ACSTM
Asian Conference on Science, Technology & Medicine

6TH ASIAN CONFERENCE ON

SCIENCE, TECHNOLOGY & MEDICINE

February 25-26, 2025

Conference PROCEEDINGS ACSTM-2025

PROCEEDING
ACSTM 2025

Innovative Approaches in Health Care: Exploring the Genetic Basis of Obesity leading to Diabetes Mellitus

Kaiser Jamil[1], Archana Jayaraman[1], Srikishen Iyengar[2]

[1]Genetics Department, Bhagwan Mahavir Medical Research Centre, Hyderabad-500004, T.S. India

[2]Mahavir hospital and Research Centre, Hyderabad, India

Presenter
Kaiser Jamil

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Leptin plays an important role in obesity, a leading cause of diabetes mellitus (DM). It is secreted by adipose tissue and acts on the brain to regulate energy expenditure and food intake. Leptin also plays a crucial role in energy balance, the insulin pathway, and inflammation. This study investigates the impact of the Lep-2548G/A polymorphism in DM patients compared to matched controls. Bioinformatics tools were used to analyze the protein-protein interactions (PPI) of the leptin gene. The study focuses on leptin gene polymorphism by screening variants in South Indian DM subjects (154 DM cases and 140 controls). A PCR-RFLP-based assay was utilized to evaluate the association between the Gln2548Arg polymorphism of the leptin gene and diabetes risk in a case-control study. Additionally, the interaction of the leptin gene with other proteins was examined using bioinformatics tools. The genotype distributions in DM cases were 18.8%, 44.8%, and 36.4%, compared to 33.0%, 29.6%, and 37.4% in controls. DM patients with associated comorbidities showed a statistically significant association with the GA genotype compared to those without comorbidities ($p = 0.001$). This difference was observed in the Gln2548Arg genotypes between cases and controls. Further analysis using bioinformatics tools elucidated the PPI of the leptin gene. The findings suggest that the LEP Gln2548Arg polymorphism may serve as a useful diagnostic biomarker for DM, particularly in obese patients. Additionally, PPI analysis revealed that the leptin gene interacts with a large number of genes and proteins through multiple signaling pathways. This novel finding provides insights into disease mechanisms, which could contribute to improved treatment strategies in the future.

Keywords

Obesity, diabetes mellitus, leptin gene, polymorphism, bioinformatics

PROCEEDING
ACSTM 2025

Advancing Reproductive Justice: Intersections of Healthcare, Policy, and Equity

Tomeka M. Robinson
Hofstra University, New York, United State

Presenter
Tomeka M. Robinson

Type
Oral Presentation

Track
Social Sciences and Humanities

Abstract
Reproductive justice, grounded in the right to bodily autonomy and equitable healthcare, demands a multidimensional approach that integrates scientific and technological advancements with an understanding of global disparities and intersectionality. Around the world, access to reproductive healthcare is shaped by a complex interplay of factors, including socioeconomic status, race, gender identity, cultural norms, geographic location, and systemic inequities. This presentation explores how the intersections between healthcare innovations and policy frameworks can influence the mitigation or exacerbation of these disparities, depending on their accessibility and cultural relevance. By centering intersectionality, I aim to highlight the unique challenges faced by marginalized communities, including women of color, LGBTQ+ individuals, and those in low-resource settings. Addressing these global inequities requires a collaborative effort to create policies and frameworks that prioritize inclusivity, cultural competence, and justice. Through this lens, the session seeks to advance a dialogue on leveraging science and technology not only to uphold reproductive rights but also to promote sustainable health equity for diverse populations worldwide.

Keywords
Reproductive justice, health equity

Vaping and Public Health: An Emerging Epidemic

Rasha M. Youssef
Faculty of Pharmacy, Alexandria University, Egypt

Presenter
Rasha Moustafa Youssef

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The rapid rise in electronic cigarette use, or vaping, has sparked global public health concerns, particularly among adolescents and young adults. Marketed as a safer alternative to traditional tobacco products, vaping has expanded into a multi-billion-dollar industry, driven by appealing flavors, aggressive marketing, and perceptions of reduced harm. However, emerging evidence highlights significant health risks, including respiratory conditions such as E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI) and Chronic Obstructive Pulmonary Disease (COPD), as well as cardiovascular and potential long-term systemic effects. This talk will examine the epidemiological trends fueling the vaping epidemic and the challenges faced by public health systems in addressing this growing issue. Emphasis will be placed on the regulatory landscape, misconceptions surrounding vaping, and the urgent need for targeted prevention strategies and public awareness campaigns. Additionally, the need for continued research to assess the effectiveness of e-cigarettes in smoking cessation will be highlighted. While the vaping industry presents opportunities for innovation and employment, governments and stakeholders must balance economic benefits with public health priorities.

Keywords
EVALI, COPD, E-Cigarette industry, vaping epidemic, public awareness

PROCEEDING
ACSTM 2025

Vaping and Its Determinants: A Focused Study on the ADU Community

Haleama al Sabbah, Malak Qonbia, Fatima Alruwishan, Muna Khaled, Maha ali
Abu Dhabi University, UAE

Presenter
Haleama Al Sabbah

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The increasing prevalence of vaping among young individuals poses significant public health concerns, particularly regarding its impact on mental health and the environmental factors that contribute to this behavior. This study aimed to determine the prevalence of vaping and its associated factors within the Abu Dhabi University (ADU) community, including students, faculty, and administrative personnel. A cross-sectional study was conducted with 450 participants selected through convenience sampling. Data were collected via a structured online survey assessing demographics, vaping behaviors, psychological factors, and social influences, including peer pressure and media exposure. Ethical approval was obtained from the university Ethical Committee prior to data collection. Findings indicate that over 60% of vapers experience anxiety symptoms, compared to 40% of non-vapers. Similarly, more than half of vapers report symptoms of depression, while only 25% of non-vapers exhibit such symptoms. Peer pressure, social media marketing, and misconceptions about vapings safety compared to smoking further contribute to its prevalence. Environmental factors, including regulatory gaps in age restrictions and marketing strategies, play a crucial role in vaping uptake among young individuals. These findings highlight the need for targeted public health interventions and comprehensive regulations to mitigate vaping-related mental health effects within academic communities.

Keywords
E-Cigarettes, mental health, public health, ADU community, peer influence, social media marketing, vaping

PROCEEDING
ACSTM 2025

Modification of Free Tyrosine: A Form of Metabolic Reprogramming in Cancer Cells and Its Mimetic as a PI3K Enzyme Inhibitor

Baseerat M[1], Dhanashree Bomle[1], Mahima Bansode[1], Sachin C Sarode[2], Nilesh Kumar Sharma[1]

[1]Cancer and Translational Research Lab, Dr. D.Y. Patil Biotechnology and Bioinformatics Institute, Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, 411033, India

[2]Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, 411018, India

Presenter
Nilesh Kumar Sharma

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Metabolic reprogramming has generated growing interest in exploring alterations in metabolic pathways in cancer cells. Among notable metabolic changes, free aromatic amino acids such as tyrosine and tryptophan play significant roles as biomarkers in cancer diagnostics due to their involvement in various metabolic pathways. However, modifications of tyrosine into nitrotyrosine and phosphotyrosine and their relevance in oral cancer remain minimally explored. A novel in-house vertical tube gel electrophoresis (VTGE) method was employed to assist in the purification of urine and nail clippings from oral cancer patients and healthy subjects. Purified metabolites were analyzed using LC-HRMS and a modified 96-well plate Lowry colorimetric assay to quantify free tyrosine. These assays were also used to estimate tyrosine levels in cancer cell cultures. A mimetic of tyrosine was evaluated as a potential PI3K inhibitor using computational tools such as Autodock Vina, molecular dynamics (MD) simulations, and the ADMET server. The findings suggest that urine samples from oral cancer patients exhibit elevated levels of nitrotyrosine and phosphotyrosine compared to healthy subjects, whereas tyrosine levels in nail clippings are reduced in oral cancer cases. Alterations in tyrosine levels were also observed in drug-induced cancer cell death. ADMET profiling indicated that the designed tyrosine mimetic falls within a safe class of drugs, showing no significant hepatotoxicity (DILI), carcinogenicity, or toxicity concerns. The mimetic demonstrated a strong binding affinity to PI3K, a key enzyme involved in tyrosine modifications in cancer cells and a well-established oncoprotein target in anticancer therapy. The study of tyrosine metabolism in normal versus cancerous cells highlights its association with tumor overactivity. The findings support the potential of a tyrosine mimetic as an inhibitor of PI3K, interfering with tyrosine phosphorylation in cancer cells, thereby disrupting signaling pathways that promote cancer cell growth and proliferation.

Keywords

Oral cancer, tyrosine, phosphorylation, metabolic reprogramming, therapies

Addressing the Framework for Quality by Design in Nanotechnology Delivery Systems

Dr. Surya Kanta Swain, Dr. Apala Chakraborty
Amity Institute of Pharmacy, Amity University Kolkata, AA II, Newtown, West Bengal, 700135, India

Presenter
Surya Kanta Swain

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Researchers can reduce the number of experimental trials, oversights, and time spent on formulation development by using the Quality by Design (QbD) strategy. Identifying key influencing factors that significantly impact product quality such as critical material attributes, formulation variables, and process parameters is essential. Nano drug delivery systems (NDDS), a specialized class of nanomaterials, leverage nanoscale properties to enhance the oral bioavailability of poorly water-soluble drugs. These systems improve drug loading capacity, increase surface area for optimal interaction at target binding sites, enhance permeation and retention (EPR) in cancer cells, reduce enzymatic drug degradation, facilitate penetration of the blood-brain barrier (BBB), and enable drug delivery to pulmonary microcirculation and endothelial tight junctions. The systematic approach of QbD enables the achievement of precise and reproducible therapeutic outcomes in formulation development. Optimizing NDDS for poorly water-soluble drugs using QbD provides a rapid, efficient, and cost-effective method for improving bioavailability. Additionally, functionalizing NDDS with target-specific antibodies and peptide linkers enhances drug concentration at the target site, increasing therapeutic efficacy. Risk assessment and initial preformulation studies help accurately identify and select independent factors, allowing further optimization of dependent variables. To ensure consistent development of NDDS, it is crucial to identify these key variables and optimize them using QbD or Design of Experiments (DoE) tools.

Keywords

Poly(lactic-co-glycolic acid), nanoformulation, optimization, quality by design, risk assessment, control strategy

PROCEEDING
ACSTM 2025

Hepatoprotective, Renoprotective, and Metabolic Effects of *Azanza garckeana* Seed Oil in Male Albino Rats

Rafiah Awad Mohamed Adam[1], Hatil Hashim EL-Kamali[2]

[1]Department of Nutrition and Food Technology, Faculty of Science and Technology, Omdurman Islamic University, Omdurman, Sudan

[2]Department of Botany, Faculty of Science and Technology, Omdurman Islamic University, Omdurman, Sudan

Presenter
Hatil Hashim EL-Kamali

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

This study investigates the hepatoprotective, renoprotective, antioxidant properties, and effects on lipid and glucose metabolism of *Azanza garckeana* seed oil, a traditional African medicinal plant, in male albino rats. Liver function was assessed by measuring AST, ALT, and ALP levels, with elevated enzyme levels indicating liver damage. Paracetamol-induced hepatotoxicity resulted in significant increases in ALT and ALP. Treatment with *Azanza garckeana* seed oil at doses of 1 mL kg^{-1} and 2 mL kg^{-1} significantly reduced these enzyme levels, with the 2 mL kg^{-1} dose showing more pronounced effects, indicating a dose-dependent hepatoprotective action. These results suggest that *Azanza garckeana* seed oil helps restore normal liver function without causing hepatotoxicity. Kidney function, assessed through serum creatinine and blood urea levels, remained unaffected by paracetamol, and both doses of *Azanza garckeana* oil showed no adverse effects on renal markers. Creatinine and urea levels in the oil-treated groups were comparable to or slightly improved compared to the control group, indicating that the oil does not induce renal toxicity. Metabolic health markers, including cholesterol, triglycerides, and glucose, were also evaluated. Paracetamol decreased cholesterol and triglyceride levels, likely due to liver damage, with a minor effect on glucose levels. Both doses of the oil (1 mL kg^{-1} and 2 mL kg^{-1}) restored cholesterol and triglyceride levels to near-normal, maintaining glucose levels within a healthy range. This suggests that *Azanza garckeana* seed oil may have a protective effect on metabolic health. The oil?s antioxidant activity was assessed using DPPH and ABTS assays, showing moderate free radical scavenging activity (57.37% and 55.97%, respectively). Although not as strong as ascorbic acid, this antioxidant activity likely contributes to its protective effects on liver and kidney function. In conclusion, *Azanza garckeana* seed oil demonstrated hepatoprotective and antioxidant effects, with no signs of toxicity at the tested doses. Its ability to normalize lipid and glucose metabolism, alongside its antioxidant properties, highlights its potential therapeutic value for managing liver and kidney damage, as well as metabolic disorders. These findings suggest that *Azanza garckeana* seed oil is a promising candidate for further research and potential therapeutic applications.

Keywords

Azanza garckeana, Renal-hepatoprotective, antioxidant, lipid and glucose metabolism, seed oil, male abino rats, Sudan

Non-Invasive Soluble Biomarkers in Cancer: Advancing Personalized Medicine

Afsheen Raza
Abu Dhabi University, UAE

Presenter
Afsheen Raza

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Biomarkers such as liquid biopsy, soluble immune checkpoint molecules, and cytokines serve as surrogate markers for invasive tissue markers and play a crucial role in early cancer detection, prognosis, and treatment response prediction. These non-invasive biomarkers offer a promising approach to personalized medicine. Evidence from various studies highlights the significance of soluble cancer biomarkers in improving patient management and therapeutic decision-making.

Keywords

Non-Invasive biomarkers, personalized medicine, liquid biopsy, cytokines, immune checkpoint molecules

Analysing of Mental Health in Humans Using AI Technique

Prof. Dr. Ekbal Rashid
Computer Science and Engineering Department, RTC Institute of Technology, Ranchi, India

Presenter
Ekbal Rashid

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Today's era is the Artificial Intelligence (AI) era, and the use of AI in human mental health trials opens the way for a transformative period with immense potential to enhance efficiency, precision, and scope in mental health studies. In this context, the promises and threats of AI in mental health are critically reviewed. On one hand, AI has the potential to revolutionize key aspects of examination and execution, such as patient treatment, data management, and predictive analytics, making them more adaptive and data-driven. On the other hand, challenges arise in applying AI to mental health. This study presents a case for robust AI frameworks subject to rigorous validation and ethical scrutiny, ensuring that AI techniques are utilized with minimized risks.

Keywords

Mental health, artificial intelligence, human beings, patient outcomes, predictive analytics

PROCEEDING
ACSTM 2025

Exploring the role of Artificial Intelligence in Advancing CNS Delivery

Mineshkumar Ashvinkumar Patel[1], Dr. G. S. Chakraborthy[2], Ankit B. Chaudhary[1]

[1]Department of Pharmacology, Saraswati Institute of Pharmaceutical Sciences, Gandhinagar 3823551, India

[2]Parul Institute of Pharmacy & Research, Vadodara, 3917602, India

Presenter
Mineshkumar Ashvinkumar Patel

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Artificial Intelligence (AI) refers to the capability of computers or machines to mimic human intelligence, including problem-solving, learning from experiences, understanding human language, and recognizing patterns. AI is widely applied in fields such as healthcare, banking, gaming, and autonomous vehicles. It primarily exists in two forms: narrow AI, which performs specific tasks like facial recognition, and general AI, which theoretically possesses human-like cognitive abilities. Traditional central nervous system (CNS) drug delivery methods include systemic delivery, non-invasive localized delivery, and invasive localized delivery. AI enhances these techniques by improving accuracy, personalization, and optimizing delivery schedules, although it does not directly deliver drugs. In diagnostics, AI enables earlier and more accurate disease prediction. With advancements in machine learning (ML) and big data analytics, AI algorithms can detect patterns in patient data and forecast disease progression, such as in cancer or Alzheimer disease. AI impact on CNS drug delivery techniques is expected to grow, offering promising advancements in understanding and treating CNS disorders. However, ethical considerations remain crucial. Continuous research and discussions on ethical limitations are essential to ensuring the responsible integration of AI in CNS healthcare.

Keywords

Artificial Intelligence, CNS Delivery, CNS Drug Delivery Process, AI Algorithm, Future of AI

PROCEEDING
ACSTM 2025

Characteristics of Pediatric and Adult Tuberculosis Cases at Pandak 1 Public Health Center, Bantul, 2020-2024

Ormy Abiga Mahendra[1,2], Yoseph Leonardo Samodra[3], Fasha Since Andampury[1]

[1]Puskesmas Pandak 1, Bantul, Indonesia

[2]Rumah Sakit Panembahan Senopati, Bantul, Indonesia

[3]Institute of Epidemiology and Preventive Medicine, National Taiwan University, Taipei, Taiwan

Presenter

Yoseph Leonardo Samodra

Type

Oral Presentation

Track

Medical & Health Sciences

Abstract

Tuberculosis (TB) remains a pressing health issue globally, but detailed localized data distinguishing between pediatric and adult TB cases is sparse, especially in high-burden areas. This study aims to delineate the characteristics of TB cases among children and adults at the Pandak 1 Public Health Center in Bantul from 2020 to 2024. Employing a retrospective descriptive design, this research analyzed secondary data from the medical records of 34 TB patients, focusing on demographic details such as age, gender, diagnosis methods, and types of TB, using a cross-sectional method. The results indicate a higher incidence of TB among adults compared to children. Specifically, of the adults, 55.6% were male, while among pediatric cases, females constituted 71.4%. Diagnostic methods showed significant differences; 74.1% of adults were diagnosed through bacteriological methods, while all pediatric cases were clinically diagnosed. Pulmonary TB was the predominant type observed in both groups, with 88.9% of adults and 100% of children affected. Notably, none of the patients had comorbid diabetes, and a majority were confirmed to be HIV negative. The treatment data revealed that nearly all patients received new TB therapy, reflecting adherence to updated treatment protocols. Additionally, this study highlighted that adult TB cases were more likely to be diagnosed through more definitive bacteriological methods, which could influence treatment outcomes. The pediatric TB cases, diagnosed only clinically, underline the challenges in obtaining bacteriological confirmations in younger patients. The lack of diabetes and low HIV prevalence among the study population suggests a focused epidemiological pattern of TB unrelated to these comorbidities. These findings emphasize the need for tailored public health strategies that address the specific characteristics and diagnostic challenges of TB in different age groups. The study provides essential localized insights that can help refine approaches to TB control and management, informing public health policies and interventions in regions similar to Bantul.

Keywords

Tuberculosis, pediatric, adult, epidemiology

Effect of Lactoferrin Loaded Nanoparticle Formulation for Postmenopausal Osteoporosis

Priya Patel, Aishwariya Trivedi
Department of Pharmaceutical Sciences, Saurashtra University, Rajkot, Gujarat, India

Presenter
Priya Patel

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The aim of the present research was to formulate and evaluate lactoferrin nanoparticle-loaded in situ gel for the vaginal delivery of bisphosphonates in postmenopausal osteoporosis. The nanoparticles were prepared using the desolvation method, with lactoferrin as a polymer. A QbD approach was adopted for optimization. Particle size, PDI, and zeta potential were analyzed using a Zetatrac particle size analyzer. Entrapment efficiency, in vitro drug release study, and SEM analysis were performed for nanoparticle characterization. For the characterization of the nanoparticle-loaded in situ gel, viscosity, gelation time, gelation temperature, and pH were evaluated, followed by container-related assessments. The nanoparticles were incorporated into a thermosensitive in situ gel using Carbopol 934 and Poloxamer 188 in a 1:20 ratio. The gelation time was found to be 41 seconds, and the gelation temperature was 28 °C. SEM analysis confirmed the spherical shape and porosity of the nanoparticles. The in vitro drug diffusion study revealed that 82% of the drug was released within 6 hours. This study successfully developed and investigated lactoferrin nanoparticle-loaded in situ gel for vaginal delivery. The vaginal administration of bisphosphonates could overcome the challenges associated with conventional dosage forms, allowing for self-administration without complex instructions and reducing the risk of oral and IV-related side effects. The prepared lactoferrin nanoparticle-loaded in situ gel demonstrated potential as a promising drug delivery system for the effective management of osteoporosis.

Keywords
Box Behnken design, osteoporosis, lactoferrin, alendronate sodium, in situ gel, vaginal drug delivery

Cardioprotective Potential of Nano-Vector (EAF-AC-NG) Targeting Oxidative Stress in Cardiac Hypertrophy Rat Model

Sobia Tabassum
Department of Biological Sciences, Faculty of Sciences, International Islamic University, Islamabad

Presenter
Sobia Tabassum

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Cardiac hypertrophy (CH) in the setting of maladaptive apoptosis results in excessive loss of cardiac muscle cells, contributing to the development of heart failure. Oxidative stress caused by reactive oxygen species (ROS) is a major factor in cell damage and chronic diseases, including cardiovascular disorders, through various signaling pathways. Myocardial damage due to ROS-induced apoptosis is a key pathological event in heart disease. Inhibiting cardiomyocyte apoptosis by scavenging ROS is considered a promising therapeutic approach. Due to the side effects of conventional therapeutics, medical trends are shifting towards natural antioxidant-based therapies to counteract ROS. This study was designed to synthesize a polymeric nano vector (EAF-AC-NG) for the targeted delivery of antioxidants to inhibit oxidative stress-induced apoptosis in the myocardium. The ethyl acetate fraction (EAF) of *Olea ferruginea* leaves was loaded onto alginate (AG)-chitosan (CS) polymer-based nano vectors to inhibit ROS-induced apoptosis in a cardiac hypertrophy rat model. EAF-AC-NG showed significant ($P<0.001$) results, reducing ROS levels by fivefold compared to the isoproterenol (ISO) group. Histopathological analysis exhibited normal tissue architecture. Expression analysis of the pro-apoptotic marker BAX mRNA revealed that nano gel treatment reversed BAX mRNA expression by 3.25-fold compared to ISO, whereas free EAF reversed it by 1.9-fold, supporting the hypothesis that nano phytomedicine is more efficacious than phytomedicine. Furthermore, at both lower (50 mg kg^{-1}) and higher (2000 mg kg^{-1}) concentrations, EAF-AC-NG nanogels did not cause significant toxicity. In conclusion, the synthesized EAF-AC-NG demonstrates potential in preventing and treating ROS-induced cardiomyocyte apoptosis. Further validation at molecular levels through preclinical and clinical studies is warranted.

Keywords

Nanomedicine, cardiac hypertrophy, oxidative stress

Current Scenario of Antibiotic Misuse and Soil Leaching in the Development of Antibiotic Resistant Waterborne Pathogenic Bacteria

Souravh Bais, Renu Kumari, Nirmal Dongre, Aaksah Singh Panwar
Institute of Pharmaceutical Sciences, SAGE University Indore, India

Presenter
Souravh Bais

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The leaching of antibiotics into soil environments is a significant environmental and public health concern, contributing to the emergence and spread of antibiotic-resistant waterborne pathogenic bacteria. Antibiotics enter the soil through various pathways, including agricultural runoff, wastewater discharge, and improper pharmaceutical waste disposal. Once in the soil, they interact with microbial communities, exerting selective pressure that promotes the proliferation of resistant bacteria and facilitates horizontal gene transfer. Several factors, such as soil pH, organic matter content, microbial activity, and hydrological conditions, influence antibiotic persistence and mobility. Antibiotics in soil can leach into groundwater and surface water systems, facilitating the dissemination of resistance genes into aquatic environments. Contaminated water bodies serve as reservoirs for resistant bacteria, posing a significant threat to public health when they infect humans or animals. The movement of antibiotics through soil and water pathways not only increases resistance in environmental bacterial populations but also contributes to the spread of resistance to clinical pathogens. This presentation explores the mechanisms driving antibiotic leaching, including adsorption-desorption dynamics, degradation rates, and hydrological transport processes. It underscores the urgency of targeted interventions, such as advanced wastewater treatment technologies, sustainable agricultural practices, and regulatory measures to minimize antibiotic contamination. Understanding the intricate interactions between antibiotics, soil, and microbial communities is crucial for developing effective mitigation strategies. Addressing this challenge is essential for protecting environmental integrity and public health in the face of the growing global threat of antibiotic-resistant infections.

Keywords
Antibiotic leaching, soil contamination, antibiotic resistance, waterborne pathogens

PROCEEDING
ACSTM 2025

Novel Marine Naturals in Drug Discovery

Leena Grace Beslin, Sobira Shirin Nufaisa
Department of Zoology, Nesamony Memorial Christian College, Manonmaniam Sundaranar University, Marthandam 629165, Kanyakumari, Tamil Nadu, India

Presenter
Leena Grace Beslin

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The discovery of natural products from various organisms significantly contributes to drug development. The vast biological diversity of the ocean provides an extensive resource for discovering secondary metabolites, as representatives of every phylum are found in marine environments. The ocean harbors more than 200,000 described species of invertebrates and algae; however, this represents only a fraction of the total species yet to be discovered and studied. Modern bioinformatics, combined with the increasing availability of sequenced genomes, offers unprecedented opportunities for identifying novel bioactive compounds and biocatalysts from marine organisms. The identification of biosynthetic genes and gene clusters through bioinformatics approaches, followed by their heterologous expression, can accelerate the discovery of natural products for drug development. Secondary metabolites, which are not essential for an organisms primary metabolic processes, play a crucial role in drug discovery. Many natural compounds identified from marine sources have been found to inhibit cell division, a key target for many anticancer drugs. Due to its largely unexplored biodiversity compared to terrestrial environments, the marine ecosystem has become a major focus of natural product research. Like terrestrial species, marine organisms produce secondary metabolites with significant pharmaceutical potential. Some of these compounds have already been developed into drugs, while others are still undergoing clinical trials. The urgent need for new drugs has intensified due to emerging diseases and increasing drug resistance among pathogens. Advancements in bioinformatics and genome mapping have made drug discovery more efficient, particularly in drug design and development. Key drug characteristics such as Absorption, Distribution, Metabolism, Excretion, and Toxicity (ADMET), along with efficacy, are now measured in laboratories and predicted in advance using bioinformatics tools, reducing costs and accelerating the drug development process.

Keywords
Drug target, marine bioactive substances, proteomic data, structural biology. transcriptomics

PROCEEDING
ACSTM 2025

The Role of Artificial Intelligence in Optimizing Pharmaceutical Formulation Components

Yogesh Subhash Chaudhari[1], Manisha Chaudhari[2]

[1]Department of Pharmaceutics, Dr. L. H. Hiranandani College of Pharmacy, Ulhasnagar 421003 India

[2]Department of Pharmaceutics, D Y Patil University School of Pharmacy, Nerul, Navi Mumbai 400706, India

Abstract

The development of novel drug delivery systems faces significant challenges, including complex formulation design, time-intensive experimentation, and high development costs. Artificial intelligence (AI) has emerged as a transformative tool with the potential to revolutionize this process. This review explores AI role in optimizing pharmaceutical formulations by leveraging techniques such as machine learning, deep learning, and evolutionary algorithms. Machine learning algorithms analyze extensive datasets from experiments and literature to identify patterns and relationships between formulation components, drug release profiles, stability, and efficacy. Deep learning models, particularly convolutional and recurrent neural networks, can extract intricate features from high-dimensional data, such as microscopy images and spectroscopic analyses, to predict critical quality attributes. Evolutionary algorithms, inspired by natural selection, efficiently navigate the vast solution space of formulation possibilities to identify optimal excipient combinations that enhance stability, bioavailability, and targeted drug delivery. By integrating AI-driven predictive modeling into pharmaceutical formulation design, researchers can accelerate development, reduce costs, and improve drug delivery outcomes.

Keywords

Artificial intelligence, drug delivery system, pharmaceutical formulation, machine learning

Presenter
Yogesh Subhash Chaudhari

Type
Oral Presentation

Track
Medical & Health Sciences

PROCEEDING
ACSTM 2025

A Cohort Study on Indicators of Oxidative Stress in Children Exposed to Cell Phone and Cell Tower Radiation

Indra Vijay Singh, Meghna Vinay K, K Dilip
MIT, Kundapura, Karnatka , India

Presenter
Indra Vijay Singh

Type
Oral Presentation

Track
Social Sciences and Humanities

Abstract
This study investigates oxidative stress in children exposed to cell phone and cell tower radiation by developing a predictive model for Superoxide Dismutase (SOD) activity. Key parameters, including radiation exposure levels and fibrinogen concentration, were analyzed to predict SOD activity. A neural network model and decision tree regression algorithm were used. A neural network model with polynomial feature transformation was implemented to capture non-linear relationships between exposure and oxidative stress markers. The model achieved an R^2 of 0.9096, with a mean absolute error (MAE) of 0.7863, mean squared error (MSE) of 0.8273, and root mean squared error (RMSE) of 0.9955.

Keywords
Neural network model, decision tree regression, superoxide dismutase, fibrinogen concentration, oxidative stress

Dynamic Silent Correlation Between Emotions and Diseases: An Innovative Approach to Oral and Dental Treatment

Rana Negm
Department of Prosthodontics, Faculty of Dentistry, Alexandria University, Egypt

Presenter

Rana Abdelazeem Mohamed Negm

Type

Oral Presentation

Track

Medical & Health Sciences

Abstract

Conventional understanding of oral and dental diseases primarily focuses on microbial etiology, encompassing bacterial, fungal, and viral infections. While this paradigm effectively explains many cases, it falls short in addressing certain perplexing scenarios, such as arrested caries exhibiting spontaneous cessation of progression. Furthermore, the literature acknowledges the multifaceted nature of these diseases, recognizing the influence of genetic predisposition, immunological factors, and even stress alongside oral hygiene practices. However, this conventional framework fails to adequately explain the occurrence of dental caries or aggressive periodontitis in young adults with meticulous oral hygiene and no discernible family history of these conditions. The presence of idiopathic etiologies in numerous oral diseases further emphasizes the limitations of current understanding. This research delves into a novel perspective, drawing inspiration from Dr. Hamers German New Medicine, which posits that microorganisms do not inherently cause disease but rather serve as biological tools utilized by the body, orchestrated by the brain, to facilitate healing processes. This theory, underpinned by the concept of embryological tissue-brain relationships, asserts that disease arises from profound psychological shocks experienced by the individual. Building upon Dr. Hamers work, Dr. Edmalway developed an innovative emotional diagnostic system that incorporates the physiological and embryological characteristics of affected tissues to identify the underlying emotional triggers of disease. This research evaluate the efficacy of this emotional diagnostic system in elucidating the emotional correlates of oral and dental diseases. A randomized clinical trial employing validated questionnaires was conducted. The findings demonstrated a significant correlation between specific emotional states, particularly the inability to assert ones rights, and the occurrence of these diseases in 95% of the cases.

Keywords

Emotions, psychodental diagnosis, dental diseases

Dengue Hemorrhagic Fever (DHF) Recommendations Using Case-Based Reasoning and 1P100S Module

Siswanto, Akhmad Rizky Perdana Putra
Faculty of Public Health, Mulawarman University, Indonesia

Presenter
Siswanto

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Dengue Hemorrhagic Fever (DHF) remains a significant public health concern, particularly in tropical regions such as Indonesia. Effective control and management of this disease require robust, data-driven approaches. This study evaluates the application of the Case-Based Reasoning (CBR) method and the 1 Problem 100 Solutions (1P100S) module in optimizing the DHF control program at the Palaran Health Center, Palaran District. The CBR method facilitates problem-solving by leveraging historical data to provide recommendations based on similar past cases, enabling personalized and efficient intervention strategies. Meanwhile, the 1P100S module supports a community-driven approach to problem-solving, promoting collaborative and sustainable solutions for disease prevention and control. This research combines qualitative and quantitative approaches to analyze program implementation, outcomes, and community impact. Findings reveal that integrating CBR improves the accuracy and timeliness of decision-making in managing DHF cases. Additionally, the 1P100S module enhances community engagement, fostering proactive participation in preventive measures such as mosquito habitat eradication and public health education. Together, these methods demonstrate a synergistic effect, leading to a significant reduction in DHF incidence rates. This study underscores the potential of combining innovative technologies with community-centered frameworks to enhance disease control efforts in public health settings.

Keywords

Dengue Hemorrhagic Fever, Case-Based Reasoning, 1 Problem 100 Solutions, Palaran

PROCEEDING
ACSTM 2025

Antibiotic Susceptibility, Molecular Profiling, and 16S rRNA-Based Identification of *Pseudomonas aeruginosa* Isolates from Musculoskeletal Infections

Maria Muddassir[1,2], Syeda Wajeeha Batool[1], Syed Zeeshan Haider Naqvi[1]

[1]Institute of Molecular Biology and Biotechnology (IMBB), The University of Lahore, Lahore, Pakistan

[2]M Islam Medical College, Gujranwala, Pakistan

Presenter
Maria Muddassir

Type
Poster Presentation

Track
Medical & Health Sciences

Abstract

Gram-negative opportunistic pathogen *Pseudomonas aeruginosa* causes musculoskeletal infections in immunocompromised individuals. The primary goal of this research was to describe antibiotic resistance and identify virulence genes in *Pseudomonas aeruginosa*. This cross-sectional study featured a randomized selection of samples, with ethical approval obtained from the Institute of Molecular Biology and Biotechnology, University of Lahore. Conducted from January to December 2023, the study encompassed a sample size of 320, including blood, pus, and wound swabs [Male: 169 (52.8%), Female: 151 (47.1%)]. Age-based categories were G1: 13-20 years, G2: 21-40 years, G3: 41-60 years, and G4: 61-80 years. Identification tests for *Pseudomonas aeruginosa* included API20NE (bioMerieux, France). Antimicrobial susceptibility testing followed CLSI 2020 guidelines for the Disc Diffusion Test. DNA extraction and purification were performed using a Genome Jet DNA Purification kit, and 16S rRNA primers were used to identify resistance genes *exoA* and *oprL*. Phylogenetic and taxonomic identification was conducted via ribosomal RNA sequencing of PCR-amplified products (BIO-RAD T100™ Thermocycler) and sequencing with an automated sequencer (Illumina MiniSeq™). A phylogenetic tree was constructed using MEGA11, with a statistically significant threshold of p-value<0.05. The prevalence of *Pseudomonas aeruginosa* was 22%, with positivity recorded from pus (152/320: 47.5%), blood (124/320: 38.75%), and wound swabs (44/320: 13.75%). G4 showed the maximum number of positive isolates (91.25%). Maximum resistance was exhibited against Meropenem (76%) and Imipenem (70%). PCR identified the presence of resistance genes, including *exoA* (125 bp) and *oprL* (105 bp). The phylogenetic tree was constructed using ribosomal RNA, and the GenBank accession number for the 16S rRNA gene of *P. aeruginosa* is PQ269824. Antimicrobial susceptibility testing helps improve treatment alternatives for stubborn strains, and the presence of resistance genes highlights how molecular-level research enhances treatment approaches for managing multidrug-resistant pathogens.

Keywords

Molecular profiling, antibiotic sensitivity, *Pseudomonas aeruginosa*

PROCEEDING
ACSTM 2025

Anthelmintic and Histopathological Evaluation of Phytochemicals in Eritrean Medicinal Plants

Danait Andehaimanot Sium[1,5], Atul Kaushik[1,2], Jeevan Jyoti Kaushik[3], Kokob Zerai Mengisteab[1], Eyasu Tesfamariam[4] Ashok Kumar Sharma[1]

[1]Unit of Pharmaceutical Chemistry, School of Pharmacy, Asmara College of Health Sciences, Asmara, Eritrea

[2]School of Applied Chemistry & Basic Sciences, Sardar Bhagwan sigh University, Balawala, Dehradun, India

[3]Department of Microbiology, School of Basic and Applied Sciences, Shri Guru Ram Rai University, Dehradun, Uttarakhand, India

[4]Department of Statistics, Eritrea Institute of Technology, Mai-nefhi, Asmara, Eritrea

[5]Information Services Unit, Pharmacy Services Division, Department of Medical Services, Ministry of Health, Eritrea

Presenter

Danait Andehaimanot Sium

Type

Oral Presentation

Track

Medical & Health Sciences

Abstract

Traditional medicine in Eritrea is deeply rooted in its originality, anthropological foundation, and widespread use, similar to other countries with rich medicinal traditions. Intestinal helminthiasis, one of the Neglected Tropical Diseases (NTDs) in Eritrea, has an overall prevalence of 2.82%. *Albizia anthelminthica, Grewia ferruginea*, and *Stereospermum kunthianum* are traditionally believed to have significant activity against intestinal worms. In this study, the anthelmintic potential of these three Eritrean medicinal plants was investigated, along with the presence of phytochemicals in their extracts. Additionally, histopathological analysis of treated earthworms was conducted. Cold and hot extraction methods were used to prepare the plant extracts and their anthelmintic activity against *Pheretima posthuma* was evaluated and compared with standard drugs. The histopathological effects on the treated earthworms were also analyzed. The study highlights novel, dose-dependent anthelmintic properties of *G. ferruginea* and *S. kunthianum*. Notably, Albizia extract (100 mg mL^{-1}) exhibited remarkable vermicidal and vermistatic activity, causing paralysis in 47 seconds and death in 90 seconds, respectively. Histopathological analysis revealed severe damage to the musculature and other body systems of the treated earthworms. The confirmed anthelmintic activity of these plants is attributed to the presence of various phytoconstituents, which disrupt the metabolic processes of earthworms by damaging their musculature and internal structures. These findings warrant further investigation and standardization of herbal formulations to develop active constituents into potential anthelmintic drugs.

Keywords

Traditional medicine, intestinal helminthiasis, vermicidal, vermistatic, histopathological

Comparative Analysis of Biowaste-Derived Carbon Dots for Theranostic Applications: A Sustainable Waste-to-Wealth Strategy

Shreeja Sen, Anindya Bose
Department of Pharmaceutical Analysis, School of Pharmaceutical Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar 751003, India

Presenter
Shreeja Sen

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

This study compares carbon dots (CDs) synthesized from different kitchen wastes, including potato peels, lemon peels, waste tea residues, and banana peels, aligning with the "waste to wealth" concept to promote sustainable waste management. The goal was to identify the best precursor for CDs with optimal properties for theranostic applications by analyzing quantum yield, size, morphology, functional groups, carbon content, water solubility, photostability, and biocompatibility. CDs were synthesized using a controlled, eco-friendly carbonization process, and their properties were characterized through UV-Vis and fluorescence spectroscopy, CHNS analysis, ATR-FTIR, TEM, EDX, SAED, and cytotoxicity studies. The results revealed significant differences in the properties of CDs depending on the biowaste source. Waste tea residue-derived CDs exhibited the brightest blue fluorescence, the highest quantum yield (22.69%), superior carbon content (68.79%), and the smallest average particle size (2.3 nm). Lemon peel CDs closely followed, with blue fluorescence, a quantum yield of 15.38%, an average particle size of 2.5 nm, and a carbon content of 68.07%. Banana peel CDs showed moderate performance, with a quantum yield of 7.62% and an average particle size of 2.8 nm, while potato peel CDs had the lowest quantum yield (5.11%) and the largest particle size (4.5 nm) with moderate fluorescence. In terms of fluorescence intensity, the sequence was lemon peel > waste tea residue > banana peel > potato peel CDs. FTIR analysis indicated that waste tea residue exhibited better functional groups, suggesting successful synthesis and desirable surface properties that enhanced water solubility and reactivity. Both waste tea residue and lemon peel CDs exhibited poly-nanocrystalline structures, ensuring high photoluminescence and structural integrity, whereas CDs from banana and potato peels were amorphous and partially crystalline, respectively. Waste tea residue CDs also demonstrated the best photostability and stability under normal conditions, while potato and banana peel CDs had the least stability. Cytotoxicity studies revealed very low toxicity across all samples, indicating excellent biocompatibility for biomedical applications. Overall, waste tea residue emerged as the most favorable precursor for synthesizing CDs with superior properties, highlighting their potential for bioimaging, drug delivery, and sustainable nanotechnology.

Keywords

Carbon, biowaste, green synthesis, fluorescence, quantum yield theranostics

PROCEEDING
ACSTM 2025

Molecular Identification of the Colistin-Resistant *mcr-1* Gene in Carbapenem-Resistant Bacteria Causing Urinary Tract Infections

Huzaifa Gulzar
Riphah International University Islamabad, Pakistan

Presenter
Huzaifa Gulzar

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

The study investigated carbapenem resistance in uropathogens causing urinary tract infections (UTIs) and identified the presence of the colistin-resistant *mcr-1* gene among them. This cross-sectional experimental study analyzed 161 urine samples. Bacterial identification was performed using the Analytical Profile Index (API 10S) biochemical test. Antibiotic susceptibility testing was conducted using the Kirby-Bauer disc diffusion method following CLSI or EUCAST guidelines. Bacteria resistant to carbapenems (meropenem and imipenem), with inhibition zones of <19 mm, were selected for *mcr-1* gene detection. Plasmid DNA from carbapenem-resistant isolates was extracted, and gradient polymerase chain reaction (PCR) was performed using specific primers. The presence of *mcr-1* was confirmed by agarose gel electrophoresis with ethidium bromide staining. Of the 161 urine samples, 52% (84/161) showed bacterial growth, of which 30.9% (26/84) were carbapenem-resistant. Among these, *E. coli* accounted for 13% (11/26), *Klebsiella pneumoniae* 8.3% (7/26), and *Pseudomonas aeruginosa* 9.5% (8/26). The distribution of carbapenem-resistant cases included 34.6% (9/26) males,65.4% (17/26) females, with participants aged between 5 and 90 years. The *mcr-1* gene was detected in 11.5% (3/26) of the carbapenem-resistant isolates, specifically in *K. pneumoniae* (28.5%, 2/7) and *E. coli* (9%, 1/11), while 88.4% (23/26) of the isolates lacked the gene. All *mcr-1* positive cases were in females aged 60, 70, and 81 years, whereas no male patients carried the gene. The findings highlight the increasing prevalence of carbapenem resistance among urinary isolates and the concurrent presence of the mobile colistin-resistant *mcr-1* gene. The detection of *mcr-1* in carbapenem-resistant isolates underscores the urgent need to address antibiotic misuse. Large-scale surveillance studies are essential to monitor resistance trends, optimize carbapenem use, and prevent further dissemination of resistance mechanisms.

Keywords

Mobile colistin resistant gene *mcr-1*, carbapenem resistance, Urinary tract infections

PROCEEDING
ACSTM 2025

Design, Synthesis, and Biological Evaluation of Novel 1,3,4-Oxadiazole Derivatives

Pratip K. Chaskar, Rakesh R. Somani
Department of Pharmaceutical Chemistry, D Y Patil Deemed to be University School of Pharmacy, Nerul, Navi Mumbai, Maharashtra, India

Presenter
Pratip K. Chaskar

Type
Poster Presentation

Track
Medical & Health Sciences

Abstract

Tuberculosis (TB) remains a major global health threat, causing approximately 1.4 million deaths annually. InhA, a crucial enzyme in mycobacterial fatty acid synthesis, is a key target for anti-TB drug development. This study focused on synthesizing and evaluating novel isoniazid (INH) analogues as potential InhA inhibitors. A combined *in silico* and *in vitro* approach was employed. InhA (PDB ID: 4TRN) was used for docking studies, and ADMET properties were predicted using SwissADME. Target molecules were synthesized using a microwave synthesizer. Anti-tubercular activity was assessed using the Microplate Alamar Blue Assay (MABA) at concentrations ranging from 250 µg mL^{-1} to 0.49 µg mL^{-1}. Four series of compounds were synthesized: 3-substituted phenyl-1-(2-substituted phenyl-5-(pyridin-4-yl)-1,3,4-oxadiazol-3(2H)-yl)-prop-2-en-1-one (6a-6j, 7a-7j) and 3-substituted phenyl-1-(2-substituted phenyl-5-(pyridin-3-yl)-1,3,4-oxadiazol-3(2H)-yl)-prop-2-en-1-one (11a-11j, 12a-12j). Anti-tubercular activity varied across the series. Compounds 6a, 6b, 6d, 6f, and 6g exhibited sensitivity at higher concentrations but resistance at lower concentrations. Compounds 7a-7g displayed a similar trend, with 7g showing sensitivity even at 0.98 µg mL^{-1}. Compounds 11g, 11h, and 11i exhibited resistance at relatively higher concentrations. Similarly, most compounds in the 12 series demonstrated sensitivity at higher concentrations but resistance at lower concentrations, with 12a and 12b showing resistance at higher concentrations. The study investigated INH analogues incorporating a 2,3-dihydro-1,3,4-oxadiazole scaffold with an imine linkage. Docking studies revealed that these compounds exhibited comparable interactions with InhA to those of the native ligand, NADP, with notable docking scores.*In vitro* anti-tubercular activity against Mycobacterium tuberculosis (Mtb H37Rv) further supported their potential as anti-tubercular agents. The observed sensitivity and resistance trends at different concentrations suggest promising avenues for further development of these compounds as new anti-TB therapeutics.

Keywords

1,3,4-oxadiazole, InhA, *Mycobacterium tuberculosis*, docking

PROCEEDING
ACSTM 2025

Decoding Health: Navigating Triumphs and Challenges in AI-Driven Diagnostics

Majani Edward[1], Emele Arthur-Hayford[2], Atuoha Ernest[3], Emmanuel Chileshe Phiri[4], Rasha ElZein[5], Aesha L.E Enairat[6]

[1]Department of Public Health, St. Francis University College of Health and Allied Science, Tanzania

[2]Accra Technical University, Ghana

[3]Department of Medical Radiography and Radiological Sciences, University of Nigeria, Enugu Campus, Nigeria

[4]Copperbelt University School of Medicine, Ndola, Zambia

[5]Department of Natural Sciences, Lebanese American University, Lebanon

[6]Faculty of Graduate Studies, Medical Imaging Technology, Al-Quds University, Palestine

Presenter

Aesha L.E Enairat

Type

Poster Presentation

Track

Medical & Health Sciences

Abstract

Artificial intelligence (AI) is revolutionizing disease diagnostics, particularly in oncology. Machine learning and deep learning algorithms enable the identification of subtle patterns and biomarkers, ushering in a new era of precision medicine. Convolutional Neural Networks (CNNs) demonstrate superior accuracy and efficiency in medical image analysis compared to traditional methods. AI-powered Computer-Aided Diagnosis (CAD) systems significantly enhance diagnostic speed and accuracy. Beyond diagnostics, AI has transformed various healthcare areas. It has facilitated epidemiological surveillance for disease tracking and forecasting. AI-powered telemedicine has improved access to diagnosis and genome analysis, particularly during crises like COVID-19. Additionally, AI has accelerated drug discovery through techniques such as de novo drug design. However, challenges remain in implementing AI for diagnostics. These include evolving legal and policy frameworks, ethical concerns, and security risks. Resistance to change among healthcare professionals and a lack of AI training further hinder adoption. Moreover, the rise of self-care technologies raises concerns about the future of patient care and the evolving role of healthcare providers. To address these challenges, robust regulations are needed to ensure the ethical and secure use of AI in healthcare. Training initiatives for healthcare professionals are crucial for the effective utilization of AI tools. Collaboration between healthcare experts and technology developers is essential to creating user-friendly AI solutions that seamlessly integrate into existing workflows. By leveraging AI as a complementary tool, healthcare can achieve better patient outcomes and more effective disease detection and treatment.

Keywords

Artificial intelligence (AI), AI-driven diagnostics, Computer-Aided Diagnosis (CAD)

PROCEEDING
ACSTM 2025

An In-Silico Analysis Reveals lncRNA TMPO-AS1 Modulates the hsa-let-7b-5p/AURKA Axis via E2F1 Regulation in Lung Cancer Cells

Prerna Vats[1], Sandeep K. Srivastava[1], Ashok Kumar[2], Rajeev Nema[1]

[1]Department of Biosciences, Manipal University Jaipur, Dehmi Kalan, Jaipur-Ajmer Expressway, Jaipur, Rajasthan, 303007, India

[2]Department of Biochemistry, All India Institute of Medical Sciences (AIIMS), Bhopal, Saket Nagar, Bhopal, Madhya Pradesh 462020, India

Presenter
Rajeev Nema

Type
Poster Presentation

Track
Medical & Health Sciences

Abstract

The study explores the prognostic significance of AURKA's role in LUAD smokers, focusing on its expression patterns and competitive endogenous RNA regulatory mechanisms. The KM Plotter database was utilized to analyze prognostic significance and gene survivability, while TCGA databases such as UALCAN, OncoDB, ENCORI, Lung Cancer Explorer, GEPIA2, and TCG Analyzer were used for differential expression studies. Transcription factor identification was performed using Enrichr, and a ceRNA network was created using miRNet. Significant overexpression of AURKA in LUAD tissues correlates with advanced disease stages and poor survival outcomes, especially in smokers. AURKA expression is strongly associated with cell cycle regulation, proliferation, invasion, and metastasis-related pathways. Transcription factor E2F1 and lncRNA TMPO-AS1 are positively correlated with AURKA, while miRNA hsa-let-7b-5p is negatively correlated. Targeting miRNA could regulate AURKA and its associated transcription factor and lncRNA expression levels. AURKA, a therapeutic target in LUAD, is particularly beneficial for high-risk smokers, offering new avenues for targeted therapies based on its regulatory mechanisms.

Keywords

Aurora A, biomarker, ceRNA Network, LUAD, smokers

PROCEEDING
ACSTM 2025

Protective Effects of Rosmarinic Acid Against Lipopolysaccharide-Induced Acute Lung Injury in Rats

Renu kumari, Nirmal Dongre, Souravh Bais
Institute of Pharmaceutical Sciences, Sage University Indore, India

Presenter
Renu Kumari

Type
Poster Presentation

Track
Medical & Health Sciences

Abstract

Lipopolysaccharide (LPS)-induced endotoxemia triggers the secretion of proinflammatory cytokines and can lead to acute lung injury (ALI). The high mobility group box 1 (HMGB1) protein serves as a late mediator of sepsis and ALI. Rosmarinic acid, an acetylcholinesterase inhibitor, has been shown to suppress HMGB1 expression. This study evaluated the protective effects of Rosmarinic acid by assessing inflammatory mediators and histopathological changes associated with LPS-induced ALI. Sixty male Sprague-Dawley rats (8-10 weeks old, 200-240 g) were randomly assigned to three groups: (1) control, (2) LPS (7.5 mg kg^{-1} LPS), and (3) LPS + Rosmarinic acid (5 mg kg^{-1} Rosmarinic acid before LPS administration). Lung specimens were collected 12 hours post-LPS administration for histopathological analysis, including wet-to-dry (W/D) weight ratio, myeloperoxidase (MPO) activity, and HMGB1 expression. Plasma levels of tumor necrosis factor-? (TNF-?), interleukin-6 (IL-6), and HMGB1 were measured at 0 (baseline), 3, 6, 9, and 12 hours post-LPS administration using enzyme-linked immunosorbent assay (ELISA). Mortality was recorded over 72 hours. LPS-induced ALI was characterized by pulmonary structural distortion, increased MPO activity, elevated W/D weight ratio, and heightened levels of TNF-?, IL-6, and HMGB1. Pre-treatment with Rosmarinic acid significantly mitigated LPS-induced lung pathology, reduced W/D weight ratio, suppressed pro-inflammatory cytokine levels, and decreased MPO activity (ANOVA). Furthermore, Rosmarinic acid treatment significantly improved survival rates (ANOVA). In conclusion, this study demonstrates that Rosmarinic acid exerts a protective effect against LPS-induced ALI in rats, likely by reducing inflammation and improving lung integrity.

Keywords

Galantamine, acute lung injury, lipopolysaccharide, HMGB1

PROCEEDING
ACSTM 2025

Design, Synthesis and Computational Studies of Benzothiazol-2-ylmethyl-(x-halide-phenyl)-amine Derivatives as Antialzheimer Agents

Manoj Ramesh Kumbhare[1], Siddhi M. Chandak[2], Vrushali P. Patole[3]

[1,2,3]Department of Pharmaceutical Chemistry, SMBT College of Pharmacy, Dhamangaon, Nashik, Maharashtra, India

Presenter
Manoj Ramesh Kumbhare

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

The study explores the potential of benzothiazol-2-ylmethyl-(x-halide-phenyl)-amine derivatives as anti-Alzheimer agents by integrating halogenated phenyl groups and amine functionalities into benzothiazole frameworks. These chemical modifications aim to enhance bioactivity, selectivity, and blood-brain barrier permeability while optimizing interactions with key Alzheimer's disease targets, the research evaluates pharmacokinetic parameters, activity spectra, and molecular docking scores to identify promising candidates. Notable results include docking scores that demonstrate the derivatives binding affinities compared to Galantamine, a standard reference compound, with Benzothiazol-2-ylmethyl-(2-methyl-5-nitro-phenyl)-amine achieving a docking score of -9.6. Synthesis and computational studies.

Keywords

Computational Studies, Benzothiazole, Alzheimers disease

Development and Evaluation of Skincare Formulations Using Honeybee (*Apis mellifera*) Hive Derivatives

Farkhanda Manzoor
Minhaj University Lahore, Pakistan
Lahore College for Women University, Lahore, Pakistan

Presenter
Farkhanda Manzoor

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Since ancient times, skincare products have been in high demand, with a growing emphasis on organically derived cosmetic products. Skincare products are among the most commonly used items to enhance appearance and slow the skin's aging process. This study aimed to develop, produce, and evaluate various skincare formulations, including face cream, lip balm, face wash, and moisturizing cream, using honeybee (*Apis mellifera*) hive products such as beeswax, honey, and propolis. Skincare formulations were prepared using different solvent phases (oil-in-water and water-in-oil). All formulations were evaluated based on various parameters, including pH, spread ability, heat stability, melting point, consistency, color, fragrance, washability, after-feel, and irritation potential. Different formulations of lip balm, face whitening cream, moisturizing cream, and anti-acne, anti-inflammatory face wash were developed, with all results falling within the prescribed limits. When compared to their counterparts, formulations F2 of the face whitening cream, F3 of the face wash, and F2 of the moisturizing cream demonstrated neutral pH, good viscosity, consistency, and spread ability. Optimization was performed based on pH studies and physicochemical parameters. The findings of this research indicate the promising potential of organic formulations containing a specific ratio of honey and beeswax as emulsifiers. Thus, it can be concluded that incorporating beeswax into organic formulations enhances their cosmetic benefits.

Keywords

Honey bee, bee wax, organic formulations

PROCEEDING
ACSTM 2025

Climate Smart Agriculture for Driving Sustainability Pathways in North Africa

Rachid Mrabet
INRA, Rabat, MOROCCO

Presenter
Rachid Mrabet

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

North Africa is experiencing severe climate change and water scarcity, which are far from normal. These challenges threaten agriculture, human health, ecosystems, and national economies. Food and nutrition security, along with climate security, have become twin crises that will shape the region's future. Policymakers are prioritizing efforts to eradicate hunger, alleviate poverty, restore soil integrity, and sustain economic growth. Climate-smart agriculture (CSA) is emerging as a crucial strategy to address these challenges by enhancing food security, mitigating climate change, and improving resilience. CSA integrates nature-based, digital, and technological solutions to optimize resource use, improve environmental outcomes, and strengthen agricultural systems. Conservation agriculture, agroforestry, and organic farming are gaining traction, requiring well-defined roadmaps for effective adoption. CSA offers significant environmental benefits, including improved soil fertility, water conservation, carbon sequestration, and biodiversity enhancement. Socioeconomic advantages include increased farm productivity, higher incomes, knowledge generation, and greater social equity, particularly benefiting youth and women. By adopting CSA, farmers can improve economic viability, diversify their crops, and enhance food and nutrition security. To maximize CSA's potential, inclusive policy dialogues, cross-sector collaboration, and enhanced information-sharing systems are essential. Development agencies should shift funding from conventional agricultural approaches to CSA-driven solutions. Given the diverse agricultural landscapes and socio-economic contexts in North Africa, tailored strategies and innovative advancements are needed. Investing in CSA will enhance regional resilience, support sustainable development goals (SDGs), and contribute to the broader MENA region's long-term sustainability.

Keywords

Climate smart agriculture, agroforestry, organic farming, carbon capture farming, sustainability

PROCEEDING
ACSTM 2025

The Role of Hygiene and Ethical Practices in Safeguarding Food Safety and Public Health

Fatemehsadat Mirmohammadmakki[1], Mahmoud Abbasi[1], Mahdi Shadnoush[2]

[1]Medical Ethics and Law Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[2]Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Presenter
Fatemehsadat Mirmohammadmakki

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

The journey of food from farm to table significantly impacts public health. Food hygiene is essential at every stage of production, processing, distribution, and consumption to ensure food safety and quality. Poor hygiene can lead to food-borne illnesses, including poisoning and infections caused by bacteria, viruses, and parasites. These health issues harm individuals, reduce quality of life, and strain public healthcare systems. Ethical principles like honesty, responsibility, and consumer respect are fundamental to food hygiene. Farmers must adopt sustainable agricultural methods, avoid harmful chemicals, and ensure clean harvesting practices to maintain food safety. Processing facilities should follow rigorous hygiene protocols, use sanitized equipment, and ensure that workers maintain proper personal hygiene. Distributors need to store and transport food under optimal conditions to preserve its quality, while consumers should practice safe handling, storage, and preparation at home. Beyond health, food hygiene offers broader societal benefits. It reduces the prevalence of food-borne diseases, enhances the quality and productivity of agricultural and livestock products, and supports environmental sustainability. Proper hygiene practices also build consumer trust, strengthening confidence in the food supply chain. Achieving a safe food system requires collective effort from all stakeholders, including farmers, processors, distributors, and consumers. By adhering to hygienic and ethical practices at every stage, the risks of contamination and illness can be significantly reduced. Food safety is a shared social responsibility, and prioritizing hygiene is critical to building a healthier society. Together, we can improve public health, enhance quality of life, and create a sustainable and reliable food system for future generations.

Keywords

Food sanitation, consumer health, ethical food production, safe food chain, sustainable agriculture, food production ethics

Bioactive Components of Algae: Fundamentals and Emerging Trends

Seher Dirican
Department of Biology, Faculty of Science, Sivas Cumhuriyet University, 58140 Sivas, Turkey

Presenter
Seher Dirican

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Algae play essential biological and ecological roles in aquatic ecosystems. They contain valuable compounds that benefit both human health and the nutrition of organisms cultivated in aquaculture. This study focuses on the bioactive components of algae, which serve as sustainable natural sources for bioactive compound production. Unlike plants, algae lack true roots, stems, and leaves but are crucial for maintaining ecological balance. As photosynthetic organisms, algae convert sunlight, water, and carbon dioxide into biomass. Their bioactive components exert positive effects on health by influencing physiological and cellular activities. Due to their rapid biomass growth, algae can yield significantly higher amounts of bioactive compounds than terrestrial plants. These naturally occurring bioactive components contribute to the growth and development of algae, providing distinct color, taste, and odor characteristics while offering protective properties against bacteria, viruses, fungi, and parasites. This defense mechanism enhances their survival and resilience in harsh environmental conditions. Algae are rich in biologically active compounds, including fats, fatty acids, proteins, carbohydrates, carotenoids, antioxidants, phenolic acids, flavonoids, sterols, polyphenols, vitamins, and minerals. Notably, they serve as an excellent source of omega-3 fatty acids. These bioactive compounds are widely utilized in food, cosmetics, medicine, and pharmaceuticals. Additionally, algae are recognized as functional foods due to their high nutritional value and bioactive components. The bioactive compounds in algae play a significant role in promoting health and preventing various diseases, including inflammation, oxidative stress-related disorders, tumors, blood coagulation issues, viral infections, diabetes, and high cholesterol.

Keywords

Algae, bioactive components, health, functional products, nutrition

Anti-Inflammatory Potential of Traditional Unani Formulations

Pawan Sharma, Falak Bamne, Binita Mandal, Tabassum Khan, Munira Momin, Nikhat Shaikh, Ahmad Ali

Department of Life Sciences University of Mumbai Vidyanagari, Santacruz (East), Mumbai 400098, Maharashtra, INDIA SVKM's Dr. Bhanuben Nanavati College of Pharmacy, Mumbai

Presenter
Ahmad Ali

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Unani medicine is a widely practiced traditional system of medicine that has been used for several centuries in India. This system harnesses the therapeutic potential of medicinal plants. The present study investigates the anti-inflammatory potential of the UNIM-H formulation, which consists of six medicinal plants. The health-promoting benefits of the hydroalcoholic extracts of individual plants and the formulation were analyzed using established methods and assays for phytochemical screening, antioxidant capacity, and anti-inflammatory potential. The results indicate that A. barbadensis contained the highest amount of phytochemicals, whereas C. scammonia exhibited the strongest free radical scavenging capacity. Additionally, these plant extracts effectively prevented oxidative DNA damage. The anti-inflammatory potential of both the individual extracts and the formulation was significant. Moreover, no histopathological toxicity was observed with the oral dosage of the formulation. These findings highlight the therapeutic potential of the UNIM-H formulation for the prevention of arthritis.

Keywords

Herbal remedies, anti-inflammatory, antioxidant properties, arthritis, DNA damage prevention

PROCEEDING
ACSTM 2025

Hydropriming and Osmopriming: Mitigation Strategies to Improve Sorghum Production by Enhancing Seedling Vigor

Adrianne C. Gonzales Christian Butch Andrew A. Balbas Raymund Julius G. Rosales Micah Benize S. Gregorio-Balbas Glisten Faith S. Pascua Joanna P. Crosby

Department of Agricultural Sciences, Mariano Marcos State University, City of Batac, Ilocos Norte, Philippines

Presenter

Raymund Julius G. Rosales

Type

Oral Presentation

Track

Agricultural & Biological Sciences

Abstract

Improving sorghum production requires enhancing the quality of planting material. This study evaluated the effects of hydropriming and osmopriming on the seedling vigor of sorghum seeds under ambient conditions (temperature: 28±2 °C; relative humidity: 65±5%). Different durations (4, 8, 12, and 16 hours) of hydropriming and osmopriming using potassium nitrate (KNO_3 at 0.5, 1.0, and 2.0%) were tested, with unprimed seeds serving as the control. A Completely Randomized Design with four replicates was employed. The results showed that seed priming, regardless of duration and KNO_3 concentration, significantly enhanced shoot and root length, seedling length, fresh weight, and overall seedling vigor compared to unprimed seeds. Specifically, hydropriming for 8 hours and osmopriming for 4 hours (irrespective of concentration) produced longer seedlings, with no further significant improvement at longer durations. The highest seedling fresh weight was observed at 1.0% KNO_3 for 4 hours, though similar results were obtained with other concentrations and hydropriming (8 and 16 hours). Fresh weight was comparable between hydropriming and osmopriming treatments. A higher seedling vigor was observed in osmopriming (0.5-2.0% KNO_3 for 4-16 hours), which was comparable to hydropriming at 8 hours. Based on these findings, farmers can opt for either hydropriming (8 hours) or osmopriming (0.5-1.0% KNO_3 for 4 hours) to improve seedling vigor and sorghum production.

Keywords

Potassium nitrate, seed germination, seed priming, seed quality, seed vigor

AI-Powered Probiotic Assessment: Potentials and Challenges

Abrar Hussain, Syed Abid Ali
Third World Center for Science and Technology, HEJ Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan

Presenter
Abrar Hussain

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
The relationship between microorganisms and hosts is complex and multifaceted, posing significant challenges in identifying, characterizing, and understanding their impact. Among the diverse communities of gut microbiota, probiotics play a crucial role in supporting various aspects of host physiological health. The World Health Organization (WHO) defines probiotics as live microorganisms that, when administered in adequate amounts, confer health benefits on the host. The field of probiotics has expanded rapidly, becoming a billion-dollar industry that influences numerous aspects of human and animal health. Despite the promising potential of probiotics, existing methods for their identification and characterization are laborious, time-consuming, and often yield inconsistent results. This underscores the need for innovative, automated approaches to overcome these limitations and advance probiotic research. One such innovation is the application of artificial intelligence (AI), which has gained significant traction in the healthcare sector. Researchers are increasingly leveraging AI and machine learning (ML) to address challenges in microbiology, particularly in microbiome research. These technologies enable full laboratory automation and provide novel solutions for microbiological assessments. AI and ML have proven effective in analyzing microbial data, predicting outcomes, and gaining insights into the dynamics of microbial communities. They enhance the understanding of probiotic behavior and contribute to optimizing their therapeutic effects. Additionally, AI and ML facilitate the development of next-generation probiotics, the establishment of artificial models for probiotic validation, and the advancement of probiogenomic research. AI tools are also widely used in microbial identification, quality assessment, outcome prediction, and process automation. Despite AI transformative role in probiotic research, several challenges remain. Ethical considerations, data reliability, and the lack of experimental validation are key obstacles. Therefore, while AI holds immense potential for the development and application of probiotics, thorough assessment and validation are essential to ensure its effectiveness and safety in this field.

Keywords
Artificial intelligence, machine learning, microbiology, microorganisms, probiotics

PROCEEDING
ACSTM 2025

Potato Landraces Exhibit Higher Resistance to Drought and Saline Stress: An Analysis of Germination Parameters

Abhisek Shrestha[1], Bharti Thapa[2]

[1,2]College of Natural Resource Management, Bardibas, Agriculture and Forestry University, Nepal

Presenter
Abhisek Shrestha

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Drought and saline areas are increasing due to changing climate conditions. Landraces offer a potential solution for mitigating this problem. Therefore, an experiment was conducted in Bajura to evaluate the seedling growth of potato landraces under PEG-induced drought and NaCl-induced saline stress. The experiment followed a two-factorial Completely Randomized Design (CRD) with two replications and 18 treatments. One factor consisted of six varieties: five local varieties (Pandusen Local, Damkane Local, Dungri Local, Sim Local, and Basala Chauka) and one improved variety (Desiree). Tubers were sown at a depth of 5-6 cm, with 15 tubers of each variety in a tray. Various growth parameters, including germination percentage, mean germination time, plant height, number of leaves, number of branches, and root length, were recorded. Data entry was performed in Excel, and statistical analysis was conducted using R-Studio version 06.2. The results revealed that all parameters were affected by drought and saline stress, with Desiree showing the highest sensitivity. Under drought and saline stress conditions, germination percentage decreased by 11.85-14.89%, mean germination time increased by 3.25-4.9 days, plant height was reduced by 21.36-26.15%, and the number of leaves decreased by 26.97-48.02%. Sim Local and Dungri Local exhibited superior performance under drought stress, while Basala Chauka performed best under saline conditions. However, further experiments are recommended to confirm these findings under both greenhouse and field conditions.

Keywords

Drought, polyethylene glycol, landraces, growth parameters, sodium chloride, salinity

PROCEEDING
ACSTM 2025

Evaluation of *Phoma sp.,* Bioherbicide against *Parthenium hysterophorus* and *Triticum aestivum*

Dr. Swati Chitranshi[1], Dr. Braj Kishor Upadhyay[2], Mr. Manish Kumar Chitranshi[3]

[1]MVN University, India
[2]Jiwaji University, India
[3]Amity University, India

Presenter
Swati Chitranshi

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Agriculture is a fundamental necessity for all, yet it faces numerous challenges, requiring continuous innovation for sustainability. Weeds pose a significant threat to crop yields. *Parthenium hysterophorus* is a weed native to America, and its adverse impacts are well documented. This weed is resistant to many herbicides, highlighting the need for new herbicidal technologies. Bioherbicides represent a promising alternative, offering benefits for agriculture, the environment, and human health. The present study aimed to evaluate the bioherbicidal activity of metabolites from the fungus *Phoma sp.* against *Parthenium hysterophorus* (weed) and *Triticum aestivum* (crop plant). First, soil fungus was isolated and identified from the Chambal Ravine, India. The ITS sequence was deposited in NCBI under accession no. MH595428. Fungal metabolites were produced using submerged fermentation. The bioherbicidal activity of crude bioherbicide (C1), various concentrations of extracted metabolites (T1 to T10), and the positive control (C2, distilled water) were tested on *Parthenium hysterophorus* and *Triticum aestivum*, focusing on seed germination and seedling growth. Crude bioherbicide from *Phoma sp.,* completely inhibited germination in *Parthenium hysterophorus*. Treatments from T1 to T10 showed varying germination percentages, with germination increasing as the concentration of crude bioherbicide decreased 50% germination at 10^{-1}dilution and 90% at 10^{-10} dilution, whereas 100% germination was observed in the control. Root shoot length and fresh weight decreased with crude bioherbicide treatment. However, bioherbicide did not affect the germination of *Triticum aestivum* seeds, with 100% germination observed across all treatments (C1, C2, and T1-T10). Root shoot length and fresh weight decreased in response to pure crude bioherbicide, but the effect diminished as the concentration decreased from T1 to T10. GC-MS analysis revealed that *Phoma sp.* produced two metabolites: 2,4,6-cycloheptatrien-1-one (45.92%) and octasiloxane (54.08%). Based on seed germination studies, the bioherbicide from *Phoma sp.* can be used as a pre-emergent herbicide against *Parthenium hysterophorus* without affecting the crop plant. Further investigations are needed to develop a commercial bioherbicide.

Keywords

Phoma sp., Bio-herbicide, *Parthenium hysterophorus*, *Triticum aestivum*, GCMS

Lactobacillus acidophilus: Boosting Immunity via IL-6 Induction

Isaac Oluseun Adejumo
Department of Animal Science, University of Ibadan, Nigeria

Presenter
Isaac Oluseun Adejumo

Type
Poster Presentation

Track
Agricultural & Biological Sciences

Abstract

The significance of animal-sourced proteins cannot be overstated, driving deliberate efforts to increase the production of animal products to meet the growing global demand. However, animals raised in intensive production systems often experience stress, which can negatively impact their welfare, productivity, and health, making them more susceptible to pathogenic infections. This has led to the exploration of feed additives, such as probiotics, that can enhance health and reduce pathogenic colonization. Probiotics, particularly lactic acid bacteria, provide health benefits when consumed in sufficient quantities. These benefits include combating pathogenic enteric bacteria, improving growth performance, and modulating intestinal microflora. Probiotic bacteria in the intestinal tract can form colonies that suppress pathogenic bacteria, thereby protecting the gut from invasion. This growing recognition has increased the demand for probiotics in animal nutrition, food supplements, cosmetics, and therapeutic applications. However, their functional mechanisms remain incompletely understood, underscoring the need for further research. In this study, fourteen uncharacterized proteins from the Lactobacillus acidophilus genome were analyzed for subcellular localization, structural properties, and their potential to induce interleukin-6 (IL-6). The aliphatic index scores were generally high, ranging from 138.39 (LBA1705) to 78.39 (LBA1825), while the instability index scores were below 40 for all proteins except LBA0995. Most proteins produced immunogenic IL-6-inducing peptides, except LBA0037, LBA1825, and LBA1788. These findings support the sustainable application of probiotics as feed additives, food supplements, and for cosmetic and therapeutic purposes.

Keywords

Lactobacillus acidophilus, interleukin-6, pathogenic infections, probiotics, feed additive, food supplement

PROCEEDING
ACSTM 2025

Commercialization Potential of Invasive Marine Resources: Blue Swimming Crab in North Tunisian Waters

Sami Mili[1], Rym Ennouri[2], Safa Bejaoui[3], Simone Libralato[4]

[1,3]Faculty of Sciences of Bizerte, Tunisia
[2]National Institute of Marine Sciences of Bizerte (ISSMB), Tunisia
[4]National Institute of Oceanography and Applied Geophysics (OGS), Italy

Presenter
Sami Mili

Type
Poster Presentation

Track
Agricultural & Biological Sciences

Abstract

The blue swimming crab, originally from the Red Sea, entered Tunisian waters via the Suez Canal, first appearing in Skhira (Sfax province) and Ghannouch (Gabes province) in late 2014. By 2015, it had adapted and spread throughout the Gulf of Gabes, reaching the Gulf of Hammamet in 2016 and northern Tunisian waters by 2018. Coastal fishermen in colonized areas have reported significant challenges, including net damage, alteration of caught species, increased disentangling time, and the decline of commercially valuable fish stocks. In response, the Tunisian government has implemented a national plan to promote crab fishing, development, and commercialization, particularly in the Gulf of Gabes. Given the limited domestic demand, exporting blue crabs is considered a viable alternative. This project aims to develop an action plan to enhance national and international circular marketing of blue crabs in Tunisia and the Central Mediterranean. The initiative is expected to create new employment opportunities and improve sustainable incomes for vulnerable coastal communities.

Keywords

Invasion, blue crab, opportunities, threats, Tunisia

Impact of River Geomorphology on Nitrogen Retention and Retention Processes: A Case Study on the Padma River in Bangladesh

Md. Ataul Gani
Department of Botany, Jagannath University, Dhaka 1100, Bangladesh

Presenter
Md. Ataul Gani

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Large tropical rivers play a significant role in retaining nitrogen and mitigating eutrophication in coastal areas. Often, these rivers are characterized by geomorphic complexity, comprising features such as islands, bars, dry channels, and river banks. Nitrogen retention of these rivers is regulated by different hydrological factors. Understanding the seasonal variation of geomorphic units (GUs) and related nutrient retention of a river at a reach scale can help to predict the importance of geomorphic units on nitrogen retention. The present investigation was carried out over 50 km reach in the Padma River of Bangladesh, downstream of the confluence of the Ganges and Brahmaputra rivers. Sentinel-2 imagery (2016-2020) was processed using NDVI values to classify geomorphic units (GUs) and map nutrient-retention/export-relevant geomorphic units (NREGUs) of the study area. The field measurements of potential denitrification rate (PDR) were performed in land use land cover (LULC) types, which are the patches of GUs. To show the spatiotemporal distribution of PDR in the study reach, different linear mixed models (LMMs) were performed, including Sentinel-2 band 11 and NDVI, which were used as a proxy of soil/sediment moisture and vegetation cover, respectively. Simultaneously, different nitrogen processes, such as nitrogen loss due to water retention (NLWR), sedimentation, and net PDR, were modeled using the measurements of the reach. NLWR was calculated based on the water retention and inflow total nitrogen (TN) concentration, and sedimentation was calculated from the difference between inflow and outflow particulate nitrogen concentration and outflow discharges. PDR was measured from the water column; later on, it was upscaled based on the water travel time and discharges. A mass balance was carried out in the reach, considering inflow and outflow TN concentrations and discharges to validate these estimations. These monthly estimations showed a substantial variation in nitrogen retention; maximum retention occurred in the monsoon months. In the non-monsoon periods, a noticeable amount of nitrogen losses occurred by PDR. The present research mainly focuses on the seasonal dynamics of river nitrogen retention, including river geomorphology. The modeling approach, which was demonstrated by PDR, showed that altering GUs can regulate the retention processes. This approach can also reveal the effect of river management programs, such as river dredging, which can change nitrogen retention and export scenarios.

Keywords

Nitrogen retention, water Retention, potential dinitrifcation rate, seasonality, geomorphic units, large tropical river

PROCEEDING
ACSTM 2025

Improving Land Use Classification in the Suluh River Basin, Ethiopia, Using a Fuzzy Approach

Hailay Hagos Entahabu[1,2], Amare Sewnet Minale[2], Emiru Birhane[3,4]

[1]Department of Geography and Environmental Studies, Raya University, May Chew, Ethiopia

[2]Bahir Dar University, Bahir Dar, Ethiopia

[3]Institute of Climate and Society, Mekelle University, Mekelle, Ethiopia

[4]Faculty of Environmental Sciences and Natural Resource Management Norwegian, University of Life Sciences, Aas, Norway

Presenter
Hailay Hagos Entahabu

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Despite the complex terrain, fragmented land use, and diverse features of the Suluh River Basin, object-based fuzzy classification of multispectral satellite imagery had not been applied to Landsat image classification. Therefore, this study aimed to classify Landsat imagery of the Suluh River Basin using an object-based fuzzy classification approach. Data were obtained from Landsat 5 (TM), Landsat 7 (ETM+), and Landsat 8 (OLI-TRIS), along with additional supplementary data. An object-based fuzzy (nearest neighbor) classification method and image segmentation, utilizing the eCognition Developer 9.2 extension program, were employed to analyze multi-resolution satellite images. Additionally, qualitative data were subjected to qualitative analysis. Land use and land cover (LULC) data were collected for eight categories: cultivated land, plantation, built-up areas, shrub-bush, forest, grazing land, and water bodies, covering the years 1990, 2002, and 2018. Despite the considerable variation in the study area, the classification achieved an overall accuracy of 88-90% and a kappa coefficient ranging from 0.87 to 0.89. These findings demonstrate that an object-based fuzzy (nearest neighbor) classification approach using Landsat data is a valuable tool for land use classification and can be further explored for research in other regions.

Keywords

Digital classification, accuracy, object-based fuzzy classification, land sat, image classification

Value-Added Products from Nature's Heart in a Conventional Practice

Venkitasamykalaigandhi, Amirthavarshini. B, Anitha Sri. M, N.K.Prasanna, Subhitsha. G, A.Thilagamirutyunjay, Dinesh. S, Akamsh Sureshbabu

School Of Biosciences, Dr. G.R. Damodaran College Of Science, Coimbatore, Tamilnadu, 641014, India

Presenter

Venkitasamykalaigandhi

Type

Poster Presentation

Track

Agricultural & Biological Sciences

Abstract

Plants have long been recognized as essential resources for combating various diseases *Cardiospermum halicacabum*, commonly known as Balloon Vine or Nature's Heart, is a medicinal plant traditionally used to treat ailments ranging from skin disorders to inflammation. This study investigates its medicinal properties to formulate nutrient-rich cookies infused with its extract. The research includes phytochemical analysis and an evaluation of the plant's antimicrobial activity to assess its potential benefits. By incorporating Balloon Vine into millet-based products, this study aligns with governmental efforts to support farmers while promoting health through sustainable and nutritious food choices. As diseases and infections continue to rise due to unhealthy dietary habits and other factors, this work presents a novel approach to developing value-added products that integrate traditional wisdom with modern health needs. The findings aim to pave the way for healthier dietary options, contributing to the well-being of future generations.

Keywords

Cardiospermum halicacabum, cookies, millet, value added product

Co-Inoculation of *Lactobacillus plantarum* and *Leuconostoc mesenteroides* in *Enset* Fermentation: Microbial Dynamics, Physicochemical Properties, and Proximate Composition

[1]Dereba Workineh Seboka, [2]Addisu Fekadu Andeta

[1]Department of Forensic Science, College of Crime Investigation and Forensic Science, Ethiopian Police University, P.O.Box. 1503, Sendafa, Ethiopia

[2]Department of Biology, College of Natural and Computational Science, Arba Minch University, P.O. Box.21, Arba Minch, Ethiopia

Presenter
Dereba Workineh Seboka

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Enset (Ensete ventricosum) is a multipurpose crop that originated and was domesticated in Ethiopia. Kocho is the major food product obtained from the scraped pseudostem and decorticated corm of the *Enset* plant through a long fermentation process. The traditional *Enset* fermentation process is time-consuming, labor-intensive, and inconsistent in quality. There is no standardized or well-defined starter culture for traditional *Enset* fermentation, resulting in poor-quality products with variable sensory properties. This study investigated the effects of *Lactobacillus plantarum* and *Leuconostoc mesenteroides* co-inoculation on physicochemical properties and microbial dynamics during *Enset* fermentation. Single and mixed inocula were prepared using *L. plantarum* (FX 15 and SAM 6) and *L. mesenteroides* (HM 53) and evaluated for *Enset* fermentation under laboratory and field conditions. *Enset*extract medium and Kocho samples inoculated with *L. plantarum* (FX 15 + SAM 6), *L. plantarum* + *L. mesenteroides* (SAM 6 + HM 53), and *L. plantarum* (SAM 6) showed rapid pH reduction and colonization of the inoculated *Enset* mass, which were promising results at the laboratory scale. For the field experiment, four mature *Enset* plants were processed, inoculated with the selected starter culture, and allowed to ferment in a sauerkraut jar for two months. Physicochemical and microbial dynamics were investigated on days 0, 7, 15, 30, and 60. The results revealed an increase in titratable acidity and a decrease in moisture content and pH. Total aerobic counts were high in all Kocho samples, while Enterobacteriaceae counts dropped below detectable levels by day 7 for inoculated samples and by day 15 for controls. Yeast and mold counts decreased as fermentation progressed. The co-inoculant (SAM 6 + HM 53) performed better in pH reduction and faster colonization of *Enset* mass than sole inoculants and controls. Scaling up such inoculants to a commercial level could address challenges associated with *Enset* fermentation.

Keywords

Enset, fermentation, inoculation, lactic acid bacteria, sauerkraut jar, starter culture

PROCEEDING
ACSTM 2025

Assessment of the Effective Concentrations of Antibiotics and *Moringa oleifera* Leaf Extracts Against Foodborne Pathogens

Neha Farid, Farwah Abbas, Kyle Anthicques, Ahmed Asif
Department of Biosciences, Faculty of Life Sciences, SZABIST University, Islamabad, Pakistan

Presenter
Neha Farid

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract

Listeria spp. and Campylobacter spp. are prevalent foodborne pathogens in Pakistan, known to cause gastrointestinal diseases and other illnesses. These pathogens can rapidly grow on raw or undercooked dairy, meat, and poultry products, posing a significant health risk through oral consumption. Additionally, they have demonstrated resistance to commonly used antibiotics in Pakistan, highlighting the urgent need for alternative antimicrobial agents. *Moringa oleifera* has been reported to possess strong antibacterial properties and various therapeutic compounds beneficial to human health. This study aims to evaluate the antibacterial activity of different antibiotic concentrations and compare them with the effectiveness of *Moringa oleifera* leaf extracts. Six antibiotics Ciprofloxacin, Erythromycin, Azithromycin, Nalidixic Acid, Amoxicillin, and Amphotericin B were tested against *Listeria monocytogenes and Campylobacter jejuni* to determine their susceptibility. Additionally, methanolic *Moringa oleifera* leaf extracts were prepared and tested against these bacterial strains. Data analysis revealed that *Moringa oleifera* methanol leaf extract exhibited significant zones of inhibition at lower concentrations as compared to the six tested antibiotics. These findings suggest that *Moringa oleifera* could serve as a potential antimicrobial agent for treating infections caused by foodborne pathogens.

Keywords

Listeria monocytogenes, Campylobacter jejuni, Antibiotics, *Moringa oliefera*, multi drug resistance, antimicrobials, foodborne diseases

PROCEEDING
ACSTM 2025

Significance and Quality Evaluation of Herbal Products Using Cutting-Edge Analytical Methods for Scientific Validation

Sophia Subhadarsini Pradhan[1], Somanath Baral[2], Bibhuti Bhusan Champati[3]

[1,3]Department of Botany, Ravenshaw University, Cuttack, Odisha, India
[2]CSIR-Centre for Cellular & Molecular Biology (CCMB), Hyderabad, Telangana, India

Presenter
Bibhuti Bhusan Champati

Type
Poster Presentation

Track
Agricultural & Biological Sciences

Abstract

The rapid advancements in modern technology have significantly accelerated scientific discoveries, particularly in the domain of medicinal plant research. The exploration of phytochemical constituents using advanced analytical techniques has introduced a new dimension to plant sciences. While numerous medicinal plants have been documented in ancient texts for their therapeutic efficacy, environmental changes may influence their bioactive potential in contemporary settings. Additionally, a vast number of plant species remain unexplored for their medicinal properties, necessitating rigorous scientific validation before therapeutic application. The growing demand for herbal medicine has led to challenges such as over-exploitation, species admixture, and adulteration of herbal materials and products. To address these concerns, modern analytical techniques?such as High-Performance Thin-Layer Chromatography (HPTLC), High-Performance Liquid Chromatography (HPLC), Gas Chromatography-Mass Spectrometry (GC-MS), Liquid Chromatography-Mass Spectrometry (LC-MS), HPTLC-MS, HPLC-MS, and Liquid Chromatography-Nuclear Magnetic Resonance (LC-NMR) play a crucial role. These methodologies facilitate the precise detection and characterization of bioactive phytoconstituents in plant extracts and essential oils. Selective fractionation and isolation of these compounds enable the determination of their biological activities through targeted bioassays. Furthermore, these advanced techniques are instrumental in assessing the purity of herbal drugs, thereby mitigating the risks associated with adulteration and ensuring the authenticity of medicinal plant materials. Given their critical role in quality control and pharmacological validation, the present chapter will provide a comprehensive overview of these analytical techniques and their applications in evaluating the medicinal properties of plants, with a particular emphasis on quality assessment and adulteration detection.

Keywords

Analytical techniques, phytochemicals, medicinal plants, adulteration, quality evaluation, scientific validation

Prophylactic Effects Of TGR5 Ligands In Insulin Secretion Using In Vitro And In Silico Docking Studies

Senthilkumar Rajagopal, Agnik Haldar
Department of Biotechnology, REVA University, Bangalore, 560064, KA, India

Presenter
Senthilkumar Rajagopal

Type
Poster Presentation

Track
Agricultural & Biological Sciences

Abstract
TGR5 plays a crucial role in regulating insulin release from the pancreas by directly stimulating pancreatic ? cells and indirectly enhancing insulin secretion through GLP-1 and GIP. This study explores the therapeutic potential of four triterpenoids?Ursolic Acid, 3-epiursolic Acid, Micromeric Acid, and Carissic Acid?focusing on their role in modulating insulin secretion via TGR5 activation. Molecular docking analysis reveals strong binding affinities of these triterpenoids to TGR5, suggesting potential applications in treating cancer, inflammation, metabolic disorders, and tissue regeneration. Among them, Micromeric Acid and Ursolic Acid exhibit the highest binding affinities, with Micromeric Acid showing additional benefits in regulating cellular metabolism and oxidative stress. Furthermore, these compounds interact with other biological targets, such as PTPN2 and CD81, expanding their therapeutic relevance. However, challenges such as low solubility, high lipophilicity, and poor oral absorption may limit clinical applications. Future research should focus on structural modifications to enhance their bioavailability and therapeutic properties. Overall, these triterpenoids hold promise for TGR5-targeted therapies and broader biomedical applications.

Keywords
Biological Activity, drug discovery, lipophilicity, molecular docking, pharmacokinetics

PROCEEDING
ACSTM 2025

Phytochemical Characterization and GC-MS Analysis of Selected Medicinal Plant Species

Prachi Baliyan, Supriya Kumari Sharma, Afroz Alam
Banasthali Vidyapith University, India

Presenter
Prachi Baliyan

Type
Poster Presentation

Track
Agricultural & Biological Sciences

Abstract
Plants contain phytochemicals with diverse pharmacological properties. While plant extracts are known to contain bioactive compounds such as alkaloids, flavonoids, and phenolics, detailed phytochemical profiling of *Amaranthus viridis L., Chenopodium album L., Parthenium hysterophorus L.,* and *Tridax procumbens L.* remains limited. This study examines the phytochemical composition of these plants using methanol, chloroform, and water extracts to validate their traditional uses and explore their potential for developing novel therapeutic agents. Preliminary screening and GC-MS analysis indicate that methanol extracts contain several bioactive compounds contributing to their therapeutic effects.

Keywords
Medicinal plants, GC-MS, phytochemicals, traditional medicine, bioactive compounds

Shape Memory Phenomena and Crystallographic Aspects of Reversibility in Shape Memory Alloys

Osman Adiguzel
Department of Physics, Firat University, Elazig, Turkey

Presenter
Osman Adiguzel

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

Shape memory alloys belong to a class of advanced smart materials that exhibit a unique property known as the shape memory effect. This phenomenon is initiated through thermomechanical treatments during cooling and deformation and is activated thermally during heating and cooling. As a result, the material cycles between its original and deformed shapes in a reversible manner. This effect is governed by crystallographic transformations, including thermally and stress-induced martensitic transformations. Thermally induced martensitic transformations occur upon cooling, involving the cooperative movement of atoms in the <110> direction on the {110} plane of the austenite matrix, along with a lattice twinning reaction. During this process, the ordered parent phase structure transitions into a twinned martensite structure. Further deformation through stress-induced martensitic transformations causes these twinned structures to convert into detwinned martensite structures. These alloys also exhibit another phenomenon known as superelasticity, which occurs purely through mechanical loading. In the parent austenite phase region, when stress is applied and subsequently released, the material undergoes immediate shape recovery, displaying elastic behavior. Superelasticity is also a result of stress-induced martensitic transformation, where the ordered parent phase transforms into detwinned martensite structures upon stressing. Lattice twinning and detwinning reactions play a crucial role in martensitic transformations and are driven by inhomogeneous lattice-invariant shear. Copper-based alloys exhibit this property in the metastable beta-phase region. However, lattice twinning in these alloys is non-uniform, leading to the formation of complex layered structures. These structures can be characterized by different unit cells, such as 3R, 9R, or 18R, depending on the stacking sequences on the close-packed planes of the ordered lattice. In this study, X-ray and electron diffraction analyses were conducted on copper-based CuZnAl and CuAlMn alloys. The X-ray diffraction profiles and electron diffraction patterns revealed superlattice reflections. X-ray diffractograms recorded over an extended period showed that diffraction angles and peak intensities varied with aging duration at room temperature. This finding indicates that the rearrangement of atoms occurs in a diffusive manner over time.

Keywords

Shape memory effect, martensitic transformation, reversibility, thermoelasticity, superelasticity, twinning, detwinning

Water Conflicts and Their Impact on International Security and Peace

Abdelazim Mohamed Negm
Department of Water & Water Structures Engineering, Faculty of Engineering, Zagazig University, Egypt

Presenter
Abdelazim M. Negm

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

Water, the source of all life on Earth, has also been a source of conflict since 2500 BC. Recently, it has become a crucial natural resource in achieving the Sustainable Development Goals (SDGs). Additionally, when a water conflict is initiated by one party, it can create water-related problems for others. Water conflicts, often arising from shortages or disputes over water sharing, can be classified based on their causes into triggers, casualties, the use of water as a weapon, or a combination of these types. The oldest recorded water conflict dates back to 2500 BC. The methodology involves identifying the primary sources of information on water conflicts, analyzing how each source classifies them, and assessing different sources for accuracy. This includes identifying potential biases and reviewing various case studies of water conflicts. It was found that sources from the Pacific Institute of California contain some bias, as not all recognized cases are true water conflict over the period from 1992 to April 2019. Some cases involve misinformation or reports taken from newspapers that may be inaccurate or biased. It is concluded that not all of the 1920 reported conflicts from 2500 BC to 2023 are genuine cases, whereas scientific sources list only 54 confirmed conflicts. It is recommended that the Pacific Institute classify its identified water conflicts into confirmed water conflicts and potential future conflicts to improve the accuracy and reliability of its dataset.

Keywords

Water conflicts, trigger, causality, weapon, pacific institute

PROCEEDING
ACSTM 2025

Comparing Classical and Quantum Algorithms in Analyzing NASA Kepler Mission Data

Avaz Naghipour, Mohammad Hossein Asheri
Department of Computer Engineering, University College of Nabi Akram, Tabriz, Iran

Presenter
Avaz Naghipour

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract
Humanity has long sought precise and scientific answers to its endless questions about the universe. One of the greatest challenges in this pursuit is the discovery of extraterrestrial life and Earth like planets. The Kepler mission, launched in 2009, marked a major milestone in this direction. Its primary objective was to discover exoplanets and assess their habitability. With the vast amount of data transmitted by the Kepler telescope, scientists faced a new challenge: analyzing and extracting meaningful insights from this data. Initially, classical computational algorithms such as regression, k-nearest neighbor, decision trees, random forests, and various types of neural networks proved effective for this task. However, as the volume of data grew, the limitations of these methods became evident. Questions arose regarding the ability of these algorithms to detect complex patterns and the computational time required for extensive calculations, prompting researchers to explore alternative solutions. Quantum computing, leveraging the principles of quantum mechanics such as superposition and entanglement, exponentially enhances the ability to perform complex computations. Unlike classical bits, qubits allow quantum computers to process multiple calculations simultaneously, making them particularly valuable for analyzing large and intricate datasets. Among the quantum algorithms currently in use, notable examples include quantum support vector machines, quantum neural networks, quantum k-nearest neighbor, and variational algorithms. Currently, both classical and quantum algorithms have distinct advantages and limitations. Classical algorithms are widely applied to everyday computational problems and are relatively easy to implement. In contrast, quantum algorithms hold the potential to solve complex problems that are either infeasible or extremely time-consuming for classical computers. The ongoing competition between these two paradigms has motivated us to compare their efficiency, aiming to assess their current capabilities and future potential.

Keywords
NASA, classical, quantum, algorithms, exoplanets, advantages, disadvantages

PROCEEDING
ACSTM 2025

How to Minimize Wellbore Instability: Techniques and Strategies

Zohreh Movahed
Alzare-Journal of Petroleum Exploration and Production Technology, Toronto, ON, Canada

Presenter
Zohreh Movahed

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

The Zagros mountain front in Iran is a region with significant in-situ stress, often resulting in borehole instability after drilling. Maintaining borehole stability is vital for the efficient production of hydrocarbons, as instability can compromise well functionality and lifespan. High stresses and stress anisotropy in this region have led to frequent drilling issues. This study utilizes image logs to enhance the understanding of borehole wall failure mechanisms and improve the stability of high-angle wells. The Ultrasonic Borehole Imager (UBI) serves as the primary tool for analyzing wellbore stability. A multi-stage image logging approach is employed to mitigate instability. Initial UBI logs are conducted during intermediate drilling stages, especially when issues like mud losses or pipe sticking occur. Final logs are performed post-drilling. The interpreted data from these logs, processed within hours, provide detailed insights into borehole deformation, cross-sections, and critical structural data. UBI log interpretations offered critical insights into drilling and natural fracture orientations, in-situ stress directions, borehole breakouts, keysets, and damaged zones. The data revealed zones of low rock strength, exceeded fracture gradients, and potential slip displacement or wellbore restrictions. Continuous deviation surveys identified doglegs and undulating trajectories, enabling the detection of unexpected geological features such as formation dips and major bedding planes. Comparative analyses of multiple log passes provided an enhanced understanding of borehole stability, fracture characteristics, and fluid movement, optimizing drilling mud weight and pressure points. Intermediate and post-drilling image log acquisition provided timely warnings of borehole instability, significantly improving drilling efficiency and reducing completion time. Benefits included minimizing lost circulation, reducing mud costs, avoiding stuck pipe incidents, and enhancing fracture characterization. These findings underscore the value of image logs in ensuring borehole stability and optimizing drilling operations, particularly in high-stress regions like Iran. The study highlights the importance of real-time data acquisition and analysis in improving operational outcomes in challenging geological environments.

Keywords

Borehole stability, ultrasonic borehole imager tool, borehole breakout, drilling-induced fractures

PROCEEDING
ACSTM 2025

Advancing Commercial Aviation: Modern Flight Control System Applications

Idriss Dagal[1], Wulfran Fendzi Mbasso[2,3,4], Ambe Harrison[3,4,5], Bilal Erol[6], Pradeep Jangir[7,8,9,10], Muhammad Suhail Shaikh[11], Hossam Kotb[12], Emmanuel Fendzi Donfack[4,13]

[1]Beykent University, Istanbul, Turkey

[2]Technology and Applied Sciences Laboratory, University Institute of Technology (U.I.T.) of Douala, University of Douala, Cameroon

[3]Department of Biosciences, Saveetha School of Engineering. Saveetha Institute of Medical and Technical Sciences, Chennai

[4]Centre for Research Impact and Outcome (CRIO), Chitkara University, Rajpura, Punjab, India

[5]Department of Electrical and Electronics Engineering, College of Technology (COT), University of Buea, P.O. Box Buea 63, Cameroon

[6]Yildiz Technical University, Davutpasa Caddesi. 34220, Esenler / Istanbul, Turkey

[7]University Centre for Research and Development, Chandigarh University, Gharuan Mohali 140413, India

[8]Department of CSE, Graphic Era Hill University, Dehradun, 248002, India

[9]Department of CSE, Graphic Era Deemed To Be University, Dehradun, 248002, Uttarakhand, India

[10]Applied Science Research Center, Applied Science Private University, 11937, Amman, Jordan

[11]School of Physics and Electronic Engineering, Hanshan Normal University, China

[12]Department of Electrical Power and Machines, Faculty of Engineering, Alexandria University, Alexandria, Egypt

[13]Nonlinear Physics and Complex Systems Group, Department of Physics, The Higher Teacher's Training College, University of Yaoundé I, P.O. Box 47, Cameroon

Presenter
Wulfran Fendzi Mbasso

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

The capabilities of flight control systems influence the future growth of the aviation sector. Enhancements in security measures, operational effectiveness, and the reduction of environmental impacts are crucial to the evolution of the aviation industry. The current research outlines the methodological void in the existing aviation systems, specifically the neglect of strategies to address the risks posed by cybersecurity threats, the use of drones, and the cost-benefit analysis of implementing such technologies. It would, in essence, involve a more nuanced analysis and understanding of contemporary dynamics in an aviation environment. We offer a systematic investigation of state-of-the-art aviation control systems, which includes, but is not limited to, the use of digital fly-by-wire, control systems that self-adjust, and tolerance of faults. This paper proposes a new model-based design-build-test-simulate that focuses on reliability and adherence to certification requirements. Exploring a diverse range of automation and artificial intelligence integration building towards sustainable aviation and fault tolerance while being exposed to varying operational environments supported this approach. Significant discoveries indicate an increase in fuel efficiency of 20% and a decrease in maintenance of 15% as benefits of utilizing advanced systems. The study showed how the developments of Artificial Intelligence and autonomous control

systems can shift the aviation industry with the help of case studies and simulations. While consolidated perspectives of insight are often blurry, this paper proposes ways to build new suggestions following the amalgamation, filling the gap between aviation systems theory and reality. The paper attempts to identify these gaps and provide a solution, suggesting the use of new technologies to tackle the next gen challenges in aviation.

Keywords

Flight Control Systems, Digital Fly-by-Wire, Adaptive Control, Commercial Aviation, and Automation and Safety

Enhancing Compressed Earth Blocks: Influence of Banana Trunk Fiber and Powder Reinforcement on Mechanical Properties

Athanas KONIN
Laboratory of Civil Engineering, Felix Houphouet-Boigny National Polytechnic Institute (INP-HB), Yamoussoukro, Cote d Ivoire

Presenter
Athanas KONIN

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract
This study examines the effects of banana powder stabilization and banana fiber reinforcement on the mechanical properties of compressed earth blocks (CEBs). Different stabilization methods were tested to improve the strength of CEBs, focusing on cement as a binder and the use of plant fibers. Results show that banana powder reduced internal cohesion by 8%, while banana fibers significantly enhanced compressive strength, increasing strength by a factor of 3.26. However, when combined with banana powder, the strength improvement decreased to a factor of 1.15. Cement stabilization provided the highest strength, with a factor of 7, but has a high environmental impact due to carbon emissions. In contrast, banana fibers and powder offer sustainable alternatives that improve CEB performance while minimizing environmental impact. This study highlights the potential of using eco-friendly materials in construction to achieve both structural durability and sustainability.

Keywords
Compressed earth blocks, stabilization with banana powder, reinforcement with banana fibers, physical and mechanical properties, eco-construction

Chitosan-Based Hydrogel Synthesis for Efficient Chromium (VI) Removal from Tannery Wastewater

Muhammad Afzaal, Muhammad Ahmed Sajid
Sustainable Development Study Center Government College University Lahore, Pakistan

Presenter
Muhammad Afzaal

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

Due to its lethal effects on the human body and other organisms, hexavalent chromium (Cr^{6+}) has gained widespread public attention, making the development of an effective adsorbent for Cr^{6+} removal essential. The surface properties of chitosan-based hydrogels make them efficient adsorbents for removing various contaminants, including Cr^{6+}. This study aimed to remove Cr^{6+} from aqueous solutions using chitosan-based hydrogels. For this purpose, novel chitosan (CS)-based hydrogel films were prepared by crosslinking CS with polyvinyl pyrrolidone (PVP), tetraethyl orthosilicate (TEOS), and sepiolite (SEP). The morphology of the prepared hydrogel films and the presence of different reactive functional groups were analyzed using scanning electron microscopy (SEM) and Fourier-transform infrared (FTIR) spectroscopy, respectively. The effects of initial Cr^{6+} concentration (20, 40, and 60 ppm), pH (2, 4, 6, and 8), and contact time (15, 30, and 45 min) on adsorption capacities and removal efficiencies of these hydrogel films were studied. The maximum Cr^{6+} adsorption capacity (23.9 mg g^{-1}) and removal efficiency (84.5%) were observed at an initial concentration of 60 ppm, pH 4, and a contact time of 30 minutes. This study provides a new method for producing low-cost adsorbents with effective Cr^{6+} adsorption and removal. The findings may contribute to future research on scaling up water and wastewater treatment systems from pilot-scale to full-scale applications.

Keywords

Leather industry, chitosan, hydrogel, chromium, water pollution

Single-Volume Magnetic Reconnection Converter (MRC) with Variable Plasma □

Oleg Agamalov
Independent Researcher

Presenter
Oleg Agamalov

Type
Poster Presentation

Track
Physical Sciences & Engineering

Abstract

This work justifies the Magnetic Reconnection Converter (MRC) based on a single-volume plasma (spheromak) with variable β at the turbulent pumping and discharge phases of the operating cycle. The proposed MRC utilizes a cyclic combination of two physical processes to obtain useful energy output. First, controlled turbulence, driven by super-linear Richardson diffusion and/or self-generated and self-sustaining processes, increases the stochasticity of the magnetic field (MF) within a limited plasma volume. This process enhances global helicity H through the twisting, writhing, and linking of MF flow tubes, reaching a local maximum (optimally global) determined by plasma parameters, boundary conditions, and magnetic field line tension. During this phase of MF turbulent pumping, plasma β decreases to its minimum possible value, leading to an increase in accumulated "topological" MF energy. Second, upon reaching the local (or global) maximum of MF stochasticity, turbulent magnetic reconnection (TMR) occurs, reducing MF stochasticity while increasing the kinetic stochasticity of plasma particles, accelerating and heating them for use in direct electrical power converters. At this stage of turbulent discharge, plasma β increases to its maximum possible value, corresponding to a rise in kinetic and thermal energy. Finally, as the kinetic stochasticity of plasma particles subsequently decreases to a local minimum, the control system initiates another MF turbulent pumping phase, repeating the cycle.

Keywords

Controlled turbulence, magnetic stochasticity, magnetic reconnection, kinetic stochasticity, variable beta plasmas

Oscillatory Volume Flow Rate of Non-Newtonian Fluid Through a Porous Medium

Dr. Awaneesh Jee Srivastava
United College of Engineering & Research, Prayagraj-211010, U.P, India

Presenter
Awaneesh Jee Srivastava

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract
This study presents a mathematical analysis of Non-Newtonian fluid flow through a porous material. The flow motion in the model is induced by a given but arbitrary inlet volume flow rate that varies with time. The model is applied to analyze the basic flow situation, which is an oscillatory flow. Analytical expressions for velocity and constant pressure gradient are derived using the Laplace transform technique and the inversion theorem of complex analysis. It is found that both steady and unsteady solutions strongly depend on the porosity parameter. The steady solution for a second-grade fluid is further found to be identical to that of a viscous fluid. The effect is less pronounced when the oscillatory piston motion varies proportionally to the power of time, as the fluid inertia increases.

Keywords
Oscillatory volume flow rate, porous material, second grade fluid, Laplace transform technique

Imaging Porous Media and Bright Spots for Reservoir Characterization Using Seismic Attributes

ADIZUA, Okechukwu Frank
Department of Physics, Faculty of Science, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria

Presenter
ADIZUA, Okechukwu Frank

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract
Seismic attributes have proven to be highly effective in identifying hidden structures and features that cannot be detected through conventional seismic data visualization and analysis. This study investigates a specific seismic attribute the trace envelope and its derivatives for imaging porous media and bright spots to enhance reservoir characterization objectives in offshore fields within the Niger Delta Basin, Nigeria. Well logs, 3D post-stack depth migrated (PSDM) seismic data, and time-depth relationship surveys obtained from the fields were processed using standard workflows, modules, and routines within industry software. Following the application of the trace envelope and its derivatives, rock and fluid properties were interpreted across the fields. The trace envelope proved highly effective in imaging porous media and bright spot locations, revealing prospective zones for drilling and exploitation programs. The first derivative of the trace envelope performed well in detecting bright spots along the inline but was ineffective along time slices and did not assist in identifying porous media. Similarly, the second derivative of the trace envelope showed poor performance in imaging both porous media and bright spots across the investigated fields. This study demonstrates the effectiveness of the trace envelope seismic attribute in imaging porous media and bright spots associated with prospective hydrocarbon zones. Incorporating the trace envelope attribute into the seismic attribute mix is recommended for comprehensive reservoir characterization projects.

Keywords
Imaging, porous media, bright spots, reservoir characterization, seismic attributes, trace envelope and derivatives

PROCEEDING
ACSTM 2025

Choquet Bargaining Path for Moon Project Models on Real Time Application Surfaces

Sulaiman Sani[1], Gadaga Tendekayi Henry[2], Isabel Linda Zulu[3], Usman Sanusi[4], Petrovious Horton[5]

[1,3,5]Department of Mathematics, FOSE, University of Eswatini, Kwaluseni Campus, Kingdom of Eswatini

[2]Department of Environmental Health Science, University of Eswatini, Mbabane Campus, Mbabane, Kingdom of Eswatini

[4]Department of Mathematics and Statistics, Umaru Musa Yaradua University, Katsina State, Katsina, Nigeria

Presenter
Sulaiman Sani

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

A quality control exercise is conducted on a class of models called Moon Project models, proving the necessity of theoretical transformations before application. The analysis also confirms that the "no straight path" dictum between scientific models and the real world holds, establishing the necessity of Choquet construction. The theoretical design of these Choquets remains viable without arbitrage, even in times of austerity. The paths assumed by Moon Project models for optimal decision-making and management are examined.

Keywords

StarGate, moon project, austerity, bridge, Choquet

Chemistry of 31 and 7 (GaN): Game Changer in Silicon Valley

Dr. Ravi Varala[1,2]

[1]INTI International University, Nilai-71800, Malaysia
[2]R&D Division, Scrips Pharma, Hyderabad-76, India

Presenter
Ravi Varala

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

The significance of gallium-based nanocages in various electrical and optical applications has recently drawn considerable attention. Gallium nitride (GaN), a wide-band gap semiconductor (Eg = 3.4 eV), is considered a promising material for BV cells due to its excellent energy conversion efficiency and radiation resistance. GaN-based BV cells offer superior performance compared to conventional materials. Building on expertise in nanomaterials, this presentation explores the synthesis of various GaN composites as viable alternatives to silicon (Si) in semiconductor applications. Potential applications in the current semiconductor industry, future prospects, and associated limitations will be discussed. The decreasing availability of silicon (Si) necessitates the exploration of alternative semiconductor materials. Gallium nitride (GaN) is emerging as a superior replacement due to its wider bandgap, which enables higher voltage sustainability, enhanced thermal stability, and faster electron mobility compared to silicon. These properties make GaN ideal for applications such as ultra-small chargers. Additionally, the role of nano-GaN and dopants in enhancing conductivity will be examined. Notably, nano-GaN chargers, already introduced to the market by Anker, have demonstrated a 20% increase in efficiency. These chargers generate less heat, operate more efficiently, and are significantly more compact than traditional ones. This talk will also provide an overview of the structural, physical, and chemical properties of gallium (Ga), highlighting its potential in next-generation semiconductor technologies.

Keywords

Gallium nitride (GaN), semiconductors, nanocomposites, batteries, betavoltaic cell

PROCEEDING
ACSTM 2025

Thermodynamic Modeling of Alkanolamine and Ethylene Glycol Systems Using SAFT Equations of State

Arash Pakravesh
Faculty of Chemistry and Petroleum Science, Bu-Ali Sina University, Shahid Fahmide Street, Hamedan, Iran

Presenter
Arash Pakravesh

Type
Poster Presentation

Track
Physical Sciences & Engineering

Abstract
Accurate thermodynamic modeling of pure alkanolamines, ethylene glycols, and their mixtures is crucial for designing, developing, and optimizing various industrial processes, such as gas sweetening and dehydration. These compounds, including monoethanolamine (MEA), diethanolamine (DEA), methyldiethanolamine (MDEA), 2-amino-2-methyl-1-propanol (AMP), monoethylene glycol (MEG), diethylene glycol (DEG), and triethylene glycol (TEG), are widely used in the chemical industry for their effectiveness in capturing CO_2 and removing water. Due to their complex behavior under varying thermodynamic conditions, accurate modeling requires advanced equations of state (EOSs). SAFT-type EOSs are particularly effective in capturing molecular interactions and phase behavior. In this study, four SAFT-type EOSs-P?T-SAFT, P?T-PC-SAFT, PC-SAFT, and SAFT were applied to model the thermodynamic properties of these compounds. Pure-compound parameters for the P?T-SAFT EOS were obtained using experimental pressure-temperature-density (P?T) data spanning a wide range of temperatures and pressures. The models predicted thermodynamic properties such as density, isobaric heat capacity, sound velocity, isobaric thermal expansivity, isothermal compressibility, and saturated vapor pressure. These predictions were validated against experimental data, with the P?T-SAFT EOS consistently showing superior performance in accurately replicating experimental values for pure substances. The study was further extended to mixtures, where over ten binary and ternary mixtures were modeled using the P?T-SAFT, P?T-PC-SAFT, PC-SAFT, and SAFT EOSs. The results demonstrated that the P?T-SAFT EOS not only provided better agreement with experimental data for pure compounds but also excelled in capturing the thermodynamic behavior of complex mixtures. Comparisons revealed significant improvements in predictive accuracy for both binary and ternary systems, reinforcing the superiority of the P?T-SAFT EOS over other SAFT-based and traditional EOSs. Overall, this research highlights the robustness and precision of the P?T-SAFT EOS, making it a valuable tool for industrial applications involving alkanolamines and ethylene glycols in both pure and mixed states. Its ability to reliably predict thermodynamic properties can facilitate process design and enhance operational efficiency.

Keywords
Equation of state, SAFT, thermodynamic modeling, alkanolamines, glycols

Muon Events Triggered by Thunderstorms: Insights from the GRAPES-3 Experiment in Ooty

Pranaba K Nayak
Tata Institute of Fundamental Research, Mumbai, 400005, India

Presenter
Pranaba Kumar Nayak

Type
Poster Presentation

Track
Physical Sciences & Engineering

Abstract
The GRAPES-3 tracking muon telescope in Ooty, India, equipped with high angular resolution and statistical precision, records short-term variations in muon counts during major thunderstorms, referred to as thunderstorm-induced muon events (TIMEs), with a 1 GeV energy cut-off. These events arise due to intense electric fields within thunderclouds, which modulate the energy of secondary cosmic ray muons produced in the atmosphere. Recent multidisciplinary investigations of TIMEs have examined seasonal variations, connections with the global electric circuit, climate interactions, long-term patterns during Boreal summers, and their correlation with the Indian Lightning Location Network (ILLN) and cloud-top temperature data from the INSAT-3DR geostationary satellite. This first-of-its-kind investigation provides valuable insights.

Keywords
Thunderstorm-induced muon event, Ooty muon telescope, Cosmic ray, Thunderstorm dynamics, Muon, Proportional counter

PROCEEDING
ACSTM 2025

The Psychology of Identity Theft: Unraveling the Human Factor in Cybercrime

Ebube Okeke[1,2]

[1]Department of Information Technology, Robert Gordon University, Aberdeen, United Kingdom

[2]Department of Economics, Federal University Lokoja, Nigeria

Presenter
Ebube Okeke

Type
Oral Presentation

Track
Physical Sciences & Engineering

Abstract

The increasing adoption of digital technology has led to a rise in cybercrime, with identity theft being one of its most prevalent forms. Identity theft refers to the unauthorized use of an individual's data to commit fraud, exploiting human vulnerabilities for personal gain. This study aims to explore the psychological aspects of identity theft as a crucial human element in cybercrime. A systematic literature review methodology was employed, involving the retrieval of relevant studies from databases such as Google Scholar and Scopus. Keywords including identity theft, cybercrime, cybersecurity, and psychology, along with Boolean operators (AND/OR), were used for the search. The study selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, adhering to predefined inclusion and exclusion criteria. Data extracted from selected studies were analyzed using thematic analysis. The findings revealed key psychological themes, including risk perception, emotional response, and cognitive biases, which contribute to individuals' susceptibility to identity theft. Factors such as lack of digital literacy and overconfidence increase vulnerability. Additionally, cybercriminals employ various social engineering tactics to manipulate individuals into disclosing sensitive personal information. Stolen data is often misused for activities such as unauthorized access to private accounts, opening new accounts without consent, conducting fraudulent transactions, and committing crimes. Victims of identity theft suffer significant consequences, ranging from financial losses to psychological distress, including anxiety, stress, and reputational damage. Moreover, digital platforms affected by identity theft experience a decline in user trust. To mitigate identity theft, this study recommends increasing public awareness about its consequences, empowering individuals with digital security knowledge, and encouraging prompt reporting of security breaches. By examining the psychology of identity theft, this study provides valuable insights for developing effective prevention and intervention strategies.

Keywords

Identity theft, cybercrime, cybersecurity, psychology

Thank you to Our Conference Sponsors

who contribute to making the
6TH ACSTM - 2025 a great success!

CONFERENCE SPONSORS

Academy of Excellence in Biosciences

ASCI database

SI

Asian Phytopathological Society

ADL ASIAN DIGITAL LIBRARY

ANSInet an open access publisher

ACE College for Women 2010

Open Access Asia

ScienceAlert