Cornary Heart Disease, PKM2.

INVESTIGATION OF EXTREME CLIMATE INDICES OVER ÇANKIRI WITH CMIP6 CLIMATE MODELS

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ABSTRACT

The objective of this study was to investigate the potential changes in extreme temperature and precipitation indices in the Çankırı province as a result of climate change throughout the 21st century. To accomplish this, a multi-tiered framework was implemented, consisting of the near future (2015-2040), middle future (2041-2070), and far future (2071-2100) time periods. The analysis was performed using the Coupled Model Intercomparison Project Phase 6 (CMIP6) models, which were driven by the Shared Socio-Economic Pathways (SSP)5-8.5 and SSP2-4.5 scenarios [1-2]. The Quantile Delta Mapping (QDM) technique was utilized as a statistical downscaling method to refine the spatial resolution of the low-resolution global climate models (GCMs) [3]. The European Centre for Medium-Range Weather Forecasts (ECMWF)'s fifth-generation reanalysis (ERA5-Land) dataset [4], with a spatial resolution of 0.1° × 0.1° (approximately 9 km), was utilized as reference dataset for the downscaling of GCM outputs. Upon evaluation of the results, it was observed that there is no significant change in total precipitation throughout the century under the SSP2-4.5 scenario in the study region. However, under the SSP5-8.5 scenario, decreases of up to 10% by the end of the century were projected. Regarding extreme precipitation, both scenarios indicate that heavy precipitation events will become more severe. It is projected that total precipitation from the heaviest 1% will increase from 32 mm to 57 mm by the end of the century under the SSP 5-8.5 scenario. When compared to the decrease in total precipitation, it is anticipated that the proportion of extreme precipitation in total precipitation will rise from 5% to 10%. Regarding extreme temperature indices, both scenarios predict continuous warming until the end of the century. It is estimated that the annual average of daily maximum temperatures may increase up to 6 °C by the end of the century, while the increase in minimum daily temperatures stands at 5.3 °C. The number of days when the minimum temperature fell below 0 °C during the year was found to be 124 days on average in the historical period; however, in the future period, this value could decrease to 60 days. Overall, the results highlight to an increase in extreme climate events' frequency and intensity over Çankırı due to climate change.

References:

[1] Gumus B, Oruc S, Yucel I, Yilmaz MT. (2023). Impacts of Climate Change on Extreme Climate Indices in Türkiye Driven by High-Resolution Downscaled CMIP6 Climate Models. *Sustainability.*15(9):7202.

[2] Eyring, V.; Bony, S.; Meehl, G.A.; Senior, C.A.; Stevens, B.; Stouffer, R.J.; Taylor, K.E. (2016). Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organization. *Geosci. Model Dev.* 9, 1937–1958.

[3] Cannon, A.J.; Sobie, S.R.; Murdock, T.Q. (2015). Bias Correction of GCM Precipitation by Quantile Mapping: How Well Do Methods Preserve Changes in Quantiles and Extremes? *J. Clim.* 2015, 28, 6938–6959.

[4] Muñoz-Sabater, J., Dutra, E., Agustí-Panareda, A., Albergel, C., Arduini, G., Balsamo, G., Boussetta, S., Choulga, M., Harrigan, S., Hersbach, H., Martens, B., Miralles, D. G., Piles, M., Rodríguez-Fernández, N. J., Zsoter, E., Buontempo, C., and Thépaut, J.-N. (2021) ERA5-Land: a state-of-the-art global reanalysis dataset for land applications, Earth Syst. Sci. Data, 13, 4349–4383

Keywords: CMIP6, climate change, extreme climate indices, quantile mapping

EXPLORING THE LIPID PROFILE PARAMETERS IN THE SERUM OF IRAQI LEUKEMIC PATIENTS

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ABSTRACT

This study investigates the potential differences in lipid profile parameters between Iraqi leukaemia patients and healthy controls to understand their association with the disease and its progression. The study included 200 Iraqis, including 150 leukaemia patients. 50 healthy individuals aged 6–68 were the control group. A medical patient got six milliliters of blood collected from Al-Yarmuk Teaching Hospital. A lipid profile test showed that leukemia patients had higher cholesterol, triglycerides, and VLDL (239.7, 40.53, and 189.2) than controls (170.8, 20.68, and 104.9) but no significant differences in HDL or LDL. This study suggests potential alterations in lipid profile parameters in Iraqi leukemia patients, which may contribute to understanding the disease's mechanisms and developing personalized treatment approaches. Further research is needed to confirm these findings and elucidate the complex interplay between lipid metabolism and leukemia pathogenesis.

Keywords: Leukemia, Lipid Profile, Cholesterol, Iraqi

OPTIMIZATION OF ELECTROPOLYMERIZATION CONDITIONS FOR ENHANCED ANTICORROSIVE RESISTANCE OF 2,6-BENZOPHENONE ON AISI316L: A RESPONSE SURFACE METHODOLOGY APPROACH

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ABSTRACT

Corrosion is a pervasive and natural process that occurs when metals react with their environment, undergoing a gradual deterioration that can have detrimental effects on structures, equipment, and infrastructure. [1]. In the pursuit of effective corrosion prevention strategies, many studies are researching the utilization of a conductive polymer coatings [2]. This study researched the effect of electropolymerization conditions (effect of monomer concentration, scan rate and electropolymerization time) of 2,6-benzophonone (5-hydroxy-2,2-diphenyl-4H-benzo[d][1,3]dioxin-4-one) [3] on the anti-corrosive performance of the resulting coating via using response surface methodology (RSM). RSM offering distinct advantages over classic methods by efficiently resolving interactions among variables on complex data sets and identifying optimal conditions for enhanced outcomes. [4]. The coatings were carried out on the surfaces of AISI 316L working electrodes in the acetonitrile medium presence of 0.15 M LiClO4 electrolyte with Ag/AgCl (3M KCl) reference electrode and Pt counter electrode by cycling voltammetry (CV) technique on CHI660B electrochemical-workstation. The electrodes obtained according to the designed operating parameters were immersed in 3.5% NaCl solution for 240 hours, and at the end of the period, its corrosion performance were monitored with the AC impedance (EIS) technique between 100 kHz - 1 mHz. The obtained impedance data were converted into equivalent circuits with ZView2 software and the response surface modeling was made by entering the resistance values obtained as response into the design.

It was determined that the model obtained as a result of the study could explain the corrosion resistance, which is affected by 97.0% of the independent parameters studied, with 91.6% accuracy and high sensitivity. According to the obtained models, it was seen that the monomer concentration had the biggest effect on corrosion resistance and the electropolymerization time had the least effect. In addition, it was determined that the individual effects of monomer concentration and scanning speed on the response were close to each other, but their combined changes were high. However, it was observed that this effect was less than the effect of the joint change of electropolymerization time and scanning speed. The results were converted into response surface graphs and formulations that allowed parameters to be optimized to achieve the desired corrosion resistance.

References:

[1] M. G. FONTANA, “Corrosion Engineering And Corrosion Science,” Corrosion, vol. 19, no. 6, pp. 199t-204t, Jun. 1963, doi: 10.5006/0010-9312-19.6.199.

[2] A. T. Ozyilmaz, İ. Filazi, C. Surmelioglu, and G. Ozyilmaz, “Optimization of Anticorrosive PANi and PPy Synthesis Conditions on ZnNiMo Coated Copper Electrode Surface with Box Behnken Design,” Prot. Met. Phys. Chem. Surfaces, vol. 58, no. 4, pp. 883–897, Aug. 2022, doi: 10.1134/S2070205122040177.

[3] C. ÇELİK, “Synthesis and characterization of benzodioxinone mono-telechelics and their use in block copolymerization,” TURKISH J. Chem., vol. 45, no. 4, pp. 1115–1124, Aug. 2021, doi: 10.3906/kim-2104-22.

[4] R. H. Myers, D. C. Montgomery, and C. M. Anderson-Cook, Response surface methodology: Process and product optimization using designed experiments, 3rd ed. New Jersey, USA: John Wiley & Sons, Inc., 2009.

Keywords: Corrosion, Response surface methodology, Electropolymerization, Stainless steel

ENGINEERING OF AEROGEL PARTICLES AND SCAFFOLDS FOR BIOMEDICAL APPLICATIONS

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ABSTRACT

Aerogels are among the Top-10 emerging technologies according to IUPAC Association criteria. Their unique physicochemical properties of aerogels are very promising for several biomedical applications, including drug delivery, regenerative medicine and biosensors [1]. In terms of production, aerogels can be easily shaped to the intended morphology, scaled-up and have even the possibility of being manufactured under good manufacturing practices (GMP). In this work, the engineering of medicated aerogels in the form of particles and scaffolds for biomedical application is presented. Spherical aerogel particles of varied shape were obtained by different technologies (prilling, 2D-printing) and applied for different applications (drug delivery, wound healing) [2]. Sterile and 3D-printed biopolymer aerogels with high printing fidelity were obtained by a dual processing strategy combining 3D-printing and supercritical CO_2 technologies. Advanced textural properties with a macro+mesoporous nanostructure adequate for harboring bone tissue formation were obtained [2]. Overall, aerogel scaffolds promoted a simultaneous bone repair and infection management in a personalized way, regulating formulation design, drug dose and porosity [3].

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References:

[1] García-González, C.A. et al (2021). Aerogels in drug delivery: From design to application. *Journal of Controlled Release*, 332, 40-63.
[2] Remuiñán-Pose, P. et al. (2022). Preparation of Vancomycin-Loaded Aerogels Implementing Inkjet Printing and Superhydrophobic Surfaces. *Gels*, 8, 417.
[3] Iglesias-Mejuto, A. et al. Vancomycin-loaded methylcellulose aerogel scaffolds for advanced bone tissue engineering (2024). Carbohydrate Polymers, 324, 121536.

Keywords: aerogels, process engineering, regenerative medicine, drug delivery, 3D-printing

IMPACT OF CEFOTAXIME ON HEPATIC ENZYMES AND SOME LABORATORY PARAMETERS

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ABSTRACT

This study investigates the impact of Cefotaxime, Cefotaxime is a third-generation cephalosporin antibiotic that is commonly used to treat a variety of bacterial infections. It is generally well-tolerated. In this study, we investigated the impact of cefotaxime on hepatic enzymes and some laboratory parameters in patients with bacterial infections. The homogeneity of the sample across age, weight, and length variables is established through the analysis of arithmetic mean, standard deviation, and coefficient of variation. Results indicate a low coefficient of variation, signifying accurate and homogeneous data. The result illustrates a 1% decrease in hemoglobin levels after Cefotaxime administration. The study attributes this effect to decrease red blood , in blood cell count, emphasizing Cefotaxime's efficacy in increasing WBCs, crucial for infection defense. Presents mean and standard deviation values for hemoglobin, WBC, S.GOT, S.ALT, S.ALP, S.Na, and S.K before and after Cefotaxime. The significant decrease in hemoglobin levels and rise in WBC count after Cefotaxime administration is evident, with a calculated T-value indicating high significance. Cefotaxime exhibits a notable impact on hematological and biochemical parameters, emphasizing its influence on hemoglobin and white blood cell levels. The study contributes valuable insights into the potential effects of Cefotaxime on hepatic enzymes and laboratory markers, enhancing our understanding of its clinical implications.

Keywords: Cefotaxim, GOT, GPT, Claforane, Crp

DESIGN AND FEASIBILITY STUDY OF SOLAR PANEL INSTALLATION ON THE ROOF OF A HOUSE CONSUMING 12 KW ELECTRIC ENERGY DAILY USING PV SOL SOFTWARE.

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ABSTRACT

Electrical energy has become an indispensable need in industrialized and developed societies. It is a resource needed even to meet basic needs at a minimum level in underdeveloped or developing societies. This need, when viewed from a world perspective, reveals that electrical energy is consumed considerably in the 21st century and that there is a search for alternative energy sources for supply [1-2]. Electrical energy is produced through power plants that use fossil fuel, nuclear and water flow. Today, countries have started to search for different energy production sources in the world due to the depletion of these production methods and resources and their accessibility. One of these energy production sources is solar energy, which is accepted as endless energy. Electricity generation with solar energy has become a highly demanded approach in recent years. As countries' sensitivity to human health and environmental protection has increased, interest in such developments has also increased [3-4]. Turkey is one of the countries where this interest is increasing. Turkey is in an important position to produce electricity from solar energy due to its location where it receives sunlight [5]. Solar energy systems, whose use has become widespread in industrial establishments, are now preferred individually by apartments, detached houses and solar energy fields [6]. For this reason, in this study, the consumption of solar energy, which is a renewable energy source, for individual use will be calculated and the solar panels that will be mounted on the roof of a house will be simulated and designed with PV SOL software for the required solar energy panels.

References:

[1] Sharma, B., & Shrestha, A. (2023). Petroleum dependence in developing countries with an emphasis on Nepal and potential keys. Energy Strategy Reviews, 45, 101053.
[2] Owen, J. R., Kemp, D., Lechner, A. M., Harris, J., Zhang, R., & Lèbre, É. (2023). Energy transition minerals and their intersection with land-connected peoples. Nature Sustainability, 6(2), 203-211.
[3] Halkos, G. E., & Tsirivis, A. S. (2023). Electricity production and sustainable development: The role of renewable energy sources and specific socioeconomic factors. Energies, 16(2), 721.
[4] Chanchangi, Y. N., Adu, F., Ghosh, A., Sundaram, S., & Mallick, T. K. (2023). Nigeria's energy review: Focusing on solar energy potential and penetration. Environment, Development and Sustainability, 25(7), 5755-5796.
[5] Endiz, M. S., & Coşgun, A. E. (2023). Assessing the potential of solar power generation in Turkey: A PESTLE analysis and comparative study of promising regions using PVsyst software. Solar Energy, 266, 112153.
[6] Lindahl, J., Johansson, R., & Lingfors, D. (2023). Mapping of decentralised photovoltaic and solar thermal systems by remote sensing aerial imagery and deep machine learning for statistic generation. Energy and AI, 14

Keywords: Solar Energy, Photovoltaic Panel, Techno-economic analysis, Rooftop Solar Panel Installation and Design

THE EFFECT OF ADDING CINNAMON EXTRACT ON THE TEXTURE PROFILE ANALYSIS OF OIL CAKE

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ABSTRACT

Bakery products, especially oil cakes, are among the most widely consumed food products [1]. The production of functional bakery products with physiological effectiveness and consumer acceptance requires careful consideration of their appearance, taste, and texture [2]. The quality of these products mainly depends on the ingredients used in the recipe, the dough mixing conditions, and the baking conditions [3]. Therefore, determining the optimal formulation to have healthy properties, maintain tissue properties, and improve the flavor of these products is very important [4]. Cinnamon is a spice that has been shown to have antioxidant, anti-inflammatory, and antidiabetic effects [5], as well as enhancing the sensory attributes of bakery products [6]. The aim of this study was to evaluate the impact of different concentrations of cinnamon extract (0%, 0.1% and 0.2%) on the hardness, adhesiveness, cohesiveness, and resilience of oil cake. We hypothesized that adding cinnamon extract would improve the texture characteristics of oil cake. Texture profile analysis was performed using TEXTURE ANALYZER model Brook field-CT310K. The results showed that adding cinnamon extract reduced the hardness of the cake samples, while the adhesiveness did not change significantly. The cohesiveness and resilience of the cake samples also decreased with increasing extract level. These results suggest that using cinnamon extract can enhance the texture and stability of oil cakes.

References:

[1] Rios, R. V, Garzón, R., Lannes, S. C. S., & Rosell, C. M. (2018). Use of succinyl chitosan as fat replacer on cake formulations. *LWT*, 96, 260–265.
[2] Siró, I., Kápolna, E., Kápolna, B., & Lugasi, A. (2008). Functional food. Product development, marketing and consumer acceptance: A review. *Appetite*, 51(3), 456–467.
[3] Doweidar, M. M., Amer, A. M., & Tawfek, A. (2016). Preparation and evaluation of healthy cinnamon cake. *Egyptian Journal of Nutrition*, 31(4), 157-195.
[4] Škrbić, B., & Cvejanov, J. (2011). The enrichment of wheat cookies with high-oleic sunflower seed and hull-less barley flour: Impact on nutritional composition, content of heavy elements and physical properties. *Food Chemistry*, 124(4), 1416–1422.
[5] Muhammad, D. R. A., & Dewettinck, K. (2017). Cinnamon and its derivatives as potential ingredient in functional food—A review. *International Journal of Food Properties*, *20* (Supl 2), 2237-2263.
[6] Ghannadiasl, F., & Bordbar Lomer, B. (2023). Physicochemical and sensory properties of oil cake enriched with cinnamon extract. *Journal of Food Research*, *33*(2), 43-55.

Keywords: Oil cake, Cinnamon extract, Texture profile analysis.

MULTILEVEL AND MULTISCALE CNN FOR ACCURATE LOCALIZATION AND CLASSIFICATION OF BREAST LESIONS

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ABSTRACT

This studay focuses on enhancing the efficiency and accuracy of breast cancer diagnosis (BCD) using computer vision and artificial intelligence. We critically examine various vision-based frameworks for BCD, emphasizing the need for precise lesion localization and categorization. We identify that the baseline frameworks, though computationally efficient, are significantly limited in their capacity to extract valuable features for final detection due to their reliance on feed-forward Convolutional Neural Network (CNN) architectures. These baseline models neglect crucial multilevel and multiscale features, which are indispensable in mitigating gradient vanishing / exploding issues and boosting early-stage diagnostic capabilities. To address these limitations, we propose a single-stage BCD framework, built on a unique CNN architecture, capable of localizing and classifying breast lesions from mammograms simultaneously. The performance of our proposed model is evaluated using two well-known benchmarks: INbreast and Curated Breast Imaging Subset of the Digital Database for Screening Mammography (CBIS-DDSM). Preliminary results show a significant improvement over the baseline frameworks. Specifically, the proposed hybrid CNN model exhibits an increase of 3.046% in accuracy and 4.767% in F1-Score for breast cancer classification on the INbreast dataset. For breast cancer detection, our model delivers a mean average precision (mAP) of 81.09%, outperforming the baseline detector by 10.75%. These results suggest a promising direction for future work in vision-based BCD, with potential implications for improved patient outcomes and clinical workflows.

Keywords: Breast Cancer Diagnosis, Mammogram Analysis, Convolutional Neural Network (CNN), Artificial Intelligence in Healthcare, Multilevel Features, Multiscale Features

PETROGRAPHIC CHARACTERISTICS OF THE NEOGENE LAVA DOME AROUND SAĞLIK AND YATAĞAN AREA, KONYA/TURKİYE

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ABSTRACT

To the west of Konya, an extensive lava dome has formed as a component of Neogene Erenlerdagi volcanism, possibly resulting from assimilation-fractional crystallization and/or magma mixing processes associated with subduction. Petrographic studies show that the phenocryst phase of the lava is represented by plagioclase (15-45%), amphibole (3-15%), opaque iron ore (3-20%), rare brown biotite (5-10%), quartz (0-5%), sanidine (0-5%), clinopyroxene (0-5%), and epidote (0-8%). The matrix is primarily composed of plagioclase, pyroxene, epidote, opaque iron ore, and occasional volcanic glass. The lava contains Mafic Microcrystalline Enclaves (MME). A chilly zone may develop between MME and its host, containing phenocrystals of plagioclase (25%) and amphibole (5%).

Keywords: Neogene, volcanism, lava, Konya

ANTIBIOTIC REMOVAL FROM WASTEWATER BY ADSORPTION

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ABSTRACT

Antibiotics, are chemicals that reduce or inhibit the proliferation and growth of microorganisms, and are useful in the treatment of human infectious diseases, the livestock industry, and aquaculture. After administration, antibiotics are only partially metabolized in the body, while the remaining antibiotics are excreted. The sewage treatment plants of municipal systems and pharmaceutical businesses are not efficient enough to remove these antimicrobials [1, 2]. Among the existing processes for the treatment of antibiotic-containing wastewater, the adsorption process is accepted as an effective and efficient method [3]. In the present study, epichlorhydrin cross-linked chitosan particles were kept in carboxymethyl cellulose solution before cross-linked with citric acid. Ampicillin (AMP) adsorption studies were carried out with the obtained particles. The physical and morphological characterization of the prepared adsorbent before and after adsorption was revealed by FTIR (Fourier-transform infrared), BET (Brunner-Emmett-Teller surface area) and SEM/EDX (Scanning electron microscopy-energy dispersive X-ray) analyses. The recommended contact time under application conditions is determined as 28 hours. Kinetic studies have shown that the process is more compatible with the pseudo-second-order kinetic model. According to the experimental data obtained, it was determined that the equilibrium adsorption obeyed the Langmuir isotherm. These results demonstrate the feasibility of the process and the application potential of the chitosan- carboxymethyl cellulose adsorbent in the treatment of AMP-containing waters such as hospital wastewater and pharmaceutical industrial wastewater.

References:

[1] Balarak, D., Khatibi, A. D., & Chandrika, K. 2020. Antibiotics Removal from Aqueous Solution and Pharmaceutical Wastewater by Adsorption Process: A Review. International Journal of Pharmaceutical Investigation, 10(2), 106-111.
[2] Dutta, J., & Mala, A. A. 2020. Removal of antibiotic from the water environment by the adsorption technologies: A review. Water Science and Technology, 82(3), 401-426.
[3] Homem, V., & Santos, L. 2011. Degradation and removal methods of antibiotics from aqueous matrices–a review. Journal of Environmental Management, 92(10), 2304-2347.

Keywords: Antibiotics, Adsorption, Ampicillin, Chitosan, Carboxymethyl cellulose

PRACTICAL NUMERICAL APPROACHES FOR FAULTS DETECTION AND PERFORMANCE IN HIGHVOLTAGE TRANSMISSION NETWORKS

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ABSTRACT

This research seeks to evaluate the significance of ML approaches in making reliable predictions of electrical faults, outages, threats, and other forms of problems in high-voltage power transmission networks. Four different ML algorithms were used (the Gradient Boosting Classifier (GBC), a modified GBC, the Light Gradient Boosting Classifier (LGBC), and a modified LGBC) to run numerical simulations and perform mathematical calculations. Research results showed that the LGBM classifier provided the highest accuracy rate (100.00%). Nonetheless, this worth was accomplished throughout the practice stages. There is no live comparable data available during training that is related to the efficiency with which ML algorithms make high-performance predictions. It has been concluded that the updated LGBC provided the maximum accuracy (85.23 %), and the testing process is complete. Further, the LGBM classifier and the modified LGBC both achieved training accuracy of at least 92.55% and as high as 100.00%. The most considerable accuracy was for the modified LSTM, while the least was for the original LSTM. The LGBM classifier had the lowest percentage, by contrast. This suggests that the outcomes of the test phase were contradictory to the results of the training phase.

Keywords: Transmission network, fault detection, gradient boosting, modified gradient boosting, light gradient boosting, accuracy

THE EFFECT OF ILLUMINATION TIME ON THE DSSC PERFORMANCE PARAMETERS

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ABSTRACT

It is undeniable fact that energy has a major role in the advancement of science, technology, and civilization. Many studies have been conducted on the creation of clean renewable energy resources as a way to lessen the negative environmental consequences of carbon based fuels and growing global energy demands. Among all the renewable energy sources, solar energy is the most popular because of its abundant supply and minimal impact on the environment. The solar energy system generates electricity from sunlight without emitting any gases that might accelerate global warming. Dye sensitized solar cells (DSSCs), a third generation solar cell, have been a prominent and frequent study topic among the many forms of solar energy studies. The study of dye-sensitized solar cells (DSSCs) has been ongoing for the last thirty years from a number of aspects. One of the shortcoming of DSSCs is the lack of comprehending of how to engineer their different components. The working electrode, mesoporous layer, dye, electrolyte, and platinum coating on counter electrode are a few of the fundamental research items of DSSCs that may be categorized [1-7]. Another factor that affects the performance parameters of solar cells is the production and operating conditions rather than the materials used in their fabrication. One of the operating conditions that has a direct impact on the performance characteristics of the solar cell device is its illumination time under a solar simulator. Here, the effect of illumination duration on the performance metrics of solar cell such the short circuit current density (JSC), open circuit voltage (VOC), fill factor (FF), and power conversion efficiency (PCE) was investigated and the obtained results were reported.

References:

[1] Yildiz, A., Chouki, T., Atli, A., Harb, M., Verbruggen, S. W., Ninakanti, R., & Emin, S. (2021). Efficient iron phosphide catalyst as a counter electrode in dye-sensitized solar cells. ACS Applied Energy Materials, 4(10), 10618-10626.
[2] Sbeta, M., Atilgan, A., Atli, A., & Yildiz, A. (2018). Influence of the spin acceleration time on the properties of ZnO:Ga thin films deposited by sol–gel method. Journal of Sol-Gel Science and Technology, 86, 513-520.
[3] Erdogdu, M., Atilgan, A., Erdogdu, Y., & Yildiz, A. (2024). Flavonoid from Hedera helix fruits: A promising new natural sensitizer for DSSCs. Journal of Photochemistry and Photobiology A: Chemistry, 448, 115288.
[4] Ozel, K., Atilgan, A., & Yildiz, A. (2024). Multi-layered blocking layers for dye sensitized solar cells. Journal of Photochemistry and Photobiology A: Chemistry, 448, 115297.
[5] Atilgan, A., & Yildiz, A. (2022). Ni-doped TiO2/TiO2 homojunction photoanodes for efficient dye-sensitized solar cells. International Journal of Energy Research, 46(10), 14558-14569.
[6] Kocak, Y., Atli, A., Atilgan, A., & Yildiz, A. (2019). Extraction method dependent performance of bio-based dye-sensitized solar cells (DSSCs). Materials Research Express, 6(9), 095512.
[7] Bilen, K., & Yildiz, Y. (2023). Synergistic effect of Ga(NO3)3 & TiCl4 post-treatment on photovoltaic performance of dye-sensitized solar cells. Applied Physics A, 129(4), 310.

Keywords: Energy, renewable energy, solar energy, DSSC, efficiency

INVESTIGATION OF IN VITRO EFFECTS OF SOME ANTIBIOTICS ON CHICKEN HEART GLUTATHIONE S-TRANSFERASE ENZYME ACTIVITY

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ABSTRACT

Glutathione S-transferase enzyme (GST; EC 2.5.1.18) is a very important antioxidant enzyme that plays important functions in living metabolism. Glutathione S-transferases have been identified as a Phase-II detoxification enzyme family. Xenobiotics, which originate from exogenous or endogenous sources, transform into metabolites with lower toxicity that are easily excreted from the living organism as a result of Phase II reactions. During this event, GST takes part in reactions that enable the conjugation of glutathione with many metabolites that may cause toxicity.

This study was carried out in two stages. First of all, the GST enzyme was purified and then the in vitro effects of some antibiotics on the purified GST enzyme activity were examined. GST enzyme was purified from chicken heart tissue by preparation of homogenate, ammonium sulfate precipitation and glutathione-agarose affinity chromatography. In the kinetic studies conducted with the purified GST enzyme, it was determined that the antibiotics amoxicillin, cefuroxime sodium and cefazolin sodium had an inhibitory effect on the enzyme. Activity%-[I] graphs were drawn with the data obtained as a result of the kinetic studies, and the IC_{50} values for the antibiotics in question were calculated as 0.66, 2.07 and 2.09 mM, respectively.

Keywords: Glutathione S-transferase, Antibiotic, Inhibition

INVESTIGATION OF A-GLUCOSIDASE INHIBITORY EFFECTS OF SOME 7-DIETHYLAMINOCOUMARINTHIAZOLE DRAVATIVES AND MOLECULAR MODELING STUDIES

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ABSTRACT

Diabetes mellitus is one of the most important health problems affecting the quality of life of people worldwide, especially in developing countries. According to the World Health Organization reports, the number of patients with diabetes is approximately 420 million, this number is estimated to be 642 million in 2040. There are 2 main types of diabetes: the body cannot produce enough insulin in type 1 diabetes (T1DM) and in type 2 diabetes (T2DM), the body cannot use insulin properly. Patients with T1DM are treated with insulin injections; Oral glucose-lowering drugs are used in patients with T2DM. Oral antihyperglycemic drugs used in the treatment of type 2 diabetes mellitus have different mechanisms. α-Glucosidase inhibitors are one of the most important inhibitors among them.

The antidiabetic effect of the 7-diethylaminocoumarinthiazoles, which have very rich in activity, draws attention. Therefore, this research, it was aimed to search 7-diethylaminocoumarinthiazole derivatives that could show potential antidiabetic activity. The inhibitor activity of the compounds 4, 5 and 6 were tested against α-glucosidase enzymes. Besides, molecular modeling was utilized to predict potential interactions of the synthesized compounds that exhibit inhibitory effects. The analyses conducted revealed that compound 4 has strong inhibitory effects against α-glucosidase enzymes (Binding energy: -121.365 MolDock Score, IC50: -121.365 µM), in both in vitro and in silico studies.

Keywords: 7-diethylaminocoumarinthiazoles, α-glucosidase inhibitory, Molecular docking

CLASSIFICATION OF BREAST CANCER ULTRASOUND IMAGES USING RADIOMIC FEATURES

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ABSTRACT

Breast cancer is one of the most common types of cancer among women, and its early diagnosis is vital due to the deadly risks. Detecting breast cancer at early stages helps extend the patient's lifespan and facilitates the treatment process. There are various methods available to diagnose breast cancer, such as ultrasound (US), mammogram, magnetic resonance imaging, and biopsy [1]. US imaging is more sensitive than mammography in terms of detection of breast lesions [2]. Therefore, this study focuses on the identification of breast tumors as benign or malignant from US images. In this study, an open dataset containing 647 breast US images was used. There are five main steps for this task: image preprocessing, segmentation, feature extraction, feature selection and classification. In the image preprocessing step, resizing, sharpening, Gaussian filtering and adaptive histogram equalization methods were applied to the images. Then, region of interests were detected in the segmentation step. In the feature extraction step, radiomic features such as first-order statistical features, shape-based features and texture features were extracted. Correlation-based feature selection was applied after the feature extraction step. In the classification part, four different machine learning algorithms were used to classify benign and malignant tumors according to selected radiomic features. These algorithms are J48, Logistic Model Trees, Random Tree, and Random Forest. The Random Forest method achieved a superior accuracy rate of over 91% on this dataset.

References:

[1] Puglisi, F., Zuiani, C., Bazzocchi, M., Valent, F., Aprile, G., Pertoldi, B., Minisini, A. M., Cedolini, C., Londero, V., Piga, A., & Di Loreto, C. (2003). Role of Mammography, Ultrasound and Large Core Biopsy in the Diagnostic Evaluation of Papillary Breast Lesions. Oncology, 65(4), 311–315. https://doi.org/10.1159/000074643

[2] Ali, E. A., Ahmed, A. M., & Elsaid, N. A. (2020). The added advantage of automated breast ultrasound to mammographically detected different breast lesions in patients with dense breasts. Egyptian Journal of Radiology and Nuclear Medicine, 51(1). https://doi.org/10.1186/s43055-020-00171-9

Keywords: Breast cancer, Ultrasound images, Radiomic features, Machine learning, Feature selection

DFT CALCULATIONS, HIRSHFELD SURFACE ANALYSIS AND MOLECULAR DOCKING STUDIES OF (1E,4E)-1,5-BIS (4-ETHOXYPHENYL) PENTA-1,4-DIEN-3-ONE

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ABSTRACT

Monocarbonyl analogues of curcumin are among the pharmaceutical scaffolds exhibiting a range of pharmacological actions, such as antibacterial, anticancer, antioxidant, and antityrosinase properties [1]. In this study, quantum chemical electronic structure, Hirshfeld surface and molecular docking studies of (1E,4E)-1,5-Bis(4-toxyphenyl)penta-1,4-dien-3-one that is a curcumin analogue were performed. The intermolecular interactions were analyzed using the Hirshfeld surface method. In order to understand molecular stability, quantum chemical descriptors calculated at the time-dependent density functional theory (TD-DFT) were investigated by visualization of frontier molecular orbitals. All calculations of the compound were conducted with the Gaussian16W package program [2] at the three-parameter hybrid functional of Becke based on the correlation functional of Lee, Yang, and Parr (B3LYP). Quantum chemical calculations show good agreement between calculated and experimental parameters obtained from the literature. The antibacterial activity of the title compound docked into the active sites of the target protein was studied from docking parameters.

References:

[1] Chantrapromma S.,Ruanwasa P., Boonnak N. (2016). Synthesis, Antityrosinase Activity of Curcumin Analogues, and Crystal Structure of (1E,4E)-1,5-Bis(4-ethoxyphenyl)penta-1,4-dien-3-one, Crystallography Reports, 61, 1081–1085.

[2] Gaussian 16, Revision C.01, M. J. Frisch, G. W. Trucks, H. B. Schlegel, G. E. Scuseria, M. A. Robb, J. R. Cheeseman, G. Scalmani, V. Barone, G. A. Petersson, H. Nakatsuji, X. Li, M. Caricato, A. V. Marenich, J. Bloino, B. G. Janesko, R. Gomperts, B. Mennucci, H. P. Hratchian, J. V. Ortiz, A. F. Izmaylov, J. L. Sonnenberg, D. Williams-Young, F. Ding, F. Lipparini, F. Egidi, J. Goings, B. Peng, A. Petrone, T. Henderson, D. Ranasinghe, V. G. Zakrzewski, J. Gao, N. Rega, G. Zheng, W. Liang, M. Hada, M. Ehara, K. Toyota, R. Fukuda, J. Hasegawa, M. Ishida, T. Nakajima, Y. Honda, O. Kitao, H. Nakai, T. Vreven, K. Throssell, J. A. Montgomery, Jr., J. E. Peralta, F. Ogliaro, M. J. Bearpark, J. J. Heyd, E. N. Brothers, K. N. Kudin, V. N. Staroverov, T. A. Keith, R. Kobayashi, J. Normand, K. Raghavachari, A. P. Rendell, J. C. Burant, S. S. Iyengar, J. Tomasi, M. Cossi, J. M. Millam, M. Klene, C. Adamo, R. Cammi, J. W. Ochterski, R. L. Martin, K. Morokuma, O. Farkas, J. B. Foresman, and D. J. Fox, Gaussian, Inc., Wallingford CT, 2016.

Keywords: DFT, Hirshfeld Surface Analysis, Molecular Docking, HOMO-LUMO.

ELECTRIC VEHICLES CHARGING BASED WIRELESS POWER TRANSFER

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ABSTRACT

With the surge in adoption of electric vehicles, finding sustainable and efficient charging solutions has become paramount. This paper delves into approach, utilizing microgrids for the wireless self-charging of electric vehicles. Microgrids, typically characterized by decentralized and renewable energy sources, offer a unique advantage in harnessing localized energy, ensuring a lower carbon footprint. This study outlines the design of a wireless charging with challenges faced, such as energy transfer efficiency, grid stability, and the optimization of energy distribution. The proposed charging station uses microgrids for system stability, working autonomously with the main grid, the station's performance was exemplary. Wireless Power Transfer technology simplifies user experience. The system achieved a 90% efficiency, demonstrating minimal energy dissipation during transfer. Experimental results demonstrate the feasibility of this approach, with electric vehicles s successfully achieving charging rates comparable to conventional methods but in a greener and more sustainable manner.

References:

[1] Detka, K., & Górecki, K. (2022). Wireless power transfer—a review. Energies, 15(19), 7236. https://doi.org/10.3390/en15197236
[2] Bi, Z., Kan, T., Mi, C. C., Zhang, Y., Zhao, Z., & Keoleian, G. A. (2016). A review of wireless power transfer for electric vehicles: Prospects to enhance sustainable mobility. Applied Energy, 179, 413–425. https://doi.org/10.1016/j.apenergy.2016.07.003
[3] Singh, S., Jagota, S., & Singh, M. (2018). Energy management and voltage stabilization in an islanded microgrid through an electric vehicle charging station. Sustainable Cities and Society, 41, 679–694. https://doi.org/10.1016/j.scs.2018.05.055
[4] Shahzad, S., Abbasi, M. A., Ali, H., Iqbal, M., Munir, R., & Kilic, H. (2023). Possibilities, challenges, and future opportunities of microgrids: A review. Sustainability, 15(8), 6366. https://doi.org/10.3390/su15086366
[5] Battula, A. R., Vuddanti, S., & Salkuti, S. R. (2021). Review of Energy Management System Approaches in Microgrids. Energies, 14(17), 5459–5459. https://doi.org/10.3390/en14175459
[6] Trung, N. K., & Diep, N. T. (2021). A maximum transfer efficiency tracking method for dynamic wireless charging systems of electric vehicles. Journal of Electrical and Computer Engineering, 2021, 1–10. https://doi.org/10.1155/2021/5562125
[7] Du, J., Pei, M., Jia, B., & Wu, P. (2022). Optimal deployment of dynamic wireless charging lanes for electric vehicles considering the battery charging rate. Journal of Advanced Transportation, 2022. https://doi.org/10.1155/2022/6428887
[8] Kashani, S. A., Soleimani, A., Khosravi, A., & Mirsalim, M. (2023). State-of-the-Art research on wireless charging of electric vehicles using solar energy. Energies, 16(1), 282. https://doi.org/10.3390/en16010282
[9] Vishnuram, P., P., S., R., N., K., V., & Nastasi, B. (2023). Wireless chargers for electric vehicle: A systematic review on converter topologies, environmental assessment, and review policy. Energies, 16(4), 1731. https://doi.org/10.3390/en16041731
[10] Palani, G., Sengamalai, U., Vishnuram, P., & Nastasi, B. (2023). Challenges and barriers of wireless charging technologies for electric vehicles. Energies, 16(5), 2138. https://doi.org/10.3390/en16052138
[11] Dimitriadou, K., Rigogiannis, N., Fountoukidis, S., Kotarela, F., Kyritsis, A., & Papanikolaou, N. (2023). Current trends in electric vehicle charging infrastructure; opportunities and challenges in wireless charging integration. Energies, 16(4), 2057. https://doi.org/10.3390/en16042057

Keywords: Microgrids, Electric vehicle, Wireless power transfer, Photovoltaic

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SYNTHESIS OF GRAPHENE OXIDE BY HUMMERS TOUR METHOD AND REDUCED GRAPHENE OXIDE BY CHEMICAL REDUCTION METHOD

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ABSTRACT

The purpose of this work was to compare the effectiveness of synthetic graphene oxide synthesis using the Hummers Tour technique from graphite and reduced graphene oxide synthesis using sodium boron hydride and ascorbic acid in the Chemical reduction method from synthesized graphene oxide. FTIR structure characterization, BET surface area measurement, Zeta Potential, and particle size distribution investigations were carried out for the synthesis of reduced graphene oxide and graphene oxide. The graphene oxide and reduced graphene oxide synthesis is successful, as can be seen from the FTIR graphs. The graphene oxide sample shows a BET surface area improvement rate of 76.64%. Because graphene oxide is hydrophilic, it can be readily dissolved in water, which has improved its Zeta Potential property by 114%. This provided a sample of reduced graphene oxide with a 41% increase in rag size due to the synthesis of sodium boron hydride. Sodium borohydride performed better than ascorbic acid in manufacturing reduced graphene oxide. However, ascorbic acid is even better when its reduction performance is evaluated in terms of expenses and eco-friendly manner.

Keywords: Graphene Oxide, Reduced Graphene Oxide, Hummers TOUR Method, Chemical reduction method

THE GENETIC POLYMORPHISMS IN POLYCYSTIC OVARIAN SYNDROME (GPPOS)

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ABSTRACT

Polycystic ovarian syndrome is the endocrine disorder that most affects the reproductive sphere of women in childbearing age, its causes are not exactly known, but most experts agree that it is a multifactorial entity, in which the factors Genetics are becoming increasingly important. In recent years, several genes involved in the pathogenic processes of this syndrome have been identified, and within these, the most important are those that encode for steroidogenesis enzymes, for the insulin receptor and other hormones related to the action of insulin. insulin, as well as gonadotropins and their receptors.

Keywords: polycystic ovary syndrome, genetics, pathogenic

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EVALUATION LEVEL OF ENDOTHELINE-1 AND SOME PARAMETERS IN ACUTE MYOCARDIAL INFRACTION

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ABSTRACT

Our study included 70 samples, divided into 30 for the total number of controls and 40 for the group of patients participating in the research. Endothelin -1 results in our study indicated a statistically significant difference between the patient group compared with the control group, at P = 0.001. This indicates the importance of this test in diagnosing acute myocardial infarction. The results of total lipids and triglycerides indicated that there were statistically significant clinical differences, which made it possible to use these parameters in combination with others to help in the early diagnosis of acute myocardial infarction.

Keywords: Acute myocardial infarction, Endothelin -1, Total cholestrol, Triglyceride

COATING OF POLY(ANILINE-CO-O-TOLUIDINE) COPOLYMER ON FTO GLASSES IN ACETONITRILE

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ABSTRACT

Electrochemical and physical properties of conjugated polymers are strongly affected by the type of electrolyte, counterion, solvent and electrode and the pH of the environment as well as the voltage/current applied during electrochemical polymerization [1]. However, the most important parameter to obtain an electroactive polymer film under good conditions is the monomer selection. Polyaniline is the most common electroactive polymer, showing high electroactivity in acidic environment, and its physical properties can vary over a wide range with changing counterions and solvent [2]. For example, by changing the type of acid used, the growth rate of polyaniline is increased, and a more porous film is formed [3]. On the other hand, the electroactivity of polyaniline is mostly affected by high pH because it loses its electroactivity as the pH increases [4]. Copolymerization is a convenient way to enhance its electroactivity in higher pH environments. Additionally, it is possible to synthesize copolymer with new electrochemical and physical properties by adding other monomers to aniline monomer solution [5]. According to a study previously reported in the literature [6], poly(aniline-co-o-toluidine) shows more electroactive properties than polyaniline and poly-o-toluidine in neutral environments. Also, this study emphasizes that the copolymer is more compact and uniform than its homopolymers. On the other hand, as mentioned before, the electrochemical and physical properties of a (co)polymer can be changed using different solvent and electrodes, and the coating of this copolymer on FTO glasses in acetonitrile has not been studied. In this study, the coating of this copolymer on FTO glasses in acetonitrile was carried out for the first time. Later, electroactivity and morphological properties of the copolymer films was investigated.

References:

1. Hussain, A.M.P., and Kumar, A. (2003) Electrochemical synthesis and characterization of chloride doped polyaniline. Bulletin of Materials Science.
2. Syed, A.A., and Dinesan, M.K. (1991) Review: Polyaniline-A novel polymeric material. Talanta.
3. Unal, A. (2022) Advances in Materials Science Research. Volume 49, Nova Science Publishers, New York.
4. Unal, A., Hillman, A.R., Ryder, K.S., and Cihangir, S. (2021) Highly Efficient Defluoridation of Water through Reusable poly(aniline-co-o-aminophenol) Copolymer Modified Electrode Using Electrochemical Quartz Crystal Microbalance. J Electrochem Soc, 168 (2).
5. Bilal, S., and Holze, R. (2006) Electrochemical copolymerization of m-toluidine and o-phenylenediamine. Electrochim Acta.
6. Unal, A., Robert Hillman, A., Ryder, K.S., and Cihangir, S. (2021) Electrogravimetric analysis of poly(aniline-co-o-toluidine) copolymer films in the presence of fluoride ions. Journal of Electroanalytical Chemistry, 895.

Keywords: Polyaniline, Poly-o-toluidine, Copolymer, Acetonitrile, FTO

INVESTIGATION OF GOLGI PROTEIN CONCENTRATION AND CA15- 3 TUMOR MARKER IN WOMEN WITH BREAST CANCER

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ABSTRACT

For study, the serum level of Golgi protein 73 (GP73), Ca15.3, and some biochemical test and the correlation between them in Iraqi women After hysterectomy, venous blood from women in the four groups (healthy, benign, newly diagnosed breast cancer, and breast cancer under treatment) pooled in gel tubes to a depth of five millimeters. showed the mean of age there were a statistically significant difference, when compared between age groups of studied groups Study, presented that a significant difference (P = 0.031 at P<0.05), when compared between studied groups of family history breast cancer; without history of the disease was high frequency in healthy control 30, (88.2%) than with history 4, (11.8%), but in other groups was comparable frequency even with or without history of the disease. Whereas, within groups, showed that a highly significant difference. Our results presented that a non-significant, when compared between studied groups of social status with breast cancer disease; married (82.4%), benign tumor (69.2%), newly diagnosis (90.5%) & under treatment (89.2%)}; more than single {Healthy control (17.6%), benign tumor (30.8%), newly diagnosis (9.5%) & under treatment (10.8%)}. Besides, a non-significant (P = 0.891 at P>0.05), when estimated the results of Ca15 -3 tumor marker test in sera of breast cancer patients. Eventually, the proved that there was a similar mean of human Golgi protein 73 assay in sera of breast cancer patients & their healthy controls with low levels in all above studies. The present study indicates no significant differences in levels of Human Golgi protein 37 between patients with breast cancer regarding tumor marker tests Ca 15 - 3.

Keywords: Golgi protein 73, Ca 15 - 3, Breast cancer, Tumor marker, Benign

FEASIBILITY STUDY IN PLASTIC PRODUCTION

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ABSTRACT

Masterbatch is the raw material of plastics and products that are frequently used in daily life. In most industrial and factory productions, masterbatch is used in the production of raw materials. Masterbatch usage areas; automotive, white goods, electrical and electronics, pet bottle and packaging industries. During the production phase of the facility, Calcite masterbatch and White masterbatch, known under commercial names, are produced in different proportions. Raw materials are produced automatically from cyclones in granular form. Mixtures are prepared in weight ratios according to the characteristics of the product to be obtained as a result of production. In addition, it is produced in granule form by cooking at the entrance of the extruder. A feasibility study was carried out in production and the hourly extruder and granulating capacity was calculated as C280.PP 700 kg/hour, C370.PE 700 kh/hour, T370.PE 1000kg/hour. The amounts of polypropylene, calcite, titanium, polyethylene, paint, polyethylene sacks, wooden pallets, stretch nylon, plastic packaging straps and filter mesh, which are the materials required for production, were also calculated.

References:

1. Evode, N., Qamar, S. A., Bilal, M., Barceló, D., & Iqbal, H. M. (2021). Plastic waste and its management strategies for environmental sustainability. Case Studies in Chemical and Environmental Engineering, 4, 100142.
2. Pan, D., Su, F., Liu, C., & Guo, Z. (2020). Research progress for plastic waste management and manufacture of value-added products. Advanced Composites and Hybrid Materials, 3, 443-461.
3. Kumar, M., Bolan, S., Padhye, L. P., Konarova, M., Foong, S. Y., Lam, S. S., ... & Bolan, N. (2023). Retrieving back plastic wastes for conversion to value added petrochemicals: opportunities, challenges and outlooks. Applied Energy, 345, 121307.

Keywords: Plastic production, Feasibility study, Masterbatches, Used areas

OPTICALLY TRANSPARENT FSS-BASED ABSORBER FOR ELECTROMAGNETIC SHIELDING IN 5G APPLICATIONS

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ABSTRACT

In this study, a frequency selective surface (FSS)-based absorber that can be used in 5G applications is proposed. The FSS-based absorber is designed to shield 3.5 GHz, the most used frequency in 5G applications. The purpose of the application is to create an electromagnetic shield for the 3.5GHz frequency and to protect devices that can be used at this frequency from electromagnetic interference. Parametric analysis is conducted employing three-dimensional full-wave electromagnetic simulation software (CST Studio Suite®). This analysis aims to verify the suitability of the chosen ground thickness and FSS pattern in meeting the specified frequency requirements. Simulation results indicate that both the ground line thickness and the diameter of the circular ring play pivotal roles in shaping the frequency characteristics of the frequency selective surface. In the design of the FSS-based absorber, transparent PVC with a dielectric constant of 2.77 was used as the dielectric material and copper as the conductor. The measurements taken from the fabricated sample were aligned with the simulation outcomes, showcasing a consistent agreement between the two sets of data.

References:

[1] Chaturvedi, P., Hsu, K., Zhang, S., & Fang, N. (2008), New frontiers of metamaterials: design and fabrication, *MRS BULLETIN,Volume 33*, pp. 915-920.
[2] Gangwar, K., Paras Dr., & Gangwar, Dr. R.P.S. (2014), Metamaterials: characteristics, process and application, *SSN 2231-1297, Volume 4*, pp. 97-10.
[3] Bukhari, S. S., Vardaxoglou, J., & Whittow, W. (2019), A metasurfaces Review : Definitions and Applications, *Appl. Sciences*.
[4] Kuester, E., Mohamed, M., Piket-May, M., & Holloway, C. (2003), Averaged transition conditions for electromagnetic fields at a metafilm, *IEEE Trans. Antennas Propag*., *Volume 51*, pp. 2641–2651.
[5] Yu, N., & Capasso, F. (2014), Flat optics with designer metasurfaces, *Nat. Mater*., *Volume 13*, pp. 139–150.
[6] Hussein, M., Hung, Y., & Zhou, J., Frequency selective surface with miniaturize different elements: a different approach.
[7] Kohlgraf, D.C. (2005), Design and testing of a frequency selective surface (FSS) based wide-band multiple antenna system, pp. 6-8.

Keywords: Frequency selective surface, Absorber, Electromagnetic shielding, Electromagnetic interference, 5G applications

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SYNTHESIS OF SOME IMIDAZOLINE DERIVATIVES AND STUDY OF THEIR ANTI-CORROSION EFFICIENCY

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ABSTRACT

Any cyclic organic compound containing N, O, or S as a substitute for one or more of a single cyclic carbon atom is called a heterocyclic compound. The rings are either nonaromatic rings or simple aromatic rings. Some examples are imidazole ($C_3H_4N_2$), pyridine (C5H5N), dioxane (C4H8O2) and pyrimidine (C4H4N2) as shown below (Bharti 2011). Imidazole is a five-membered aromatic heterocycle containing two nitrogen atoms. It exhibits resonance due to the delocalization of electrons within the ring (Bharti 2011). In imidazole, the lone pair of electrons on each nitrogen atom can delocalize into the π system of the ring, leading to resonance stabilization. This electron delocalization occurs through the formation of a π bond between the nitrogen atoms and the adjacent carbon atoms in the ring. As a result, the electrons are shared between multiple atoms, creating resonance structures (John and Joule 2010). The resonance structures of imidazole show that the electrons are not localized on specific atoms but are spread out over the entire ring system. This delocalization of electrons enhances the stability of the molecule. It also influences the reactivity of imidazole, making it more nucleophilic and capable of participating in various chemical reactions (John and Joule 2010).

Keywords: Synthesis, Imidazoline, Anti-corrosion, Efficiency, fatty acid, NMR, FT-IR, H1-NMR, C13-NMR

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REGULARIZED LOGISTIC REGRESSION MODELS FOR BREAST CANCER

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ABSTRACT

Breast cancer classification is a critical facet of modern oncology, employing advanced statistical learning algorithms to distinguish between benign and malignant cases. Accurate classification is imperative for early detection, treatment planning, and patient outcomes. The importance of effective breast cancer classification lies in its potential to enhance diagnostic precision, guide treatment strategies, and ultimately improve survival rates and quality of life for affected individuals. In this paper we implemented three sophisticated models, such as Lasso, Ridge, and Elastic Net logistic regression which play a pivotal role in achieving high accuracy, precision, and recall. To ensure robust and reliable results, a comprehensive step of preprocessing techniques was implemented, encompassing data cleaning to address null values and duplicate records, data scaling for feature normalization, random over-sampling to tackle class imbalance, and an 80:20 data splitting ratio for training and testing. Additionally, cross-validation was employed to assess model generalization and robustness. The paramount importance of accurately diagnosing cancer types lies in its potential to significantly impact patient outcomes and guide treatment strategies. Lasso logistic regression emerges as the top performer, achieving 97.2% accuracy, balanced precision and recall at 97%, and an F1-score of 97%. Ridge logistic regression follows closely with 95.8% accuracy and balanced precision, recall, and F1-score at 96%. Elastic Net logistic regression, positioned between Lasso and Ridge, attains 96.5% accuracy, with precision and recall both at 96.5%, and an F1-score of 96.2%. These findings underscore the trade-offs and strengths of each algorithm, offering guidance to practitioners for optimal model selection in breast cancer classification. In conclusion, this research provides a comprehensive analysis of statistical learning algorithms for breast cancer classification, offering insights into their performance metrics, trade-offs, and discriminative abilities. These findings empower practitioners to make informed decisions based on specific objectives and requirements in the context of breast cancer diagnosis.

Keywords: Breast cancer classification, oncology, Lasso logistic regression

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INVESTIGATION OF ACETYLCHOLINESTERASE INHIBITORY EFFECTS OF SOME NEW HYDRAZIDES AND MOLECULAR MODELING STUDIES

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ABSTRACT

In this study, three compounds, namely 5, 6, and 7, were investigated for their potential to inhibit enzyme activity. Alzheimer is associated with various health risks, and inhibiting AChE (acetylcholinesterase) activity is considered a potential approach for managing this condition. The results indicate that all three compounds, 5, 6, and 7, demonstrated a reduction in AChE (acetylcholinesterase) enzyme activity. The concentration-dependent inhibition is clearly illustrated in the graphical representations (Figures 1, 3, and 5). These findings suggest that these compounds have the potential to be utilized in the treatment of diseases linked to AChE (acetylcholinesterase) enzyme activity, such as Alzheimer. The 2D interaction maps (Figures 2, 4, and 6) provide insight into the specific amino acid interactions between each compound and the AChE (acetylcholinesterase) enzyme. Notably, hydrogen bond interactions with amino acids like ARG 296 and SER 293 were identified, emphasizing their role in the inhibitory process. Additionally, the red separation contacts in the interaction maps suggest that the active site of the enzyme is no longer occupied by water molecules, leading to a change in enzyme shape and the cessation of catalytic reactions. The results of this study support the potential therapeutic use of compounds 5, 6, and 7 in treating conditions associated with elevated AChE (acetylcholinesterase) activity, such as Alzheimer. Further research, including in vivo studies and clinical trials, would be necessary to validate these findings and assess the safety and efficacy of these compounds as potential anti-Alzheimer agents.

Keywords: AChE (acetylcholinesterase), Inhibition, Alzheimer

A DENSITY FUNCTIONAL THEORY ANALYSIS OF THE PRESSURE-INDUCED MECHANICAL STABILITY OF KNIF3 PEROVSKITE COMPOUND

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ABSTRACT

In this study, we employed density functional theory to evaluate the structural, electronic, and mechanical properties of the $KNiF_3$ cubic perovskite compound, which belongs to the *Pm3m* space group, under high-pressure conditions ranging from 0 to 100 GPa. The results were calculated employing the GGA-PBE approximation in the Vienna Ab initio Simulation Package (VASP) code. Our findings were compared with existing research, and consistent results were obtained. The mechanical properties that our calculations determine are the following: Cauchy pressure, bulk modulus, Young's modulus, shear modulus, Pugh's ratio, Poisson's ratio, hardness, machinability index, Zener anisotropy factor, sound velocities, and Debye temperature. $KNiF_3$ compound was found to meet the criteria for mechanical stability and exhibited consistent mechanical stability across the entire 0 to 100 GPa pressure range. The computed mechanical properties suggest that $KNiF_3$ is a ductile material, and its ductility increases with pressure. The elastic anisotropic mechanical properties were visually represented. The estimation of electronic properties has been performed through spin-polarized calculations.

Acknowledgments
The numerical calculations reported in this paper were performed at TUBITAK ULAKBIM, High Performance and Grid Computing Center (TRUBA resources).

Keywords: KNiF3, density functional theory, structural properties, mechanical stability

PSORIASIS ARTHRITIS PROGRESSION CONTROLLED BY A CLINICAL AND HEMATOLOGICAL EVALUATIONS

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ABSTRACT

Most of the prevalent chronic autoimmune and inflammatory diseases is a psoriasis arthritis (PsA), that is a mostly with an idiopathic cause. Our present study results were gaining a positive significance changes between the biochemical, hematological parameters in all subject's serum that they enrolled at this our case control study. That shows below (clinical parameters) Vitamin D, Vitamin K2, CRP, GSH/GSSG. As well as the genetic results of a (CCHCR1 Gene) revealed also with a significant polymorphism for the (rs3130453) SNP. Apparently affected levels of CRP, ESR and GSSG parameters that been increase for the PsA group also were found normal in healthy group. Decrease in the levels of serum Vitamin D, Vitamin K2 and the GSH ratio to the GSSG seen obviously in PsA group and also been normal in the second group. Due to our revealed and present study results, after matching oxidative stress will be concluded finally elevated. The poor controlling for the PsA diagnosed cases also may contributed with the family risk and triggering genes factors, for disease (PsA) pathogenesis and exacerbations.

Keywords: Vitamin D, Vitamin K2, ESR, CRP, GSH and GSSG

DEVELOPMENT OF A MULTI-SENSOR SYSTEM FOR EVALUATING URINE QUALITY

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ABSTRACT

Multiple infections and diseases have strong, reliable biomarkers in human urine. Diabetes mellitus, urinary tract infection, and hepatovirus are the main disorders that relate to changes in urine composition and quality. Utilizing such characteristics of these diseases, urine quality evaluation can be a very reliable, non-invasive method to perform early diagnosis of diseases like diabetes. Both non-invasive and point-of-care systems can be considered major steps forward in the early diagnosis of diabetes. The objective of this study is to assess the quality of human urine by utilizing a multi-sensor system that measures two key parameters: ammonia concentration using the MQ137 sensor and urine turbidity using the SEN0189 sensor. The measurements of these sensors were collected by a microcontroller board and displayed on an LCD screen. The study utilized pre-tested real urine samples to display and verify the functionality of the application. An extensive evaluation of the sensitivity, accuracy, and error margins of the sensory application was performed to verify adequate results. Finally, this study presents a new, reliable, and cost-effective method for early diagnosis of diabetes. It has a great potential for implementation and customization for different urinalysis-related diseases.

Keywords: Urine quality, Diabetes, Ammonia, Turbidity, Sensor

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OPTIMIZATION OF LASER CUTTING PARAMETERS OF COMPOSITE MATERIALS MODIFIED WITH BORON NITRIDE

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ABSTRACT

In this study, a total of five different continuous fiber-reinforced composite materials, one control and four with boron nitride modified at different weight ratios, were cut using the laser cutting method, and the changes in dimensions after cutting were observed. Laser cutting parameters (control factors) were determined as cutting speed, laser power, and laser focusing distance. 10, 14, 18 mm/s, 50%, 60%, 70%, and 5, 6, 7 mm were used for cutting speed, laser power, and focal length, respectively. Experiments were performed using a Taguchi L9 orthogonal array for each material. Using the Taguchi method, control factors were optimized in terms of changes in dimensions (quality characteristics), and their importance levels were determined. Even though the impact rates vary for each material group, cutting speed was found to be the most important control factor. This was followed by laser power and focal length. Optimum results were observed at cutting parameters of 50% power value and 10 mm/s cutting speed. With the help of the experimental results, regression analysis was performed, and mathematical models were developed for measurement changes. Mathematical models have been tested with verification experiments, and it has been seen that the models can be used safely.

Keywords: Boron nitride, laser cutting, laminated composite, Taguchi method

THE RESULT ON FIXED POINTS IN Δ-SYMMETRIC QUASI-METRIC SPACES THROUGH Θ-CONTRACTION

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ABSTRACT

In this presantation, we present a fixed point theorems for single-valued mappings considering a new type contraction on some kind of complete Δ-symmetric quasi-metric spaces, which has a comprehensive structure space and has a more application on computer science and semantics. On the other hand, an attracted generalization of the Banach contraction principle given by Jleli and Samet, introduced a new type of contractive condition, we shall call it as θ-contraction. On the other hand, -admissibility and θ-contractivity of a mapping are popular concepts in recent metrical fixed point theory. In this work, by considering the Jleli and Samet's technique for contractions on metric space, we give a new concept for single-valued mappings on Δ-symmetric quasi metric spaces.

Keywords: Quasi metric space, θ-contraction, fixed point, Δ-symmetric quasi metric

INNOVATIVE PROCESSING TECHNIQUES UNVEIL THE POTENTIAL OF CHICKPEA AQUAFABA

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ABSTRACT

Chickpea aquafaba, the residual liquid from cooked chickpeas, stands out as a noteworthy player in the dynamic landscape of plant-based ingredients, captivating the food science community with its distinct attributes. This study delves deeply into the physicochemical properties of chickpea aquafaba and its powder counterpart, highlighting the protein-rich profile. Chickpea aquafaba inherits these nutritional components, boasting 1-1.5% protein and 3.5% carbohydrates by weight, and distinguishing itself with exceptional foaming ability derived from a unique composition rich in soluble proteins, oligosaccharides, saponins, and starches [1,2]. Aquafaba's foaming ability distinguishes it as a sought-after ingredient for vegan and egg-free recipes, excelling in achieving desirable textures[3,4].. The investigation extends into cutting-edge technologies, with a focus on the transformative impact of microwave vacuum technology and custom-designed microwave equipment on aquafaba. These methods not only fine-tune critical parameters for optimized protein content and foaming ability, but they also improve protein extraction precision. The study delves deeper into spray-dried chickpea aquafaba, presenting a concentrated and shelf-stable powder that expands the benefits of this plant-based elixir. Chickpeas, aquafaba, advanced processing technologies, and custom-designed equipment have all come together to usher in a new era of plant-based innovation. The study emphasizes microwave vacuum technology which is a method that combines the advantages of microwave and vacuum drying [5] and its superior performance, consistently yielding higher protein content and desirable properties in both liquid and powder forms of aquafaba. In the ever-changing landscape of food science, this comprehensive examination of composition, foaming ability, and advanced processing illuminates the path toward realizing the full potential of chickpea aquafaba.

Keywords: Chickpea, Aquafaba, Microwave-Vacuum, Spray Drying, Powder

SOFT HESITANT SETS

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ABSTRACT

Fuzzy sets and soft sets are important tools for dealing with uncertainty. There are many extensions of fuzzy sets. The hesitant fuzzy set is one of them. In this study, we define the concept of soft hesitant sets and present some representations of them. We also introduce the set-theoretical operations between two soft hesitant sets and give their examples.

Keywords: Soft set, Hesitant Fuzzy set, Soft hesitant sets, set operation

THE SALT OF ASSAL LAKE DJIBOUTI

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ABSTRACT

Lake Assal is a crater lake located in the central west of Djibouti and approximately 120 km west of Djibouti City. Lake Assal is the deepest point on land in Africa and the third deepest point on Earth, at 153 m below sea level. There are hot springs around Lake Assal, it is surrounded by inactive volcanoes and dense dark black colored lava deposits. It increases the salinity level of its waters due to high evaporation. Lake Assal is the world's largest salt reserve. The northern and northwestern part consists of a large salt flat and the eastern side consists of a basin of approximately 900 km^2 consisting of a high density salt water mass. Assal lake is an oval lake with a length of 19 km and a width of 6.5 km. Located in the north-northeast, the crystal salt surface is 68 km^2 and the dense brine area is 54 km^2. The crystallized salt zone extends to a depth of more than 60 m, with an estimated resource of approximately 300 million tonnes. The maximum depth of the water part of the lake is 40 m, and the average depth is 7.4 m, which means a water volume of 400 million cubic meters. Located in the hot desert, the lake experiences summer temperatures as high as 52 °C from May to September. From October to April, winter temperatures are not as low as 34 °C and there are rare rains in the coastal area. The chemical composition of the lake water is 300 g/L NaCl and it is evaluated with potential reserves ranging from 4 to 8 million tons. The hot spring, which feeds Lake Assal from the gulf, has the same salinity level as sea water. The salinity concentration in the lake causes an average annual evaporation rate of 460 million m3 due to the effects of wind and sun. Dissolved salts include NaCl, KCl, $MgCl_2$, $CaCl_2$, $CaSO_4$ and $MgBr_2$.

Keywords: Lake Salt, Assal lake, Salt formation

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ROUGH N,M-RUNG ORTHOPAIR FUZZY SETS

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ABSTRACT

A rough set approximates a subset of a universal set based on some binary relation and is significant for the reduction of attributes in an information system. An n,m-Rung orthopair fuzzy set provides information about the extent of truthness and falsity of a statement. Both of these theories deal with different forms of uncertainty and can be combined to get their combined benefits. In this paper, we define the concept of rough n,m-Rung orthopair fuzzy sets by combining rough sets and n,m-Rung orthopair fuzzy sets. We also discuss some relationships related to the defined concept. This model can encapsulate two distinct types of uncertainties that appear in imprecise available data through the approximation of n,m-Rung orthopair fuzzy sets in crisp approximation space.

Keywords: Rough nm-Rung orthopair fuzzy set, nm-Rung orthopair fuzzy set, Rough set, q-Rung orthopair fuzzy set, Fuzzy set

THE MARINE ENVIRONMENT AND ITS INFLUENCE ON THE DURABILITY OF THE CONCRETE OF THE EL-HAMIZ DAM

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ABSTRACT

The study presented deals with the mechanical consequences and the degradations caused by the external attack of sulphates from the marine environment on the prefabricated concretes of the spillway and the dyke of the El hamiz dam in Boumerdès (Algeria), concrete produced by solar curing and renewable energy all year round. Three different external sulphate attack protocols were applied for three types of concrete based on crushed aggregates (dry concrete at 45°C, ordinary concrete (28 days), water-hardened concrete at 28 days, the samples are immersed in a 6% H_2SO_4 solution.

The results show that the impact of the age of the material on its degradation in contact with the sulfuric acid solution was highlighted, visual observations then a rapid and brutal degradation on the surface then in depth towards the core then a loss of mass and cracking and finally the ruin of the material.

Keywords: El-Hamiz dam, precast concrete, external sulphate attack, degradation.

INVESTIGATION OF A-GLUCOSIDASE INHIBITORY EFFECTS OF SOME NEW HYDRAZIDES AND MOLECULAR MODELING STUDIES

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ABSTRACT

In this study, three compounds, namely 4, 5, and 6, were investigated for their potential to inhibit enzyme activity. 2 diabetes is associated with various health risks, and inhibiting α-glucosidase activity is considered a potential approach for managing this condition. The results indicate that all three compounds, 4, 5, and 6, demonstrated a reduction in α-glucosidase enzyme activity. The concentration-dependent inhibition is clearly illustrated in the graphical representations (Figures 1, 3, and 5). These findings suggest that these compounds have the potential to be utilized in the treatment of diseases linked to α-glucosidase enzyme activity, such as2 diabetes. The 2D interaction maps (Figures 2, 4, and 6) provide insight into the specific amino acid interactions between each compound and the α-glucosidase enzyme. Notably, hydrogen bond interactions with amino acids like ARG 442, GLN 353 and GLU 411 were identified, emphasizing their role in the inhibitory process. Additionally, the red separation contacts in the interaction maps suggest that the active site of the enzyme is no longer occupied by water molecules, leading to a change in enzyme shape and the cessation of catalytic reactions. The results of this study support the potential therapeutic use of compounds 5, 6, and 7 in treating conditions associated with elevated α-glucosidase activity, such as 2 diabetes. Further research, including in vivo studies and clinical trials, would be necessary to validate these findings and assess the safety and efficacy of these compounds as potential anti-2 diabetes agents.

Keywords: α-glucosidase, Inhibition, diabetes

DIFFERENT METHODS USED FOR INCREASING GINGIVAL TISSUE

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ABSTRACT

Gingival recessions can lead to dentin hypersensitivity, root caries, and aesthetic issues (1,2). When gingival recession occurs, maintaining hygiene in the affected area becomes challenging due to factors like sensitivity to mechanical and thermal stimuli or difficulty in reaching the area during brushing, leading to inflammation. Therefore, it is necessary to cover exposed root surfaces with gingival grafts. The purpose of our study is to present different soft tissue grafting methods used in various cases. Various soft tissue grafting methods are available, and treatment success depends on selecting the most suitable method. Evaluating factors such as keratinized gingiva quantity, gingival quality, recession depth and width, and patient complaints collectively guides the method selection (6).

References:

[1] Cortellini P, Bissada NF. (2018). Mucogingival conditions in the natural dentition: Narrative review, case definitions, and diagnostic considerations. J Clin Periodontol. Jun;45 Suppl 20:S190-S198.
[2] Jepsen, S, Caton, JG, et al. (2018). Periodontal manifestations of systemic diseases and developmental and acquired conditions: Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Periodontol*. 89(Suppl 1): S237–S248.
[3] Scheyer ET, Sanz M, Dibart S, et al.(2015) Periodontal soft tissue non–root coverage procedures: a consensus report from the aap regeneration workshop.J Periodontol 86 : 73-76.
[4] Zucchelli G, Tavelli L, McGuire MK, Rasperini G, Feinberg SE, Wang HL, Giannobile WV. (2020). Autogenous soft tissue grafting for periodontal and peri-implant plastic surgical reconstruction. J Periodontol. Jan;91(1):9-16.
[5] Zadeh HH. (2011). Minimally invasive treatment of maxillary anterior gingival recession defects by vestibular incision subperiosteal tunnel access and platelet-derived growth factor BB. Int J Periodontics Restorative Dent. 31:653-660.
[6] Blanc A, Pare-Dargent C, Giovannoli JL.(1991). Traitement des recessions gingivales par lambeau positionne coronairement. J Parodontol. Sep;10(3):329-34.

Keywords: Free gingival graft, Keratinized gingival tissue, Soft tissue graft, Subephitelial connective tissue

EXPLORING EXTRACTS AS LIPASE INHIBITORS IN VITRO: A PROMISING APPROACH FOR OBESITY MANAGEMENT

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ABSTRACT

In this study, three compounds, namely 5b, 5f, and 5g, were investigated for their potential to inhibit lipase enzyme activity. The motivation behind this research stems from the increasing prevalence of obesity due to sedentary lifestyles and the consumption of high-fat and high-sugar processed foods. Obesity is associated with various health risks, and inhibiting lipase activity is considered a potential approach for managing this condition. The results indicate that all three compounds, 5b, 5f, and 5g, demonstrated a reduction in lipase enzyme activity. The concentration-dependent inhibition is clearly illustrated in the graphical representations (Figures 1, 3, and 5). These findings suggest that these compounds have the potential to be utilized in the treatment of diseases linked to lipase enzyme activity, such as obesity. The 2D interaction maps (Figures 2, 4, and 6) provide insight into the specific amino acid interactions between each compound and the lipase enzyme. Notably, hydrogen bond interactions with amino acids like GLY 76, ARG 256, PHE 77, HIS 151, and SER 152 were identified, emphasizing their role in the inhibitory process. Additionally, the red separation contacts in the interaction maps suggest that the active site of the enzyme is no longer occupied by water molecules, leading to a change in enzyme shape and the cessation of catalytic reactions. The results of this study support the potential therapeutic use of compounds 5b, 5f, and 5g in treating conditions associated with elevated lipase activity, such as obesity. Further research, including in vivo studies and clinical trials, would be necessary to validate these findings and assess the safety and efficacy of these compounds as potential anti-obesity agents.

Keywords: Lipase, Inhibition, Obesity

THE USE OF PHASE CHANGE MATERIALS WITH WASTE MATERIALS FOR SUSTAINABLE ENERGY STORAGE IN BUILDINGS

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ABSTRACT

This study provides an overview of the utilization of phase change materials (PCMs) with waste materials in buildings for thermal energy storage. PCMs, with their unique ability to absorb and release latent heat during phase transitions, present a revolutionary solution for mitigating temperature fluctuations in diverse climates [1]. However, some issues including leakage and stability need to be considered when integrating them into building materials. To prevent or minimize these issues, PCMs could be used with some carrier mediums such as capsules, shells, pouches, pipes, or porous materials [2]. The use of waste materials, particularly those with porous structures, has become the subject of research as they have a great potential to be used as carrier mediums of PCMs. Apart from these, repurposing industrial by-products, biomass, wood-derived materials and other kind of wastes offer economic feasibility and environmental benefits aligned with circular economy principles [3-5].

While the benefits of PCM application in buildings have been recognized, there is still a paucity of studies specifically addressing their combination with waste materials. This study aims to inspire further research, innovation, and mainstream adoption of the use of PCMs with waste materials, driving progress toward energy-efficient and environmentally conscious buildings.

References:

[1] Wang, R., Kang, Y., Lei, T., Li, S., Zhou, Z., and Xiao, Y. (2021) Microcapsules Composed of Stearic Acid Core and Polyethylene Glycol-based Shell as a Microcapsule Phase Change Material, International Journal of Energy Research.

[2] Sparavigna, A. C. (2021) Phase-Change Materials and Biochar: Some New Composite Materials in Recent Literature, SSRN Electronic Journal.

[3] Chen, B., Han, M., Zhang, B., Ouyang, G., Shafei, B., Wang, X., and Hu, S. (2019) Efficient Solar-to-Thermal Energy Conversion and Storage with High-Thermal-Conductivity and Form-Stabilized Phase Change Composite Based on Wood-Derived Scaffolds, In Energies.

[4] Liu, P., Zhang, Z., Gu, X., Rao, J., Shi, J., and Bian, L. (2020) Fabrication of a novel shape-stabilized composite phase change material based on multivariate supporting materials by using typical solid wastes, Construction and Building Materials 240.

[5] Anagnostopoulos, A., Navarro, M. E., Stefanidou, M., Ding, Y., and Gaidajis, G. (2021) Red mud-molten salt composites for medium-high temperature thermal energy storage and waste heat recovery applications, Journal of Hazardous Materials 413, 125407.

Keywords: Phase change material, Thermal energy storage, Latent heat, Waste materials, Thermal energy efficiency in buildings

DEEP LEARNING MODEL FOR TONGUE CANCER CLASSIFICATION

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ABSTRACT

The advancement in computer vision and technology motivated its deployment in various life applications. Medical uses of computer vision were one of the main focal of the technology. Image processing with artificial intelligence was the main tool used for medical diagnosis. In this paper, tongue images are used to classify health. Two classifiers are used, namely artificial neural network (FFNN) and Convolutional neural network (CNN). Features extraction is also performed using two techniques, namely wavelet and image coding. The results show that image coding-based feature extraction has optimum results with both FFNN and CNN.

References:

[1] T.J.W. Klein Nulent et al. Intraoral ultrasonography to measure tumor thickness of oral cancer: a systematic review and meta-analysis, Oral Oncol (2018).
[2] Y. Shinozaki et al. Relationship between appearance of tongue carcinoma on intraoral ultrasonography and histopathologic findings, Oral Surg Oral Med Oral Pathol Oral Radiol (2014).
[3] A. Yesuratnam et al., Preoperative evaluation of oral tongue squamous cell carcinoma with intraoral ultrasound and magnetic resonance imaging—comparison with histopathological tumour thickness and accuracy in guiding patient management, Int J Oral Maxillofac Surg (2014).
[4] A. Kaneoya et al., Quantitative analysis of invasive front in tongue cancer using ultrasonography, J Oral Maxillofac Surg. (2009).
[5] S. Shintani et al., Intraoral ultrasonography is useful to evaluate tumor thickness in tongue carcinoma. Am J Surg. (1997).
[6] T.M. Pimenta Amaral et al., Predictive factors of occult metastasis and prognosis of clinical stages I and II squamous cell carcinoma of the tongue and floor of the mouth. Oral Oncol. (2004).
[7] L. Lam et al., Retrospective study of survival and treatment pattern in a cohort of patients with oral and oropharyngeal tongue cancers from 1987 to 2004. Oral Oncol (2007).
[8] T. T. Deng, "Basic theory of traditional Chinese medicine," in Diagnostics of Chinese Medicine, pp. 5–11, Chih-Yin Publishing, Taipei, Taiwan, 1995.
[9] C. H. Li and P. C. Yuen, "Tongue image matching using color content," Pattern Recognition, vol. 35, no. 2, pp. 407–419, 2002.
[10] Y. Wang, Y. Zhou, and J. Yang, "A tongue analysis system for tongue diagnosis in traditional Chinese medicine," in Proceedings of the International Symposium Computational and Information Science (CIS '04), vol. 3314 of Lecture Notes in Computer Science, pp. 1181–1186, Springer, 2004.
[11] Y.-G. Wang, J. Yang, Y. Zhou, and Y.-Z. Wang, "Region partition and feature matching based color recognition of tongue image," Pattern Recognition Letters, vol. 28, no. 1, pp. 11–19, 2007.

Keywords: Tongue images, Wavelet, Coding, CNN, FFNN

ANALYSIS OF ONE-DIMENSIONAL PHOTONIC CRYSTAL BIOSENSOR FOR DETECTION OF SARS-COV-2

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ABSTRACT

We theoretically investigate one-dimensional photonic crystal (1D PC) with a defect layer as a biosensor for the detection of COVID-19 (SARS-CoV-2) virus in the lungs [1]. The composed of 1D photonic crystal is chosen as Silicon dioxide and Titanium dioxide, with a central defective layer. The defect layer is taken as healthy lung tissue and infected lung tissue [2]. The different refractive indices of samples cause a shift in the transmission peak which can be used for the detection of COVID-19 (SARS-CoV-2) [3,4]. We optimized our structure and designed it in OptiFDTD software which uses the Finite-difference time-domain method (FDTD) to calculate the transmission spectrum of the biosensor [5, 6, 7]. We show that the sensitivity of the biosensor is 101.46 nm/RIU, the quality factor is 3.22 × 105 and the detection limit is 1.97 × 10-4 RIU.

Keywords: Photonic crystal, Transmittance, Defect modes, Biosensors, SARS-CoV-2

IN VITRO EFFECTS OF SOME CHEMOTHERAPY DRUGS ON GLUCOSE-6-PHOSPHATE DEHYDROGENASE ENZYME PURIFIED FROM SHEEP SPLEEN

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ABSTRACT

In this study, the inhibition effects of some important drugs used in chemotherapy on glucose-6-phosphate dehydrogenase, a $NADP^+$-dependent enzyme obtained from sheep spleen tissue, were examined in vitro. Sheep spleen glucose-6-phosphate dehydrogenase enzyme (D-glucose-6-phosphate: NADP+ oxidoreductase, EC 1.1.1.49, G6PD) was first purified by 2', 5'-ADP Sepharose 4B affinity chromatography. Enzyme activity was determined spectrophotometrically at 340 nm by the Beutler method. This method was applied in all kinetic studies. Carboplatin, cisplatin, oxaloplatin, fluorouracil, cyclophosphamide and ibandronic acid were used as drugs. In vitro studies showed that oxaloplatin, carboplatin and cyclophosphamide drugs had inhibitory effects on the enzyme in question. It was observed that other drugs did not affect the enzyme much. IC_{50} values were found by drawing % Activity-[I] graphs for drugs showing inhibitory effects. The IC_{50} values obtained for oxaloplatin, carboplatin and cyclophosphamide drugs were 3.22 mM, 7.26 mM, and 34.5 mM, respectively.

Keywords: Glucose-6-phosphate dehydrogenase, Kemoterapi ilaçları, Inhibiton

MODELLING AND SIMULATION OF LORENTZ-DRUDE DISPERSIVE MATERIAL AS NANO WAVEGUIDES BY USING FDTD METHOD

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ABSTRACT

In this work, we theoretically investigate the electric (TE) and magnetic (TM) field behaviors in linear nanowaveguides with different Lorentz-Drude dispersive materials [1] using the finite difference time domain method (FDTD) [2,3,4]. We simulate the propagation of light in different materials to obtain the maximum efficient media. We investigate the amplitude, extinction and dissipation characteristics of the fields in the nanowaveguides and make comparisons to select the appropriate material for our needs [5,6,7]. For electric field we obtain Titanium media for maximum amplitude, Gold media for maximum extinction, and Gold media for maximum dissipation. For magnetic field we obtain Gold media for maximum amplitude, Gold media for maximum extinction, and Silver media for maximum dissipation.

References:

[1] Rivzi S.: Handbook of Photomask Manufacturing Technology. CRC Press, Boca Raton (2005)
[2] Kolwas K., Derkachova A., Shopa M.: Size characteristics of surface plasmons and their manifestation in scattering properties of metal particles. J. Quant. Spectrosc. Radiat. Transfer. 110, 1490–1501 (2009)
[3] Taflove A.:Computational Electrodynamics. Artech House, Vol. 160, London (2000)
[4] Lee, K. H., Ahmed, I., Goh, R. S. M., Khoo, E. H., Li, E. P., and Hung, T. G. G.: Implementation of the FDTD method based on Lorentz-Drude dispersive model on GPU for plasmonics applications. Progress in Electromagnetic Research. 116, 441-456 (2011)
[5] Carcione, José M.: Wave fields in real media: Wave propagation in anisotropic, anelastic, porous and electromagnetic media. Elsevier, Vol. 38, (2007)
[6] Melenk, Jens M., and Ivo Babuška.: The partition of unity finite element method: basic theory and applications. Computer methods in applied mechanics and engineering. 139.1: 289-314 (1996)
[7] He, Ji-Huan.: A coupling method of a homotopy technique and a perturbation technique for non-linear problems. International journal of non-linear mechanics. 35.1: 37-43 (2000)

Keywords: Lorentz-Drude Materials, Nano waveguide, FDTD Method

ASSESSMENT OF PHYSICAL AND CHEMICAL FEATURES OF UNSATURATED POLYESTER RESIN ENHANCED WITH EGGSHELL COMPONENTS

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ABSTRACT

This study aims to investigate the physical and chemical properties of unsaturated polyester resin with the addition of eggshells. Eggshells were first crushed, dried, and then ground to particle sizes ranging from 50 to 100 mesh. The experiment was conducted by adding eggshell additives at proportions of 0 wt.%, 1 wt.%, 2 wt.%, 3 wt.%, and 4 wt.% to the unsaturated polyester resin. The properties examined include density, Shore D hardness, thermal conductivity coefficient, and activation energy values. According to the results obtained in this research, eggshell reinforcement increases the density of the polyester composite. As the filler ratio increases, Shore D hardness of the composite rises. The thermal conductivity coefficient of the polyester composite is also directly proportional to the filler ratio. Additionally, when thermal decomposition experiments of the samples are examined, eggshell reinforcement raises the activation energy of the composite. Accordingly, it can be said that the thermal stability of the composite is improved with the organic filler. The results indicate how the addition of eggshells affects the physical and chemical properties of unsaturated polyester resin. The study highlights the potential advantages of using materials in a more sustainable and environmentally friendly manner. This research offers a fresh perspective in the fields of materials science and chemistry, presenting innovative solutions for industrial applications.

Keywords: Unsaturated Polyester Resin, Eggshell Additives, Chemical Properties, Natural Additives

THE CORRELATION BETWEEN UREMIC TOXINS WITH CRP LEVEL IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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ABSTRACT

The kidneys play an important role in fluid control as well as the removal of harmful waste products which known as (uremic toxins). Our study was focused on the measurement the concentrations of some uremic toxins which accumulates in the blood of the patients with chronic kidney disease. The concentration of blood urea, serum creatinine and protein bound uremic toxin (indoxyl sulfate) were measured and the results is compared with results of samples taken from healthy people (control group). Then, correlation between uremic toxins with CRP was studied. The results showed that the levels of uremic toxins were significantly higher ($P < 0.05$) in patients' group than in healthy group. The results were respectively (132.49± 32.59), (5.72± 1.57) and (1.432 ± 0.392). Also, the mean of CRP was measured and the findings showed, the CRP concentration was significantly higher ($P < 0.05$) in patients (15.32 ± 6.48) compared to the control group (1.02 ± 0.48). The correlation between uremic toxins and CRP also determined, there were positive correlation between each of blood urea, serum creatinine and indoxyl sulfate concentration with CRP.

Keywords: Uremic toxins, CRP, chronic kidney disease.

EXPLORATION OF ENZYMES EFFECTS BY SILVER NANOPARTICLES SYNTHESIZED FROM VARIOUS BOTANICAL EXTRACTS

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ABSTRACT

Many Antibiotics and vaccines no longer prevent and cure microbial illnesses [1]. Antiviral and antimicrobial drugs were essential in battling infectious disorders caused by viruses, bacteria, and fungus decades ago, but antibiotic-resistant bacteria and viruses remain a worry today. Virus and bacteria-induced medicine resistance makes this obstacle tough to overcome. It's vital to find medications that suppress these pathogens' proliferation and treatment resistance [2]. Pharmaceutical companies, universities, and biomedical research organisations tout nanotechnology as a revolutionary weapon against viral and microbial infections. Silver nanoparticles are chemically stable, conductive, and biologically active (antimicrobial, antiviral, antifungal, anti-inflammatory) [3]. Bio-labeling, food preservation, anticancer, wound healing, water purification, antioxidant, and cosmetics employ AgNPs. Green manufacturing of metal nanoparticles is popular owing to its optical, chemical, and electrical characteristics and use in textile, catalysis, and paint industries [4]. Nanotechnology has made AgNPs simpler to make, increasing their medicinal use and anti-decay properties. Recent results show that AgNPs may kill fungus, Gram-positive and Gram-negative bacteria, and antibiotic-resistant strains [5]. Although there are other techniques to synthesise AgNPs, the biological method is still popular. Plant-assisted AgNPs synthesis is second only to microbial synthesis in merit, due to its availability, reliability, and potential for large-scale production. It has been reported that bark, flower, root, stem, fruit, pulp, seed, callus, peel, bulb, and leaves may be employed to synthesise AgNPs. The best conditions for managing plant AgNP synthesis parameters were established [6].

References:

[1] Balouiri, M., Sadiki, M., & Ibnsouda, S. K. (2016). Methods for in vitro evaluating antimicrobial activity: A review. Journal of pharmaceutical analysis, 6(2), 71-79.

[2] Freire-Moran, L., Aronsson, B., Manz, C., Gyssens, I. C., So, A. D., Monnet, D. L., ... & ECDC-EMA working group. (2011). Critical shortage of new antibiotics in development against multidrug-resistant bacteria—Time to react is now. Drug resistance updates, 14(2), 118-124.

[3] Selvaraj, V., Sagadevan, S., Muthukrishnan, L., Johan, M. R., & Podder, J. (2019). Eco-friendly approach in synthesis of silver nanoparticles and evaluation of optical, surface morphological and antimicrobial properties. Journal of Nanostructure in Chemistry, 9, 153-162.

[4] El-Saadony, M. T., El-Wafai, N. A., El-Fattah, H. I. A., & Mahgoub, S. A. (2019). Biosynthesis, optimization and characterization of silver nanoparticles using a soil isolate of Bacillus pseudomycoides MT32 and their antifungal activity against some pathogenic fungi. Adv. Anim. Vet. Sci, 7(4), 238-249.

[5] Pirtarighat, S., Ghannadnia, M., & Baghshahi, S. (2019). Green synthesis of silver nanoparticles using the plant extract of Salvia spinosa grown in vitro and their antibacterial activity assessment. Journal of Nanostructure in Chemistry, 9, 1-9.

[6] Vergara-Castañeda, H., Granados-Segura, L. O., Luna-Bárcenas, G., McClements, D. J., Herrera-Hernández, M. G., Arjona, N., ... & Pool, H. (2019). Gold nanoparticles bioreduced by natural extracts of arantho (Kalanchoe daigremontiana) for biological purposes: physicochemical, antioxidant and antiproliferative evaluations. Materials Research Express, 6(5), 055010.

Keywords: AgNPs, Enzyme, Plant

IONIZATION RADIATION APPLICATIONS AND RADIATION SAFETY PROCEDURES IN TÜRKIYE

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ABSTRACT

In this study, firstly, it is given all the application of the ionization sources and devices in Türkiye. The general information about radiation sources and devices and radiation application in Türkiye are given. Additionally, information is given regarding the authorization and control of radiation sources in our country. Until August 2018, Turkish Atomic Energy Authority (TAEK) was the regulatory body of Türkiye. After that time, the regulatory activities of TAEK have been transferred to the Nuclear Regulatory Authority (NDK). Thus, NDK has undertaken the regulatory activities concerning facilities (including nuclear power plants), devices, substances and activities related to nuclear energy and ionizing radiation as the regulatory authority of Türkiye. According to the NDK national radiation sources registration system, there are various radiation sources throughout our country, including radioactive sources and devices that produce or emit radiation (X-ray devices, closed and open radioactive sources and devices containing closed radioactive sources) [1]. Ionizing radiation has many beneficial applications in medicine, industry, energy production, agriculture, and research when it is used safely. But the use of ionizing radiation sources can be harmful effect to the health of human, and environment if it not properly used or not controlled [2]. In this scope, secondly, this study contains information concerning current the radiation safety procedures in scope of the regulatory body in Türkiye.

References:

1. Radiation Sources in Türkiye 2022, Nuclear Regulatory Authority (NDK), Ankara (2022).
2. Zeyrek, C. T., Akbıyık, H. (2016). Development of Human Resources Through Awareness Education and Training Activities on Occupational Radiation Protection for Industrial Radiography in Turkey, Journal of Materials Education 38(5-6), 191-201.

Keywords: Radiation, X-ray, Safety, Radioactivity, IAEA

SYNTHESIS AND INVESTIGATION OF THE MAGNETIC PROPERTIES OF Bi_2O_3 ELECTROLYTES DOPED WITH RARE EARTH OXIDES, CeO_2, Ho_2O_3 AND Tb_4O_7

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ABSTRACT

In this investigation, we conducted the synthesis and magnetic analysis of stabilized systems comprising Bi_2O_3–solid electrolyte, with a specific focus on their suitability for Intermediate-Temperature Solid Oxide Fuel Cells (IT–SOFCs). The face-centered cubic structure inherent to pure Bi_2O3 crystals is recognized for its distinctive oxygen ion conductivity. Nevertheless, the super-ion conductor phase within this structure is known to have limited stability within a narrow temperature range, necessitating stabilization for consideration in SOFC applications. For the stability assessment, dopants such as Ce–Ho–Tb rare earth elements were incorporated, and all formulations were synthesized through solid-state reactions conducted at room temperature. To achieve optimal phase stability, the resulting samples underwent annealing at 750 °C for a duration of 100 hours. Magnetic properties of the annealed samples were investigated by Vibrating Sample Magnetometer (VSM) module of the physical properties measurement system (PPMS-Quantum Design). Magnetization vs. temperature (M-T) assessments were conducted across a temperature spectrum of 10-310 K under a 500 Oe applied field. Additionally, magnetic-field-dependent magnetization (M-H) measurements were performed at 10 K and room temperature (300 K), encompassing an applied magnetic-field range of ±2 T for constant temperature evaluations. M-T measurement results revealed the paramagnetic nature of all samples. Both the M-T and the M-H measurements at low temperature showed that the increasing doping rate of Ce and Tb resulted in increasing magnetization.

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References::

1. M.A. Azizi, J. Brouwer. Progress in solid oxide fuel cell–gas turbine hybrid power systems: System design and analysis, transient operation, controls and optimization. Appl. Energy., 215 (2018), pp. 237–289.
2. M. Singh, D. Zappa, E. Comini Solid oxide fuel cell: Decade of progress, future perspectives and challenges Int. J. Hydrog., 46 (2021), pp, 27643–27674.
3. E. D. Wachsman, K.T. Lee. Lowering the Temperature of Solid Oxide Fuel Cells. Science, 334 (2011), pp, 935–939.
4. Z. Zakaria, S. H.A. Hassan, N. Shaari, et al.. A review on recent status and challenges of yttria stabilized zirconia modification to lowering the temperature of solid oxide fuel cells operation. Int. J. Energy Res., 44 (2020), pp, 631–650.
5. N. Mahato, A. Banerjee, A. Gupta, et al. Progress in material selection for solid oxide fuel cell technology: A review. Prog. Mater. Sci., 72 (2015), pp. 141–337.

Keywords: Bi2O3–solid electrolyte, Solid oxide fuel cell, Magnetic Properties

LEVERAGING DEEP LEARNING FOR CRITICAL X-RAY CLASSIFICATION IN THE ERA OF RESPIRATORY DISEASES

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ABSTRACT

This research addresses the challenge of categorising X-ray images into three categories: Covid, normal, and viral pneumonia. Effective classification in respiratory diseases is crucial for timely diagnosis and treatment planning, with direct implications for patient health [1-3].

Deep learning, particularly Convolutional Neural Networks (CNNs), is becoming an essential tool in medical image classification due to its unique capabilities in pattern recognition and feature extraction. This paper emphasises the significance of using deep learning techniques to automate and enhance the accuracy of X-ray image classification, thereby assisting healthcare professionals in making informed decisions [4, 5].

Transfer learning is an important aspect of this work, as it can utilise pre-existing knowledge from large datasets. This approach is particularly useful in the medical field, where labelled data is often limited and difficult to obtain. The discussion emphasises the advantages of transfer learning in optimising model performance and reducing the need for extensive labelled data.

The EfficientNetB0 model was chosen due to its superior efficiency in balancing model complexity and computational resources. The rationale behind this choice is explained by highlighting the model's robustness and generalisation capabilities in medical image classification tasks.

The paper concludes by presenting results that prove the effectiveness of the proposed methodology and underline its contribution to the field. The research presented here is unique in its comprehensive approach, which combines X-ray classification, deep learning, and transfer learning to create an efficient model. The evidence provided in this research demonstrates the model's strong performance, contributing to the advancement of medical image analysis and holding promise for real-world applications in the rapid and accurate diagnosis of respiratory diseases.

References:

[1] L. Brunese, F. Mercaldo, A. Reginelli, and A. Santone, "Explainable deep learning for pulmonary disease and coronavirus COVID-19 detection from X-rays," Computer Methods and Programs in Biomedicine, vol. 196, p. 105608, 2020.
[2] G. M. M. Alshmrani, Q. Ni, R. Jiang, H. Pervaiz, and N. M. Elshennawy, "A deep learning architecture for multi-class lung diseases classification using chest X-ray (CXR) images," Alexandria Engineering Journal, vol. 64, pp. 923-935, 2023.
[3] P. Vieira, O. Sousa, D. Magalhães, R. Rabêlo, and R. Silva, "Detecting pulmonary diseases using deep features in X-ray images," Pattern Recognition, vol. 119, p. 108081, 2021.
[4] I. M. Baltruschat, H. Nickisch, M. Grass, T. Knopp, and A. Saalbach, "Comparison of deep learning approaches for multi-label chest X-ray classification," Scientific reports, vol. 9, no. 1, p. 6381, 2019.
[5] A. U. Ibrahim, M. Ozsoz, S. Serte, F. Al-Turjman, and P. S. Yakoi, "Pneumonia classification using deep learning from chest X-ray images during COVID-19," Cognitive Computation, pp. 1-13, 2021.

Keywords: X-Ray Classification, Deep Learning, Transfer Learning, EfficientNetB0, Respiratory Diseases

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HYBRIDIZATION OF GRAPHENE OXIDE AND SILVER NANOPARTICLES FOR CEMENTITIOUS COMPOSITES

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ABSTRACT

Graphene oxide (GO) and silver nanoparticles (AgNPs) are attractive nanomaterials due to their unique structure and physico-chemical properties. While the GO has a high surface area, AgNPs have antibacterial, thermal, and electrical properties. Hybridization of these materials' synergistic characteristics has proven beneficial in several applications such as electronics, catalysis, textiles, electrochemical biosensing, drug delivery, and antimicrobial agents. The GO-AgNPs dispersion with low particle size and high stability was important for such dispersion application. This study proposes Hummer's method- production of graphene oxide and silver nanoparticles dispersion. Four factors such as GO amount, AgNPs amount, and ultrasonic prop. time (UPT), and amount of distilled water (DIW) was determined to be effective on graphene oxide/silver nanoparticles dispersion features. Four quality criteria such as electrical conductivity, thermal conductivity, particle size, and zeta potential were selected. Taguchi method was applied for the first time to achieve the analyzed and optimized features of graphene oxide/silver nanoparticles. It was concluded that the optimum particle size and zeta potential of the GO/AgNPs dispersion are found as 164 ± 17 nm and -44 mV ± 0.4 mV, respectively. The hybridized GO/AgNPs dispersion zeta-potential varied between -30 mV and -60 mV. Furthermore, hybridized GO/AgNPs dispersion mixed cementitious composites were designed. The optimum GO and AgNPs hybrid usage was determined as 5 mg for each nanofiller and the highest compressive strength was determined as 22MPa by usage of 5 mg of GO and 5 mg of AgNPs. It was also concluded that compressive strength and ultrasonic pulse velocity of the GO-AgNPs dispersion mixed cementitious composites decreased with the GO and AgNPs usage of more than 5 mg due to the decrement in dispersion stabilities.

Keywords: Cementitious composites, Graphene oxide silver nanocomposites, Hybrid nanoparticles, Synergistic effect

SPECIALIST DENTISTS' USE OF UNDERGRADUATE PATHOLOGY EDUCATION IN THE CLINIC

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ABSTRACT

The education curriculum at the faculty of dentistry includes courses in both general pathology and oral pathology (1). In our planned study, we aim to determine the need for pathology knowledge of dentists who have graduated from the faculty of dentistry and have received specialization training in their active professional lives and the importance of pathology education according to specialties. Survey questions(2); 66 specialist dentists who graduated from the faculty of dentistry and received specialization training and working in the clinic (Oral and maxillofacial surgery 18.2%, Radiology and oral diagnosis 13.6%, Endodontics 18.2%, Orthodontics 4.5%, Pedodontics 6%, 1, Periodontology 19.7%, Prosthetic dental treatment 13.6%, Restorative dental treatment 6.1%) were applied.

When the benefit of pathology training in the professional life of a specialist dentist was questioned, the specialty that was thought to be most beneficial was oral and maxillofacial surgery, followed by periodontology, radiology, and oral diagnosis specialties. The specialty thought to provide the least benefit was restorative dental treatment. When asked whether physicians send biopsies/materials of their patients to the pathology laboratory in their clinical studies and how often they evaluate pathology results/reports, they stated that they most frequently send samples and evaluate reports in the fields of oral and maxillofacial surgery, periodontology, radiology, and oral diagnosis, respectively. It was stated that orthodontics, prosthetic dental treatment, restorative dental treatment, pedodontics, and endodontics send fewer materials and read reports.

The topics covered in the pathology training curriculum have many overlaps with oral and maxillofacial surgery (3). Similarly, it is known that oral diagnosis and periodontology course subjects have common courses with pathology. In our study, the areas of specialist physicians who benefit from pathology training in the clinic are the areas of specialization where the subjects overlap more with the departments in the training curriculum. Adequate training in basic medical sciences must be given to dentists to train them as physicians who do not perceive the patient only as mouth and teeth but can evaluate the patient as a whole and give the right guidance at the right time when necessary. Integration between basic sciences dentistry and clinical sciences should be ensured. (4) For pathology education to be permanent and useful, a practice-based curriculum should be organized specifically to the departments and to meet the needs of the clinic.

References:

1. Mıtchell, R. , Kumar, V. , Abbas, A.K. , Fausto,N. (2008). Robbins And Cotran, Pathologic Basis Of Disease, Eighth Edition, Saunders.
2. Şensu, S., Koçak, H., Gürbüz, Y. S., Fışgın, N., & Erdoğan, N. (2022). Hangi Yöntem Kullanılarak Yapılan Patoloji Eğitimi Aktif Meslek Hayatında Daha Yararlı? Klinisyenlerde Bir Anket Çalışması. Tıp Eğitimi Dünyası, 21(63), 69-83.
3. GÜVEN, Y. (2017). Türkiye□deki Diş Hekimliği Fakülteleri Akreditasyona Ne Kadar Hazır?. Yükseköğretim Ve Bilim Dergisi(2), 192-199.
4. Mezuniyet Öncesi Diş Hekimliği Ulusal Çekirdek Eğitim Programı(DUCEP)-2021 Diş Hekimliği Dekanları Konseyi Eğitim ve Araştırma Alt Kurulu

Keywords: Pathology, Dentistry, Education

IN VITRO EFFECTS OF SOME CATIONS ON GLUTATHIONE S-TRANSFERASE ENZYME PURIFIED FROM CHICKEN HEART

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ABSTRACT

Glutathione S-transferase enzyme (GST; EC 2.5.1.18) is an important antioxidant enzyme in metabolism and takes part in reactions that enable the conjugation of glutathione with many metabolites that may cause toxicity. In this study, firstly, the GST enzyme was purified from chicken heart by homogenate preparation, ammonium sulfate precipitation and glutathione-agarose affinity chromatography.

Then, the inhibition effects of Ag^{+}, Pb^{2+} and Na^{+} ions on enzyme activity were examined in vitro. Enzyme activity was determined spectrophotometrically at 340 nm by the method of Habig et al. (1974). This method was applied in all kinetic studies. In the kinetic studies, it was found that Ag^{+} (in the range of 0.1-0.7 mM), Pb^{2+} (in the range of 0.1-0.7 mM) and Na^{+} (in the range of 1-5 mM) cations caused inhibition on the enzyme activity. IC_{50} values were found by drawing % Activity-[I] graphs for these cations showing inhibition effects. IC_{50} values for Ag^{+}, Pb^{2+} and Na^{+} were found to be 0.239, 0.283 and 1.725 mM, respectively.

Keywords: Glutathione S-transferase, Ag+, Pb2+, Na+, Inhibiton

ORIGINAL NOTIONS AND NEW INSIGHTS FOR NEUTROSOPHIC SUPERHYPER BI-TOPOLOGICAL SPACES

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ABSTRACT

The manuscript represents the inaugural effort in establishing a novel class of neutrosophic topological spaces, focusing on introducing a distinctive structure known as the ????????*h*-power set ????????(????) of a set. This innovative type of set formation serves as the basis for the development of Neutrosophic SuperHyper Topological Spaces and Neutrosophic SuperHyper Bi-Topological Spaces, offering optimal representations for real-world applications. Within this article, a range of new concepts and theorems pertinent to these emerging topologies is explored.

Keywords: ???? ????*h* -power set ???? ????(????) ; Neutrosophic SuperHyper Topological Spaces (NSHTSs); Neutrosophic SuperHyper Bi-Topological Spaces (NSHBi-TSs)

EXISTENCE OF L_∞ QUASI-ISOMORPHISMS FOR POLYDIFFERENTIAL OPERATORS WITH CONSTANT COEFFICIENTS

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ABSTRACT

M. Kontsevich proved in his groundbreaking paper that there exists an L_∞ quasi-isomorphism from the graded Lie algebra of polyvector fields on the affine space
$\mathbb{R}^d$ to the differential graded (dg) Lie algebra of polydifferential operators on $\mathbb{R}^d$.

The coefficients entering Kontsevich's L_∞ quasi-isomorphism are hard to compute, even for simple graphs. The situation simplifies dramatically if we consider the algebra of polydifferential operators on $\mathbb{R}^d$ with constant coefficients.

In this talk, we prove that there exists L_∞ quasi-isomorphisms from the graded Lie algebra of polyvector fields on the affine space $\mathbb{R}^d$ with constant coefficients to the dg Lie algebra of polydifferential operators on $\mathbb{R}^d$ with constant coefficients.

In our proof, we recall the notion of a stable formality quasi- isomorphism (SFQ). Finally, we use the fact that any SFQ gives us an L_∞ quasi-isomorphism from the graded Lie algebra of polyvector fields on the affine space $\mathbb{R}^d$ to the dg Lie algebra of polydifferential operators on $\mathbb{R}^d$.

References:

[1] Dolgushev, V. A. (2021). Stable Formality Quasi-isomorphisms for Hochschild Cochains, M´em. Soc.Math. Fr. (N.S.)168(2021), vi+108 pp.

[2] Dolgushev, V. A., Hoffnung A.E. , and Rogers C. L. (2015) What do homotopy algebras form? Adv. Math. 274 562–605

Keywords: L_∞ quasi-isomorphism, stable formality quasi-isomorphisms

FOOD SAFETY DEBATES OF SALT

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ABSTRACT

Excessive salt consumption is a factor in the formation of cardiovascular diseases, hypertension, kidney diseases, osteoporosis, stomach diseases, obesity and some other diseases. For this reason, health institutions are working to reduce salt consumption [1]. On the other hand, salt can contain important risks such as radioactives, heavy metals, microplastics, dynamite residues and exhaust in terms of food safety. In this study, salt was evaluated in terms of food safety.

Keywords: Salt Residue, Salt, Heavy Metal, Microplastic, Radioactivity

THIAZOLE–BASED PVC MEMBRANE POTENTIOMETRIC ION–SELECTIVE SENSORS

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ABSTRACT

Ion–selective electrodes (ISEs) offer versatile advantages including wide linear concentration range, low detection limit, low cost, short response time, high selectivity, long lifetime, ease of preparation and use [1–3]. Undoubtedly, the most important component of ion–selective electrodes is the ionophores that enable interaction with the analyte ion [4]. In this study, we investigated the ionophore properties of 2-acetamido-4-(2-hydroxyphenyl)thiazole (T1), 2-amino-4-(trifluoromethyl)thiazole-5-carboxylic acid (T2) and ethyl 2-amino-4,5,6,7-tetrahydrobenzo[d]thiazole-6-carboxylate (T3). It was determined that the potentiometric performance characteristics of the sensors prepared with T1 were superior to T2 and T3. The new ion–selective sensors, which exhibit a highly selective behavior towards copper(II) ions, exhibited a low limit of detection over a wide concentration range. The developed sensor had fast response time (5s), wide pH working range (5.0–9.0), good repeatability and stability. Finally, this novel sensor was applied for the direct determination of copper(II) ions in different water samples.

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References:

[1] Özbek, O., & Ölcenoglu, A. (2023). The use of bis–thiadiazole and bis–oxadiazol derivatives as ionophores: A novel copper (II)–selective potentiometric electrodes. Microchemical Journal, 190, 108679.
[2] Özbek, O. (2023). A potentiometric sensor for the determination of potassium in different baby follow–on milk, water, juice and pharmaceutical samples. Journal of Food Composition and Analysis, 115, 104937.
[3] Özbek, O., & Isildak, Ö. (2022). Potentiometric determination of copper (II) ions based on a porphyrin derivative. Journal of the Chinese Chemical Society, 69(7), 1060-1069.
[4] Özbek, O., Çetin, A., Koç, E., & Isildak, Ö. (2022). Synthesis and sensor properties of a phenol derivative molecule: potentiometric determination of silver (I) ions. Electrocatalysis, 13(4), 486-493.

Keywords: Thiazole, sensor, potentiometry, copper(II), heavy metal

EQUISINGULAR STRATA OF SINGULAR K3-SURFACES

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ABSTRACT

K3-surfaces occupy a very special niche in algebraic geometry: they are sophisticated enough to pose interesting problems, and they provide adequate tools for solving these problems. We are interested in the geometry of smooth rational curves and finite group actions on K3-surfaces. In this study we show that, using the global Torelli theorem and surjectivity of the period map, any reasonable question about a K3-surface can be restated in terms of its Néron-Severi lattice, and the corresponding arithmetical problem can be solved by means of Nikulin's theory of discriminant forms, extended by Miranda and Morrison.

A projective model of a K3-surface X gives rise to a *polarization*, i.e., class h of the hyperplane section. Irreducible smooth rational curves on X are (some) classes l of square (-2) intersecting h in a prescribed way. The simplest case is that of *exceptional divisors*, where we deal with the equisingular deformation classification of singular models. The case of plane sextic curves (degree 2) was closed by Akyol and Degtyarev [1], after numerous fruitless attempts to settle it by the conventional, equation based methods. This study was based on the previous work by Degtyarev [3], Shimada [5], Urabe [6], Yang [7] and others. The case of spatial quartics (degree 4) was treated conventionally by Degtyarev [2] in the presence of a non-simple singularity. The K3-theoretic approach, also pioneered by Urabe and Yang and used by Güneş Aktaş [4] to complete the classification in the non-special case, has been intensively discussed in this project.

References:

[1] Akyol, A., Degtyarev, A. (2015). Geography of irreducible plane sextics. Proc. Lond. Math. Soc. (3), 111(6), 1307–1337.
[2] Degtyarev, A. (1989). Classification of quartic surfaces that have a nonsimple singular point. Izv. Akad. Nauk SSSR Ser. Mat., 53(6), 1269–1290
[3] Degtyarev, A. (2008). On deformations of singular plane sextics. J. Algebraic Geom., 17(1), 101–135.
[4] Günes ̧ Aktas, Ç. (2017). Classification of simple quartics up to equisingular deformation. Hiroshima Math. J., 47(1), 87–112.
[5] Shimada, I. (2018). Connected components of the moduli of elliptic K3 surfaces. Michigan Math. J., 67(3), 511–559.
[6] Urabe, T. (1990). Tie transformations of Dynkin graphs and singularities on quartic surfaces. Invent. Math., 100(1), 207–230.
[7] Yang, J.-G. Enumeration of combinations of rational double points on quartic surfaces. Singularities and complex geometry, Beijing, 1994, volume 5 of AMS/IP Stud. Adv. Math., 275–312.

Keywords: K3-surface, Quartic, Singularity, Projective Model, Polarization

MOLECULAR DOCKING STUDY AGAINST HUMAN LACTATE DEHYDROGENASE A ENZYME OF SOME PHENOXY CHALCONES

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ABSTRACT

Human lactate dehydrogenase A (hLDHA), a glycolytic enzyme responsible for the conversion of pyruvate to lactate coupled with oxidation of NADH to NAD+ , plays a crucial role in the promotion of glycolysis in invasive tumor cells. Recently, hLDHA has been considered a vital therapeutic target for invasive cancers. Selective inhibition of hLDHA using small molecules holds potential prospects for the treatment of cancer and associated diseases. Consequently, significant progress has been made in the discovery of selective small molecule h LDHA inhibitors displaying remarkable inhibitory potencies. Molecular docking studies using Molegro Virtual Docker (MVD) provided insights into the binding affinity and interactions of the selected compounds with the Human Lactate Dehydrogenase A enzyme. Results and discussions revealed that several Phenoxy Chalcones, including 5a, 5e, 5f, 5d, 5c, 5g, 5b, 4e, 4g, 4d, 4c, 4f, 4a , and 4b, demonstrated significant affinity potantials on Human Lactate Dehydrogenase A enzyme activity. In this study Molecular docking analysis of designed molecules with hLDHA (PDB ID: 4AJP) demonstrates that VAL30, THR 247 , GLN 99 , TYR 82 , GLY 31, ARG98 , ASN 137 , ARG 105 , and VAL 52 possessed strong interaction with the compounds. Notably, compounds 5a, 5e, 5f, 5d, exhibited strong binding affinity with key amino acids, inhibiting the enzyme's activity. In this study contributes to the understanding of the Phenoxy Chalcones potential, benefits of specific in modulating Human Lactate Dehydrogenase A enzyme activity .The inhibitory effects of the selected compounds suggest their potential as valuable therapeutic agents for conditions associated with Human Lactate Dehydrogenase A deficiency

Keywords: Lactate dehydrogenase A, Phenoxy chalcones, Docking study

CO-ENZYME Q10 IN MALE INFERTILITY WITH A STUDY OF HORMONAL EFFECTS AND SEMEN MOTILITY

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ABSTRACT

The presented prospective randomized placebo-controlled study was conducted in Thi Qar city (Iraq). The study deployed 90 infertile male subjects for the administration of Q 10. The results revealed enzyme Q 10 as an effective treatment for improving the sperm parameters (motility, morphology, sperm concentration) which were statistically significant except for semen volume where P value was > 0.05. Also, this study showed no statistical significance between the use of enzyme Q 10 as a single agent therapy (P>0.05). In this study, we can conclude that enzyme Q 10 is an effective treatment options for improving sperm motility, morphology and concentration. It was clear from the table that the older the men, the less interest in treatment with Co-enzyme Q10. The educational level is also considered an important factor in how this group accepts this disease and is convinced of the ways of Q 10 treatment. The study showed that the patients' doses are less than the control group's doses, as well as the PH and the volume of semen, while it was Pus cells higher, and this result indicates that the increasing of level of Co-enzyme Q10 improving the ability of infertile men in a large extent. Also it was clear from the data there was a clear relationship of Viscosity and Co-enzyme Q 10 in patient groups. The incapacity of a sexually active, non-contraceptive couple to become pregnant after 12 months or more of consistent, unprotected sexual activity is known as infertility, which is classified as a disorder of the reproductive system [1, 2]. Subfertility is a type of infertility, either primary or secondary, in which 1 in 7 couples require specialized assistance in order to conceive. For a pair who has never conceived before, primary subfertility is a delay in pregnancy; for a couple who has conceived before, secondary subfertility is a pregnancy delay [3]. The length of sexual exposure, frequency of coitus, and age of the partner all affect the likelihood of conception. Normal, young couples that engage in unprotected sexual activity had a 25% chance of becoming pregnant after one month, a 70% risk after six months, and a 90% chance after a year. After a year and a half or two years, only 5% of the couples will become pregnant [4, 5]. The causes are equally the fault of men and women. The majority of infertile pairs have one of the three main reasons, which are tubal-peritoneal illness, ovulatory failure, or a male factor [4].

References:

[1] Evenson DP, Larson KL, Jost LK. Sperm Chromatin Structure Assay: Its Clinical Use for Detecting Sperm DNA Fragmentation in Male Infertility and Comparisons With Other Techniques. Journal of Andrology. 2002;23(1):25-43.
[2] Leaver RB. Male infertility: an overview of causes and treatment options. Br J Nurs 2016;25:S35–40.
[3] Chehab M, Madala A, Trussell JC. On-label and off-label drugs used in the treatment of male infertility. Fertil Steril 2015;103: 595–604.
[4] ROUSSEL – LOUIS ; La famille incertaine; ED: Odile Jacob. Paris . 1989
[5] Leaver RB. Male infertility: an overview of causes and treatment options. Br J Nurs. 2016;25:S35–40.

Keywords: CO-enzyme Q10, Male infertility, Antioxidants, Sperm motility, Morphology

CLASSIFICATION OF X-RAY IMAGES OF ATELECTASIS AND PNEUMONIA

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ABSTRACT

Atelectasis and pneumonia are serious lung diseases that can lead to serious complications, including death. The gold standard for diagnosing these diseases is X-ray imaging. This study focuses on the classification of atelectasis and pneumonia diseases through chest X-ray images. A dataset that includes 744 X-ray images was used. In this work, different image processing, feature extraction, feature selection, and classification techniques are examined to improve the performance of medical image classification. In the image processing step, resizing, Gaussian filtering and adaptive histogram equalization methods were applied to the images. Then, region of interests were detected in the segmentation step. In the feature extraction step, first-order statistical features, texture-based features, morphological features and shape-based features were extracted. Information gain, wrapper and correlation-based feature selection methods were applied in the feature selection step. In the classification part, five different machine learning algorithms such as Naive Bayes, Logistic Regression, Support Vector Machines, K-Nearest Neighbor and Decision Tree were utilized to classify X-ray images. The results of this study demonstrate that selecting the most effective feature selection and classification methods significantly improves accuracy rates.

Keywords: Chest X-ray images, Atelectasis, Pneumonia, Image processing, Machine learning

INVESTIGATION OF THE UTILIZATION OF POLYVINYL ALCOHOL AS SURFACE TREATMENT IN MORTARS USING END-OF-LIFE TIRE

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ABSTRACT

This study explores the potential benefits of employing polyvinyl alcohol (PVA) as a surface treatment in mortars incorporating end-of-life tire (ELT) particles. The investigation focuses on assessing the mechanical, physical, and thermal properties of cementitious mortars with the incorporation of PVA and end-of-life tire materials. The research aims to enhance the sustainability and performance of mortars by utilizing waste materials and innovative surface treatments. The mechanical properties of the mortars were evaluated through compressive strength, flexural strength, and tensile strength tests. The addition of end-of-life tire particles with PVA exhibited notable effects on the strength characteristics of the mortars. The physical properties, including porosity, density, and water absorption, were examined to understand the material's structural integrity and durability. The study also delved into the thermal behavior of the mortars using techniques such as thermal conductivity and thermal expansion analysis. Results indicate that the incorporation of PVA as a surface treatment contributes to improved mechanical strength, reduced porosity, and enhanced durability of the mortars. The synergy between PVA and end-of-life tire particles demonstrates promising outcomes in terms of sustainable construction materials. The study provides insights into the potential of utilizing waste materials for enhancing the performance of mortars, contributing to both environmental conservation and construction industry sustainability.

Keywords: ELT, PVA, Silica Fume, Surface treatment, Sustainability

THE PARTICIPATION OF RURAL WOMEN IN DECISIONS CASE OF KARAPINAR DISTRICT OF KONYA PROVINCE

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ABSTRACT

The aim of the study is to determine the participation of women living in rural areas in decisions. The main material of the study consists of the results of the survey conducted with women in the Karapınar district of Konya. The sample size was chosen purposefully, and questionnaires were conducted face-to-face with 20 women who voluntarily participated in the survey in Karapınar. The land assets, livestock, agricultural and non-agricultural incomes of the enterprises were determined by simple percentage calculations over the averages. The roles of women living in rural areas in the family and the level of women's participation in decisions were calculated with the Likert scale. It has been determined that the spouses decide together on matters related to the house, the purchase of agricultural tools and machinery necessary for agricultural production, the type of product, and the fact that women work in a job other than agriculture. Women, on the other hand, only decide which party to vote for in the elections. Training to be given to businesses or any fair, excursion, etc. Women's participation in activities should be ensured, and their communication with the outside world should be strengthened.

Keywords: Konya, Participation in Decisions, Rural Women

THE INFLUENCE OF PRESSURE ON THE STRUCTURAL AND ELASTIC PROPERTIES OF THE CUY INTERMETALLIC COMPOUND

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ABSTRACT

Intermetallic compounds incorporating rare earth elements exhibit compelling physical and mechanical characteristics that typically surpass those of conventional metals. These properties encompass heightened strength and hardness, reduced specific gravity, enhanced corrosion resistance, and superior hot strength. Our investigation delved into the theoretical analysis of the intermetallic compound CuY. This study is purely theoretical, devoid of any reliance on experimental parameters. The compound adopts a cubic CsCl structure. We examined the impact of pressure on both the structural and electronic properties of the compound, employing the first principles method within the framework of Density Functional Theory (DFT). Given its significance as a crucial parameter, investigating materials under pressure holds merit. Exploring the deformation behavior of compounds subjected to compression is valuable, as it provides insights into alterations in their physical and chemical properties. Such research is indispensable for a comprehensive understanding of the nature of solids. The CuY compound satisfied the Born criteria, demonstrating structurally stable properties. By utilizing elastic constants, we scrutinized the impact of increasing pressure on its mechanical properties. Furthermore, upon confirming its electronic metallic properties, we delved into the examination of the compound's response to pressure.

Keywords: DFT, Elastic properties, Electronic properties

THE EFFECTS OF INCREASED SALINITY ON ORGANISMS IN FRESHWATER ECOSYSTEMS: A CASE STUDY OF FRESHWATER MUSSELS

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ABSTRACT

The melting of terrestrial glaciers, the expansion of the sea levels, and droughts due to global warming cause the increase of salinity levels in the freshwater. Notably, research on salinity in marine ecosystems is significantly higher than research in freshwater ecosystems. Freshwater mussels are an essential group of organisms that improve water quality by filtering the water body in which they are located. In addition, they are symbiotically related to other organisms in the feeding and reproduction cycle. These characteristics make freshwater mussels good model organisms. In this study, the effects of salinity increasing on total haemocyte levels (THCs) and lipid peroxidation by-product malondialdehyde (MDA) were investigated on freshwater mussels (*Unio delicatus*). After obtaining the freshwater mussels from local fishermen in Bursa (Türkiye), they were adapted to laboratory conditions for two weeks. Five freshwater mussels were placed in each aquarium and directly transferred to 12 ‰ salinity at a constant water temperature of 24 ºC for 1 hour and 24 hours in the experiment. There was also a positive control group. At the end of the exposure times, mussels were placed under ice anesthesia, and the hemolymph liquid, gill, and digestive gland tissues were taken. The THCs were investigated with the hemolymph liquid, and the levels of MDAs were calculated in gills and digestive tissues. The amount of THCs increased significantly at the end of 1 hour of salinity exposure but returned to the level of control group values at the end of 24 hours. According to the MDA results, levels in digestive and gill tissues did not change significantly within 1 hour after exposure but showed a tendency to increase during the rest of the exposure. It has been understood that mussels develop a rapid physiological and cellular response to salinity. The effects of salinity on freshwater mussels should be monitored using other parameters.

Keywords: Salinity, Freshwater Mussel, Total Hemocyte Counts, MDA

ASSOCIATION BETWEEN BIOCHEMICAL SALIVARY AMYLASE ENZYME ACTIVITY WITH IN IRAQI OBESITY PATIENTS

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ABSTRACT

The objective of the study is to correlate the relationship between body composition and the activity of the alpha-amylase enzyme in the saliva of healthy people and people with obesity which may provide further clues to investigate the potential regulation and biological mechanism of obesity. A total of 100 (57 male and 48 Female) specimens were obtained from different source, non-duplicate clinical samples (25%) of Control healthy individuals (Control), Patients without obesity and Patients with obesity. They were picked up from "Al-Ramadi Teaching Hospital". Between Septmber 2022 and June 2023, all of the samples were examined. The results showed the gender of patients of the two groups revealed no significant differences in mean of age (males and females) between the groups (control healthy individuals).

Data showed that the there is a significant difference between the mean of patients with obsity, the mean of age of patients of the two groups studied was ranged from 24.75 years in patients with obesity group to 32.55 years. The statements indicated that there is a significant difference between weight, BMI, and groups studied, patients with obesity significantly excellence in mean of height of patients and BMI. The results showed that no significant differences between the mean of Homa-IR levels. The results pointed that no significant differences between amylase levels of the two groups studied, mostly patients groups deceased the mean of amylase levels as compared with healthy control, patients with obesity revealed upper decreasing in amylase level.

Keywords: Amylase Activity, BMI, Insulin Level, Homa-IR Level

INVESTIGATION OF METHYLENE BLUE ADSORPTION FROM AQUEOUS SOLUTIONS BY DRIED LEAVES

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ABSTRACT

With the arrival of autumn each year, the leaves of trees dry up and consequently fall off. The fallen leaves are beneficial for preserving declining wildlife populations. They cover the tree/shrub and plant root systems, maintain soil moisture, prevent weeds, and suppress other plants. They gradually decompose, returning essential nutrients to the plants. However, in landscaped gardens created through landscaping, especially in October, fallen leaves are collected. If not collected, they can cause discoloration in the lawn area and promote fungal growth. These leaves are considered waste and are sometimes disposed of by burning or sent to landfills. In recent years, research has been conducted on the utilization of fallen leaves from various trees. Some of these studies explore various applications such as using leaves as a feed supplement [1] and in paper manufacturing [2]. In this study, the adsorption of methylene blue dye from aqueous solutions by dried Acer platanoides leaves was investigated. In experiments conducted at 25°C, the qe value of dried Acer platanoides leaves used at 0.5 g/L was found to be 0.3395 mol/kg.

References:

[1] Boğa, M, Avcı, B.C., Kılıç, H.N., Civaner, A.G. (2022). Bazı Baklagil Ağaç Yapraklarının Alternatif Yem Kaynağı Olarak Besin Madde İçerikleri ve Sindirilebilirliklerinin Belirlenmesi. Kahramanmaraş Sütçü İmam Üniversitesi Tarım ve Doğa Derg, 25(5): 1191–1197.
[2] Sibaly, S., Jeetah, P. (2017). Production of paper from pineapple leaves. J Environ Chem Engi 5(2017): 5978–5986.

Keywords: Adsorption, Wastewater, Methylene Blue, Acer platanoides leaves, Adsorbent

TYROSINASE INHIBITORS: UNCOVERING TYROSINASE INHIBITORS IN VITRO FOR SKIN HYPERPIGMENTATION MANAGEMENT

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ABSTRACT

Tyrosinase has attracted a lot of interest as a potential inhibitor target since it is an enzyme that plays an important role in human melanogenesis as well as in the enzymatic browning of fruits and fungi. Complex chemical and enzymatically catalysed events are involved in melanogenesis, the process that leads to melanin synthesis. The purpose of this research is to find tyrosinase inhibitors in both natural and manmade compounds. Also discussed are the possible medicinal uses of these inhibitors in avoiding fruit enzymatic browning and skin hyperpigmentation, two undesirable results. Synthetic compounds (5d, 5e, 5f, and 5g) were tested for their inhibitory effect on mushroom tyrosinase using a microtiter plate reader. Compounds 5d, 5e, 5f, and 5g exhibited inhibitory effects on tyrosinase activity, and the results showed that the inhibition was concentration dependent. Additional information on the binding sites of these synthetic compounds with the tyrosinase active site was gleaned from molecular docking experiments. The inhibitory effects of compound 5d were highlighted using enzyme activity testing and visual depictions, indicating its potential as a tyrosinase inhibitor. To highlight the inhibitory mechanism, a two-dimensional interaction map was used to demonstrate critical hydrogen bond interactions with certain amino acids. There was a concentration-dependent reduction in tyrosinase activity when compounds 5e, 5f, and 5g were tested. Important hydrogen bond interactions were highlighted in the interaction maps, suggesting that the chemicals may be able to stabilise binding and increase inhibitory effects. Our research adds to the growing body of knowledge on potential new tyrosinase inhibitors for use in skin lightening and antibrowning foods. The research highlights the need of studying the molecular interactions between tyrosinase and synthetic inhibitors in order to create anti-hyperpigmentation medicines that work. To confirm these chemicals' medicinal potential, further study may include in vivo tests and clinical trials.

Keywords: Skin hyperpigmentation, Tyrosinase, Activity enzyme

COMPUTATIONAL INVESTIGATION ON THE COMPLEXES BETWEEN AZA-CRYPTANDS AND TRANSITION METALS

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ABSTRACT

Cryptands are useful in a variety of fields such as organic chemistry, biochemistry, and material science because of their ability to selectively interact with metal ions. In this study, we have performed a computational study to elucidate the structures and energetics of the complexes formed by transition metals, such as Cr^{2+}, Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+} and Zn^{2+}, with aza-cryptand 3^6adamanzane using DFT method. At their optimized geometries of complexes studied, all complexes possess the S_4 symmetry except the 3^6adz−Cr^{2+} and 3^6adz−Cu^{2+} complex (C_1 symmetry). The computed interaction energies of all 3^6adz−M^{2+} complexes studied were given with and without relativistic energy corrections at the CAM-B3LYP/6-311++G(d,p) level. The 3^6adz−Ni^{2+} complex possesses a highest IE value (−438.6 kcal mol^{-1}) including relativistic energy corrections than the other complexes.

Keywords: Cryptands, Transition Metal Complexes, DFT, Noncovalent Interactions

HISTOPATHOLOGICAL EVALUATION FOLLOWING EXPOSURE TO A TOXIC COCKTAIL IN A COELOMATE, "APORRECTODEA CALIGINOSA (SAVIGNY, 1826)

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ABSTRACT

The primary objective of this study was to investigate the effects of a toxic cocktail composed of cadmium chlorite ($CdCl_2$) and the herbicide 2,4-dichlorophenoxyacetic acid (2,4-D) on the histological structure of earthworms of the species "Aporrectodea Caliginosa," which play a predominant role in the Annaba region. To achieve this goal, we organized four groups of earthworms, each subjected to a different treatment. The first group served as a control, while the others were exposed to cadmium, pesticides, or the combination of both for a duration of 14 days.

We conducted histological sections to perform a qualitative and quantitative analysis of tissue damage resulting from these treatments. The results revealed tissue lesions, necrosis, and the presence of vacuoles in the form of clusters. These observations suggest the development of a non-specific defense mechanism, resulting in the accumulation of minerals. Additionally, the rates of intestinal and gonadal lesions were significantly higher compared to the control groups, regardless of the treatment. This underscores the detrimental effects that these foreign chemicals, or xenobiotics, can have on the growth and reproduction of earthworms.

Keywords: Aporrectodea caliginosa, pesticide, ETM, cocktail, toxicity, study, histology

SMALL INTERFERING RNAS (SIRNAS) BASED APPROACHES FOR COMBINATION THERAPY OF BREAST CANCER

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ABSTRACT

Breast cancer is a high mortality disease and common among women. Based on this, polyurethane-oleic acid based nano-system was developed for the treatment of breast cancer by combining siRNA and curcumin (CUR) to overcome multi-drug resistance by silencing gene expression in cancer cells. For this, TPU-Ole polymer was synthesized. Then TPU-Ole nanoparticles (TPU-Ole NPs) were prepared and the particle size and zeta potential values were found about 170 nm and -27.5 mV. CUR was encapsulated into NPs and cmyc-siRNA was attached to the surface of PLL-TPU-Ole NPs. In vitro release and stability studies were examined at pH 5.0 and 7.4. Agarose gel electrophoresis was realised to test the siRNA condensation capacity. The apoptotic-necrotic effects and gene silencing ability of siRNA-CUR-NPs on L929 and MCF-7 cells were determined by flow cytometry and RT-PCR analysis. As a result, siRNA-CUR-TPU-Ole NPs were quite sucessful to silence the cmyc gene.

References:

1. F. Bray, J. Ferlay, I. Soerjomataram, R.L. Siegel, L.A. Torre, A. Jemal, Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality natural biflavonoids from plants: a brief review, Mini Rev. Med. Chem. 17 (10) (2017) 834-862.
2. S. Medel, Z. Syrova, L. Kovacik, J. Hrdy, M. Hornacek, E. Jager, M. Hruby, R. Lund, D. Cmarko, P. Stepanek, I. Raska, B. Nyström, Curcumin-bortezomib loaded polymeric nanopartciles for synergistic cancer therapy, European Polymer Journal 93 (2017) 116-131.
3. T. Saleh, T. Soudi, S.A. Shojaosadati, Aptamer functionalized curcumin-loaded human serum albümin (HSA) nanoparticles for targeted delivery to HER-2 positive breast cancer cells, International Journal of Biological Macromolecules 130 (2019) 109-116.
4. R. Jain, Delivery of molecular medicine to solid tumors: lessons from in vivo imaging of gene expression and function, J. Control. Release 74 (1-3) (2001) 7–25.
5. S.H. Jang, M.G. Wientjes, D. Lu, J.L.S. Au, Drug delivery and transport to solid tumors'', Pharm. Res., 20 (9) (2003) 1337–1350.
6. S.J. Lee, M.J. Kim, I.C. Kwon, T.M. Roberts, Delivery Strategies and potential targets for siRNA in major cancer types, Adv Drug Deliv Rev. 104 (2016) 2–15.

Keywords: TPU, oleic acid, CUR, siRNA, L929, MCF-7

COST ANALYSIS OF THREE DIFFERENT ROOF SYSTEMS IN THREE DIFFERENT SPANS IN THE DESIGN OF A STEEL STRUCTURE'S ROOF

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ABSTRACT

The primary objective of this study is to conduct a comprehensive cost analysis of three distinct roofing systems (beam, truss, lattice truss) within varying spans (10m, 20m, 30m.) for the design of a steel structures. By examining the cost implications of three different roofing systems across various spans, this study seeks to identify the roofing system that offers the highest level of cost-efficiency for each specific span. Three distinct roofing systems (beam, truss, lattice truss) within varying spans (10m, 20m, 30m.) are modeled in SAP2000 package program. Safe and low-cost solutions were investigated for each model. In the final solution, the amount of steel per square meter for each model was evaluated. The most economical roof system varies for each span. The system has the lowest steel usage per unit area is the 'beam' roof system for a 10-meter span, the 'truss beam' system for a 20-meter span, and the 'lattice truss' system for a 30-meter span. In all systems, as the span increases, the steel cost per unit area increases. While this increase rate is approximately proportional to the span in the ‘beam’ roof system, while the rate of increase gradually decreasing in the ‘truss’ roof system and ‘lattice truss’ roof system. This study will help engineers and decision makers make informed choices about the choice of roof systems during the design phase of steel structures. This study will also provide us the evaluation of the economic feasibility of each roofing system according to the different spans.

References:

1. İpekçi, Z., & Kavraz, M. (2020). Çelik Düzlemsel Kafes Kirişlerde Kafes Tipi ve Yüksekliğinin, Ağırlık ve Maliyete Etkileri Üzerine Bir Çalışma. Düzce Üniversitesi Bilim ve Teknoloji Dergisi, 9(2021): 114-129, 16.
2. Jost, E, W., Moore, D, G., & Saldana, C. (2021). Evolution of global and local deformation in additively manufactured octet truss lattice structures. Additive Manufacturing Letters, 1(2021) 100010.
3. Deren, H., Uzgider, E., Piroğlu, F., & Çağlayan, Ö. (2012). Çelik yapılar (4 edition). İstanbul, Turquie: Çağlayan Kitabevi.
4. Daloğlu, A., Pul, S., & Özgan, K. (2021). Çelik yapılar (1 edition). Trabzon, Turquie: KTÜ Matbaası.
5. İpekçi Z., Çelik Düzlemsel Kafes Kirişlerde Kafes Tipi ve Yüksekliğinin, Ağırlık ve Maliyete Etkileri Üzerine Bir Çalışma, Yüksek Lisans Tezi, Karadeniz teknik üniversitesi, Fen Bilimleri enstitüsü, 2020, 138, Trabzon.
6. Albaş O., Çelik kafes kirişli sistemlerde aşık+kafes kiriş optimizasyon, Yüksek Lisans Tezi, İstanbul teknik üniversitesi, Fen Bilimleri enstitüsü, 1999, 78, İstanbul.

Keywords: Cost Analysis, Steel structures

A DFT STUDY OF (2Z,3Z)-1,4-DITHIANE-2,3-DIONEDIOXIME

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ABSTRACT

In this study, electronic structures vicinal dioxime were studied by DFT calculations. Structural and electronic parameters of the complexes were determined by using Gaussian 09 program. First of all, geometric parameters (bond length, bond angle, torsion angle) of the most stable form of the complex were determined with mPW1PW91 iop(3/76=0572004280) / gen [S: cc-pvqz, C and H: 6-31+g(d,p), N: 6-31+g(2d), O: cc-pvqz] level. The theoretical frontier molecular orbital descriptors such as electronegativity, chemical potential, softness, electrophilicity index, and electron affinity of the title compound were calculated with the same level. In addition, the total and partial density of state distribution (TDOS, PDOS) of the molecular orbitals, molecular electronic potential surface map (MEP) and nonlinear optical properties (NLO) of the compound were determined.

Keywords: Vicinal dioxime, Density Fuctional Theory, MEP, Nonlinear optics

AUTOMATED DETECTION OF SOLAR PANEL DEFECTS USING DEEP LEARNING

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ABSTRACT

In the solar energy sector, the production process of photovoltaic (PV) cells frequently grapples with the issue of micro-crack formation. These defects, predominantly resulting from high temperature differentials and external pressures during the manufacturing process [1], have traditionally been identified through manual inspection. However, this manual approach is fraught with challenges such as susceptibility to human error, fatigue, and consequent elevated costs [4]. In response to these issues, our study delves into the application of deep learning techniques for the automated detection of defects in PV modules. We have developed and rigorously evaluated two distinct models: a custom-designed Convolutional Neural Network (CNN) and an adapted, pre-trained InceptionV3 model. Our experimental analysis utilized a dataset consisting of 2,624 electroluminescence (EL) images [2, 3], focusing on a binary classification task to differentiate between functional and defective PV cells. The outcomes reveal that the custom-built CNN, noted for its simpler architecture, achieved an accuracy of 88.5%. In contrast, the InceptionV3 model, recognized for its complexity, attained a marginally higher accuracy of 90.88%. These results underscore the efficacy of both bespoke and pre-trained deep learning models in detecting defects in PV modules, illustrating their potential viability considering the available resources, computational capacity, and specific application requisites. This research highlights the escalating significance of machine learning applications in the progression of renewable energy technologies, particularly in enhancing the quality and reliability of PV cells.

References:

[1] Dhimish, M.; Mather, P. Development of Novel Solar Cell Micro Crack Detection Technique. IEEE Trans. Semicond. Manuf. 2019, 32, 277–285.

[2] Buerhop-Lutz, C., Deitsch, S., Maier, A., Gallwitz, F., & Brabec, C. J. (2018). A Benchmark for Visual Identification of Defective Solar Cells in Electroluminescence Imagery. 35th European PV Solar Energy Conference and Exhibition, 1287–1289.

[3] Deitsch, S., Christlein, V., Berger, S., Buerhop-Lutz, C., Maier, A., Gallwitz, F., & Riess, C. (2019). Automatic classification of defective photovoltaic module cells in electroluminescence images. Solar Energy, 185(February), 455–468. https://doi.org/ 10.1016/j.solener.2019.02.067

[4] Akram, M. W., Li, G., Jin, Y., Chen, X., Zhu, C., Zhao, X., & Ahmad, A. (2019). CNN based automatic detection of photovoltaic cell defects in electroluminescence images. Energy, 189. https://doi.org/10.1016/j.energy.2019.116319

Keywords: CNN, Photovoltaic (PV), InceptionV3, Electroluminescence (EL), Defect detection

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NEW METHODS AND MATERIALS USED IN SOIL–RELATED ROAD DETERIORATION IN THE ULUYAZI (ÇANKIRI) CAMPUS, TÜRKIYE

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ABSTRACT

While the world is experiencing the age of technology at full speed, Turkey is also taking steps to implement innovations by following these technological developments. These technological and industrial innovations have become rapidly widespread in the construction industry. The rapid population growth of countries, which is seen as a problem of the developing world, increases the need for new settlement areas and new roads. With population growth and the slow development of widespread railway networks in public transportation services due to their costs, the vehicle load on the roads also increases and old roads and traditional methods lose their effectiveness in the long term. Therefore, these vehicle loads cause permanent problems on the roads. The main reasons for deterioration in road structures are the same applications in regions with different weather conditions, errors during application, errors in the selection of methods, as well as deformations caused by the type of ground on which the application will be made. Problems that may occur as a result of ground effect are observed as cracks and deformations on the coating surface. The lithological characteristics of the ground of the new road line in the Çankırı Karatekin University, Uluyazı Campus especially the melting–collapse at gypsum levels, the deformations caused by these and the areas with landslide risk were examined. For the improvements that can be made on the new road line and landslide risk area, the contributions of a number of new applications and materials (geosynthetics) suitable for the lithological characteristics of the region have been examined.

Keywords: Çankırı, Gypsum, Landslide Prevention, New Road Construction Method, Geosynthetics

NUMERICAL SOLUTIONS OF SOME SECOND KIND FREDHOLM INTEGRAL EQUATIONS VIA PELL POLYNOMIALS

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ABSTRACT

In this study, we obtain the approximate solutions of some second kind Fredholm integral equations via Pell polynomials. To do this, the collocation method was presented for the approximate solution of some integral equations. Moreover, we give certain numerical examples to verify the theoretical results.

References:

[1] Chakrabarti, A., & Martha, S.C. (2009). Approximate solutions of Fredholm integral equations of the second kind, Appl. Math. And Comput., 211 459-466.
[2] Maleknejad, K., & Aghazadeh, N. (2005). Numerical solution of Volterra integral equations of the second kind with convolution kernel by using Taylor-series expansion method, Appl. Math. Comput. 161 915-922.
[3] Mandal, B. N., & Bhattacharya, S. (2007). Numerical solution of some classes of integral equations using Bernstein polynomials, Appl. Math. and Comput. 190 1707–1716.
[4] Nadir, M. (2018). Solving linear integral equations with Fibonacci polynomials. Malaya Journal of Matematik, 6(4) 711-715.
[5] Nadir, M. (2014). Solving Fredholm integral equations with application of the four Chebyshev polynomials, J. of Approx. Th. And App. Math., 4 37-44.
[6] Nadir, M., & Chemcham, M. (2017). Numerical solution of linear integral equations using hat function basis, Asian Journal of Math. and Comp. Research, 15(1) 1-8.
[7] Nadir, M., & Lakehali, B. (2018). A variational form with Legendre series for linear integral equations, Malaya Journal of Matematik, 6(1) 49-52.
[8] Nadir M., & Dilmi, (2017) M. Euler series solutions for linear integral equations, The Australian Journal of Math. Analy. and Appl., 14(2) 1-7.

Keywords: Linear integral equation, Pell polynomials, Collocation methods, Approximate solution.

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PERIODIC SOLUTIONS OF SOME HIGHER ORDER DIFFERENCE EQUATIONS

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ABSTRACT

In this work, we deal with the general form of the solutions and the periodicity of some higher order difference equations

$$x_{n+1}=\frac{\prod_{k=0}^{r}x_{n-2k}}{\prod_{k=0}^{r-1}x_{n-(2k+1)}\left(-1\pm\prod_{k=0}^{r}x_{n-2k}\right)},\qquad n,\,k\in\mathbb{N}_0,r\in\mathbb{N}$$

where the initial values are nonnegative real numbers such that the denominator is always nonzero. Moreover, some numerical examples are presented to verify our theoretical results.

References:

[1] Elaydi, S. (1996). *An Introduction to Difference Equations*, Springer-Verlag, New York, Inc.

[2] El-Metwally H., & Elsayed, E. M. (2012). Qualitative Study of Solutions of Some Difference Equations, *Abstract and Applied Analysis*, Article ID 248291, 16 pages.

[3] Elsayed, E. M. (2016). Expression and behavior of the solutions of some rational recursive sequences, *Mathematical Methods in the Applied Sciences*, 39(18) 5682-5694.

[4] Elsayed, E. M. (2011). On the solution of some difference equations, *European Journal of Pure and Applied Mathematics*, 4(3) 287-303.

[5] Elsayed, E. M., & Ibrahim, T.F. (2015). Solutions and periodicity of a rational recursive sequences of order five, *Bulletin of the Malaysian Mathematical Sciences*, 38 95–112.

[6] Göcen, M., & Cebeci, A. (2018). On the periodic solutions of some systems of higher order difference equations, *Rocky Mountain J. Math*., 48(3) 845-858.

[7] Göcen, M., & Güneysu, M. (2018). The global attractivity of some rational difference equations, *Journal of Computational Analysis and Applications*, 25(7) 1233-1243.

[8] Ibrahim, T.F. (2009). On the Third Order Rational Difference Equation $x_{n+1}=\frac{x_n x_{n-2}}{x_{n-1}(a+bx_n x_{n-2})}$. *Int. J. Contemp. Math. Sciences*, 4(27) 1321-1334.

[9] Ibrahim, T.F. (2009). Dynamics of a rational recursive sequence of order two. *International Journal of Mathematics and Computation*, 5(9) 98-105.

[10] Göcen, M., & Cebeci, A. (2022). Form of the periodic solutions of some systems of higher order di¤erence equations. *Asian-European Journal of Mathematics*, 15(2), Doi: 10.1142/S1793557122500292.

[11] Folly-Gbetoula , M., Göcen, M., & Güneysu, M. (2022). General form of the solutions of some difference equations via Lie symmetry analysis. *Journal of Analysis and Applications*, 20(2), 105-122.

Keywords: Periodicity, Higher order difference equations, Form of the solutions.

EFFECT OF GLIDING ARC DISCHARGE ON REDUCING THE MICROBIAL LOAD OF BLACK TABLE OLIVES

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ABSTRACT

In this study, it was aimed to investigate the potential of Gliding Arc Discharge (GAD) plasma, one of the non-thermal cold plasma types, for reducing the natural microbial load in Gemlik type black olives obtained from İzmir province. The GAD plasma conditions were optimized using the Box-Behnken experimental design with black olives, harvested in 2020 and then stored at +4 °C for natural microorganism growth. Olives were treated with the GAD plasma at optimum plasma condition of 0.7 mL/min gas flow rate, 0.5 cm distance between electrodes, 5 min time with dry air (99.9%). Changes in microbiological (mold-yeast and lactic acid bacteria count) of olives with and without plasma treatment were determined. After plasma treatment, 5.4% reduction in mold-yeast count and 10.7% reduction in lactic acid bacteria count were detected. The results showed that air-GAD plasma is a promising method for the pre-decontamination of fruits that are sensitive to heat and have high moisture content.

Keywords: Gliding arc discharge plasma, Black table olives, Mold-yeast, Lactic acid bacteria, Decontamination

EFFECT OF MICROWAVE HEATING ON TECHNOLOGICAL PROPERTIES OF AQUAFABA

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ABSTRACT

The production of plant-based food additives for food formulations instead of animal-based proteins gains importance due to changes in eating habits, climate change and sustainability. Aquafaba is a plant-based product which is obtained by cooking or canning chickpeas in water and draining chickpea seeds. Functional properties, foaming, emulsifying and gelling, lead to the use of aquafaba as an egg replacer. However, those properties need to improve since the effect of microwave heating on functional properties of aquafaba was investigated in this study. Firstly, aquafaba samples were heated by microwave at 350 W and 600 W and no heated samples were named as control. The foaming expansion, foaming capacity and emulsifying activity index were analysed. To understand the effect of microwave heating on chemical composition, FTIR and XRD analyses were carried out and SEM analyses were conducted for morphological analyses. The effect of microwave heating on foaming properties was statistically insignificant ($p>0.05$), which of statistically significant for the emulsifying activity index after 72h ($p<0.05$). FTIR and XRD results showed that saponin structure may have changed after microwave heating. This study showed that promising results can be obtained about the emulsifying properties of aquafaba using moderate microwave heating.

Keywords: Aquafaba, Microwave, Emulsion

EFFECT OF INITIAL REACTANT CONCENTRATION ON THE CALCIUM SULFATE SIZE DISTRIBUTION

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ABSTRACT

In ancient Egypt and medieval Europe, gypsum, known as alabaster, was used for wall decorations and reliefs (Jeong et al., 2019). Gypsum, a mineral abundant in nature, consists of calcium sulfate (CaSO4). In parallel with developing technology, traditional practices have also become widespread. The ability to control the size distribution during crystallization in synthesis has enabled its use in various fields. [1,2].

This study investigates the effect of initial concentrations of reactants on the size distribution of CaSO4 crystals that precipitate at low temperatures through the reaction of calcium chloride (CaCl2) and sodium sulfate (Na2SO4) spontaneously. The sizes of the resulting crystals were measured via SEM analysis to determine their size distribution. (This study was prepared from the student's master's thesis.)

References:

[1] Gong, S., Li, X., Song, F., Lu, D., Chen, Q. (2020). Preparation and Application in HDPE of Nano-CaSO4 from Phosphogypsum. ACS Sustain Chem Eng, 8:4511–20. https://doi.org/10.1021/acssuschemeng.9b07632.
[2] Wang, Y., Li, Y., Yuan, A., Yuan, B., Lei, X., Ma, Q., et al. (2014). Preparation of calcium sulfate whiskers by carbide slag through hydrothermal method. Cryst Res Technol, 49:800–7. https://doi.org/10.1002/crat.201400155.

Keywords: Concentration, CaSO4, Calcium sulfate, Size distribution, Crystallization, Bassanite

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PERFORMANCE OF MACHINE LEARNING-BASED NETWORK SLICING METHODS IN 5G AND BEYOND COMMUNICATION

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ABSTRACT

In recent years, advancements in communication technologies have given rise to needs such as high transmission speed, reliability, and low latency. Improvements in these aspects are crucial in fourth-generation (4G) communication technologies. Following 4G, the Network Slicing method introduced with 5G allows the network infrastructure to be divided to meet different service requirements, enabling flexible and efficient utilization of network resources. The performance of machine learning-based 5G network slicing methods was tested by simulating 3rd Generation Partnership Project (3GPP) compliant error-prone users and base stations. Five different machine learning methods, along with their parameter spaces, were used in tests for network slicing, employing four methods (eMBB, M1oT, V2X, and URLLC). The performance of these classifier models was analyzed using both error-prone user data and ideal user data. The simulation data were used to conduct a performance analysis of machine learning methods mentioned in the literature, investigating their usability. A 96% accuracy rate was achieved using the XGBoost method with error-prone user data, and a 97% accuracy rate was achieved with ideal user data. Additionally, the relationships between the system cycle and user count, as well as the data rate reduction system, were examined in the simulation.

Keywords: 5G and Beyond Communication, Machine Learning, Network Slicing

MANUFACTURE OF {GROWTH-PROCESSING AND-MEASURING EQUIPMENT} REQUIRED FOR THE LABORATORY SCALE AND MASS-PRODUCTION OF SEMICONDUCTOR MICRO AND OPTO ELECTRONIC DEVICES

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ABSTRACT

Fabrication of semiconductor devices has currently this 2023-2024 year exceeded a one hundred years since its beginning all over the world. Returning back a century ago we realize that throughout this whole year's fabrication equipment for micro and optoelectronics were based upon five major axis or five major Fundamental requirements. a) Vacuum requirement and/or at least clean environment requirement, b) Chemically Purified water requirement, c) Device alignment requirement, d) Ultra clean chemicals as necessary materials for Device fabrication. This material purity exceeds 99.9 %. e) High temperature (around 1000 degrees) for device Growth, Deposition & Coating requirement. These five requirements are the crucially most important building blocks for fabrication in the laboratory scale as well as in mass production. Moreover, many of this equipment among these exists around us but we are not aware of their existence. Others can be home-made manufactured and with reasonable prices much cheaper than its selling price. Our Presentation will cover two major complete issues: Explaining the manufacture of such equipment with a successful equipment already manufactured and a full explanation of how to build your own cheap lab/productive clean room for the fabrication of silicon and III-V based semiconductor solar cells photodetectors transistors LEDs and lasers.

Keywords: Semiconductor, Measuring Equipment

TYROSINASE INHIBITORY CAPACITY OF EXTRACTS OBTAINED FROM DIFFERENT BRANCHES OF ENDEMIC CENTAUREA (C. PAPHLAGONICA AND C. CANKIRIENSE) PLANTS FROM THE SAME REGION

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ABSTRACT

In recent years, a lot of resources have been devoted to research for the treatment of disorders caused by this enzyme, especially on the discovery and use of herbal products. This study aims to demonstrate the antithyrosinase effects of the extracts of two endemic plant species from the Centaurea family from the same region by targeting the inhibition of the tyrosinase enzyme, which also causes skin cancer by increasing melanin synthesis. Inhibitory activity values of methanol:chloroform extracts of *Centaurea paphlagonica* and *Centaurea cankiriense* plant samples against tyrosinase enzyme were investigated. The samples examined were found to have IC50 values in the concentration range of 180.51-1359.13 µg/ml. In the light of the findings obtained, it was observed that *C. paphlagonica* extracts had the highest activity and had more inhibitory effect, and that changing the extraction method affected the activity very much. The high activity of some extracts of our plant samples against tyrosinase enzyme, albeit selectively, is a promising factor for future research.

Keywords: Centaurea paphlagonica, Centaurea cankiriense, Tyrosinase, Enzyme activity, Endemic

EVALUATION OF FIBROBLAST GROWTH FACTOR 23 (FGF23) IN SERUM OF PATIENTS WITH DIABETIC NEPHROPATHY

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ABSTRACT

FGF23 is the phosphate-regulating bone-derived hormone and the metabolism of vitamin D3. fgf23 is secreted by osteocytes/osteoblasts and works by binding to the klotho complex of the FGF receptor fgf23 suppresses proximal tubular phosphate reabsorption by reducing sodium phosphate absorption by modulating vitamin D3 expression Metabolizing enzymes and reducing the level of excessive and deficient action of FGF23 at 1.25 dihydroxy vitamin D3 cause hypophosphatemic and hyperphosphatemic disease and FGF23 plays an important role in the development of mineral chronic kidney disease and the identification of FGF23 produced a new concept that bone also functions as an endocrine organ disorder

Aim of the study to analyze the relationship between vitamin D3 growth factor 23(FGF23) and to evaluate whether these results will be markers for patients with diabetic nephropathy

All groups are between (20 -60) years old. The presented study was conduction in the medical city hospital in Baghdad, Iraq. This study included three groups all of them totaling 180 samples and they are first of all 1- the 60 patients with diabetic nephropathy including 30 males and 30 females 2-the 60 patients with kidney disease without diabetes of whom 30 are males and 30 females 3-the healthy(control) 60 of them were 30 males and 30 females.

Results showed that is an inverse relationship between vitamin D3 and FGF23 and all there are significant differences except for no difference between age and BMI.

Keywords: FGF23(fibroblast growth factor 23), Vitamin D3

OXIDATIVE STRESS AND ANTIOXIDANT IN PREGNANCY WOMEN CONCEIVED BY IN VITRO FERTILIZATION AND INTRAUTERINE INSEMINATION

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ABSTRACT

Background: One of the most widely used methods of assisted reproduction is in vitro fertilization (IVF). This approach is a most used infertility curative and frequently represents the sole chance for the infertile couples to become parents. The Intrauterine Insemination (IUI) is a straightforward, affordable, non-invasive, and secure therapy option for the management of infertility. Oxidative stress (OS) is the outcome of significant reactive oxygen species (ROS) causing oocyte senility and many reproductive problems in females, while antioxidant can balance out the increased levels of ROS that cause a high state of OS, they have long been used in the treatment of subfertility. This study was to detect the serum of superoxide dismutase, catalase, glutathione, reactive oxygen species, and Malondialdehyde levels of pregnant with different types of assisted reproductive techniques in relation with the age group, body mass index (BMI).

Methods: enzyme-linked immune sorbent assay (ELISA) based on for the detection of SOD,CAT, ROS levels in the serum of pregnant women in the first trimester of pregnancy, while GSH measured by using amino acid analyzer.

Results: The present study showed that the serum SOD, CAT, and GSH showed a significant decrease in IVF, IUI, SP pregnant groups in comparison with NP. While ROS and MDA significant increase. There were a non-significant difference present between the different pregnant groups (IVF, IUI, and SP) also in ages and BMI groups.

Keywords: Superoxide dismutase, Catalase, Glutathione, Reactive oxygen species, Malondialdehyde

EFFECT OF PRESSURE ON OPTOELECTRONIC PROPERTIES OF IR3ZRC COMPOUND

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ABSTRACT

Ever since their discovery by Russian mineralogist Perovski in 1839, perovskite materials have been the subject of extensive study. This diverse class includes various structures like perovskite, antiperovskite, inverse perovskite, double perovskite, and anti-double perovskite, each characterized by unique compositions and coordination geometries. Ternary nitrides or carbides with a cubic antiperovskite structure fall into a distinct class of materials described by the general formula AXM3 or M3AX, where A represents a main group III-V element, X stands for carbon or nitrogen, and M is a transition metal. Our focus in this study is on the compound Ir3ZrC, which adopts an antiperovskite structure, belongs to the Pm3m space group, and exhibits a cubic arrangement. Using the first-principles method with Density Functional Theory (DFT), we conducted a comprehensive theoretical analysis of the compound. This investigation delved into the effects of pressure on its structural, electronic, and optical properties. Understanding how compounds deform under compression and the consequent changes in their physical and chemical characteristics is crucial for comprehending the nature of solids, given the importance of pressure as a key parameter. We compared lattice constants, volumes, bulk modulus, and its first derivative under pressure with both experimental and theoretical data at zero pressure, providing a detailed analysis of their variations. The values of the studied compound at zero pressure were consistent with literature values, and Ir3ZrC demonstrated stability according to Born criteria across different pressure values. Furthermore, its electronically metallic nature was maintained even under the influence of pressure. In conclusion, we utilized the complex dielectric function to explore the optical properties of Ir3ZrC, presenting a thorough evaluation of optical parameters under pressure. The study not only examines the pressure effect but also investigates the optical properties of the perovskite cubic compound Ir3ZrC for the first time, contributing valuable data for experimental studies and enriching the existing literature.

Keywords: DFT, B2 structure, electronic properties, elastic, properties, vibrational properties

EFFECTS OF SOME HONEY EXTRACTS ON PANCREATIC LIPASE AND TYROSINASE ACTIVITY

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ABSTRACT

Honey is a viscous, liquid, natural product with a complex chemical composition. It is made up of carbohydrates, free amino acids, vitamins, trace elements and phenolic compounds. Honey has been an important food source since ancient times. It is also an indispensable part of traditional medicine. In this study, the effects of extracts obtained from honey samples collected from ELDİVAN, MERKEZ, KURŞUNLU and ILGAZ districts of Çankırı province on lipase and tyrosinase enzymes activity were investigated. 20 honey extracts were used for this purpose. In the study, it was determined that 4 samples taken from Ilgaz district, 1 sample from the center and one sample taken from Eldivan district were effective on lipase enzyme activity. Also, 5 samples taken from Ilgaz district, 1 sample from the center and one sample taken from KURŞUNLU district were effective on tyrosinase enzyme activity.

Keywords: Pancreatic lipase inhibitory activity, Tyrosinase inhibitory activity, Honey extracts

INVESTIGATIONS OF EFFECTS OF HONEY EXTRACTS OBTAINED FROM CANKIRI ON PANCREATIC LIPASE AND TYROSINASE ACTIVITY

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ABSTRACT

Honey has been an important food source since ancient times. It is also an indispensable part of traditional medicine. In this study, the effects of extracts obtained from honey samples collected from ŞABANÖZÜ, ORTA/SANI YAYLASI, ORTA dodurga, KORGUN Alpsarı, KORGUN and BAYRAMÖREN DOLAŞLAR KÖYÜ of Çankırı province on lipase enzyme inhibitory activity and the effects of extracts obtained from honey samples collected from ATKARACALAR, KIZILIRMAK CACIKLAR, ORTA/SANI YAYLASI, KORGUN Alpsarı and two samples from MERKEZ Ballıca,on Tyrosinase enzyme inhibitory activity, that were investigated. A 23 honey extracts were used for this purpose. As a result it was observed that sample No.73 from region korgun Alpsarı is very good lipase inhibitory activity, but it is not as good as region korgun sample No. 75. On the other hand sample No. 66 from KIZILIRMAK CACIKLAR region seem to act as good Tyrosinase inhibitory activity, , but it is not as good as samples No. 77, 78 from MERKEZ Ballıca.

Keywords: Pancreatic lipase inhibitory activity, Tyrosinase inhibitory activity, Honey extracts

STUDY OF COPEPTIN AS A BIOMARKER OF METABOLIC SYNDROME AND DIABETES MELLITUS IN IRAQI FEMALES

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ABSTRACT

This study was aimed to measure copeptin levels in the metabolic syndrome (MetS) and Diabetes Mellitus in Iraqi Females because of its importance as a possible early biomarker of cardiovascular disorders related to MetS and Diabetes Mellitus. Arginine vasopressin (AVP) which is also called antidiuretic Hormone is released from the pituitary gland in conditions of high plasma osmolality, low plasma volume, and low blood pressure. Arginine vasopressin (AVP) is secreted under conditions of water deprivation. Since AVP has a low half-life in the plasma, the C-terminal fragment of AVP-precursor (copeptin) was used to estimate the AVP levels. the C-terminal sequence of pre-pro vasopressin (Copeptin), a 39-amino acid-long glycosylated peptide secreted equimolarly with arginine-vasopressin (AVP), has been used as an alternative marker of AVP because of its long-term stability and being easy to measure on blood [1, 2]. Copeptin is related to several cardiometabolic disorders, such as heart failure, T2DM, polycystic ovary syndrome, preeclampsia, and renal disease [3,4]. A role for the AVP system in glucose homeostasis, insulin resistance, and diabetes mellitus. In patients with poorly controlled diabetes mellitus, plasma AVP is markedly elevated, [5] and in healthy subjects, AVP infusion leads to increased blood glucose levels [6]. plasma copeptin levels correlated with body mass index, fasting plasma glucose and insulin, homeostasis model assessment of insulin resistance, triglycerides, and (inversely) high-density lipoprotein cholesterol .High plasma copeptin was associated with reduced insulin sensitivity . High copeptin levels increase the risk for the development of diabetes mellitus independently of established clinical risk factors, including fasting glucose and insulin. These findings could have implications for risk assessment, novel antidiabetic treatments, and metabolic side effects from arginine vasopressin system modulation.

References:

[1] M. Christ-Crain,(2019) “Vasopressin and copeptin in health and disease,” Reviews in Endocrine & Metabolic Disorders, vol. 20, no. 3, pp. 283–294.
[2] M. Christ-Crain and W. Fenske,(2016) “Copeptin in the diagnosis of vasopressin-dependent disorders of fluid homeostasis,” Nature Reviews Endocrinology, vol. 12, no. 3, pp. 168–176 .
[3] I. Bellos, V. Pergialiotis, A. Papapanagiotou, D. Loutradis, and G. Daskalakis, (2020) “Association between serum copeptin levels and preeclampsia risk: a meta-analysis,” European Journal of Obstetrics & Gynecology and Reproductive Biology, vol. 250, pp. 66–73.
[4] T. Noor, F. Hanif, Z. Kiran et al., (2020) “Relation of copeptin with diabetic and renal function markers among patients with diabetes mellitus progressing towards diabetic nephropathy,” Archives of Medical Research, vol. 51, no. 6, pp. 548–555.
[5] Zerbe RL, Vinicor F, Robertson GL. (1979) Plasma vasopressin in uncontrolled diabetes mellitus. Diabetes;28:503–508.
[6] Spruce BA, McCulloch AJ, Burd J, Orskov H, Heaton A, Baylis PH, Alberti KG.(1985) The effect of vasopressin infusion on glucose metabolism in man. Clin Endocrinol;22:463– 468.

Keywords: Arginine vasopressin, copeptin, diabetes mellitus, metabolic syndrome

INHIBITORY POTENTIAL OF ENDEMIC CENTAUREA PAPHLAGONICA AND CENTAUREA CANKIRIENSE PLANT EXTRACTS OBTAINED BY USING DIFFERENT BRANCHES AGAINST ALPHA GLUCOSIDASE ENZYME

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ABSTRACT

Synthetic drugs are viewed with a negative eye, in the scientific field and in the community, because of their excessive side effects or for some reasons, such as drug resistance. Some diseases caused by synthetic drugs arise as a result of drug resistance, unconscious consumption, or a change in the genetic form of the disease. To solve this problem, especially in the process that has been going on since the 21st century, herbal-based natural compounds can help to mitigate the effects as a drug potential. Nowadays, type 2 diabetes can be prevented by the presence of natural inhibitors of α-glucosidase and α-amylase enzymes. This makes it possible to treat diabetes. (Mekonnen and Alemu Balcha, 2012; Telagari and Hullatti, 2015). In this study, the potential for aglycosidase enzyme inhibition of methanol/chloroform extracts obtained from different branches of C. cankiriense and C. paphlagonica plant was studied. The highest activity of the C. cankiriense plant was found to be IC50 of 474.76 µg/ml with the extrain of the flower part. On the other hand, the activity of the C. paphlagonica plant, with an IC50 range of 181.93-787.67 µg/ml, was shown to vary depending on the extraction method and to have the highest activity. The results are remarkably positive for the availability of flower extract from the C. paphlagonica plant as α-glucosidase enzyme inhibitor

Keywords: Centaurea paphlagonica, Centaurea cankiriense, Alpha-glucosidase, Enzyme activity

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A FIXED POINT RESULT FOR ALMOST-THETHA CONTRACTIONS ENDOWED WITH A GRAPH

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ABSTRACT

Within this study, our aim is to present a new fixed point theorem in metric spaces. To achieve this objective, we introduce a new contraction concept referred to as an 'almost type θ_G-contraction' within a metric space equipped with a graph. By applying this specialized contraction, we prove a fixed point theorem.

Keywords: Fixed point, Almost contraction, θ contraction

INVESTIGATION OF THE IMPACT ON XANTHINE OXIDASE ACTIVITY OF ACETONE-DISSOLVED DIGITALIS LAMARCKII IANINA (FOXGLOVE) EXTRACTS

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ABSTRACT

This study focuses on xanthine oxidase (XO), a key enzyme generating reactive oxygen species (ROS) in biological systems. XO plays a role in purine metabolism by converting hypoxanthin to xanthine and then to uric acid, with electron transfer to nicotinamide adenine dinucleotide (NAD+). Under specific stress conditions, XO transforms into an oxidant enzyme, potentially causing health issues such as kidney stones and gout when uric acid levels are high. Current medications for gout include uricosuric drugs promoting urea excretion and XO inhibitors decreasing uric acid synthesis. The primary objective of this research is to use plant extracts to block the xanthine oxide enzyme. Hypoxanthine is converted to xanthine by the xanthine oxide enzyme, and xanthine is then converted to uric acid, which is excreted by the kidneys. The study of this research is to investigate the ability of the plant extract Lamarck's Ianina in inhibiting the xanthine oxide enzyme by taking boiled extracts obtained from the root, stem, leaves and flowers of the plant Digitalis Lamarckii and dissolving them in acetone. The inhibitory effects of Digitalis lamarcke on xanthine oxide enzyme have been demonstrated. The results showed its effectiveness in 4 samples due to its ability to inhibit xanthine oxide. This means that the plant Digitalis lamarcke ianina has a very great ability to influence the enzyme xanthine oxide. There was a study between the chemical compounds present in the plant Lamarcke ianina and the enzyme xanthine oxide, and a chemical reaction occurred between them, such as Quercetin (MolDock score: -118.319) llh dadv, which indicates In the future, there will be new medicines to treat pathological conditions associated with increased xanthine oxide enzyme activity, such as gout and related infections, by inhibiting xanthine oxide enzyme activity.

Keywords: Xanthine oxidase, Acetone, Digitalis Lamarckii, Enzyme activity, Docking Studies

EFFECT OF PSSS CONCENTRATION ON $CaCO_3$-ZnO PARTICAL SIZE DISTRIBUTION

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ABSTRACT

Calcium carbonate is a material abundant in nature. Its main areas of use are the rubber industry, paint industry, paper industry and plastic industry. Zinc oxide is also used in similar areas. Improvements in material properties can be achieved by producing two materials together as a composite. Similar composites were produced in different studies and their properties and application areas were examined [1,2].
In this study, the effect of PSSS initial concentrations on the size distribution of crystals that spontaneously form $CaCO_3$-ZnO composite at low temperatures was examined. The sizes of the obtained crystals in SEM analyzes were measured and used to create size distributions. (This study was prepared from the student's master's thesis.)

Acknowledgement
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References:

[1] Shifu Chen Yunguang Yang, M.J., Liu, W. (2011). Preparation, characterisation and activity evaluation of CaCO3/ZnO photocatalyst. J Exp Nanosci 6: 324–36. https://doi.org/10.1080/17458080.2010.509873.
[2] Kumar, L.S., Shantha, V., Naik, C., Drakshayani, D.D.N., Kataraki, P.S., Janvekar, A.A., et al. (2020). Synthesis of calcite-zincite nano composite materials using sol-gel auto combustion method. IOP Conf Ser Mater Sci Eng 1003.

Keywords: Composite, $CaCO_3$, Calcium Carbonate, ZnO, Zinc oxide

EVALUATION OF THE EFFECT OF HYPOTHYROIDISM ON INFLAMMATORY CYTOKINES STIMULATION ASSOCIATED WITH OXIDATIVE STRESS IN IRAQI PATIENTS

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ABSTRACT

The current study aims to evaluate the relationship of hypothyroidism to the stimulation of inflammatory cytokines and oxidative stress and to study the role of levothyroxine as a treatment for hypothyroidism and its effect in alleviating these side effects by raising the levels of thyroid hormones to the normal level. The study groups were distributed into three groups, two groups for hypothyroidism patients and one for healthy people. The first group (G1) was for healthy people, the second group (G2) was for hypothyroidism patients with treatment of levothyroxine according to the doctor's instructions, and the third group (G3) was for hypothyroidism patients who were without treatment and those who are newly diagnosed with hypothyroidism. Samples were collected and biochemical factors in the group of patients receiving levothyroxine as therapeutic for hypothyroidism state. The results of the study showed increase significantly level of TSH in the patient groups compared to the control group (G1), but decreased values of T3 and T4 ($P<0.001$). a significant increase in body mass patient groups compared to control, as well as in the values of TC, TG, LDL, and VLDL concentrations but decrease in HDL level in patient groups compared to control ($P<0.001$). Increased level of oxidative markers Malondialdehyde (MDA), and Advanced oxidation protein products(AOPP) in patient groups (G2 and G3) compared to G1 ($P<0.001$), regarding the activity of antioxidant enzymes, it was found that there was a non-significant difference in the activity of superoxide dismutase between all groups but there is significantly increase the activity of catalase in patients groups compared to control ($P<0.001$). Increased levels of inflammatory markers, Tumor Necrosis Factor Alpha (TNF-α), and C-reactive protein(CRP) significantly in patient groups compared to the control group ($P<0.001$). When comparing between the two groups of patients, there are also significant differences in the results. TSH level significantly decreased in G2 compared to G3. T4, and T3 increased in G2 compared to G3 ($P<0.001$). Oxidative stress (MDA, AOPP) and inflammatory markers (TNF-α, CRP) significantly decreased in G2 compared to G3 ($P<0.001$). Regarding antioxidant enzyme activities, CAT activity decreased significantly ($P<0.001$) in G2 compared to G3 but there are no significant differences in SOD activity. The results show the extent of the positive effect of treatment, not only in enhancing thyroid hormone levels, but also in helping reduce the effect of oxidative stress and inflammation that may occur as side effects of the disease by reducing the levels of inflammatory cytokines, despite not reaching the ideal condition, as was seen in the results of the healthy group.

Keywords: Hypothyroidism, Triiodothyronine, Tetraiodothyronine, Thyroid-stimulating hormone, Antioxidant enzyme, Oxidative stress, Inflammatory cytokine

ECO-FRIENDLY APPROACH: DRIED LEMON PEEL AS AN ADSORBENT FOR METHYLENE BLUE IN AQUEOUS SOLUTIONS

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ABSTRACT

The effect of dyestuffs in increasing environmental pollution is quite high. Moreover, they pollute the planet's scarce potable water resources. Therefore, cleaning wastewater has strategic importance. There are also adsorbents among various methods to clean dyestuffs in wastewater. Adsorbents can be produced from various materials. Cost and environmental impacts need to be taken into consideration during the production of these adsorbents. In this study, the adsorption of methylene blue from lemon peels, which are considered as waste, without being subjected to any other process other than drying, was examined.

The results of this study show that dried lemon peels are insufficient for methylene blue adsorption. To obtain higher adsorption efficiency, pre-treatment of lemon peels is necessary. Additionally, the effects of initial concentration and amount of adsorbent on the adsorption capacity were determined and the effect of temperature on the adsorption capacity was examined. These findings show that adsorption of methylene blue from aqueous solutions with dried lemon peels is possible, but the removal efficiency is low. In this context, it is necessary to investigate and apply pre-treatment methods and different conditions to increase the adsorption capacity of lemon peels.

Keywords: Adsorption, Wastewater, Methylene Blue, Lemon peel, Adsorbent

DETERMINATION OF ERYTHROPOIETIN AND CYSTATINC AND SOME BIOCHEMICAL PARAMETERS IN PATIENTS WITH CHRONIC RENAL FAILURE

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ABSTRACT

This study has been designed to research in the role of anemia associated chronic kidney disease (CKD), and the vitamins D and C. The study has included 80 subjects with CKD, 40 male and 40 female of different stages of the disease and controlled with 40 un-diseased subjects of match ages. The results have shown a significant increase in the level of urea, creatinine, cystatin C, and ferritin in CKD patients compared to control. Additionally, the levels of erythropoietin, transferrin, hemoglobin, vitamin D, and vitamin C were reduced significantly in CKD patients compared to control. In CKD patients, cystatin C was correlated proportionally with creatinine and inversely with vitamin C. Also, vitamin C was correlated inversely with urea in CKD patients. Erythropoietin level has shown proportional correlation with ferritin and inverse correlation with hemoglobin in CKD patients. Furthermore, receiver operating characteristic (ROC) curve has indicated that cystatin C has very excellent sensitivity in the diagnosis of CKD. Vitamin D and vitamin C were shown excellent sensitivities in the diagnosis of CKD, while erythropoietin was shown fair sensitivity. In conclusion, anemia is frequently associated with CKD.

Keywords: Chronic renal failure, Cystatin C, Erythropoietin, Anemia, Vitamin D, Vitamin C

POMEGRANATE PEEL WASTE: A STUDY ON METHYLENE BLUE ADSORPTION IN WASTEWATER

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ABSTRACT

While overall, biosorbents offer an environmentally friendly, sustainable and cost-effective solution, appropriate biosorbent selection and temperature of process conditions are important to ensure maximum efficiency in certain applications. The type of biosorbent, preparation type and concentration, temperature and pH have an impact on the removal rate.

The results of this effect on the removal of dyes from pomegranate peel in wastewater were investigated. The aim of the study is to evaluate the processes of removing methylene blue from water using pomegranate peel. In the study, what are the characteristics of adsorption distributions of variables such as dyestuff temperature, adsorbent amount and temperature. The findings show that pomegranate peel can be used in the adsorption of methylene blue in water without any pretreatment under the examined conditions.

Keywords: Adsorption, Wastewater, Methylene Blue, Pomegranate peel, Adsorbent

EVALUATION OF PHYTOCHEMICAL PROFILE, ANTIMICROBIAL AND ANTIOXIDANT EFFICACY OF MACROLEPIOTA PROCERA EXTRACT VIA GREEN EXTRACTION TECHNIQUE

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ABSTRACT

Macrolepiota procera is a common parasol mushroom of classified under the family “Agaricaceae”. Recent reports indicate dynamic properties such as anti-inflammatory, antioxidant, immunomodulatory compounds, antiangiogenic, topoisomerases, and apoptosis inducers. In view of encompassing such versatile combinations, the innate properties of this mushroom can be leveraged for medicinal purposes. Concurrently, the prestigious title of the first investigation concerning the antimicrobial, antifungal, and antioxidant activities of Macrolepiota procera can be attributed to this study. Initially, cumulative antimicrobial and antifungal activities were measured through a well diffusion method. Subsequently, a DPPH scavenging assay was conducted to ascertain the antioxidant potential. Moreover, the presence of tannins, steroids, alkaloids, saponins, and flavonoids was confirmed by the phytochemical assays. Among the seven bacterial strains tested for antibacterial activity, P. aeruginosa exhibited higher levels of susceptibility with the inhibition zone, ranging from 13.90 mm ±0.85 to 21.17 mm ±0.20 mm, against 20 mg/ml to 100 mg/ml concentrations. Nevertheless, S. enterica showcased the least susceptibility with MIC, with values more than 250 µg/ml. Among the three fungal strains, the array of activities exhibited significant extremities, ranging from a maximum value of 16.31 mm ±0.27 to 20.33 mm ±0.20 against Fusarium brachygibbosum. Furthermore, this mushroom also displayed considerable free radicle scavenging activity with IC50 214 µg/ml. Thus, the overall results suggest the overwhelming presence of compelling inhibitory activity against P. aeruginosa, thereby enabling the practicality of this mushroom as a novel natural drug to treat bacterial and fungal diseases.

Keywords: Antimicrobial activity, antifungal activity, antioxidant activity, Pseudomonas aeruginosa, mushrooms

EXPLORING THE ADSORPTION EFFICIENCY OF DRIED BANANA PEEL AGAINST METHYLENE BLUE IN WATER

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ABSTRACT

Removal of methylene blue from wastewater using various adsorbents has been a subject of extensive research. As biosorbents, polyaniline/walnut shell waste composites[1], Urfa stone[2], chemically activated carbon from pomegranate peel [3], peach seed shell [4] and Chaff [5] was used in the removal of methylene blue.

In this study, the adsorption capacity of banana peel is examined by drying it without any pretreatment. Time, temperature, initial concentration of methylene blue and the amount of banana peel were used as parameters in the study. Adsorbent capacities were calculated through experiments performed by changing the parameters and the trends caused by the changes were found.

References:

[1] Cerit, A. (2021). Atık Sulardan Metilen Mavisi Gideriminde Polianilin/Ceviz Kabuğu Atığı Kompozitlerinin Kullanımı. Gazi Üniversitesi Mühendislik-Mimarlık Fakültesi Derg. https://doi.org/10.17341/gazimmfd.845443.
[2] Dilekoğlu, M.F. (2018). Harran Ovasi Tarim Arazileri Etrafinda Bulunan Urfa Taşi'nin Metilen Mavisi Boyar Maddesini Adsorpsiyonu. Türkiye Tarımsal Araştırmalar Derg. https://doi.org/10.19159/tutad.333988.
[3] Yılmaz, N., Alagöz, O. (2019). Nar Kabuklarından Kimyasal Aktivasyon Ile Hazırlanan Aktif Karbon Üzerinde Metilen Mavisinin Adsorpsiyonu. El-Cezeri Fen Ve Mühendislik Derg. https://doi.org/10.31202/ecjse.583102.
[4] Polat, İ., Orhan, R. (2019). Şeftali Çekirdeği Kabuğu Kullanarak Metilen Mavisi Boyasının Giderilmesi İçin Sabit Yataklı Kolonun Adsorpsiyon Performansı. Afyon Kocatepe Univ J Sci Eng 2019. https://doi.org/10.35414/akufemubid.605325.
[5] Han, R., Wang, Y., Han, P., Shi, J., Yang, J.W., Lu, Y. (2006). Removal of Methylene Blue From Aqueous Solution by Chaff in Batch Mode. J Hazard Mater. https://doi.org/10.1016/j.jhazmat.2006.02.029.

Keywords: Adsorption, Wastewater, Methylene Blue, Banana peel, Biosorbent

INVESTIGATION OF THE EFFECTS OF SOME CHOLESTEROL DERIVATIVES COMPOUNDS AGAINST PANCREATIC CHOLESTEROL ESTERASE ENZYME USING MOLECULAR DOCKING

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ABSTRACT

High blood cholesterol levels are a major problem for blood vessels. High levels cause cardiovascular problems, which are among the leading causes of death in our country. Pancreatic cholesterol esterase plays an important role in the hydrolysis and absorption of dietary cholesterol from the small intestine. This enzyme is considered a therapeutic target to reduce the amount of dietary cholesterol. In this study, the affinities of some cholesterol-derived compounds towards pancreatic cholesterol enzyme were investigated using in silico methods. Beta-Sitosterol and Stigmastanol were observed to have affinity towards the enzyme with MolDock Scores of -122.204 and -121.696. How the molecules could interact with the active site of the enzyme at the molecular level was analyzed.

Keywords: Pancreatic cholesterol esterase, cholesterol-derived compounds

IN SILICO DETERMINATION OF THE AFFINITY OF SOME LACTONES AGAINST MITOCHONDRIAL ClpP

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ABSTRACT

ClpP is a serine protease found in the mitochondrial matrix, and it is unique in that it is found only in mitochondria. By digesting misfolded or damaged proteins, this protease contributes to mitochondrial protein quality control and the maintenance of normal metabolic activity. ClpXP is a multimeric complex composed of ClpX, an ATP-dependent unfoldase, and ClpP, a ring of heptamers that is both stable and active as a peptidase. ClpXP is overexpressed In both blood cancers and solid tumours, and it seems to be essential for the survival of a subset of cancers. In moreover, blocking or overactivating Cancer cells treated with ClpXP exhibit diminished respiratory chain activity and eventually die. As a result, mitochondrial ClpXP targeting may represent a promising new approach to cancer therapy. In this study, the affinities of some cholesterol-derived compounds towards ClpXP were investigated using in silico methods. 5alpha-Campestan-3-one and 6-Oxocampestanol were observed to have affinity towards the enzyme with MolDock Scores of -101.116 and -98.3876, respectively. Predicted interactions of molecules at the active site at the molecular level are presented.

Keywords: MitochondriaL ClpP, 7-diethylamino coumarin thiasole, 5alpha-Campestan-3-one, 6-Oxocampestanol

THE PERFORMANCE OF WASTE BANANA PEELS IN THE REMOVAL OF CONGO RED IN WASTEWATER

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ABSTRACT

Various studies demonstrate the potential of banana peels as a biodegradable and low-cost biosorbent. Banana peels have a multilayered porous structure, which increases the chance of success in its use as an adsorbent. When the literature is examined, it can be seen that banana peels are used to remove lead (II), mercury and also various pollutants from water. In this study, the adsorption of Congo Red dye in wastewater with banana peel was investigated. The aim of the study is to examine the effects of variables such as time, initial dye concentration, adsorbent amount and temperature on adsorption during the removal of Congo Red from water with banana peel.

Keywords: Wastewater, Adsorption, Congo Red, Banana peel, Adsorbent

SALVIANOLIC ACID DERIVATIVES AS INHIBITORS OF SARS-COV NSP12 POLYMERASE

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ABSTRACT

The coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) uses an RNA-dependent RNA polymerase (RdRp) for the replication of its genome and the transcription of its genes [1]. RNA dependent RNA polymerase (RdRp) is an important enzyme for the virus that mediates replication of the viral RNA. Inhibition of RdRp could inhibit viral RNA replication and thus new virus particle production. [2]. In this study, the binding potential of some salvianolic acid derivatives to the active site of this enzyme was tried to be determined using the docking program, which is a molecular modeling technique. For the study, the crystal structure of the enzyme coded 5HEX was downloaded from the protein database. Salvianolic acid derivatives were taken from the Pubchem database web page. Ten trials were performed for each molecule. According to the docking results, it was determined that Salvianolic acid C and Salvianolic acid I had better binding potential to the active site of the enzyme, with MolDock Scores of -180.673 and -167.802, respectively. It is estimated that hydrogen bonds are very effective in binding molecules to the active site.

References:

[1] Hilgenfeld, R., & Peiris, M. (2013). From SARS to MERS: 10 years of research on highly pathogenic human coronaviruses. Antiviral research, 100(1), 286-295.

[2] Begum, F., Srivastava, A. K., & Ray, U. (2021). Repurposing nonnucleoside antivirals against SARS-CoV2 NSP12 (RNA dependent RNA polymerase): In silico-molecular insight. Biochemical and Biophysical Research Communications, 571, 26-31.

Keywords: SARS-CoV-2, NSP12 polymerase, Salvianolic acid derivatives

BANANA PEEL AS AN ADSORBENT FOR BRILLIANT BLACK REMOVAL IN AQUEOUS SOLUTIONS

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ABSTRACT

Banana peels have been utilized as a potential adsorbent for the removal of various pollutants from aqueous solutions. In the literature, the effectiveness of banana peel-based adsorbents in removing cyanide, selected metals, dyes, Fe (II) ions, cadmium, lead (II), brilliant green, and congo red from wastewater has been demonstrated [1-5]. This study aims to investigate the adsorption capacity of the adsorbent obtained by merely drying the banana peel without any pretreatment, in the removal of Brilliant Black dye from wastewaters. The effects of variables such as time, initial dye concentration, amount of adsorbent, and temperature on the adsorption of Brilliant Black with banana peel from wastewater have been examined.

References:

[1] I. Arunakumara KK, Walpola BC, Yoon M-H. Banana Peel: A Green Solution for Metal Removal From Contaminated Waters. Korean J Environ Agric 2013. https://doi.org/10.5338/kjea.2013.32.2.108.

[2] Deshmukh PD, Khadse GK, Shinde VM, Labhasetwar P. Cadmium Removal From Aqueous Solutions Using Dried Banana Peels as an Adsorbent: Kinetics and Equilibrium Modeling. J Bioremediation \& Biodegrad 2017. https://doi.org/10.4172/2155-6199.1000395.

[3] Abdelaziz MA, Taha M, .Gahly MS, Hefnawy HT. Removal Of Fe+3 And Pb+2 Ions From Aqueous Solutions By Adsorption Using Banana Peels. Zagazig J Agric Res 2022. https://doi.org/10.21608/zjar.2022.278248.

[4] Singh SK, Gupta H, Dhiman S, Sahu NK. Decontamination of Cationic Dye Brilliant Green From the Aqueous Media. Appl Water Sci 2022. https://doi.org/10.1007/s13201-022-01596-5.

[5] Mondal NK, Kar S. Potentiality of Banana Peel for Removal of Congo Red Dye From Aqueous Solution: Isotherm, Kinetics and Thermodynamics Studies. Appl Water Sci 2018. https://doi.org/10.1007/s13201-018-0811-x.

Keywords: Wastewater, Adsorption, Congo Red, Banana peel, Adsorbent

THE INVESTIGATION OF THE INHIBITORY POTENTIALS OF SOME 7-DIETHYLAMINOCOUMARINTHIAZOLE DRAVATIVES FOR HUMAN LACTATE DEHYDROGENASE A

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ABSTRACT

Human lactate dehydrogenase (hLDH)5 plays a pivotal part in the support of glycolysis and is overexpressed in several human tumors such as such as non-Hodgkin lymphoma, colorectal cancer, melanoma, pancreatic cancer, lung cancer, prostate cancer, gastric cancer and endometrial cancer, and thus could be a potential anticancer drug target. In this study, the affinity of some 7-diethylamino coumarin thiasole derivatives towards this enzyme was tried to be predicted using the Molegro Virtual Docker program. The structures of the molecules were drawn in ChemDraw and optimized in MarvinSketch. (E)-7-(diethylamino)-3-(2-((4-(diethylamino)-2-hydroxybenzylidene)amino)thiazol-4-yl)-2H-chromen-2-one and (E)-7-(diethylamino)-3-(2-((2-hydroxy-3-methoxybenzylidene)amino)thiazol-4-yl)-2H-chromen-2-one were observed to have affinity towards the enzyme with MolDock Scores of -177.401 an -172.338, respectively.How the molecules could interact with the active site of the enzyme at the molecular level was analyzed.

Keywords: Human lactate dehydrogenase (hLDH)5, 7-diethylamino coumarin thiasole

EFFECT OF PAINT COMPOSITION ON THE PROPERTIES OF BLACK AUTOMOTIVE GLASS ENAMEL

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ABSTRACT

The main processes used in the production of automobile glasses are lamination, tempering, sag bending, and press bending. Laminated glasses can be produced by sag bending or press bending [1]. Windshield glasses produced by sag bending process should ensure low tempering temperature, high chemical and physical properties and low UV transmittence means high optical density [2]. Automotive glass enamels [3] that ensures those specifications include 3 main components; high opacity low melting bismuth base frit [4], $CuCr_2O_4$ black spinel pigment, and an organic medium [5].

The composition of the enamel as well as process factors such as frit production method, frit grinding types, frit particle size distribution, pigment particle size, media contents and final process steps also affect the final glass enamel paint properties.

Present study, the effect of the composition of glass enamel paint on physical properties such as color, gloss, optical density and chemical resistance was investigated. The structure, surface and physical properties of the automotive glass enamel applied on the substrate by silk screen printing [6] method were characterized by using various techniques such as XRF, XRD, SEM, PSD, BET, colour colorimetry.

References:

[1] Tu,Lele.,Wang,Hui.,Liu,Xianping.,Guan,Jinliang.,Caı,Feng.,(2023).Windshield for Vehicle and Method for Manufacturing the Same, US20230211587A1, 1-15
[2] Sakoshe,George,E.,Maloney,John,J.,Gleason,Cody.,Sridharan,Srinivas-an.(2017).Modified Black Spinel Pigments for Glass and Ceramic Enamel Applications, International Application Published Under The Patent Cooperation Treaty, WO2017127788A1, 3-7.
[3] Sing,Sandeep,K.,Sakoshe,George,E.,Klimas,David,A.,(2013).Glass Enamel for Automotive Applications, WO2013/126369A1,1-6
[4] Prunchak,Robert.,Sgriccia,Matthew.,(2008).Frits and Obscuration Enamels for Automotive Applications, WO2008/130747A1,1-8
[5] Hung-Wen,Lin.,Chang-Pin,Chang.,Wen-Hwa, Hwu., Ming-Der,Ger.(2008).The Rheological Behaviors of Screen-Printing Pastes, Journal of Materials Processing Technology 197, 284-291
[6] Sauer, M.,Meilchen,S.,Kalleder,A.,Mennig,M.,Schmidt,H.,(2004). Sol-gel Technologies for Glass Producers and Users, Silk Screen Printing,117-120

Keywords: Automotive, sag bending, lamination, black enamel, glass-ceramics

CAFFEIC ACID DERIVATIVES (CAFDS) AS INHIBITORS OF HEXOKINASE 2

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ABSTRACT

Stimulated glucose metabolism is a habitual characteristic of cancer cells. Hexokinase 2 (HK2) as the rate-limiting enzyme catalyzes the first step of glucose metabolism [1-2]. It is overexpressed in most of the human cancers and has been a favorable target for cancer therapy. In this study, the binding potential of some caffeic acid derivatives to the active site of this enzyme was tried to be determined using the docking program, which is a molecular modeling technique. For the study, the crystal structure of the enzyme coded 5HEX was downloaded from the protein database. Caffeic acid derivatives were taken from the Pubchem database web page. 5 trials were performed for each molecule. According to the docking results, it was determined that Chicoric acid and Cynarin had better binding potential to the active site of the enzyme, with MolDock Scores of -138.107 and -136.684, respectively. It is estimated that hydrogen bonds are very effective in binding molecules to the active site.

References:

[1] Wilson, J. E. (2003). Isozymes of mammalian hexokinase: structure, subcellular localization and metabolic function. Journal of Experimental Biology, 206(12), 2049-2057.

[2] Moro, L. (2019). Mitochondrial dysfunction in aging and cancer. Journal of clinical medicine, 8(11), 1983. [

Keywords: Hexokinase 2, Caffeic acid derivatives, Docking

CHANGES IN ZONGULDAK ECOSYSTEM: NDVI AND LST ANALYSIS

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ABSTRACT

In this study, Normalized Difference Vegetation Index (NDVI) and Land Surface Temperature (LST) analyses were carried out in Zonguldak region. While NDVI indicates the density of vegetation cover, LST indicates changes in surface temperature. These analyses play an important role in various fields such as agricultural productivity, water resources management and environmental changes. NDVI and LST analyses of Zonguldak were carried out with MODIS data obtained using remote sensing methods. Vegetation and temperature changes of the region were analyzed between 2016-2020. It was observed that NDVI and LST values increased especially in the summer season. The results obtained helped us to understand the vegetation dynamics, seasonal changes and climatic effects in the region. These analyses provide important data to decision makers on issues such as agricultural planning, water resources management and environmental sustainability. In conclusion, NDVI and LST analyses in the Zonguldak region provide a comprehensive overview of the ecological balance, vegetation and climate changes in the region. These analyses are of strategic importance for the protection of the region's natural resources and a sustainable environment.

Keywords: Normalized Difference Vegetation Index, Land Surface Temperature, MODIS

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