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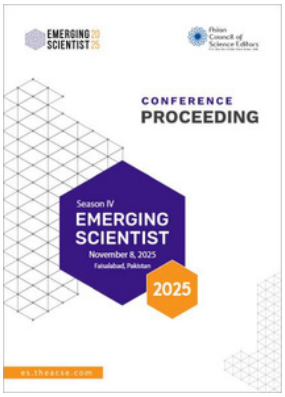
01 Conference Track

- **Social Sciences & Humanities**

Session Moderator:

Dr. Jeanne Alejo-Abitago
Guest Lecturer, University of Mindanao
Davao, Philippines

EMERGING SCIENTIST 2025



PROCEEDING
ES2025

Technology-Driven Supply Chain Management in the Post-Pandemic Era

Md. Mamun Habib
Independent University, Dhaka, Bangladesh

Presenter
Prof. Dr.Md. Mamun Habib

Type
Oral Presentation

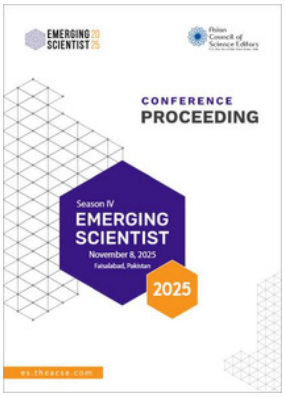
Track
Social Sciences and Humanities

Abstract

This keynote speech will demonstrate the theory and evolution of Supply Chain Management (SCM), highlighting the latest innovations in research, as well as providing a chronological perspective of SCM within different areas of manufacturing and service industries. The objective of SCM is to incorporate activities across and within organizations to provide value to customers and stakeholders. There are several attempts made by researchers and practitioners to appropriately define SCM. Amidst fierce competition in all industries, SCM has gradually been embraced as a proven managerial approach to achieving sustainable profits and growth. This keynote would illustrate SCM from the raw materials to finished products, i.e., suppliers to consumers in various industries. Due to the application of technological advancements, including AI, Automation, Blockchain, big data, etc., this keynote speech demonstrates technology-enabled SCM, resilient, transparent SCM for various industries, including manufacturing and service industries. Though earlier supplier and customer relationships were based on paper-based systems, in the post-pandemic era, the necessity of technology reflects the seamless coordination among all stakeholders of the supply chain, particularly suppliers, manufacturers, distributors, retailers, inventory, and transportation. This technology-driven supply chain adds value to the transparency among all stakeholders. In addition, multiple suppliers or diversifying suppliers are another lesson from the pandemic.

Keywords

Supply Chain, Technology, Post-Pandemic, Manufacturing, Service



Personality Traits, Impulsivity and Vaping in University Students

Arooba Ehsan, Muzamil Abdullah and Shahnila Tariq
Department of Applied Psychology, School of Professional Psychology, University of Management and Technology, Lahore, Pakistan

Presenter
ShahnilaTariq

Type
Oral Presentation

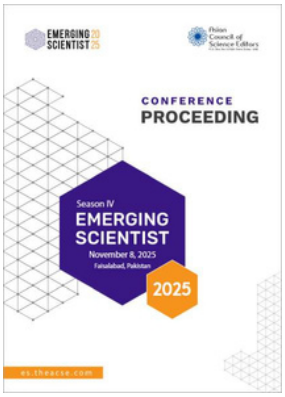
Track
Social Sciences and Humanities

Abstract

It is generally observed that nowadays cigarette smoking has been reformed and is replaced by electronic device called vape. This devise is easy to carry and use, therefore people prefer to use it instead of conventional cigarette. This change is observed in university students too. The students use vape due to their specific personality trait, or impulsive behavior? To explore this relationship, the current study aimed to explore the correlation between personality traits, impulsivity and vaping in university students. It was hypothesized that there will be a relationship between personality traits, impulsivity and vaping in university students. It was also hypothesized that personality traits and impulsivity will likely to predict vaping in university students. Correlational research design and purposive sampling technique was used to collect data from 150 university students, including both genders, who use vape. Big Five Inventory-10 (BFI-10), UPPS-P Impulsive Behavior and Vaping (HONC) scales were used as assessment measures. Descriptive statistics were used for demographic findings and inferential statistics was used to analyze data. Reliability analysis, correlation and linear regression analyses were performed to determine the association between personality traits, impulsivity and vaping in university students. The findings showed relationship and predictability between and of the study variables. The findings highlighted the importance of personality and impulsivity in understanding health-risk behaviors and provide insights for designing preventive interventions targeting university population.

Keywords

Personality, Impulsivity, Vaping, University Students



A Corpus-Based Study of Impression of Acupuncture

Masatoshi Shoji
Shokei Gakuin University, Natori, Japan

Presenter
Masatoshi Shoji

Type
Oral Presentation

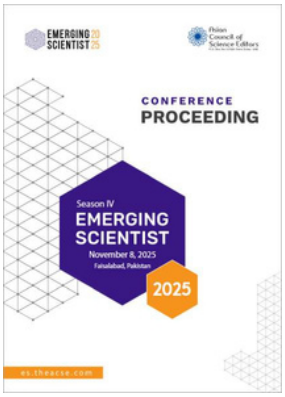
Track
Social Sciences and Humanities

Abstract

Acupuncture has been used as a tool of treatment and as a part of Traditional Chinese Medicine for many years. In Japan, acupuncture was widely practiced until the Meiji Restoration. To align with Western countries, the Japanese government adopted Western medicine as the standard practice. Additionally, after WWII, the Supreme Commander for the Allied Powers issued a directive to prohibit the use of acupuncture. Although the directive was not effectively enforced, only about 5% of the Japanese population has experienced acupuncture today. Conventional Western medicine has certain limitations, despite its effectiveness in many areas. As a result, integrative medicine, previously referred to as alternative or complementary medicine, has become increasingly utilized. Acupuncture is regarded as one of the integrative medical practices and has been applied in specific cases worldwide, supported by a growing body of clinical research. In Japan, where Western medicine also faces limitations, acupuncture is sometimes employed to assist patients in particular conditions. Recent research has sought to increase the proportion of the population receiving acupuncture treatment. However, identifying the underlying reasons for its limited use remains challenging, as many studies have relied on questionnaires administered to the general public by acupuncturists. This indicates the need for alternative approaches to better understand why acupuncture has not achieved broader acceptance. A Corpus Linguistics approach can be employed to investigate public perceptions of acupuncture by analyzing English and Japanese literature. Such an approach may reveal impressions and attitudes toward acupuncture that are not easily captured through surveys, thereby providing insights for strategies to enhance its utilization rate. The working hypothesis is that corpus-based research can uncover more fundamental causes of acupuncture avoidance compared with questionnaire- based methods.

Keywords

Corpus, Acupuncture, Impression



English Language Teaching within the Framework of Sustainable Development Goal 4 Quality Education: A Scopus-based Bibliometric Review (2015-2025)

Abdul Syahid
Universitas Islam Negeri, Palangka Raya, Indonesia

Presenter
Abdul Syahid

Type
Oral Presentation

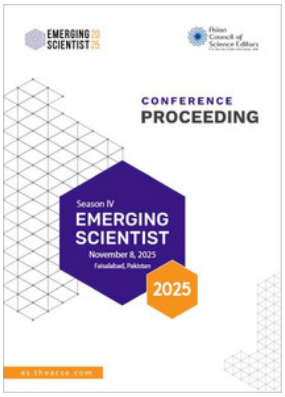
Track
Social Sciences and Humanities

Abstract

To understand how research into English language teaching (ELT) aligns with the Sustainable Development Goal (SDG) 4 Quality Education, this bibliometric review maps research trends and identifies key themes of ELT within the framework of SDG 4. On August 6, 2025, the Elsevier 2025 SDG 4 and ELT-related queries were combined in Scopus to find relevant English-language articles, conference papers, books, and book chapters from 2015 to 2025. Metadata such as keywords were cleaned using OpenRefine to minimize indexing inconsistency and to remove duplicate or incomplete records. Through Bibliometrix, a corpus of 6,129 documents was presented and synthesized using descriptive analysis and network analysis. The study shows steady growth and moderate average citations per document. About 80% of publications were journal articles, with active author collaboration and a notable proportion of international co-authorship. The conceptual structure shows four thematic clusters, including "reading comprehension" and "English language learners". The historiography of intellectual structure reveals that ELT directly contributes to SDG 4 by focusing on building foundational literacy skills, fostering global citizenship and intercultural understanding, and leveraging technology to enhance learning opportunities. In terms of country collaboration, the social structure is organized into a cohesive Asia-Pacific network led by China and a Western-focused network led by the USA and the United Kingdom. Despite its reliance on Scopus and potential indexing inconsistencies, this study can reveal the publication and citation patterns as well as the knowledge structure of ELT and SDG 4. The evidence informs policies and practices to advance quality and equitable education.

Keywords

Education for Sustainable Development, English as a Second Language, English as a Foreign Language, Sustainable Teaching and Learning, Educational Quality



The Future of AI in Transforming Public Discourse on Social Media Platforms

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Presenter
Ghias Akram

Type
Oral Presentation

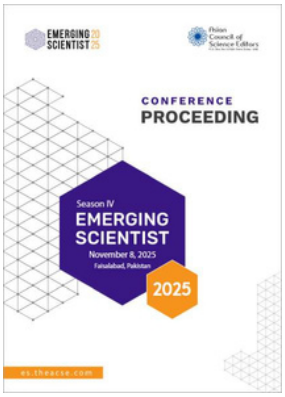
Track
Social Sciences and Humanities

Abstract

Artificial intelligence has advanced in modern times, compelling social media users to develop unique digital methods for connecting with their social network audience. Artificial intelligence systems of today require evaluation based on how they affect both delivery frameworks and public service moderation installations. All social media platforms among nations implemented AI systems to manage content operations, and this development became essential for executing public dialogue systems. The combination of progressive information-sharing techniques, which unite powerful NLP models with contemporary moderation systems and emotion analysis mathematical algorithms, results in elevated content connectivity. Better hazardous material detection becomes possible through new technologies because they integrate advanced interaction protocols to customize user experiences. The integration of an AI tracks moderation system content through its monitoring devices for deep fake detection in real-time and predictive analytics of digital communication modifications. Academic research on technology evaluation emphasizes the analysis of two fundamental aspects that unite public expression protections with algorithm-based choices, along with their resulting legal framework. AI technology delivers productive outcomes, but also has adverse effects, when comprehensive examination processes are implemented for public communication systems. The automatic system operates through specially designed programs that allow any community group to control operations. Civil organizations and social media platforms must construct equal principles that will support the sustained progress of AI technology. The scientific community devotes its efforts to creating improved strategic guidelines for creating egalitarian digital tools of public communication over the upcoming decade.

Keywords

Artificial Intelligence, Social Media Platforms, Public Discourse, Digital Discourse, Digital Public Space



Machine Learning Analysis of Global GDP Per Capital Drivers Data Using tidymodels in R

Hin Lyhour
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Presenter
Hin Lyhour

Type
Oral Presentation

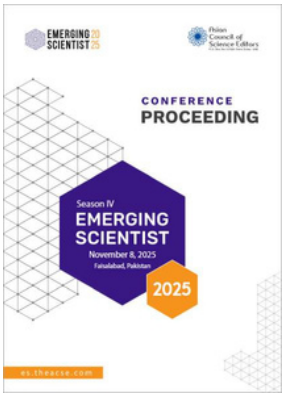
Track
Social Sciences and Humanities

Abstract

Machine learning is a powerful analytical tool widely adopted by analysts, researchers, and business professionals to solve problems, make predictions, and automate tasks. It can be used to address large datasets rapidly through code-based programs such as Python and R. Therefore, the aim of this study was to apply machine learning to determine the drivers of gross domestic product (GDP) per capita. Global data were retrieved from the World Bank open source using the WDI package in R. The extracted data comprised 10 variables spanning from 2010 to 2024, encompassing economic structure and performance, human capital and social development, as well as technology and sustainability. The multiple linear regression was performed using the tidymodels package in R. GDP per capita (USD) was treated as a dependent variable, while the predictors were agriculture share (%), GDP growth (%), gross capital formation (%), education spending (%), life expectancy (year), literacy rate (%), human capital index (HCI), renewable energy consumption (%), and internet usage (%). The data were cleaned and checked for the variance inflation factor (VIF) using the car package to detect multicollinearity before analysis. Due to high VIF (> 5), literacy rate and gross capital formation were removed. The final dataset contained eight variables and 109 samples, which were then split into training data (80%) and testing data (20%). The findings indicate that all the predictors, except for the agriculture share, positively affected GDP per capita. Investment in education, internet usage, and renewable energy contributes to increasing GDP per capita. Higher HCI and GDP growth are associated with increasing GDP per capita. If GDP grows by 1%, GDP per capita increases by 456 USD. Likewise, a 1% increase in educational spending results in 1,014 USD of GDP per capita, and a 1% increase in HDI results in 50,782 USD. It can be concluded that using machine learning is a quick, effective, and replicable approach that yields a reliable result. Therefore, machine learning is recommended for future data analytics, especially in combination with freely available online data sources.

Keywords

GDP per capita, Machine Learning, Multiple Linear Regression, R, Tidymodels, World Bank Data



Exploring Mental Health Challenges Encountered by Educators in the South Asian Countries- A Netnographic Study

[1] Anjum Bano Kazimi [2] Munir Moosa and [3] Mevlut AYDOGMUS

[1] Faculty of Education and Social Sciences, Iqra University, Pakistan
[2] Department of Education, SMI University, Pakistan
[3] Department of Curriculum and Instruction, Faculty of Education, Necmettin Erbakan University, Ahmet Keleşoğlu, Turkey

Presenter
Anjum Bano Kazimi

Type
Oral Presentation

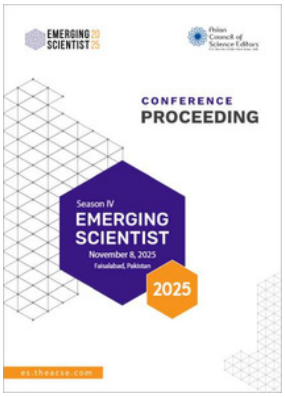
Track
Social Sciences and Humanities

Abstract

Mental health challenges are a growing concern across academia, significantly impacting teachers' well-being and, ultimately, the quality of education provided to students. This study aims to understand mental health challenges encountered by teachers in their workplace. The research design employs a phenomenological approach. Participants include seven hundred school teachers, selected via convenience sampling from seven South Asian countries through a virtual global teaching platform. Data was gathered through online interviews, transcribed, and analyzed through narrative analysis. Despite a diversity of contexts worldwide, the findings confirm that the challenges faced by teachers in all seven developing countries share commonalities: burnout, lack of communication and exploitation, and professional jealousy. The barriers to discussing mental health issues include a culture that discourages sharing, a lack of awareness, and the unavailability of mental health services in the workplace. To cope, teachers often rely on sharing their feelings with friends and family, practicing meditation, engaging in recreational activities, improving communication, and participating in community engagement. It is recommended to introduce mental health policies in the workplace, parallel with empowering teachers to enhance their well-being through self-empowerment courses and counseling. Further, there is a dire need to establish a mental health services unit for teachers.

Keywords

Mental Health, Well-Being, Wellness, Personal Identity, Teaching Identity, South Asia



Cultural Identity Crisis Among Urban Youth: The Impact of Western Media and Traditional Family Expectations

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[1]Social Welfare & Bait-ul-Maal, Sargodha, Pakistan
[2,3]Department of Sociology & Criminology, University of Sargodha, Pakistan

Presenter
Zaryab Fatima

Type
Oral Presentation

Track
Social Sciences and Humanities

Abstract

The study explored the cultural identity crisis among urban youth, focusing on the impact of Western media and traditional family expectations. The research aimed to understand how exposure to Western media influences the cultural identity of young people in urban areas, particularly in balancing traditional family values with modern, globalized perspectives. The study adopted a qualitative methodology, utilizing in-depth interviews with 30 urban youth aged 18-25 from Sargodha, Islamabad & Lahore. A purposive sampling technique was employed to ensure participants who experienced tension between traditional and modern influences were included. The research design centered on thematic analysis, where interview data were analyzed to identify recurring patterns and themes. The findings revealed that the majority of participants experienced significant conflict between adhering to traditional family expectations and embracing the individualistic and liberal values promoted by Western media. This conflict often led to a sense of confusion and uncertainty regarding their cultural identity. The study concluded that the cultural identity crisis among urban youth is a complex phenomenon, deeply rooted in the interplay between traditional and modern influences. It was recommended that interventions such as cultural education programs and counseling services be introduced to help young people navigate these conflicts. Additionally, the study suggested that families adopt a more open-minded approach, allowing youth to integrate both traditional and modern values, thereby fostering a more cohesive cultural identity

Keywords

Cultural Identity Crisis, Urban Youth, Western Media, Traditional Family Expectations, Cultural Conflict

02 Conference Track

• Agricultural & Biological Sciences

Session Moderator:

Aisha Abdullahi Mahmud
Assistant Lecturer, FederalUniversity
Dutsin-Ma, Katsina State, Nigeria

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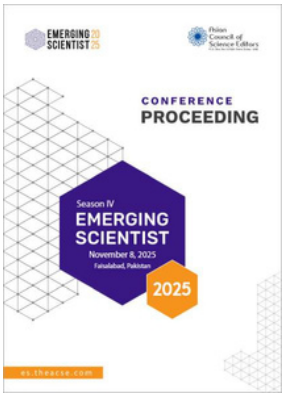


Biofuel Production from Algae: A Renewable and Sustainable Energy Solution

SeherDirican
Department of Biology, Faculty of Science, Sivas Cumhuriyet University, Sivas, Turkey

Presenter
SeherDirican

Type
Oral Presentation

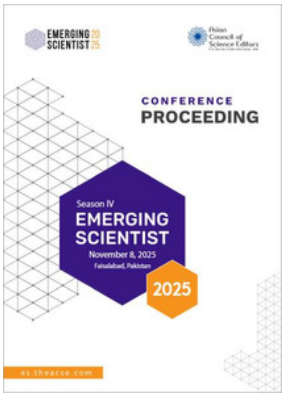
Track
Agricultural & Biological Sciences

Abstract

Algae offer numerous aquacultural, public health, and industrial benefits. In recent years, the production and use of biofuels from algae has increased significantly in developing countries. Furthermore, biofuel production from algae is attracting significant interest and has the potential to replace fossil fuels. This study focuses on biofuel production from algae. Biofuels are a significant alternative to existing petroleum-based fuels due to their compatibility with current engine technologies. Biofuel production is crucial for renewable energy solutions. Biofuel production from algae is economical and easy. Algae are autotrophic organisms, encompassing a wide range of organisms, ranging from unicellular to multicellular. Containing a large amount of protein, carbohydrates, and fat in their bodies, algae offer many advantages as a biofuel source. Compared to terrestrial biomass, algae have the capacity to produce much greater biomass and more biofuel per hectare. Because algae use carbon dioxide as a carbon source, they reduce carbon dioxide emissions. Producing biofuel from algae, a renewable energy source, minimizes the associated environmental impacts. While many factors influence the production of biofuel from algae, algae cultivation is particularly important. Considering the depletion of resources, along with negative factors such as fossil fuels, global warming, climate change, and environmental pollution, algae, as a renewable energy source, will become even more important in the coming years. In other words, biofuel production from algae will become even more important as a renewable energy source. In this context, further research is needed on utilizing algae as a raw material source for biofuel production. Identifying new algae species with high oil content and growth rates and using them for biofuel production would be a fully renewable, sustainable, and environmentally friendly energy solution.

Keywords

Algae, Biofuel, Energy, Renewable, Sustainable



Antioxidant and Antimicrobial Activities of Phenolic Compounds Extracted fromTecomella Undulata (Sm.) Seem. Plant Parts and Callus Culture

Sharad Vats and Nikkee Bhandari
Department of Bioscience and Biotechnology, Banasthali Vidyapith, Rajasthan, India

Presenter
Sharad Vats

Type
Oral Presentation

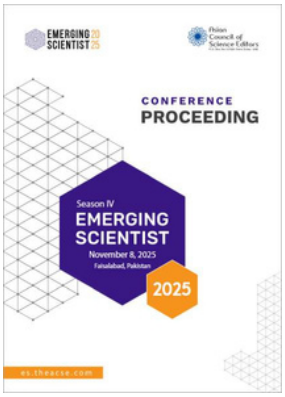
Track
Agricultural & Biological Sciences

Abstract

Tecomella undulata (Sm.) Seem is commonly called Rohida and desert teak in India. Traditionally, the plant has been used to treat leucorrhoea, fever, cough, digestive disorders, skin infection, sexual disorders, and pain. In the present study methanolic extract of plant parts and callus culture were evaluated for their antioxidant potential and antimicrobial activity against Pseudomonas aeruginosa. Comparing the plant parts and callus culture, maximum total phenolic content (4.76 0.21 mg GAE g^{-1} DW) and total flavonoid content (2.780.16 mg QE g^{-1} DW) were observed in in vitro culture grown on MS medium supplemented with BAP (1.0 mg L^{-1}) + IAA (4.0 mg L^{-1}), followed by stem bark (3.700.17 mg GAE g^{-1} DW). The test samples (plant parts and callus culture) demonstrated a protective effect against DNA damage and substantial in vitro antioxidant potential, as determined using the 2,2-diphenyl-1-picrylhydrazyl radical scavenging assay, nitric oxide scavenging assay, deoxyribose degradation assay, and ferric Reducing Antioxidant Power assay. Similarly, all the test samples exhibited potential antibacterial activity against P. aeruginosa with MIC 60 µg mL^{-1} (stem bark) and 80 µg mL^{-1} (callus culture). At sub-MIC levels, significant anti-quorum-sensing and anti-biofilm activity was observed against Pseudomonas aeruginosa. HPLC analysis showed the highest concentration of naringin (30.17 mg g^{-1} extract) in flowers, whereas vanillic acid (46.32 mg g^{-1} extract) and salicylic acid (73.2 mg g^{-1} extract) were predominant in stem bark. The callus culture resulted in the highest accumulation of p-hydroxybenzoic acid (131.9 mg g^{-1} extract). The results project T. undulata as a potential antioxidant and antimicrobial agent, which supports its use as a traditional medicament. Being an endangered plant, its callus culture provides an alternative for the production of bioactive compounds, which can be seen as a conservation strategy.

Keywords

Phenolic compounds, Callus culture, *Tecomella undulata, Pseudomonas aeruginosa*



AMP-CapsNet: Antimicrobial Peptide Prediction Using Hybrid Deep Capsule Networks

Ali Ghulam
Information Technolgy Centre, Sindh Agriculture University, Sindh, Pakistan

Presenter
Ali Ghulam

Type
Oral Presentation

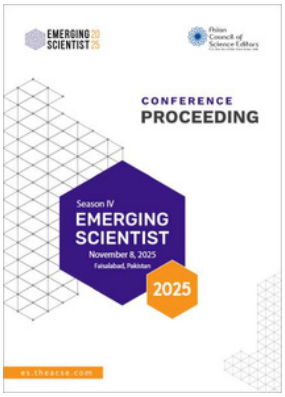
Track
Agricultural & Biological Sciences

Abstract

Antimicrobial peptides (AMPs) are universally found in both intracellular and extracellular settings, and their role in combating antibiotic-resistant bacteria is becoming increasingly significant. In medical laboratories, AMPs have shown notable anti-bacterial effectiveness in treating diabetic foot infections and related issues. New medication development frequently targets AMPs, which are considered ensuing components of the adaptive immune system. The findings of this research employ deep learning to identify antibiotic activity. Numerous computational methods have been established to detect antimicrobial peptides via deep learning algorithms. A deep learning approach called antimicrobial peptides Capsule Neural Network (AMP-CapsNet) was introduced to precisely forecast AMPs and evaluated against other deep learning and baseline models. AMP-CapsNet uses antimicrobial peptide capsule networks, a type of next-generation neural network, to build prediction models. Additionally, Amino Acid Composition (AAC) and dipeptide composition (DPC) were utilized as effective feature encoding methods. Every model underwent independent cross-validation and external testing. The findings indicate that the enhanced AMP- CapsNet deep learning model surpassed its counterparts, achieving an accuracy of 97.29% and an AUC value of 0.9891 on the test set using dipeptide Composition (DPC). Consequently, the proposed technique is anticipated to enhance the accuracy of antimicrobial peptide predictions in the future. By producing powerful peptides for medication development and application, this study advances deep learning-based AMP drug discovery approaches. This finding has important ramifications for how biological data is processed and how pharmacology is calculated.

Keywords

AMP-CapsNet, AAC, DPC, Drug discovery, Antimicrobial peptides, A.I, Deep Learning



Synthesis, Characterization, and Antimicrobial Activity of Gluconate Stabilized Silver Nanoparticles Against Penicillium Italicum

[1]Devanushi Dutta and [2]Pranab Dutta

[1] Assam Agricultural University, Jorhat, Assam, India
[2] School of Crop Protection, CPGS-AS, Central Agricultural University (Imphal), Umiam, Meghalaya, India

Presenter
Devanushi Dutta

Type
Oral Presentation

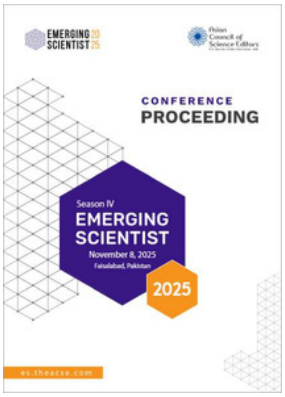
Track
Agricultural & Biological Sciences

Abstract

Khasi mandarin (Citrus reticulata, Blanco) is a widely cultivated commercial fruit crop of North East India. The fruit has immense export potential owing to its juice quality and thinner peel. But the fruit deteriorates rapidly after harvest due to microbial infection, especially the Penicillium rot, resulting in biochemical changes and physiological aging, thereby reducing the fruit's edible quality. The present research aims at the synthesis and characterization of gluconate-stabilized silver nanoparticles (Glu-Ag NPs) and to assess their efficacy against *Penicillium Italicum*. Glu-Ag NPs were synthesized by the sodium borohydride reduction method and characterized by TEM, SEM, FTIR, NTA, DLS, Zeta sizer, and UV-Vis spectroscopy. The synthesized Glu-Ag NPs showed a SPR peak at 410 nm with an average size of 94.10 nm with a polydispersity index of 0.413, and a negative zeta potential value of -15.0 mV. The concentration of nanoparticles was determined as 1.2 million per mL by NTA. The TEM image reveals the crystallinity of the synthesized Glu-Ag NPs, and SEM depicts the spherical shape of the nanoparticles. The synthesized Glu-Ag NPs showed the highest (58.23%) mycelial growth inhibition at 250 ppm concentration against P. italicum. Thus, the present investigation proved the antimicrobial activity of synthesized gluconate-stabilized silver nanoparticles against the potent post-harvest pathogen *Penicillium Italicum*.

Keywords

Gluconate, Inhibition, *Penicillium Italicum*, Silver Nanoparticles, TEM



Harnessing Indigenous Plant Bioactives and Biocontrol Agents for Climate-Smart Management of Multi-Pathogen Crop Infections

[1]Aisha Abdullahi Mahmud and [2]Abdulrahman Mahmoud Dogara

[1]Department of Plant Science and Biotechnology, Faculty of Life Science, Federal University Dutsin-Ma, Katsina, Nigeria
[2] Biology Education Department, Tishk International University, Erbil, Iraq

Presenter
Aisha Abdullahi Mahmud

Type
Oral Presentation

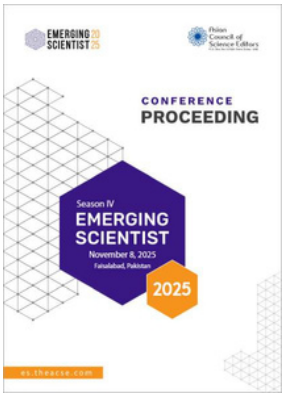
Track
Agricultural & Biological Sciences

Abstract

Bioactive compounds were extracted and screened from Piliostigma thonningii and Piliostigma reticulatum, plants valued in traditional medicine but underexplored in crop protection. In parallel, root-nodule bacteria from leguminous crops were evaluated for antagonistic activity against Aspergillus species. Dual inhibition assays demonstrated strong synergistic effects when plant extracts were combined with selected BCAs, suggesting mechanisms such as antibiosis, quorum-sensing disruption, and metabolic interference. Beyond laboratory trials, the research involved collaboration with rural tomato farmers in Katsina State, Nigeria, who participated in disease identification and fungicide replacement experiments. The outcomes provide dual benefits: eco-friendly fungal control and farmer empowerment through accessible and affordable alternatives. This work advances climate-resilient agriculture by reducing chemical inputs, enhancing biological defenses, and validating indigenous knowledge. It establishes a foundation for developing region-specific, bio-based formulations for integrated disease management, particularly in resource-limited settings. The oral presentation will share a scalable intervention model that bridges scientific innovation with community-driven agricultural solutions, demonstrating how local biodiversity can be harnessed for global agricultural resilience.

Keywords

Biocontrol agents (BCAs), *Aspergillus fumigatus* , Climate-smart agriculture, Indigenous Knowledge



Fighting Plant Pathogens with Green Silver Nanoparticles: A Sustainable Antifungal Approach

Ansar Mehmood
Department of Botany, University of Poonch, Rawalakot, Pakistan

Presenter
Ansar Mehmood

Type
Oral Presentation

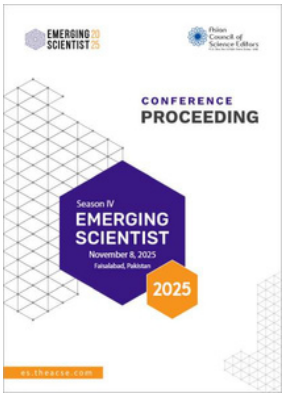
Track
Agricultural & Biological Sciences

Abstract

Fungal diseases greatly affect crop production across the globe, leading to substantial yield losses and contamination by mycotoxins in food and feeds. The infection reduces agricultural productivity and makes food unsafe and unmarketable. At present, chemical fungicides are the most widely used management strategy for fungal diseases, but long-term excessive use of chemical fungicides has raised concern over certain issues such as the risk of environmental pollution, toxicity to non-target organisms, and the emergence of resistance in pathogen strains to fungicides. Therefore, alternative environment-friendly measures are most promising for developing a sustainable disease-managing strategy in agriculture. Antifungal agents are still undergoing research and trial; however, silver nanoparticles (AgNPs) have attracted more attention to be used as valuable antifungal agents because of their property to act against various microorganisms, stability, and less resistance to their products. The present study has a well-defined synthesis of AgNPs using green chemistry approaches that bioactive compounds from medicinal plant leaf extracts affect reduction and stabilization. Such an eco-friendly method reduces or eliminates hazardous chemicals while improving the biocompatibility and effectiveness of nanoparticles. The antifungal efficacy of the biosynthesized AgNPs was evaluated against various phytopathogenic fungi using in vitro approaches like disc diffusion and agar well diffusion methods. The results confirmed strong antifungal activity, and the inhibition of fungal growth was statistically significant. AgNPs were further validated in their efficacy by foliar application in greenhouse trials to control fungal diseases in crop plants. The greenhouse experiments showed that the AgNPs inhibited pathogen growth beyond 80%, which was better than that obtained with $AgNO_3$, and conventional fungicides. These findings indicate the potential of biosynthesized AgNPs as innovative, sustainable alternatives to synthetic fungicides. By being capable of adequately controlling plant pathogens while mitigating environmental and resistance concerns, they would be a strong candidate for future applications in agriculture. Field applications, toxicity assessments, and formulation optimizations are expected to provide promising development for such AgNP-based nano-fungicides in sustainable crop protection strategies.

Keywords

Green synthesis, Antibacterial, Nanoparticles



Allelopathic Effects of Chenopodium murale on Crop Growth and Sustainable Weed Management Program

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Presenter
Mohd.Sayeed Akhtar

Type
Oral Presentation

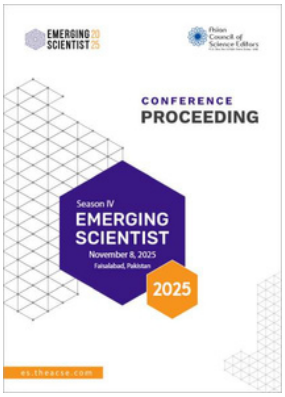
Track
Agricultural & Biological Sciences

Abstract

This study scrutinises the allelopathic effects of *Chenopodium murale L.* on the growth of crops and weeds via its rhizosphere soil. Comprehensive morphological examination and soil sampling demonstrated that *C. murale* dramatically modifies soil characteristics, increasing pH, electrical conductivity, and total phenolic content. Growth experiments utilising crops, namely *Pisum sativum L., Cicer arietinum L., Triticum aestivum L., Oryza sativa L.* , and specific weeds *Melilotus indicus (L.) All., Phalaris minor Retz, Cassia tora L., and Vicia villosa Roth.* demonstrated significant decreases in root and shoot length, along with dry biomass, when cultivated in rhizosphere soil compared to the control group. SEM-EDX analysis confirmed the presence of nutrients, ruling out nutritional deficit as a growth-limiting factor. Conversely, increased phenolic compounds were associated with growth inhibition. The research illustrates species-specific sensitivity and indicates allelopathic interference as a significant element in weed-crop dynamics. These findings underscore the potential influence of*C. murale*on plant communities and advocate for its inclusion in sustainable weed management techniques due to its phytotoxic effects. The study sought to characterise the morphological characteristics of *C. murale*L., examine the physicochemical features of its rhizosphere soil, and evaluate its allelopathic effects on specific crops and weeds. SEM-EDS was utilised to analyse the elemental composition of the rhizosphere soil.

Keywords

Allelopathy, Nutrient Deficiency, Phenolic contents, Soil Characteristics, Weed Management



Integrating Ethical Principles into Food Safety, Science, and Nutrition for Sustainable and Health-Oriented Food Systems

[1]Fatemehsadat Mirmohammad Makki, Mahmoud Abbasi, and [2]Mahdi Shadnoush

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Presenter

Fatemehsadat Mirmohammad Makki

Type

Oral Presentation

Track

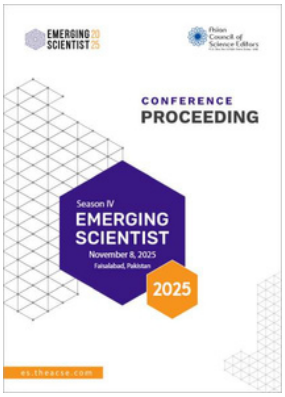
Agricultural & Biological Sciences

Abstract

Food is not just about taste or convenience; it plays a major role in our health and well-being. Today, with numerous food products and technologies available, it is more crucial than ever to consider ethics in food safety. This means making sure food is not only safe to eat, but also healthy, fairly produced, and honestly labeled. Food science helps us improve the quality, shelf life, and nutrition of food. At the same time, nutrition science teaches us what kinds of food help us live healthier lives. But without ethical standards, these sciences can be misused. For example, food companies might use unhealthy ingredients, exaggerate health claims, or target low-income communities with cheap yet unhealthy food. This creates a risk to both safety and fairness. Ethics in food safety includes being honest with consumers, using science responsibly, and making sure everyone has access to safe and nutritious food. It also means respecting cultural values and being careful about the long-term effects of food technologies, like artificial additives or ultra-processed foods. In short, food safety is not only about avoiding harm, but it is also about doing good. By connecting ethics with food science and nutrition, we can create a healthier and more trustworthy food system for everyone. This approach supports informed choices, promotes better public health, and fosters greater social responsibility in how food is produced and shared.

Keywords

Food Safety, Ethics, Nutrition, Food Science, Public Health, Honesty, Food Labels, Healthy Eating, Fair Access, Food Systems



Biochemical Profile of Cuttle Bones

Leena Grace Beslin and S. P. Divya

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Presenter

Leena Grace Beslin

Type

Oral Presentation

Track

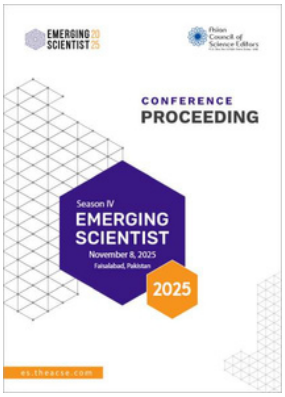
Agricultural & Biological Sciences

Abstract

Today, growing awareness of healthy food has increased the demand for fish due to its exceptional nutritional benefits. Fishery by-products used in animal feed require proper biochemical evaluation to ensure their nutritional value is optimal. The cuttlebone, which serves as both a rigid structural component and a buoyancy aid in cuttlefish, provides strength, high porosity, and permeability while maintaining a reduced weight for buoyancy. This study aimed to evaluate the biochemical profile of the otherwise discarded cuttlebone of cuttlefish. Biochemical analysis revealed that protein (2.90 mg mL^{-1}) and lipid (2.60 mg mL^{-1}) contents were higher in fresh samples. In contrast, carbohydrates were significantly higher in dry samples (210.7 mg mL^{-1}). Thin-layer chromatography further confirmed the presence of proteins in cuttlebones. Mineral composition (mg mL^{-1}) was higher in fresh samples compared to dry ones: sodium (7.2 0.21), calcium (0.296 0.04), magnesium (0.761 0.18), potassium (0.38 0.10), phosphorus (0.084 0.06), manganese (0.04 0.05), iron (0.022 0.02), and zinc (0.021 0.07). The findings highlight the notable organic and inorganic constituents of cuttlebone, suggesting its potential use as a substitute source of valuable nutrients.

Keywords

Carbohydrate, Fat, Lipid, Nutrition, Protein



Circular Plant Protection Measures against Xanthomonadaceae Plant Pathogens: Antibacterial Potential of Pomegranate Peel Extract and Cellulose Nanocrystals

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Presenter

MuhammadAmir Muawiya

Type

Oral Presentation

Track

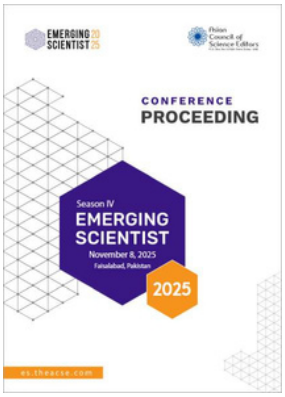
Agricultural & Biological Sciences

Abstract

Pomegranate peel extract (PGPE) and cellulose nanocrystals (CNC), derived from agro-waste, are promising bioactive compounds, potentially useful in crop protection. PGPE, rich in polyphenolic compounds like ellagic acid, gallic acid, and punicalagins, has demonstrated significant antibacterial effects. Current studies show that PGPE inhibits the growth, motility, and biofilm formation of *Xanthomonas campestris pv. campestris (Xcc)*, the pathogen responsible for black rot in cruciferous crops, along with a significant decrease in disease severity when applied as a protective treatment. PGPE fully inhibited *Xylella fastidiosa* subsp. pauca (Xf), under in vitro conditions, when applied at 0.5%; furthermore, PGPE reduced Xf biofilm formation, a critical factor in managing pathogen virulence and persistence. Phenotypic and molecular studies on olive cuttings and 2-year-old olive plants showed that PGPE exhibits biostimulant effects, enhancing chlorophyll metabolism and plant defense-related genes, when applied at the root level in combination with CNC. Indeed, CNC, a biodegradable nanomaterial, has also shown promising potential for controlling Xf by modulating biofilm production and reducing bacterial growth in vitro. Ongoing research is focusing on developing combined formulations of the compounds to optimize the delivery by endotherapy and soil application, though the synthesis of novel thermo-reversible polymer and soil amendments, improving their efficacy in field conditions, both for disease control and biostimulant activity. This research underscores the potential of PGPE and CNC as sustainable, circular solutions for bacterial plant disease management, which are under evaluation on model pathosystems (e.g, tobacco) and on naturally infected plants in the Apulia region.

Keywords

Circular Plant Protection, Nanotechnology, Vascular Plant Pathogens, Cellulos Nanocrystals, Pomegranate Peel Extract



Evaluation of Nutritional Parameters of Exotic and Local Pineapple (Ananas comosus) Varieties

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Presenter
Adesike Oladoyin Olayinka

Type
Oral Presentation

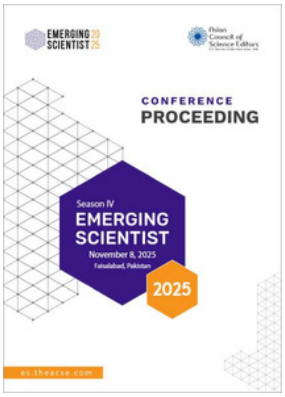
Track
Agricultural & Biological Sciences

Abstract

Pineapple (Ananas comosus) is widely consumed and recognized as the third most important tropical fruit worldwide due to its high production and nutritional value. It is particularly rich in essential nutrients like vitamins, minerals, and dietary fibre, which contribute to its health-promoting properties. However, the nutritional quality of pineapple can vary greatly among varieties. Understanding varietal differences is crucial for breeders, farmers, and the food industry to select and promote varieties with superior nutritional and functional properties. This study set out to compare the proximate and mineral composition of two exotic varieties (MD2 and Sugar Loaf) and one locally cultivated (smooth cayenne) pineapple variety. Ripe and healthy fruits were harvested from tagged plants at the experimental field of the National Horticultural Research Institute (NIHORT), Ibadan, Nigeria. Laboratory analyses were carried out in triplicate using standardized AOAC methods to determine the proximate, nutrient, and color quality of the pineapple varieties. The data collected were analysed using R statistical software. Significant differences ($p<0.01$) were observed among the varieties for most measured parameters. MD2 recorded higher values for ash (3.84 g/100g), lightness (56.3), and iron (0.62 mg/100g), while Sugar Loaf had the highest levels of carbohydrate (4.70 g/100g), potassium (797.67 mg/100g), and sodium (38.33 mg/100g). Smooth cayenne stood out in fibre (3.64 g/100g) and calcium (240.70 mg/100g) content. Principal component analysis (PCA) showed that PC1 and PC2 accounted for nearly 100% of the total variation among the pineapple varieties. Ash and fat contents were highly positively correlated; as pineapple brightness increases, its yellowness also increases. The evaluated pineapple varieties have distinct nutritional and quality profiles that could influence consumer preference and breeding programmes.

Keywords

Pineapple, Nutrient Analysis, Variety Comparison, Proximate Composition, Fruit Quality



Bridging Scales and Disciplines: Collaborative Pathways for Prosopis julifloraManagement in the Horn of Africa

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Presenter
Kflay Gebrehiwot

Type
Oral Presentation

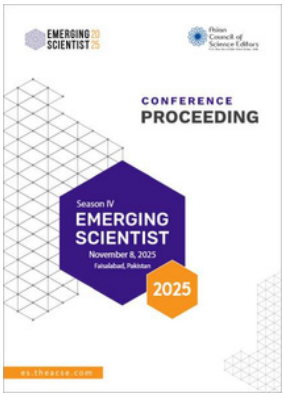
Track
Agricultural & Biological Sciences

Abstract

Invasive alien plant species pose a critical threat to global biodiversity, with *P. juliflora* emerging as a major concern in Ethiopia's lowland regions. This invasive plant has a significant impact on local biodiversity and undermines the livelihoods of pastoralist and agro-pastoralist communities. This study aims to synthesize current knowledge on *P. juliflora* research and management efforts in Ethiopia through a systematic evidence synthesis. Using the ROSES (Reporting Standards for Systematic Evidence Syntheses) framework, we reviewed 85 relevant studies published over the past three decades. Current findings reveal a sharp increase in *P. juliflora*-related research, with the majority focusing on natural sciences (52.9%). However, transdisciplinary studies remain rare. Most research collaborations were either international (48.2%) or local (41.2%), while national-level collaborations were limited (10.6%). Geographically, zonal-level studies dominated (31.8%), with limited work at national (5.9%) and regional (2.4%) scales. Despite this growing body of research, studies on *P. juliflora* management remain scarce. Critical gaps include a lack of integrated, transdisciplinary approaches and a need for long-term experimental and observational studies. These findings highlight the need for transdisciplinary research and multiscale collaboration for managing *P. juliflora* in the Horn of Africa. The proposed multiscale collaboration bridges scientists, local people, investors, and the governments of neighbouring countries.

Keywords

Invasive, Alien, Non-native, Tansdisciplinary, Multi-Scale Collaboration



Evaluation of Microclimate Modification on Yield, Growth, and Disease Management in Capsicum Cultivation

M.H.T.S. Jayathilaka and U.M.Aruna Kumara
Department of Agricultural Technology, Faculty of Technology, University of Colombo, Sri Lanka

Presenter

Udawasala Mudiyanselage Aruna Kumara

Type

Oral Presentation

Track

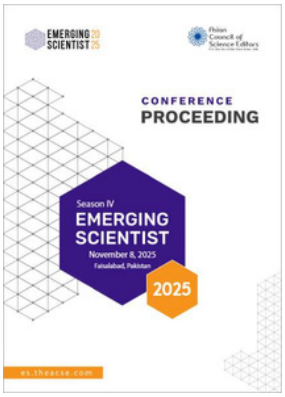
Agricultural & Biological Sciences

Abstract

Capsicum, a vital vegetable crop for agricultural economics in Sri Lanka, is also widely grown worldwide. It originates in South America, and it is believed that both Mexico and Central America could also be considered as a diversity spot for the taxa, and it is classified as an important genetic resource for agriculture and food. Often faces challenges in achieving optimal yield and quality due to environmental constraints and pest pressures. This study evaluated the effectiveness of microclimate modification on the growth, yield, and pest and disease management of Capsicum cultivated under polytunnel and open field conditions. Data on growth performance, reproductive attributes, yield quantity and quality, pest and disease incidence, and microclimatic factors such as temperature and relative humidity were systematically collected and analyzed. The results demonstrated that poly tunnel cultivation significantly enhanced growth, reproductive performance, and yield quality and quantity compared to open field cultivation. Yield was notably higher in the polytunnel, 11.9 kg per unit, than in the open field, 3.8 kg per unit, alongside superior fruit quality. Regression analysis revealed moderate correlations between temperature and plant height, with R values of 0.5684 for the poly tunnel and 0.529 for the open field. Despite the advantages in productivity and quality, pest incidence was higher in the polytunnel, posing a key challenge to its widespread adoption. These findings underscore the potential of microclimate modification to improve Capsicum cultivation outcomes while highlighting the necessity of integrated pest management strategies to mitigate increased pest pressures in protected environments.

Keywords

Capsicum annuum L., Microclimate modification, Poly tunnel cultivation, Open field cultivation, Yield performance



Plastic Use in Ornamentals: A Threat to Nature and the Floriculture Industry

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Presenter
Ravidnran Chandran

Type
Oral Presentation

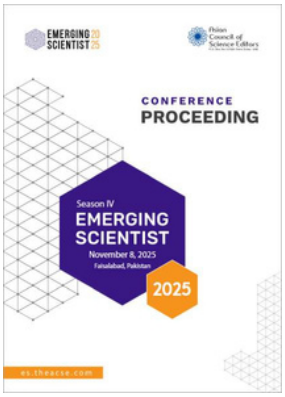
Track
Agricultural & Biological Sciences

Abstract

Earth was once a beautiful landscape, but over the past century, it has been ruthlessly exploited by human greed. Among the many contributors to this degradation, the widespread use of plastics for decorative purposes has emerged as a growing concern. The increasing reliance on plastics for ornaments not only threatens environmental health but also undermines the livelihood of farmers and the floriculture industry. Horticultural plant species, in contrast, play a vital role in promoting environmental sustainability. They reduce pollution, act as bioindicators, and contribute significantly to ecological balance. Many species of horticultural importance are evergreen, bear large leaves, possess rough bark, and are ecologically compatible. They require minimal care, low water input, and demonstrate pollution tolerance and dust-scavenging capacity. By absorbing pollutants, releasing oxygen, and improving air and water quality, these plants provide essential ecosystem services. Today, however, the use of plastics has extended into multiple domains, including bouquet preparation, decoration of marriage halls, ornamental plant displays, religious offerings, potted plant arrangements, banana leaf substitutes, airports, hotels, and even some botanical gardens. This practice directly and indirectly affects flower growers while drastically weakening the floriculture sector. In contrast, adopting green horticulture practices- such as the use of dry flowers and biodegradable materials, presents a sustainable alternative. Such practices emphasize ecological design, traditional approaches, and the integration of environmentally friendly resources. Although challenges remain in terms of economic feasibility and large-scale adoption, growing consumer awareness and supportive policy interventions are gradually driving the transition toward greener solutions.

Keywords

Floriculture, Ornamentals, Plastics, Environment, Eco-system



Anti-Inflammatory and Antioxidant Potential of Unani Herbal Formulation

Pawan Sharma, Binita Mandal,TabassumKhan,Shaikh Nikhat and Ahmad Ali
Department of Life Sciences University of Mumbai Vidyanagari, Santacruz (East), Mumbai 400098, Maharashtra, India

Presenter
Ahmad Ali

Type
Oral Presentation

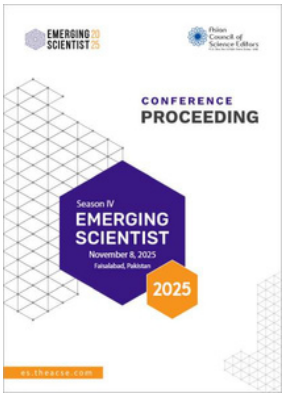
Track
Agricultural & Biological Sciences

Abstract

Unani medicine is a very commonly practiced in the Indian health system. It is also known as the Greco-Arabic system of medicine. In the present study, an Unani formulation and its ingredients have been characterised for anti-inflammatory and antioxidant potentials. Initial experimental systems included the phytochemical characterization of the six plants of the formulation. Antioxidant potential of the extracts and the formulation was examined using established methods such as scavenging BTS and NO scavenging. Different dosage of the formulation was tested on animals for their cytotoxic effect as per OECD guidelines. The anti-inflammatory and pro-inflammatory cytokines were evaluated from the blood collected from the treated as well as diseased animals. The presence of phenolics and other phytoconstituents in the plant extracts contributed towards the antioxidant potential of the formulation. All these studies indicated the efficacy of the formulation in suppressing the pro- inflammatory cytokines and a significant increase in the level of anti-inflammatory cytokines. Dosage up to 2000 mg was also safe for the animals, as evident from the overall body weight and the individual organ weights of both male and female rats. It can be concluded from the study that Unani formulations can be safely used for the treatment of diseases where inflammation is a potential contributor.

Keywords

Anti-inflammatory, Antioxidants, Cytokines, Medicinal Plants, Unani Medicine



Genetic Variants in Candidate Genes and Their Role in Obesity Susceptibility

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[1] Department of Biotechnology, BUITEMS, Quetta, Pakistan Multan
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Presenter
Shakeela Daud

Type
Oral Presentation

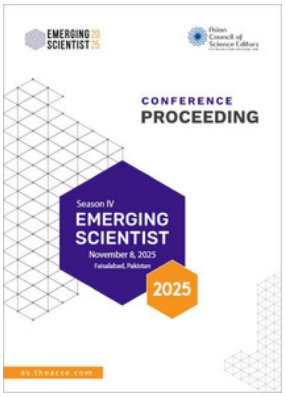
Track
Agricultural & Biological Sciences

Abstract

Obesity is described as a body mass index (BMI) ≥ 30 kg/m^2. It is a medical condition, considered a metabolic disorder resulting from long-term consumption of excess energy, as related to expenditure that leads to the storage of an excessive quantity of triglycerides in adipose tissues. A significant method for identifying pathogenic variants in genes associated with monogenic disorders is to genetically screen the Pakistani population, which is known to have a higher level of consanguinity. Consequently, sequencing of Pakistani consanguineous families with severe obesity that appeared at an early stage of life represents a potent way to discover homozygous novel variants. By identifying potential gene targets, this genetic investigation will be beneficial in the diagnosis of genetic obesity. Ten affected (obese) families were identified and recruited from different cities in Balochistan for the identification of mutations or variants in high-risk pathogenic causative genes (novel genes/locus), associated with syndromic and non-syndromic monogenic obesity. Written informed consents were obtained from all affected individuals, blood samples were collected, and processed for extracting genomic DNA. Following the clinical evaluation of each family, a genetic analysis was performed to identify the obesity causative genes carrying the harmful sequence variants. This was achieved by using whole-exome sequencing and subsequently Sanger sequencing approaches to confirm the identified variants. The identified variants were then analysed using different online bioinformatics tools. The results of the current study, whole-exome sequencing and subsequent Sanger sequencing, revealed four novel pathogenic variants that segregated with extremely affected families. A heterozygous missense variant was identified in the HIP1R gene, a silent variant in the POMC, while a 22bp exonic deletion was identified in the gene MAN1B1. Furthermore, a heterozygous missense variant was identified in the gene SMPD1, associated with autosomal dominant obesity. Other previously reported variants segregating with non-syndromic Obesity phenotype in causative genes HIP1R and POMC. Additionally, previously reported variants in the SMPD1 gene are associated with syndromic obesity. Other variants identified in causative genes, LIPC, FN1, LEPR, AKT2, and DYRK1B, segregate with affected (obese) families. Current investigations not only expand the mutational spectrum but will also be helpful in future research and diagnosis of patients with similar phenotypes in the Balochistan population. This research will also support the establishment of genotype-phenotype correlations, the understanding of issues in genetic counselling, and awareness associated with cousin marriages.

Keywords

Obesity, Genes, Exome Sequencing, Mutations



Isolation, Diagnosis, and Pathogenicity of Two Types of Entomopathogenic Nematodes for Palm Borers in The Iraqi Environment

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[2]College of Biotechnology, Al-Nahrain University, Ministry of Higher Education and Scientific Research, Iraq
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Presenter

Mohammed Zaidan Khalaf

Type

Poster Presentation

Track

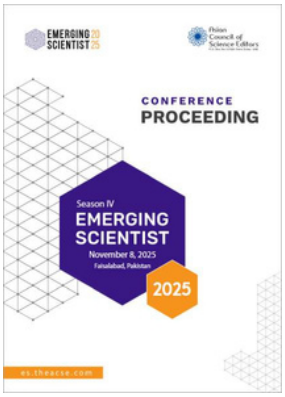
Agricultural & Biological Sciences

Abstract

Laboratory experiments were completed on the isolation, diagnosis, and testing of the pathogenicity of Entomopathogenic nematodes of palm borers belonging to the genus Oryctes spread in the Iraqi palm orchard environment. Larvae and adults of palm borers were collected from two locations, the first being Wasit Governorate (Numaniyah District) palm orchards, and the second. Baghdad Governorate (Al-Madain District), the larvae and adults isolated that showed symptoms of lethargy and color change, from each location separately, and left them until the nematodes emerged from the insect's bodies. Samples of the nematodes were sent to international scientific centers for diagnostic purposes. The pathogenicity of nematodes on larvae and adults of palm borers belonging to the genus Oryctes was tested using several concentrations of a solution containing each ml of: 0, 600, 1200, 1800 Infective Juveniles (IJs) of nematodes. Diagnostic results indicated the presence of two nematode species: *Metarhabditis blumi* in the orchard environment of Wasit Governorate and *Metarhabditis adenobia* in the orchard environment of Baghdad Governorate. Pathogenicity results test showed that the effectiveness of the nematode on the larvae of the genus Oryctes borers reached 92.3% and 92.9% for both species, respectively, when treated. With 1800 Ijs per mL by the direct spraying method, compared to 64.3% for both species when treating nematode food. Also, results showed that the effectiveness of nematodes on adults is less than on larvae, as it did not exceed 26.7% for both species, whether by direct spraying or treated nematode food in which the adults are present. This is when using nematodes at a concentration of 1800 Ijs per mL. The results of this study can be used to use these nematode species as a biological control agent against palm borers within an integrated control program.

Keywords

Entomopathogenic nematode, Metarhabditis blumi, Metarhabditis adenobia, Palm borers, Palm orchards Environment



Effects of Handling Duration on Fear-Related and Exploratory Behavior in 4-Day-Old Broiler Chicks

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[2]Ghada Abd El-Reda

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[2]Department of Physics, Faculty of Science, Assiut University, Assiut, Egypt

Presenter

Usama Taha Mohammed Fareed Mahmoud

Type

Poster Presentation

Track

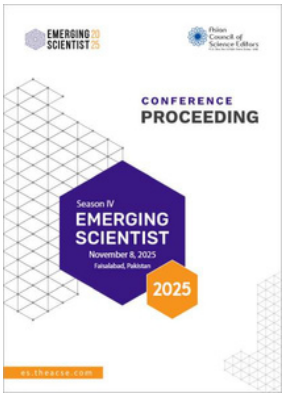
Agricultural & Biological Sciences

Abstract

Broiler chickens are often subjected to handling procedures during commercial production, particularly within the first week of life. Early handling experiences may influence behavioral responses, including fearfulness and exploratory activity, which have implications for poultry welfare and management. This study investigated the effects of different handling durations on the behavior of 4-day-old broiler chickens using four behavioral tests: tonic immobility (TI), emergency out test, open field test, and novel object recognition test. A total of 18 broiler chickens (Ross strain; 3 males and 3 females per group) were randomly assigned to three different treatment groups: minimal handling (control), short handling (60 seconds), and prolonged handling (180 seconds). Handling treatments were applied once, after which all birds were tested individually in a randomized order. Data were analyzed using the non-parametric Kruskal-Wallis test, followed by the Mann-Whitney U test for pairwise comparisons. No significant differences were observed among groups in most behavioral measures, including latency to emerge, locomotor activity, or object exploration. However, the group subjected to 60 seconds of handling exhibited a significantly lower number of induction attempts required to achieve tonic immobility compared to the control group ($p < 0.05$), indicating a reduced induction threshold. Prolonged handling (180 seconds) did not significantly change the duration of tonic immobility or other fear-related responses compared to control or short-handled birds. In conclusion, handling durations of up to 180 seconds at 4 days of age did not increase fearfulness in broiler chicks, while short handling (60 seconds) slightly modified the induction of tonic immobility. These findings suggest that moderate early handling does not adversely affect behavioral indicators of welfare in young broilers.

Keywords

Broiler Chick Welfare, Handling Duration, Tonic Immobility, Fear-Related Behavior, Exploratory Behavior, Early Life Experience



Rapid Biosynthesis of Zinc Oxide Nanoparticles Using Housefly Extract with Promising In Vitro Anti-Cancer and Biomedical Applications

Mariyam Shafiq and Saiqa Tabassum

Department of Biosciences, Faculty of Life Sciences, SZABIST University, Karachi, Pakistan

Presenter

Mariyam Shafiq

Type

Poster Presentation

Track

Agricultural & Biological Sciences

Abstract

Zinc oxide nanoparticles (ZnO-NPs) are valued for their exceptional surface activity, photostability, and biocompatibility, with broad applications from nanomedicine to environmental remediation. While green synthesis is gaining prominence as an eco-friendly alternative to chemical methods, the use of insects as biological resources remains largely unexplored. This study pioneers a rapid, sustainable synthesis of ZnO- NPs using housefly (Musca domestica) extract, an abundant, low-cost, and underutilized bioresource. The extract, rich in proteins (611 µg mL^{-1}), phenolics (187.1 µg mL^{-1}), and reducing sugars (27.52 µg mL^{-1}), acted as both a reducing and stabilizing agent. ZnO-NPs formed within just 15 minutes, confirmed by UV-Vis absorption at 365 nm. SEM revealed an average particle size of 79.6 nm, while XRD indicated a 5.14 nm crystallite size with a hexagonal wurtzite phase. FTIR, EDX, and zeta potential analysis (-3.93 mV) validated their composition and moderate colloidal stability. Functionally, the nanoparticles showed strong antioxidant (83.05% DPPH scavenging), antidiabetic (78.09% α-amylase inhibition), and anticancer activity (95.14% cell growth inhibition; IC50 = 3.58 µM). This work not only introduces an innovative insect-mediated synthesis route but also offers a fast, cost-effective, and scalable method for producing multifunctional nanoparticles. By transforming a common pest into a valuable nanomaterial resource, it opens new avenues for sustainable nanotechnology in healthcare and beyond.

Keywords

Zinc Oxide Nanoparticles, *Musca domestica*, Insect-Mediated Synthesis, Green Nanotechnology, Nanoparticle Characterization, Antioxidant Activity, Anti-Inflammatory, Antidiabetic, Anticancer, Sustainable Nanomaterials

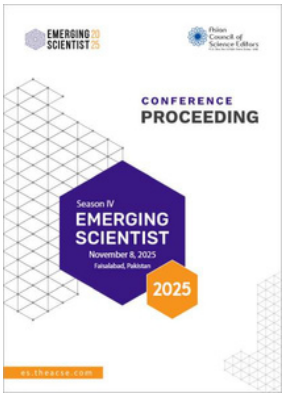
03 Conference Track

• Medical & Health Sciences

Session Moderators:

Maj Gen [Retd] Prof. Muhammad Aslam
Professorof Physiology
Rawalpindi, Pakistan

Prof. Dr. Mona Mohammed El-Husseiny
Professor of Physiology
Cairo University, Egypt



Lifestyles and Health Issues in the United Arab Emirates

Haleama Al Sabbah
Department of Public Health, Abu Dhabi University, United Arab Emirates

Presenter
Haleama Al Sabbah

Type
Oral Presentation

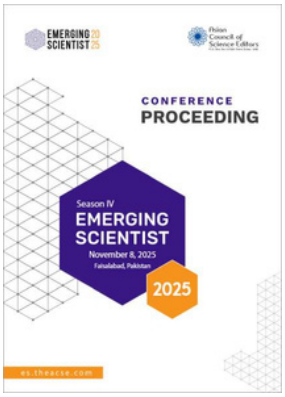
Track
Medical& Health Sciences

Abstract

The rapid urbanization of the UAE, especially in cities like Dubai and Abu Dhabi, has led to a significant influx of expatriates and the development of a multicultural society. This transformation has introduced diverse dietary patterns and increasingly sedentary lifestyles. The popularity of fast food and processed meals, combined with limited physical activity due to climate constraints and urban work culture, has contributed to a rise in obesity and non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular disorders. This study aims to explore how lifestyle changes are shaping public health trends in the UAE and to identify priority areas for intervention. Using a multidisciplinary framework, the research integrates quantitative data analysis with cultural and policy assessments to examine how modern living, environmental factors, and socio-cultural norms interact to impact health outcomes in the UAE. Recognizing the escalating burden of NCDs, the UAE government has implemented national strategies, including health awareness campaigns, promotion of physical activity, and improved access to quality healthcare services. These efforts are supported by substantial investments in infrastructure and community-level interventions to promote healthier behaviors. Despite commendable efforts, challenges remain. Deep-rooted cultural practices, such as the social importance of hospitality and traditional high-calorie foods, often hinder sustained dietary changes. Furthermore, long working hours and high-paced urban life contribute to rising mental health concerns. A culturally tailored, holistic public health approach is essential. Future strategies must address both physical and mental health, balance tradition with modernization, and ensure inclusivity. Policymakers should design integrated interventions to promote long-term health and well-being for the UAE's diverse population.

Keywords

UAE, Lifestyle, Health, Urbanization, Non-Communicable Diseases, Public Health Policy.



Long COVID: The Next Public Health Crisis

Kaushik Bharati
Health Policy Consultant - UNESCO, India

Presenter
Kaushik Bharati

Type
Oral Presentation

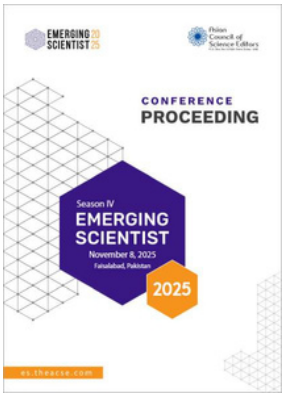
Track
Medical& Health Sciences

Abstract

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the etiologic agent of Coronavirus Disease 2019 (COVID-19), emerged in 2019 and then spread across the globe at lightning speed and soon reached pandemic proportions. It wreaked havoc worldwide for approximately three years. It is the deadliest viral pandemic since the Spanish flu of 1918 and has claimed over seven million lives and infected more than 700 million people. Now that the pandemic has subsided, residual symptoms persist, and new ones are also being reported. These symptoms can linger for a very long period of time, ranging from six months to more than three years, depending on the severity of the initial infection during the acute phase of the disease. This is why the condition has been named Long COVID, which affects about 10-20% of individuals who have recovered from acute COVID-19, as certified by a negative qRT-PCR test. While over 200 symptoms have been reported, the primary features include cognitive impairment ("brain fog"), breathing difficulties, and severe fatigue. Because of its wide range of symptoms, treatment approaches must be comprehensive and multi-dimensional. This lecture will cover the key aspects of Long COVID, including its epidemiology, symptomatology, clinical features, pathology, underlying mechanisms, management strategies, and prospects.

Keywords

Long COVID, Brain Fog, Cognitive Impairment, Symptoms, Treatment



Mutational Spectrum and In-Silico Analysis of Mismatch Repair Pathway Genes in Pakistani Oral Squamous Cell Carcinoma Patients

Ali Talha Khalil
Department of Pathology, Lady Reading Hospital Medical Teaching Institution, Peshawar, Pakistan

Presenter
Ali Talha Khalil

Type
Oral Presentation

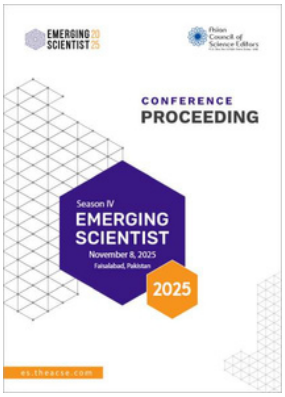
Track
Medical& Health Sciences

Abstract

Mismatch repair (MMR) gene mutations are implicated in cancers; however, they are less explored in oral squamous cell carcinoma (OSCC). The present study reports mutations in the MMR pathway genes HFM1, MLH3, MSH3, MSH4, and PMS2 identified through next-generation whole-exome sequencing (NG-WES) and determines their pathogenicity, structural, and functional roles in OSCC using diverse bioinformatics tools. Among the 52 identified mutations, 10/52 (19.2%) were novel. A total of 37/52 (71.15%) nonsynonymous single-nucleotide variants (SNVs) were detected, with MSH3 harboring the highest mutation burden, followed by MSH4, PMS2, HFM1, and MLH3. Several mutations, including MSH4p.K691N, MSH4p.P681T, MSH4p.P681Q, and PMS2p.S15, were predicted to be highly pathogenic. ISPRED-SEQ analysis revealed 13/52 (25%) interaction site mutations, with 5/13 (38.4%) in MSH4, 3/13 (23%) in MLH3, 3/13 (23%) in PMS2, and 1/13 (7.7%) each in HFM1 and MSH3. Molecular dynamics simulation (MDS) results indicated structural destabilization characterized by an elevated radius of gyration and disrupted protein conformation. MLH3p.P844L (9/13; 69.2%) and MSH3p.Q949R (13/13; 100%) mutations were common in individuals aged ?56 years and predominantly observed among males. Additionally, the MSH3 variants MSH3p.Q949R and MSH3p.A1045T were detected in 16/18 (88.89%) of Naswar users. These mutations may serve as potential biomarkers for cancer detection and progression. Variants such as HFM1p.I117V, PMS2p.K435E, and MSH3p.Q949R displayed high frequencies in oral cancer patients, suggesting their potential utility as biomarkers for cancer detection and progression. The results underscore the critical role of these mutations in cancer biology and their possible application in diagnostic and therapeutic development.

Keywords

MMR gene mutations, Oral squamous cell carcinoma (OSCC), Bioinformatics analysis; Molecular dynamics simulations (MDS), Biomarkers



Comparative Analysis of Solanine Content in Wild, Hydroponically and Home Grown Varieties of Nightshade

Mukesh Singh Sikarwar, Abhishek Kumar, Aman Singh Rajawat and Kanha Sharma

Amity Institute of Pharmacy, Amity University Madhya Pradesh

Presenter

Mukesh Singh Sikarwar

Type

Oral Presentation

Track

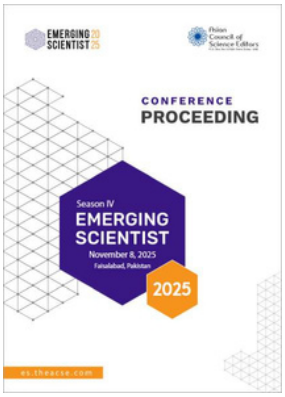
Medical & Health Sciences

Abstract

The objective of this study was to conduct a comparative analysis of solanine content in wild, hydroponically grown, and home-grown varieties of *Solanum nigrum* (family: Solanaceae). An HPLC method was employed for the simultaneous quantitative determination of solanine. Additionally, a preliminary phytochemical screening was conducted to assess the comparative phytochemical profile of plants grown under various environmental conditions. HPLC was selected as it is a reliable and accurate method for quantitative analysis. The separation of solanine was achieved using a reversed-phase C-18 column with binary elution consisting of acetonitrile-methanol (80:20, v/v) at a flow rate of 1 mL min-1, with UV detection at 227 nm. The quantitative analysis revealed significant variation in alkaloid content across different growing conditions. Hydroponically grown *Solanum nigrum* showed the highest phytochemical concentration, likely due to optimized nutrient uptake and controlled environmental stress. Cultivated (home-grown) samples displayed a balanced alkaloid profile with moderately high phytochemical content. In contrast, wild samples exhibited lower phytochemical levels, possibly due to genetic variability, environmental stress, or seasonal influences. For pharmacological or nutraceutical applications aimed at maximizing phytochemical yield, hydroponic cultivation appears most efficient. However, for broad-spectrum phytochemical investigations, cultivated samples may offer greater compound diversity.

Keywords

Solanine, Hydroponic, Nightshade



Synthesis and Evaluation of Histidine-Capped Silver Nanoparticles Loaded with Ciprofloxacin as a Potent Antibacterial Formulation

Kashif Ali and Neha Farid
SZABIST University, Pakistan

Presenter
Kashif Ali

Type
Oral Presentation

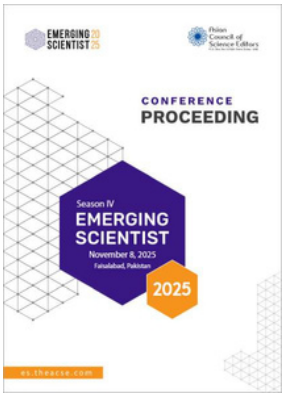
Track
Medical & Health Sciences

Abstract

The scientific discipline of nanotechnology is becoming more and more significant every day. Researchers are employing nanotechnology to combat bacterial strains that have developed resistance to broad-spectrum antibiotics. In this research, the activity of the drug Ciprofloxacin has been enhanced by synergizing it with histidine-capped silver nanoparticles. The presented research, therefore, loaded the antibiotic ciprofloxacin (CIP) onto histidine-capped AgNPs (silver nanoparticles), resulting in improved antibacterial activity of CIP against resistant strains of Gram-negative bacteria, Pseudomonas aeruginosa and Escherichia coli; Gram-positive bacteria, Staphylococcus aureus and Listeria monocytogenes. Histidine stabilizes the AgNPs conjugate against aggregation and controls the size of AgNPs. All AgNPs were characterized through color transition, UV-visible spectrometry, Fourier-Transform infrared spectroscopy, and scanning electron Microscopy. The antibacterial, antioxidant, and anti-biofilm activities of AgNPs, HisAgNPs, and Cip-HisAgNPs were tested against the resistant strains, through the well-diffusion method, DPPH scavenging assay, and anti-biofilm assay. Results have shown that Cip-HisAgNPs exhibited enhanced antimicrobial activity in contrast to ciprofloxacin and bare AgNPs. The Nano-conjugate of Cip-HisAgNPs inhibited the growth of bacteria remarkably, and the highest zone of inhibition in diameters was 35 mm for E. coli, 28 mm for P. aeruginosa, 25 mm for S. aureus, and 28 mm for L. monocytogenes. The anti-biofilm activity is exhibited by several bacterial strains, where Cip-HisAgNPs completely inhibited the biofilm of resistant bacteria at various concentrations. Similarly, Cip-HisAgNPs exhibited the highest antioxidant activity at a concentration of 100 µg mL-1. To our knowledge, this is the first time a Nanoconjugate of Cip-HisAgNPs has been synthesized. The results of UV-visible spectroscopy, FTIR, and SEM further support the formation of Cip-HisAgNPs.

Keywords

Histidine Capped Silver Nanoparticles, Ciprofloxacin, Antibacterial activity



From Leaves to Leads: Exploring the Antimalarial Potential of Vernonia ambigua Through Green Chemistry and in Silico Tools

[1-4] **Amina Jega Yusuf,** [2] **Balikis Aderonke Abdulsalam,** [2] **Mustapha Salihu,** [1] **Jamila Aminu,** [1] **Sonia Kamran,** [5] **Nurhuda Manshoor**

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[5] Atta-ur-Rahman Institute for Natural Products Discovery (AuRins), Faculty of Pharmacy, Universiti Teknologi MARA Cawangan Selangor, Kampus Puncak Alam, Selangor Darul Ehsan, Malaysia

Presenter

Amina Jega Yusuf

Type

Oral Presentation

Track

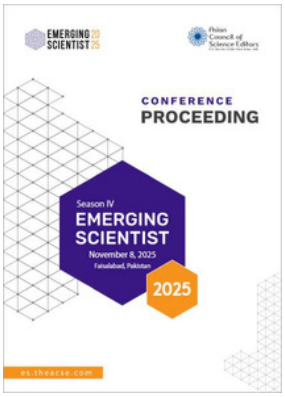
Medical & Health Sciences

Abstract

Vernonia ambigua (Family: Asteraceae) is traditionally used in ethnomedicine to treat malaria, inflammation, among other ailments. The study aimed to determine the antimalarial efficacy and phytochemical profile of hexane leaf extract from *Vernonia ambigua* using GC-MS and in silico molecular docking studies. The median lethal dose (LD50) of the extract was determined following Lorke's method, while the antimalarial effect was assessed using Ryley and Peter's curative test with chloroquine-sensitive Plasmodium berghei (NK65). Chemical constituents were identified through GC-MS analysis, and in silico docking studies were performed using AutoDock Vina in PyRx, and ADMET properties were evaluated using SwissADME and Protox-III servers. The hexane leaf extract demonstrated an LD50 value of ≥ 5000 mg kg^{-1}, indicating its non-toxic nature. The extract also exhibited a significant ($p < 0.05$) and dose-dependent curative effect, achieving cure rates of 83.40, 75.74, and 63.61% at 500, 250, and 125 mg kg^{-1} doses, respectively. Notably, the standard drug chloroquine achieved a cure rate of 69.67 %. GC-MS analysis identified 23 bioactive compounds, which showed good binding affinities to Plasmodium falciparum lactate dehydrogenase (pfLDH) with docking scores ranging from -7.8 to -5.4kcal mol^{-1}, compared to the standard ligand (NADH) with a score of -10.1 kcal mol^{-1}. These compounds also exhibited a favorable ADMET profile. In conclusion, the hexane leaf extract of *V. ambigua* demonstrated significant curative antimalarial activity, likely due to the presence of the bioactive constituents identified. This highlights its potential as a source for antimalarial drug development

Keywords

Vernonia ambigua, Antimalarial Activity, Hexane Leaf Extract, GC-MS Analysis, *Plasmodium berghei*, Molecular docking



MAC Protocol in Power Reproduce for RNA Sequence

[1]Naila Rozi, [2]Khadija Ayoub and [3]Syed Maqsood Zia Shah

[1]Department Artificial Intelligent and Mathematical Sciences, Sindh Madressatul Islam University, Karachi

[2]Department of Computer Science, University of Karachi, Karachi

[3] Shah Abdul Latif University, Campus ghootki Sindh, Karachi

Presenter

Naila Rozi

Type

Oral Presentation

Track

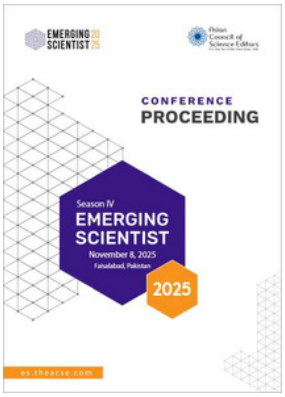
Medical & Health Sciences

Abstract

The activity and random walk reactions on tracks of width three in PCR were observed. The rate constants of the two reactions were determined by comparing the two-thirds completion time with the experimental data. The robot walked at a rate of roughly 5 minutes per step with a 6 nm step size, which is similar to other autonomous DNA motors on origami. The rate of the free-floating triggered strand interacting with the inhibited robot on the origami was roughly 100 times slower than a similar strand displacement reaction between two free-floating molecules, but comparable to other hybridization and strand displacement rates measured on origami surfaces. Once activated, the DNA robot was designed to start a random walk, pick up cargo upon encounter, and continue walking while carrying the cargo. The series 5'-atttcccgggaaaaaccccc-3' for the complementary two-sided Laplace integral is a Fourier integral. For power series and the one-sided Laplace integral, the robot scans between 0 and +∞. This information in robots, as a natural generalization of the power series, suggests that known properties of the power series may also pertain to the Laplace integral. The convergence of the DNA sequence partial sum is guaranteed by the Leibniz criterion. DNA sequences are usually treated as symbolic data corresponding to the four types of nucleic acids. Well-established DSP techniques have been developed to analyze these numeric signals for many applications. The proposed DNA-based scheme can efficiently solve the graph isomorphism problem.

Keywords

MAC Power Laplace integral, RNA Sequel & Leibniz



Platelet Aggregation Inhibitory Activity of Three Syzygium Species Against Different Platelet Inducers

[1,2]Oladipupo A. Lawal, [2]Victoria A. Dada, [2]Emmanuel E. Aduak, [2]Sharafadeen A. Adegoke, [2]Kanyinsola O. Akinkunmi, [2]Kamsobechukwu G. Imaechi, [1]Foluso O. Osunsanmi and [1]Andy R. Opoku

[1]Department of Biochemistry & Microbiology, University of Zululand, South Africa
[2]Department of Chemistry, Lagos State University, Ojo, Lagos, Nigeria

Presenter
Oladipupo Lawal

Type
Oral Presentation

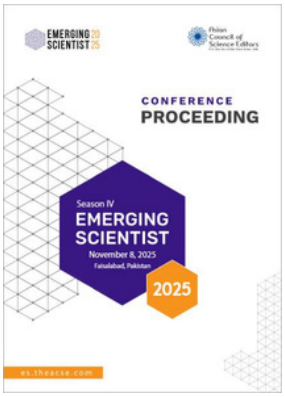
Track
Medical & Health Sciences

Abstract

Platelet aggregations have been implicated as one of the major causes of cardiovascular diseases in atherothrombotic dysfunctions, and targeting these diseases might be the best approach in reducing high mortality rate associated with cardiovascular diseases. However, clinical studies of some drugs that inhibit platelet aggregation were reported to demonstrate beneficial effects in preventing cardiac deaths or myocardial infarction. In contrast, others have been undesirable or show only a trend toward satisfactory. Medicinal plants are now the new frontline of treatments based on their wider spectrum of biological and pharmacological activities with minimal or no side effects. This study aimed to investigate the in vitro anti-platelet aggregation inhibitory activity of methanol extracts of three Syzygium species (Syzygium aromaticum, Syzygium cordatum and Syzygium cumini) against platelet agonists Adenosine 5-Diphosphate (ADP), collagen, and epinephrine using an enzymatic colorimetric assay. The results revealed the extracts to be dose-dependent ($p < 0.05$), inhibiting platelet aggregation against the induced platelet agonists. The inhibitory concentration (IC50) of S. aromaticum (0.85 mg mL^{-1}) demonstrates better platelet inhibitory activity than S. cordatum and S. cumini, with IC50 of 0.92 and 1.05 mg mL^{-1}, respectively. Also, the extracts showed superior platelet inhibitory activity against the reference compound (aspirin with IC50 = 1.18 mg mL^{-1}) at the same concentration. They may be considered for the synthesis of an antiplatelet agent from natural origin.

Keywords

Syzygium species, Myrtaceae, leaf extracts, anti-platelet aggregation, Adenosine 5-Diphosphate, collagen, epinephrine



Papain Decorated Multi-Functional Polymeric Micelles for the Targeted Intracellular Delivery of Paclitaxel

[1]Sobia Razzaq, [2]Aisha Rauf, [3]Abida Raza, [1]Tanveer A. Tabish and [2]Gul Shahnaz

[1]Department of Pharmacy, Quaid-i-Azam University, Islamabad, Pakistan

[2] NILOP Nanomedicine Research Laboratories, National Institute of Lasers and Optronics College, PIEAS, Islamabad, Pakistan

[3]UCL Cancer Institute, University College London, London, UK

Presenter

Sobia Razzaq

Type

Oral Presentation

Track

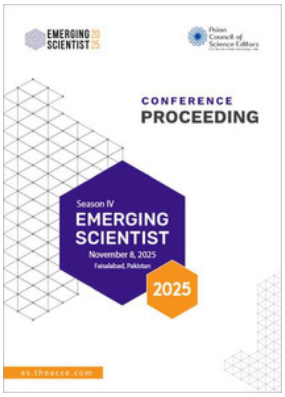
Medical & Health Sciences

Abstract

Mucopermeating nanocargoes capable of overcoming both mucosal and extracellular barriers enhance the penetration of poorly soluble anticancer drugs at their target site. In this study, we developed an innovative approach to deliver amphiphilic mucopermeating functional micelles to tumors. Papain (Pap)-grafted thiolated hyaluronic acid-Pluronic F127-lithocholic acid triblock copolymer (Pap-THA-g-F127-SS-LCA) was synthesized to obtain papain-functionalized thiolated redox micelles (PT-R-Ms). The mucolytic and tumor extracellular matrix-degrading properties of papain facilitated the diffusion of paclitaxel-loaded PT-R-Ms. Furthermore, PT-R-Ms exhibited glutathione-triggered release, mimicking the tumor microenvironment and enabling enhanced intracellular tumor penetration, thereby resulting in high tumor cytotoxicity. The PT-R-Ms were spherical, with an average particle size of 80 nm, a negative zeta potential of -29 3.85 mV, and a high encapsulation efficiency of 80 3.29% for paclitaxel. In vitro anticancer studies demonstrated significantly higher cytotoxicity of PT-R-Ms against HCT-116, Hep-2, and RD cancer cell lines compared to free paclitaxel. PT-R-Ms also showed superior tumor tissue penetration, as indicated by maximum fluorescence intensity. In summary, this delivery system addresses current clinical challenges by enabling site-specific release of paclitaxel, thereby minimizing off-target toxicity. The targeted drug delivery using such nanocargoes holds strong potential to advance the field of drug delivery and contribute to solving real-world clinical problems.

Keywords

Extracellular Matrix, Mucolytic Barrier, Mucopenetrating Micelles, Tumor Milieu



Development of an Eco-Friendly High Performance Liquid Chromatographic Method for Determination of Cardiovascular Drugs in Combination

Shaista Qamar, Ammara Zahid,Sadia Chamun,Waqas Ilyas,Abu Safyan, Shahid Ali, Muhammad Ahmad,Muhammad Usama and Amna Munir

Institute of Pharmaceutical Sciences, University of Veterinary and Animal Sciences, Lahore, Pakistan

Presenter

Shaista Qamar

Type

Oral Presentation

Track

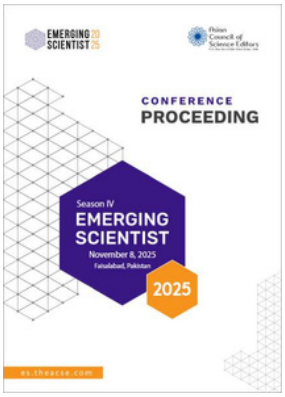
Medical & Health Sciences

Abstract

Currently, pollution is the dominant issue in the world, so "Green Revolution is the Best Solution to Save the World". Green analytical chemistry is making the world more sustainable and pollution-free by introducing eco-friendly methods which not only protect the environment but also are non-expensive, consume less amount of solvents, energy & time while doing analysis of pharmaceuticals by replacing traditional solvents with green solvents. The green solvents include propanol, isopropanol, ethyl lactate, propylene carbonate, and many others. Among them, ethanol and water are the most eco-friendly solvents, which were used for the analysis of metoprolol and amiodarone instead of acetonitrile and methanol, which are hazardous to nature and the analyst. By using the green solvents, with less time & energy consumption, the method was developed and validated by ICH guidelines and USP monographs. The conditions were optimized according to the elution of the AMD and MTP with green mobile phase in a gradient system of RP-HPLC. After developing the method, all the parameters, linearity, robustness, specificity, accuracy, precision, range, and system suitability have been validated by Q2R1-ICH guidelines. A novel HPLC method was developed, which is not only sensitive, linear, cheap, precise, accurate, along with eco-friendly to make our world greener and cleaner.

Keywords

Green Chemistry, Method Validation, ICH Guidelines, RP-HPLC, Eco Friendly



Integrative Network Pharmacology and Molecular Modeling Reveal Synergistic Honey Bioactive for Concurrent Diabetic Retinopathy and Age- Related Macular Degeneration

Afaq Akram and Fatima Noor

Institute of Molecular Biology and Biotechnology, The University of Lahore, Lahore, Pakistan

Presenter

Afaq Akram

Type

Oral Presentation

Track

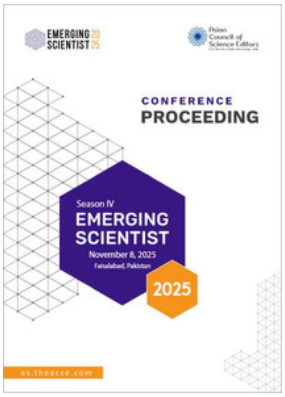
Medical & Health Sciences

Abstract

Age-related macular degeneration (AMD) and diabetic retinopathy (DR) are major causes of vision loss worldwide. These conditions often occur together, sharing overlapping pathological mechanisms such as oxidative stress, inflammation, and abnormal angiogenesis, which create complex challenges for effective treatment. However, therapeutic options that target both conditions simultaneously remain limited. This study employed network pharmacology, molecular docking, and molecular dynamics (MD) simulations to evaluate the efficacy of natural bioactive compounds from honey against DR and AMD. The aim was to investigate their potential bioactivity, map their target genes and disease-related functional pathways, and assess molecular interactions with key disease-related proteins. A total of 170 honey-derived compounds were identified from the literature, and ADMET screening narrowed these down to five potent candidates: taxifolin, morin, epicatechin, rhamnetin, and quercetin. Analysis of a GEO dataset revealed 588 common target genes, which were further examined using DAVID and Cytoscape to identify key pathways such as inflammatory responses and HIF-1 signaling. Protein-protein interaction analysis highlighted STAT3, EGFR, HSP90AA1, SRC, AKT1, TNF, HIF1A, EP300, BCL2, and MAPK1 as hub genes. Molecular docking demonstrated strong interactions of the compounds with EP300, HIF1A, and BCL2, with favorable binding affinities. MD simulations further confirmed the stability of these complexes over time, while density functional theory (DFT) analysis validated the structural stability of the ligands. Honey bioactive compounds modulated key genes and pathways associated with inflammation, oxidative stress, and angiogenesis, and computational analyses supported their potential inhibitory effects on disease progression. Rhamnetin, taxifolin, quercetin, morin, and epicatechin emerge as promising natural therapeutic candidates for DR and AMD by targeting critical signaling pathways, although further experimental validation and clinical studies are required to confirm their therapeutic potential.

Keywords

Diabetic Retinopathy, Age-Related Macular Degeneration, Honey Bioactives, Network Pharmacology, Molecular Modeling, DFT Analysis



Phyto-Emulsomes: A Novel Approach for Enhanced Morin Hydrate Delivery in Leukemia Treatment

[1]Rabab Kamel, [1]Mona M. AbouSamra, [2]Sherif M. Afifi and [3]Asmaa F. Galal

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Presenter
Rabab Kamel

Type
Poster Presentation

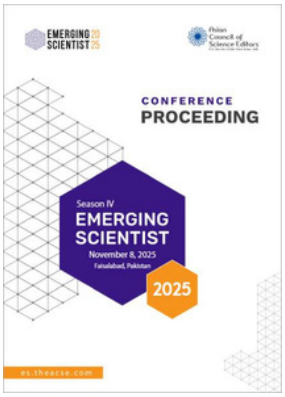
Track
Medical & Health Sciences

Abstract

This research explores the development of morin hydrate-loaded Phyto-Emulsomes (MH-EMs) as a nano-carrier system to combat leukemia. A key innovation in this study is the use of β-sitosterol, isolated from the aerial parts of C. pallescens Delile (Compositae), as a "heart-friendly" alternative to cholesterol in the emulsome formulation. The Phyto-Emulsomes were prepared using varying ratios of glyceryl monostearate (GMS), phospholipon 80H (P80H), and β-sitosterol (SS). These formulations were then evaluated for their particle size, entrapment efficiency, and drug release characteristics. Among the formulations, MH-EM5 (composed of GMS:P80H: SS in a 2:0.5:0.5 ratio) demonstrated superior performance. It exhibited the highest drug release (82.28 1.96%) and the smallest, uniformly distributed particle size (271.7 4.86 nm). Further characterization of MH-EM5 included micro-morphological examination using Transmission Electron Microscopy (TEM), thermal analysis, and extensive biological evaluations. The study also confirmed the biostability of MH-EM5 in both serum and bile salts, indicating its robustness in biological environments. The study also investigated the cytotoxicity of the free drug, MH-EM5, and its unmedicated counterpart against normal oral epithelial cells and acute monocytic leukemia cells. The results were highly promising: all tested samples showed negligible cytotoxicity in normal cells. In contrast, MH-EM5 demonstrated a significant decrease in the viability of cancer cells compared to both the unmedicated formula (EM5) and the free drug, even at concentrations up to 300 µg/ml. Furthermore, an oral bioavailability study confirmed a substantial increase in all measured pharmacokinetic parameters after a single oral administration of MH-EM5 compared to a suspension of the free drug (MH). Based on these compelling findings, Phyto-Emulsomes emerge as a safe and highly promising nanometric delivery system for the oral administration of morin hydrate. This novel approach significantly enhances morin hydrate's solubility, oral bioavailability, and antitumor efficacy.

Keywords

Morin, Nanovesicles, Cancer, Cell Biology, Pharmacokinetics



Antibacterial Efficacy of Silver Nanoparticles Against β-Lactamase-ProducingPseudomonas aeruginosa

[1,2] Maria Muddassir, [2] Syed Zeeshan Haider Naqvi

[1]M. Islam Medical & Dental College, Gujranwala, Pakistan
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Presenter
Maria Muddassir

Type
Poster Presentation

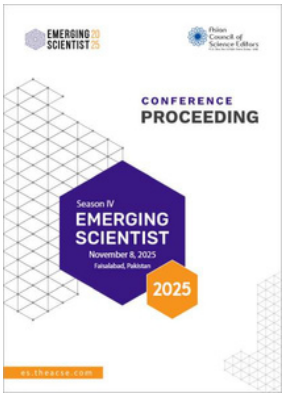
Track
Medical & Health Sciences

Abstract

Globally, carbapenem resistance is a concern, particularly in underdeveloped nations with inadequate medical infrastructure. Over the past 20 years, the emergence of *Pseudomonas aeruginosa* that is multidrug resistant (MDR-PA), considered a critical global health concern and opportunistic pathogen, has been observed. In Pakistan, it is the paramount cause of hospital-acquired infections, especially in postoperative surgical patients, in trauma and burn units, intensive care units, along with individuals having a precedent pulmonary disease like cystic fibrosis. Silver nanoparticles (AgNPs) were investigated for their ability to combat multidrug-resistant (MDR) Pseudomonas aeruginosa, as well as their antibiogram, prevalence, and PCR detection of antibiotic resistance genes. The antibiogram, in addition to drug resistance genes of 255 Pseudomonas aeruginosa isolates from a tertiary care hospital, was examined using PCR and the Kirby-Bauer disc methodology. AgNPs extracellular mycosynthesis was brought about through a combination of silver nitrate salt (AgNO3) precursor salts and culture filtrate of *Aspergillus flavus*. To begin with, visible UV spectroscopy was used to routinely monitor mycosynthesis, recording AgNP peaks at about 400-470 nm. The formation of AgNPs within the 5-30 nm range was confirmed by transmission electron micrographs. Ten antibiotics and AgNPs were examined for their individual and combination antibacterial activities. For both genotypic and phenotypic multidrug resistance, Pearson correlation coefficients (r) were determined. SPSS version 20 was used for data evaluation. Carbapenemase production was elicited by 61.5% of the samples ($p < 0.01$). For blaIMP-1, blaSHV, blaVIM, blaOXA, and blaTEM, the corresponding recorded frequencies were 13%, 32%, 15%, 21%, and 43%. When AgNPs were present, it was shown that the drug's antibacterial efficacy increased. The measurement range for the inhibitory zones was 14-31 mm. When AgNPs were employed alone, their bactericidal effects were less pronounced. The antibacterial activity increased by 0.15-3.51 (average 2.09) when conventional antibiotics and AgNPs were combined. Usually, piperacillin/tazobactam in conjunction with AgNPs produced the highest zone of inhibition or zones. MDR Pseudomonas aeruginosa was efficiently suppressed by AgNPs coupled with antibiotics. To our understanding, this record is the first from Punjab, Pakistan, utilizing the activity of antimicrobial AgNPs in conjunction with the coexpression of Metallo β-lactamase, extended spectrum β-lactamase, along with AmpC β-lactamases.

Keywords

Pseudomonas aeruginosa, Silver nanoparticles, Antibiotic, Metallo β-lactamase



Person-to-Person Transmission of Cancer Cells: Myth or Medical Reality?

Chahrazed Dous
Public Hospital of Theniet El Abed, Batna, Algeria

Presenter
Chahrazed Dous

Type
Poster Presentation

Track
Medical & Health Sciences

Abstract

Cancer is the fastest-growing pathology worldwide and has become a major public health issue, incurring significant costs for both treatment and prevention while potential causes continue to be explored. Various studies examine the pathophysiology and molecular biology of cancer cells, focusing on both endogenous and exogenous factors that can alter the cell cycle and lead to carcinogenesis. Research has also highlighted the mechanisms by which cancer spreads within the same organism. However, the concept of person-to-person cancer cell transmission remains poorly understood and continues to raise important questions. If proven possible, preventive measures would need to be established, and patients may require management similar to that of individuals with contagious infections. This review reports on articles identified through searches of the PubMed, Google Scholar, and Web of Science databases. No date restrictions were applied, and only full free-text articles were included. The objective of this review is to explore the possible mechanisms of cancer transmission, which, although rare in humans, are well- documented in animals such as canines-particularly in the case of Canine Transmissible Venereal Tumors (CTVT). Understanding these mechanisms is essential for preventing potential accidental transmission between patients or from patients to healthcare professionals, as well as for improving the quality and delivery of cancer care.

Keywords

Cancer Cells, Transmission, Contagious, Pathophysiologyy

04 Conference Track

• Physical Sciences & Engineering

Session Moderators:

Dr. Sofiah Hamzah
Lecturer, Universiti Malaysia Terengganu,
Kuala Terengganu, Malaysia

Dr. Kaushik Bharati
Public Health Consultant
UNESCO Inclusive Policy Lab, New Delhi, India

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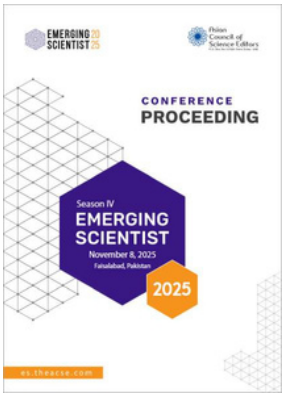


Exploring Solar Energy Adoption in Urban Bangladesh: A Mixed-Methods Study on Renewable Energy Potential in two City Corporations

Ashim Kumar Saha
NETZ Partnership for Development and Justice, Bangladesh

Presenter
AshimKumar Saha

Type
Oral Presentation

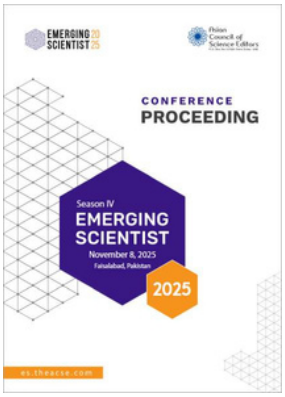
Track
Physical Sciences & Engineering

Abstract

This study explores the potential for solar energy adoption in two urban City Corporations in Bangladesh, aiming to inform a comprehensive action plan aligned with national renewable energy strategies. Using a mixed-methods approach, the research integrates household surveys (n=206) with focus group discussions, key informant interviews, and in-depth interviews. It examines energy usage patterns, stakeholder perceptions, and the readiness of households and institutions to transition to solar electricity. Findings indicate a moderate level of awareness about solar energy, shaped largely by traditional and mass media. However, knowledge gaps remain regarding solar electricity generation, net metering, and government incentive schemes. Most respondents rely on grid electricity, which is often insufficient for their needs. Despite this, over 99% expressed willingness to adopt solar technologies if available through free or subsidized programs. Current household use of solar energy is limited, constrained by high costs, restricted access, and inadequate technical knowledge. The study highlights key barriers such as affordability, lack of awareness, and limited institutional support. Respondents strongly supported government-led measures, including public awareness campaigns, subsidies for solar panels and cookstoves, and easier financing options. Experts and policymakers also emphasized the importance of regulatory reforms, improved technical infrastructure, and capacity- building among local suppliers and technicians. Drawing on these insights, the research proposes actionable strategies to expand solar adoption in urban contexts. These include targeted awareness programs, financial incentives, improved distribution systems, and a clear regulatory framework for solar promotion and grid integration. Such measures are essential for advancing Bangladesh's sustainable development goals and ensuring equitable energy access in urban areas. Overall, this study contributes to the discourse on renewable energy transitions in developing countries and offers a model for scaling solar adoption in densely populated urban settings with socio-economic challenges.

Keywords

Solar Energy, Renewable Energy, Solar Electricity Adoption, Energy Awareness, Grid Electricity, Net Metering.



Dielectric and Electrical Properties of Polyetherketone–Silica Nanocomposites for High-Performance Electronic Applications

Mandar J Joshi
Dr S and S S Ghandhy College of Engineering & Technology Surat ,India

Presenter
Mandar J Joshi

Type
Oral Presentation

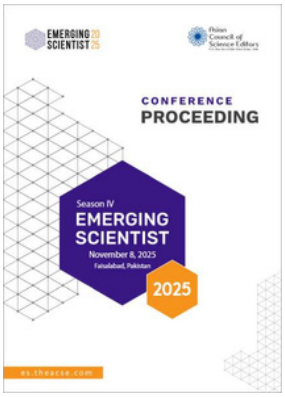
Track
Physical Sciences & Engineering

Abstract

Poly(ether-ketone) (PEK) is a high-performance engineering thermoplastic widely recognized for its excellent thermal stability, chemical resistance, and mechanical strength. These attributes make PEK attractive for electronic packaging and insulation; however, its relatively high dielectric constant and limitations in electrical performance restrict its direct use in advanced electronic applications. To address these challenges, PEK-silica nanocomposites were developed and investigated with a focus on their dielectric, electrical, thermal, and mechanical behavior. Nanocomposites containing 0-30 wt% SiO_2 were fabricated using a planetary ball mill followed by hot pressing. Microstructural analysis revealed well-dispersed nanoparticles with minimal agglomeration, particularly at lower concentrations. Dielectric studies showed that the incorporation of silica reduced the dielectric constant while maintaining low dielectric loss, thereby improving suitability for high-frequency electronic applications. Electrical characterization further confirmed excellent insulating behavior across a wide frequency range. Complementary property evaluations highlighted the multifunctional potential of these nanocomposites. The addition of 30 wt% SiO_2 increased microhardness by over 50% compared to neat PEK. Thermogravimetric analysis demonstrated thermal stability exceeding 560 °C, while dynamic mechanical analysis indicated a >100% increase in storage modulus below Tg and a >250% increase above Tg. Scanning electron microscopy confirmed homogeneous filler dispersion with strong polymer-filler interfacial interactions. These findings demonstrate that PEK-SiO_2 nanocomposites effectively integrate enhanced dielectric, electrical, mechanical, and thermal properties, making them promising candidates for next-generation high-performance electronic packaging and insulation components. This work further illustrates the role of nanofiller engineering in tailoring polymer properties to meet the evolving demands of modern electronic technologies

Keywords

Poly(ether-ketone), Silica Nanocomposites, Dielectric Constant, Electrical Insulation, Electronic Packaging



An Integrated Solar-Powered Greenhouse Model for Sustainable Agriculture, Education, and Research

Abdelazim Negm
Water and Water Structures Engineering Dept., Faculty of Engineering, Zagazig University, Egypt.

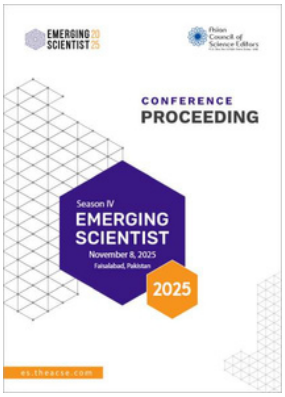
Presenter
AbdelazimNegm

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract
This research presents a comprehensive, integrated agricultural model designed to address critical challenges of water and energy scarcity. The system's core is a solar energy array that powers a small-scale desalination unit, providing all the necessary water for the entire operation. This approach ensures self-sufficiency and significantly reduces the carbon footprint. The project employs a dual-crop strategy with an automated, modern drip irrigation system. Inside the greenhouse, high-value crops, including various vegetables and other economically valuable plants, were cultivated. Outside the greenhouse, it utilizes the same modern drip irrigation for cultivating salt- tolerant crops such as halophytes and canola, demonstrating the system's adaptability to marginal lands. A sophisticated monitoring system is seamlessly integrated, using a network of sensors to provide real-time data on key environmental parameters like soil moisture, temperature, and nutrient levels. This real-time feedback loop allows for precise resource management, ensuring optimal plant health and maximizing yields. Beyond its agricultural function, the entire system is designed as a multi-purpose platform. It serves as a practical training center for local farmers, offering valuable skills and knowledge in modern agricultural practices. The model also provides expert consultation services for other greenhouse owners, helping to propagate sustainable techniques. Furthermore, it functions as a state-of-the-art educational laboratory for students and a dedicated research facility for higher studies, promoting innovation and knowledge creation. This multi-functional design showcases the model's versatility and its potential to build resilient, self-sufficient agricultural communities in arid regions. This work was supported by the British Council (BC) of the UK (No. 332435306) and the Science & Technology Development Fund (STDF) of Egypt (No. 30771), through the project titled "A Novel Standalone Solar-Driven Agriculture Greenhouse Desalination System That Grows its Energy and Irrigation Water" via the Newton Musharafa funding scheme.

Keywords
Solar Energy, Desalination, Smart Irrigation, Greenhouse, Sustainable Agriculture



Quasi-Dynamic Modeling of a Generic Turbojet Engine Using System Identification Techniques

Muhammad Umer Sohail, Saadullah Babar and Shaazil Atique
Institute of Space Technology, Islamabad, Pakistan

Presenter

Muhammad Umer Sohail

Type

Oral Presentation

Track

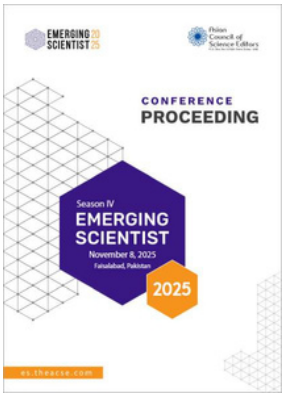
Physical Sciences & Engineering

Abstract

This study presents a quasi-dynamic modeling framework for a small turbojet engine using system identification techniques to develop an accurate and computationally efficient predictive model. The research aims to capture the transient behavior of the engine under varying Mach numbers, altitude, and throttle conditions, providing a reliable foundation for aerospace propulsion system analysis and optimization. A comprehensive dataset was generated using GasTurb 14, covering a wide range of operational scenarios to ensure model robustness. To establish an effective predictive model, polynomial regression, artificial neural networks (ANNs), and Gaussian Process Regression (GPR) were employed for system identification and parameter estimation. The identified models were validated using MATLAB's System Identification Toolbox and further implemented in Simulink to simulate time-dependent engine responses under dynamic conditions. Simulation results indicate high predictive accuracy for key performance metrics, particularly net thrust and exhaust gas temperature (EGT), with minor deviations observed in fuel flow rate, suggesting potential areas for refinement. The ability to accurately capture turbojet engine dynamics using data-driven methodologies demonstrates the effectiveness of system identification techniques in propulsion modeling. This research contributes to the advancement of virtual engine modeling, offering scalable applications in aerospace propulsion optimization, real-time performance analysis, and aircraft system simulation. The findings underscore the significance of integrating machine learning techniques in aero-engine diagnostics and predictive modeling, paving the way for enhanced engine health monitoring, fault detection, and performance optimization. By leveraging computationally efficient system identification methodologies, this study provides valuable insights into turbojet engine control strategies, supporting next-generation developments in intelligent propulsion systems and autonomous flight technologies.

Keywords

Turbojet Modeling, System Identification, Quasi-dynamic Modeling, Artificial Neural Networks, Gaussian Process Regression, Aerospace Propulsion Systems



Hybrid Solar Power System Using Stirling Engine and Phase Change Material for Energy Storage: Design, Optimization and Efficiency Enhancement

[1]Sulaiman Al-Hashmi, [1]Mingjie Chenb, [2]Amira Al-Rajhib, [2]Rasha Al-Saadib

[1]Center for Environmental Studies and Research, Sultan Qaboos University, Muscat, Oman

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Presenter

Sulaiman Salim Al Hashmi

Type

Oral Presentation

Track

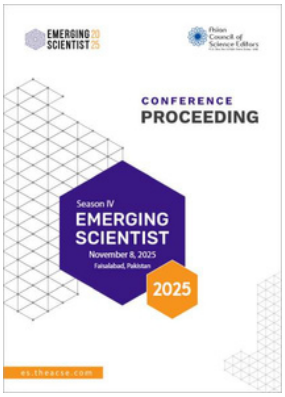
Physical Sciences & Engineering

Abstract

To address the challenges of high energy prices and network losses, decentralized power generation has become essential. Stirling engines, known for their remarkable efficiency, offer an economically viable solution by harnessing solar energy, which is not suitable for internal combustion engines. Solar Stirling engines have the potential to be commercialized and utilized for decentralized electricity generation on a small to medium scale. A critical aspect of setting up an efficient solar Stirling engine system is the selection and design of the collector. This research aims to develop a novel hybrid parabolic dish system integrated with a Stirling engine and thermal storage. The installation of this hybrid design is complex and has been divided into three main sections: the parabolic Stirling system (2m2), the parabolic thermal receiver system (6m2), and the phase-change materials thermal storage system that connects both systems. An in-depth study has been conducted on a meticulously designed 50-watt solar parabolic collector optimized for Stirling engines, with the incorporation of optical energy storage and thorough thermal analysis. In this setup, solar energy is concentrated and directed towards a fluid-filled pipe through a mirror arrangement. SolidWorks software was employed to determine collector parameters, considering geographic, temporal, and environmental conditions, fluid inlet temperature, and other relevant factors. The results demonstrate that the Stirling engine exhibits oscillating performance in response to temperature fluctuations. Testing confirms that the prototype model achieved a net output power of up to 50 W at a temperature of 330 °C, effectively storing energy and extending production capabilities until midnight. While initial experiments yielded unsatisfactory production power, the integration of an additional 4 hours of operation with the thermal control system significantly improved performance.

Keywords

The Stirling engine, Parabolic solar system, Solar heat storage system, Phase change materials (PCM)



Temperature-Driven Solubility and Recovery of Manganese in Magnesium with Effects on Microstructure, Mechanical Properties, and Corrosion Behaviour

[1]Sonam M. Patel and [2]Vandana J.Rao

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[2]Metallurgical & Materials Engineering Department, Faculty of Technology & Engineering, The M. S. University of Baroda, Vadodara, India

Presenter

Sonam Mukeshkumar Patel

Type

Oral Presentation

Track

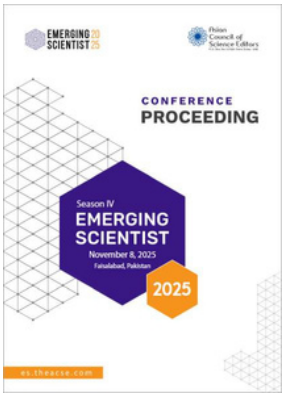
Physical Sciences & Engineering

Abstract

Magnesium alloys are preferred for lightweight applications because of their low density and unique properties. However, their lower strength and corrosion resistance compared to aluminium alloys limit their use in outdoor environments. To overcome these shortcomings, manganese is added to magnesium alloys to improve corrosion resistance, enhance mechanical properties, and mitigate the detrimental effects of iron (Fe) impurities. Manganese solubility and recovery in magnesium depend greatly on temperature, type of manganese added, and other alloying elements. The present work investigates the solubility and recovery of manganese in pure magnesium by preparing five Mg-Mn systems at temperatures ranging from 750 °C to 950 °C. EDS was used to determine the actual manganese retained in the alloy, while XRD confirmed the coexistence of primary magnesium and α-Mn phases. XRD results show that manganese partially dissolves in the Mg matrix, with the excess precipitating as α-Mn. It was found that manganese recovery increased with increasing temperature, reaching a maximum at 950 °C. Microstructural analysis revealed that the addition of manganese refined the coarse grains of pure magnesium. This grain refinement contributed to reduced ductility while increasing hardness and UTS. Among the five systems developed, Mg-2.66% Mn alloy treated at 850 °C showed the best overall performance, with a hardness of 58 HV0.1 and a UTS of 140 MPa. In addition, corrosion tests conducted for 24 h and 48 h in a 3.5 weight percent NaCl solution indicated that alloys with higher manganese content exhibited significantly improved corrosion resistance compared to pure magnesium.

Keywords

Magnesium Alloys, Manganese Solubility, Microstructure, Mechanical Properties, Corrosion Resistance



Materials for Soft Electronics

Naveen Tiwari
Faculty of Medicine and Health Technology, Tampere University, Finland

Presenter
Naveen Tiwari

Type
Oral Presentation

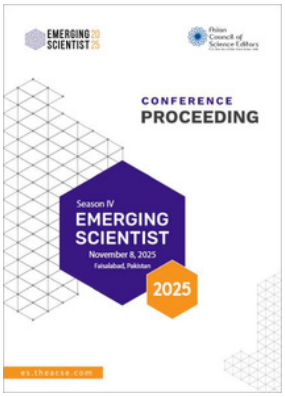
Track
Physical Sciences & Engineering

Abstract

Next-generation electronics, such as wearable devices, electroluminescent displays, and transparent electronics, require advanced polymer material systems with enhanced functionality, durability, and extended shelf life to support widespread applications. However, continuous exposure of these polymeric materials to abrasion, impact, and various mechanical, chemical, and thermal stresses leads to the deterioration of their physical and chemical properties, ultimately resulting in mechanical failure. Additionally, the rigidity of traditional hard materials limits the adaptability and flexibility of conventional robots. In contrast, the intrinsic compliance and adaptability of soft materials empower soft electronics to perform functions beyond the capabilities of rigid systems. Among these materials, elastomeric materials stand out for their ability to undergo large deformations, respond quickly, and exhibit high energy density under external electrical stimuli, making them highly promising for soft electronics, including soft robotics applications. Hence, growing demand has led to the exploration of polymeric, transparent, and conductive active materials that can be utilized for soft electronics. To prevent the failure of active materials, various functional polymers emerge as promising candidates for designing next-generation technologies, including flexible and conformable electronics subjected to constant mechanical stress. These polymers can repair themselves when damaged, restoring the original properties of the parent material, which significantly enhances their endurance and lifespan in real-world applications.

Keywords

Self-Healing Materials, Sensors, Soft robots, Actuators



Thermotropic Cholesteric Phase Study of the Emerging Display Technology Using Zeolite Catalyst

[1]Mujtaba Ellahi, [2]Shahista Taimur, [3]Adnan Murad Bhayo, [4]Muhammad Furqan Ali, [5]Fatima Bibi, [6]Mahnoor Gull and [7]Irtiza Najeeb

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Presenter
Mujtaba Ellahi Arain

Type
Oral Presentation

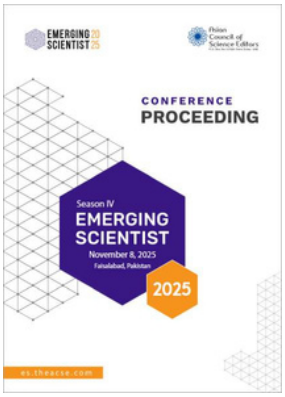
Track
Physical Sciences & Engineering

Abstract

This study explores the thermotropic cholesteric phase behavior of liquid crystals (LCs) influenced by zeolite catalyst to enhance performance in emerging PDLC (polymer-dispersed liquid crystal) film display technologies. Cholesteric liquid crystals, characterized by their helical molecular arrangement and selective reflection of circularly polarized light, offer significant potential for reflective and bistable display applications. The integration of zeolite catalysts, microporous crystalline sodium aluminum silicate (Na_2 Al_2 Si_2 O_8 XH_2O) known for their high surface area and catalytic activity, introduces a novel method to control and stabilize the cholesteric pitch and phase transition temperatures of these LCs through a combination of polarized optical microscopy (POM), scanning electron microscopy (SEM), LCT detector tester parameters, and UV-Vis spectroscopy. The thermal and optical behavior of cholesteric systems doped with varying zeolite concentrations was analyzed. The resultsdemonstrate that zeolite catalysts not only enhance thermal stability and responsiveness but also enable fine-tuning of optical properties critical to display performance. In addition, differences in viscosity, heat stability, and monomer methyl (-CH_3) chain length among the different cross-linking agents must be considered. This approach paves the way for developing low-power, high-resolution, and environmentally adaptive display technologies based on advanced LC-zeolite hybrid systems. The findings suggest that zeolite-doped CLCs can significantly contribute to the advancement of low-power, tunable, and environmentally adaptive intelligent PDLC films that support sustainable technologies. Nevertheless, improved mechanical and thermal stability remains necessary, particularly for applications involving flexible electronics and smart windows.

Keywords

Thermotropic Phase, Intelligent PDLC Films, Zeolite, SEM, Sustainable technology



Assessment of Background Ionizing Radiation and Pediatric X-ray Exposure Risks at Rivers State University Teaching Hospital, Nigeria

Olinya Lilian Chidinma, Yehuwdah E. Chad-Umoren and Adizua Okechukwu Frank

University of Port Harcourt, Rivers State, Nigeria

Presenter

Olinya Lilian Chidinma

Type

Oral Presentation

Track

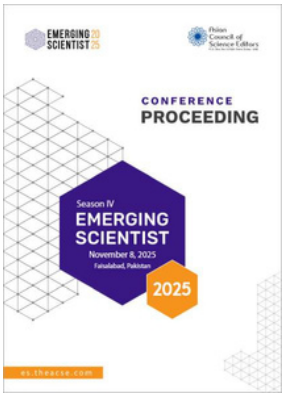
Physical Sciences & Engineering

Abstract

Nigeria's Niger Delta grapples with environmental stressors, including hydrocarbon pollution and geological radon, amplifying ionizing radiation risks in healthcare. Pediatric populations, which are 2-3 times more radiosensitive than adults due to their rapid cellular proliferation and longer latency for stochastic effects, face heightened vulnerability. Yet, comprehensive radiation assessments in sub-Saharan Africa remain scarce, perpetuating global disparities in safety standards. This study highlights critical gaps between international benchmarks and practices at a leading Nigerian hospital, underscoring the need for a reevaluation of pediatric radiation safety in resource- limited settings. To conduct a pioneering evaluation of background ionizing radiation (BIR) and pediatric X-ray exposure risks at Rivers State University Teaching Hospital, providing foundational data to enhance radiation protection across developing healthcare systems. A dual-phase approach integrated geospatial BIR monitoring with patient-specific dosimetry. In-situ measurements at 37 hospital loci utilized calibrated Digilert-200 survey meters with GPS localization. Optically stimulated luminescence dosimeters captured real-time exposure for 39 pediatric patients (aged 3-15 years) during routine X-rays. Dosimetric indices like the entrance surface dose (ESD), absorbed doses, effective doses, and excess lifetime cancer risk (ELCR) were computed using ICRP-validated coefficients and Monte Carlo-derived factors. BIR surveillance revealed 55% of indoor sites exceeding ICRP thresholds, peaking at 0.020 0.002 mR hr-1 near radioactive waste storage 54% above norms. Outdoor levels ranged from 0.008 0.002 to 0.020 0.002mR hr-1 (mean: 0.011 0.003 mR hr^{-1}). Pediatric dosimetry showed variability: chest X-rays (40% of procedures) averaged 0.009 mGy ESD, while skull and abdomen examinations reached 0.368 mGy and 0.371 mGy, respectively. Tube voltage strongly correlated with dose ($R = 0.73$, $p < 0.05$), indicating inconsistent techniques.ELCR values (0.37 × 10-3 to 0.96 × 10^{-3}) surpassed the global threshold (0.29 × 103), signaling elevated oncogenic risks. This investigation uncovers significant radiation safety deficiencies in Nigerian pediatric healthcare, with ambient levels and cumulative risks exceeding international standards. While individual doses align with reference levels, environmental hotspots and variable protocols pose long-term health threats. Urgent reforms, including enhanced shielding, standardized imaging, and national pediatric reference levels, are critical to safeguarding vulnerable populations in developing nations.

Keywords

Pediatric Radiosensitivity, Background Ionizing Radiation, Entrance Surface Dosimetry, Stochastic Risk Modeling, Radioprotective Policy



Using Plastic Waste for the Water Treatment

[1]Umer Shafique, [2]Muskan Saher and [3]Faheem Hassan Akhtar

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Presenter

MuhammadUmer Shafique

Type

Oral Presentation

Track

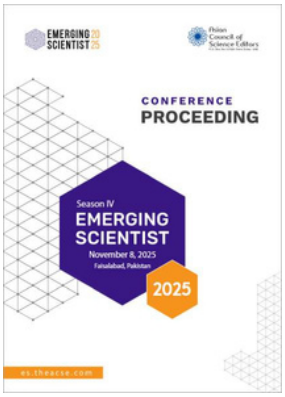
Physical Sciences & Engineering

Abstract

Waste plastic-based membranes represent a promising and sustainable approach for removing pollutants, including emerging contaminants, from water sources. Plastic waste is an abundant, low-cost, and economically viable raw material for fabricating functional membranes. Various modification techniques, such as surface functionalization, nanomaterial incorporation, and polymer blending, can significantly improve the physicochemical properties and filtration efficiency of these membranes. Depending on their design, they can be applied in microfiltration, ultrafiltration, and nanofiltration processes, enabling the removal of a broad spectrum of pollutants, ranging from heavy metals to pharmaceuticals. In contrast to conventional membranes, which are typically produced from non-renewable and expensive polymers, recycled plastic-based membranes are both cost-effective and environmentally friendly. Their use not only reduces reliance on virgin polymer sources but also helps mitigate plastic waste accumulation, aligning with global sustainability goals. Furthermore, these membranes can reduce the overall cost of water treatment technologies, making them more affordable and accessible. By enhancing water purification efficiency and promoting resource recovery, modified waste plastic membranes actively support the principles of the circular economy. This research contributes directly to Sustainable Development Goal (SDG) 6 (Clean Water and Sanitation) by providing innovative solutions for safe and affordable water treatment, while simultaneously advancing SDG 12 (Responsible Consumption and Production) by fostering the reuse of plastic waste and minimizing environmental impact through circular resource management.

Keywords

Waste Plastic Membranes, Water Purification, Emerging Contaminants, Circular Economy, Sustainable Development Goals (SDGs)



Retq and Fataq in Light of the Theory of Continua and Duality – An Alternative Cosmological Vision

Hussein Azzaz Murad
National Research Centre, Cairo, Egypt

Presenter
Hussein Azzaz Murad

Type
Oral Presentation

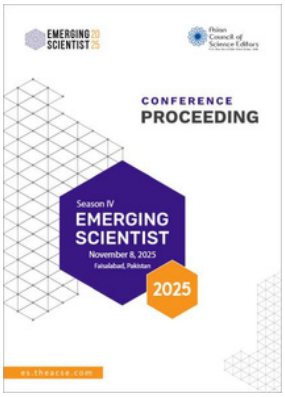
Track
Physical Sciences & Engineering

Abstract

According to the Theory of Continua, the universe was created according to standards of utmost precision and creativity. It is expanding within a stable space-time continuum that has remained unchanged since the beginning of creation. Based on what is stated in the Qur'an, the universe was originally composed of two distinct, conjoined layers, described by the term Retq, which represents the primary nucleus of the cosmos, characterized by unimaginable density and mass. Among its essential components was water. Prophetic traditions affirm that water existed before the universe itself: "There was Allah and nothing else, and His Throne was upon the water." This implies that oxygen and hydrogen were already created before the formation of the universe, and perhaps other elements as well. Upon further analysis, it can be suggested that the Retq, due to its extreme pressure, density, and heat, provided an appropriate medium for the synthesis of heavier elements such as iron, cobalt, nickel, and other metals, unless some of them were already created along with hydrogen and oxygen. The Retq may thus be considered a cosmic embryo that developed over an era, forming various components, including water and elements. To understand the composition of the Retq, one may examine the current composition of Earth and other planets, as they represent physical samples from the Retq (albeit with later modifications). Then came the moment of Fataq, which may be likened to childbirth in human terms. This stage occurred with great precision and creativity, not as a random, chaotic explosion. Through this Fataq, massive and dense cosmic bodies were launched, including black holes, neutron stars, stars, planets, and accumulations of dark matter. These bodies, with their immense gravitational forces, interact with a portion of the Retq that was not disintegrated, which now acts as a colossal central gravitational core whose influence extends across the full range of the expanding universe. In contrast, a vast gaseous black cloud was released, enveloping these cosmic objects that moved into predetermined paths and orbits with remarkable precision, forming the primordial or "mother" sky. This great cloud carried with it intense centrifugal dispersion energy, accompanied by massive momentum resulting from the Fataq. All known forms of energy were released during this stage.

Keywords

Theory of Continua, space-time continuum, Retq, Fataq



Design, Implementation, and Theoretical Analysis of Fractional Order Iterative Methods

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National University of Modern Languages, Islamabad, Pakistan

Presenter
Naila Rafiq

Type
Oral Presentation

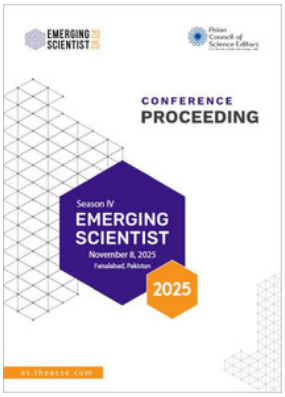
Track
Physical Sciences & Engineering

Abstract

This research aims to design and implement new iterative methods for solving nonlinear equations using the tools of fractional calculus. Classical iterative techniques such as Newton-Raphson and its variants are widely used for root-finding; however, they often struggle with issues related to convergence speed, divergence near singularities, and sensitivity to initial guesses. Fractional calculus, which generalizes traditional differentiation and integration to non-integer orders, offers promising features such as memory effects and greater flexibility. These characteristics can be effectively utilized to improve the performance of root-finding algorithms. The primary focus of this study is to develop fractional order iterative methods by incorporating Caputo and Riemann-Liouville derivatives into classical schemes. The theoretical formulation of these methods will be accompanied by rigorous convergence and stability analysis. By varying the fractional order parameter, we aim to observe its influence on the behavior of the iterative process, to identify optimal conditions for faster and more reliable convergence. In addition to theoretical work, the study includes numerical implementation and experimentation. Various test functions and nonlinear models will be used to validate the efficiency and accuracy of the proposed methods. Comparative analysis with standard iterative techniques will highlight the advantages of the fractional approach in terms of residual error, number of iterations, and robustness. The outcomes of this research are expected to contribute significantly to the field of numerical and computational mathematics, offering new tools that are both mathematically sound and practically applicable. These methods have potential applications in physics, engineering, and other disciplines where nonlinear equations frequently arise and classical methods are insufficient.

Keywords

Iterative Methods, Nonlinear Equations, Caputo Derivative Riemann-Liouville Derivative, Convergence Analysis, Stability Analysis, Fractional Order Algorithms, Root-Finding Techniques Numerical Methods, Fractional Newton Method



Assessment of Groundwater Potential Using Dar-Zarrouk Parameters in the Vikasnagar Block, Dehradun District, Uttarakhand

Somvir Singh
Central Ground Water Board Mid Eastern Region, Patna-800001, India

Presenter
Somvir Singh

Type
Oral Presentation

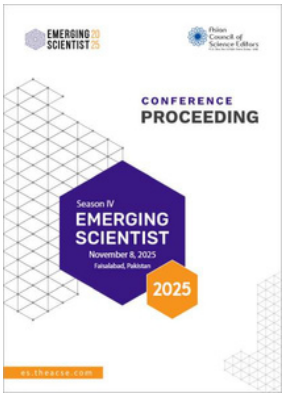
Track
Physical Sciences & Engineering

Abstract

The present study aims to characterize the geoelectrical properties of the aquifers and estimate their hydraulic parameters in the study area. For this study, twenty vertical electrical soundings have been carried out, and data were analyzed using 1-D inversion software. Qualitative evaluation recognized four primary geoelectric layer patterns known as HK curves (ρ1 > ρ2 < ρ3 > ρ4) and KH curves (ρ1 < ρ2 > ρ3 < ρ4). After interpretation of VES data shows seven to eight geoelectric layers, with resistivity ranging from 23.68 Ω-m to 257.53 Ω-m and an average resistivity of 121.06 Ω-m. The main aquifer was located within the three to seven geoelectric layers, consisting of alluvium, sediment, weathered or fractured phyllites, granite, quartzite & sand. The aquifer depth varied from 7.03 to 114.7 meters (average 65.08 meters), and its thickness ranged from 17.22 to 68.13 meters (average 36.92 meters). Hydraulic characteristics derived from the geoelectric data indicated a porosity range of 37.69% to 61.01% (average 48.43%), protective capacities from 0.07 to 1.63 ohm (average 0.48 ohm), and transverse resistance between 805.20 and 14236.81 Ωm2 (average 4765.36 Ωm2). Transmissivity values ranged from 37.51 to 799.26 m/day (average 243.42 m/day), transverse resistivities from 10.59 Ω-m to 208.14 Ω-m (average 86.15 Ω-m), longitudinal resistivities from 19.74 Ω-m to 864.13 Ω-m (average 280.98 Ω-m), effective resistivity from 23.68 to 257.53 Ω-m (average 130.83 Ω-m), and anisotropy values from 0.27 to 2.79 (average 0.77). Hydraulic conductivity varied between 2.18 and 20.18 m/day (average 7.37 m/day). The predictable Dar-Zarrouk parameters served as a source for evaluating aquifer hydraulic conductivity and transmissivity. Dar-Zarrouk parameters were utilized to assess groundwater potential, classifying the area into moderate and good productivity zones. This study demonstrates the efficacy of surface geophysical methods in estimating aquifer hydraulic characteristics where pumping test data are unavailable.

Keywords

Electrical method, VES, Dar-Zarrouk Parameters, Hydraulic Parameters, Longitudinal Resistivity, Transverse Resistivity and Anisotropy



Synthesis of ZnO Nanoparticles for Inverse Opal Photonic Crystals Using a Non-Aqueous Sol–Gel Technique at Room Temperature

Cliff Orori Mosiori
Technical University of Mombasa, Kenya

Presenter
Cliff Orori Mosiori

Type
Oral Presentation

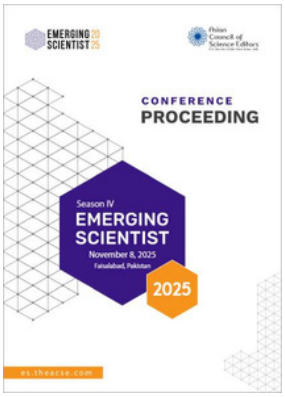
Track
Physical Sciences & Engineering

Abstract

This study reports the synthesis of ZnO nanoparticles (NPs) using a non-aqueous sol-gel technique with zinc acetate dihydrate, ammonium hydroxide, and ethanol. After calcination, a nanocrystalline powder was obtained and its optical, morphological, and structural properties were investigated. Optical emission and absorption were analyzed using fluorescence and absorption spectrometers. XRD analysis revealed a hexagonal wurtzite polycrystalline structure with prominent peaks corresponding to the (100), (002), and (101) planes. Texture coefficient values indicated preferential growth along the c-axis. Lattice constants, d-spacing, bond length, unit cell volume, lattice strain, and dislocation density were calculated using Scherrer's formula, GSAS software, and the Williamson-Hall method. Scherrer's analysis yielded a dislocation density of 4.018 × 10-3 nm-2, microstrain of 5.322 × 10-3 , and a crystallinity index of 47.2%. Surface morphology observed through SEM and TEM confirmed the XRD findings, showing crystallite sizes in the 15-20 nm range. EDS analysis indicated a Zn:O atomic ratio of 0.95. Results suggest that lattice strain arises from excess grain boundary volume generated by dislocations. XRD line broadening can be attributed to dislocations, deformations, microstrain, and crystallite size effects, while peak broadening reflects a combination of instrumental effects and root-mean-square strain.

Keywords

Microstrain, Texture Coefficient, Deformations, Crystallinity Index, Dislocation Density



AI Driven Optimization and Adaptive Control for Smart Microgrid Resilience under Renewable Uncertainty

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WulfranFendzi Mbass

Type

Oral Presentation

Track

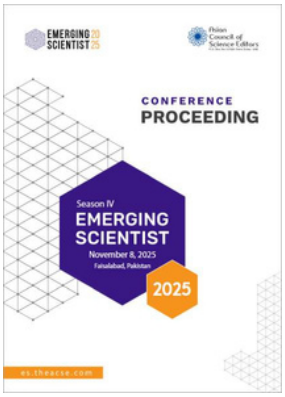
Physical Sciences & Engineering

Abstract

The growing use of renewable energy sources, especially solar photovoltaic (PV) and wind, in microgrids makes things more unpredictable and variable, which makes it harder to control voltage, improve power quality, and keep the grid stable overall. This study shows a strong and flexible control framework that will make smart microgrids more resilient and efficient when there are a lot of renewable energy sources. The suggested design combines real-time forecasting, multi-objective optimization, and AI- based control methods in a way that helps keep the system reliable even when renewable energy sources are not always available. The main part of this system is a hybrid metaheuristic optimization engine that uses both Genetic Algorithms (GA) for exploration and Particle Swarm Optimization (PSO) for convergence. This engine manages the best use of distributed energy resources (DERs) and battery storage systems based on short-term projections of renewable energy generation and changes in load. The adaptive controller makes system reactions even better in real time to keep the voltage stable and cut down on power losses when conditions change. The efficiency of the proposed system was examined using a simulated Canadian rural microgrid, combining accurate weather patterns and load data. The findings of the simulation show that voltage deviations are 25% to 40% lower, the energy balance is better, and the grid is better prepared to handle forecast mistakes and rapid changes in renewable energy. This study shows how important it is for microgrid operations to have intelligent energy management systems that combine forecasting, optimization, and adaptive control. The suggested system uses edge-level intelligence and predictive analytics to create a scalable path toward smart grid infrastructures that can handle the changing behavior of renewable energy sources.

Keywords

Renewable Energy Integration, Smart Microgrid, Voltage Stability, AI Control, Metaheuristic Optimization, Energy Storage Scheduling



A Note on Some Structures of Generalized Groups

Nosratollah Shajareh Poursalavati
Shahid Bahonar University of Kerman, Iran

Presenter

NosratollahShajareh Poursalavati

Type

Poster Presentation

Track

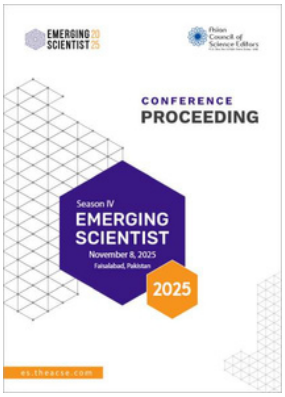
Physical Sciences & Engineering

Abstract

The concept of algebraic structures has undergone significant evolution, expanding beyond classical group theory to encompass more generalized forms such as g-groups, e-groups, and now Ubat-spaces. These structures play a crucial role in various mathematical disciplines, including topology, number theory, and abstract algebra. Ubat-spaces represent a novel algebraic structure with distinct properties, bridging concepts from group theory and generalized algebraic systems. This study explores their foundational properties, examines their relationships with g-groups and e-groups, and investigates their potential applications in mathematical modeling and computational structures. Recent advancements in algebraic topology and category theory provide new perspectives on the significance of Ubat-spaces. The study further highlights their role in modern algebraic systems and their applications in logic circuits and abstract algebra. Let G be a non-empty set. A binary operation in G is a function * : G×G → G. We denote the image of (a; b) by a * b or for brevity ab. An algebra (G; *) (where * is a binary operation in G) is a group if the following properties hold: (G1) x * (y * z) = (x * y) * z for all x; y; z in G; (G2) There exists an element e in G (called an identity element) such that e * x = x * e = x for all x in G; and, (G3) For each a in G, there is an element b in G such that a * b = b * a = e (where e is an identity element mentioned in G2).

Keywords

Generalized Groups, g-groups, e-groups



Sustainable Development through Local Resources for Digital Currency Mining: A Strategic Area Assessment Approach

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[1]Department of Industrial Management, University of Tehran, Tehran, Iran

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Presenter

Hasa Narabameri

Type

Poster Presentation

Track

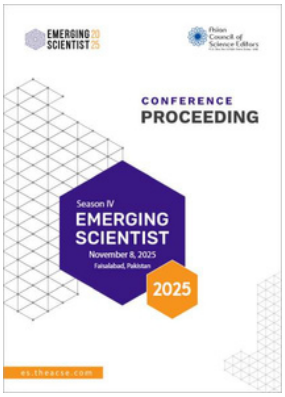
Physical Sciences & Engineering

Abstract

Dynamism is the fundamental element in all phenomena in the world. Humans perceive phenomena through systems concepts and study their dynamic behaviors over time. One practical method of systems concepts is the Strategic Area Assessment (SAA), which is used as a tool for local and regional development. The SAA identifies the potential facilities specific to a local area and the most probable strategies for innovation. Therefore, the main purpose of this research is to investigate the application of the SAA method as a case study for the sustainable development of the Torud region within the mining industry and digital assets (while addressing the issue of electricity shortage resulting from mining). In this study, a strategic assessment approach, which is considered one of the soft operations research methods, was used. Within this approach, A wide range of stakeholders were involved, and based on their knowledge, their readiness to pursue new pathways is strengthened. In this research, the five main stages of the SAA have been implemented as follows: a conference consisting of 54 stakeholders and experts in the mining and digital currency industry in Torud village was formed. The Innovation Compass was also used as the main tool of SAA. After identifying the 9 components and 45 sub-components of SAA, and after conducting key questions regarding the past and present, the final score of each component and sub-component was obtained. These scores were plotted in a spider web diagram to identify strategic priorities for innovation in the mining and digital currency industry. In the final stage, the identified priorities were used to draw a forward path. With the help of the Strategic Area Assessment tool, not only is the problem of electricity shortage for cryptocurrency miners addressed, but utilizing the region's potential resources (solar energy) also makes electricity more accessible and cost-effective through solar panels. This approach not only results in cost savings but also generates additional income, fostering the sustainable economic development of the region. Strategic Area Assessment, including methods of systems thinking and soft operations. Research has been rarely used in Iran and is very limited in research worldwide. Hopefully, this study will serve as a source for further research, both globally and especially in Iran.

Keywords

Mining Industry, Digital Currencies, Strategic Area Assessment, Torud village



Advancing Solar Energy Infrastructure in Sistan and Baluchistan: The Role of Private Sector, Government, and Public Participationation

Iman Elahi and Mohadeseh Fatemi
Azad University, Mashhad Branch, Iran

Presenter
Iman Elahi

Type
Poster Presentation

Track
Physical Sciences & Engineering

Abstract

It is proposed to establish a large-scale, integrated network of solar power plants across Sistan and Baluchestan province, ranging from small, distributed rooftop or community installations to utility-scale solar farms. The primary aims are to significantly reduce regional and national dependence on fossil fuels, dramatically improve sustainable electricity access in underserved rural and deprived areas, and enhance the overall quality of life for residents through reliable, clean power. Implementation hinges on a robust public-private partnership, actively attracting private investment from diverse sources, such as knowledge-based companies, rural energy cooperatives, and micro-investors. This is complemented by crucial government support mechanisms, including guaranteed long-term power purchase agreements (PPAs), targeted tax exemptions, and dedicated low-interest financing facilities. Beyond generating substantial clean energy, these projects are fundamental drivers of sustainable socio-economic development. They directly combat rural out-migration by creating diverse local green job opportunities in construction, operation, and maintenance. This is achieved through comprehensive training programs, empowerment of the local workforce, and strategic technology transfer, fostering a skilled renewable energy sector within the province. Critically, Sistan and Baluchestan possess exceptional solar resources, characterized by exceptionally high and remarkably stable solar irradiation levels year-round. This endows the province with immense, largely untapped potential capacity for solar energy generation. Successfully harnessing this potential through the proposed network can contribute substantially to national goals of reducing greenhouse gas emissions and mitigating climate change impacts.

Keywords

Solar power plants, Sistan and Baluchistan, Private-public partnership, Socio-economic development

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Emerging Scientist a great success!