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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

ABSTRACT BOOK

Editor(s)

Dr. R.Harikrishnaraj, Dr. S.Nithyapriya, Dr. R.Valarmathi,
Dr. P.Ananthi, Dr. V.Kathirvelmurugan, Dr. P.R.Janani

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DEPARTMENT OF LIFE SCIENCES
PADMAVANI ARTS & SCIENCE COLLEGE FOR WOMEN
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Accredited by NAAC with A+ Grade (CGPA 3.44)-Cycle 2 Recognized Under section 2(f) & 12(B)
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10TH & 11TH JULY 2025

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Dr. P. Ananthi, Dr. V. Kadirvelmurugan, Dr. P.R. Janani

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DEPARTMENT OF BIOTECHNOLOGY, BOTANY, MICROBIOLOGY & ZOOLOGY

Jointly Organizes a

INTERNATIONAL CONFERENCE ON "CURRENT SCIENCE IN BIOLOGICAL SCIENCES"

10TH & 11TH JULY, 2025

ABOUT THE COLLEGE

Padmavani Arts and Science College for Women was established in the year 2005. The college is situated in a sylvan surrounding easily accessible in the outskirts of Salem-Bangalore NH-7. The Institution imparts quality education with innovative training and skill development apart from the regular curriculum. The institute grooms a developed individual to challenge the scenario of today's corporate dependent world. The state of art lab facilities with modern infrastructures, library, internet, hostel and qualified faculty altogether ensures a student community of the future.

About the Life Sciences Department

The Department of Biotechnology was established in the year 2006. The Department of Botany was established in the year 2015. The Department of Zoology was established in 2016 The Department of Microbiology was recently established in the year 2020. All the departments offer Undergraduate, Postgraduate programme along with a research programme. The department has well qualified and experienced staff with rich experience in the field of Academics, publication of books and articles in various refereed /reputed national and international journals. It has been providing quality education, to achieve outstanding result and secure first rank in the university exam and to strives make students employable in their society. The students periodically visit various science institutes and gains a deep knowledge about the recent research and instruments.

About of the Seminar

The conference aims to provide researchers in biological sciences and its related fields a shared forum for dialogues and collaborations, discuss and showcase recent significant advances, and allow experts in the disciplines to connect intimately. It offers a forum for in-depth study of current problems and solutions in the dynamic domains of biological sciences and allied subjects.

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MESSAGE FROM THE SECRETARY

Thiru. K. Duraisamy, M.A.,
Secretary

It gives me an immense pleasure that Padmavani Arts and Science College for Women, organizing a International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences.

The central theme of the conference is on agricultural, health and environment. All the Departments provides an opportunity for meeting of Researchers, Faculties, Scientists and specialists in the various research and development fields of Science and Technology.

The conference offers a premise for global experts to gather and interact intensively on the topics of agricultural, health and environment. I hope eminent speakers will cover the theme virtual reality from different perspectives. I am privileged to say that this conference will definitely offer suitable solutions to the global issues of **Current trends**.

The success of this seminar is solely on the dedication and efforts of innumerable people who started working on the preparations in many ways to make this seminar become a reality. Eventually I express my special thanks and appreciation to all. I wish **IC-CTBS** all the best for its success.

Thiru. K.Duraisamy, M.A.,
Chief – Patron IC-CTBS -2025

MESSAGE FROM THE CHAIRMAN

Thiru.K.Sathiyamoorthy
Chairman

I am pleased to welcome you all for the International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences.

Padmavani Campus is a camouflage wealth of knowledge, innovation and technology that lies within. Padmavani itself is a niche of opportunities to all aspiring researchers. The events in the seminar are targeted towards researchers, practitioners, professionals, educators and students to share their experience, innovative ideas, issues, recent trends and future directions in field of Science and Technology.

This conference is a unique forum for exchange of innovative ideas, technical expertise for technological advancements etc. in this evergreen field. It includes keynote address from Academicians and paper presentation by research scholars. It is a matter of joy for us to welcome the participants to this seminar.

In a nutshell, the seminar promises to transcend to a new and unprecedented level of excellence. It is thus the zenith where technology and skill meets opportunities and guidance. It is a milestone that one would not dare to miss. I wish **IC-CTBS** a grand success.

Thiru.K.Sathiyamoorthy
Chairman- IC-CTBS - 2025

MESSAGE FROM THE DIRECTRESS

Tmt.Esaivani Sathiyamoorthy
Directress

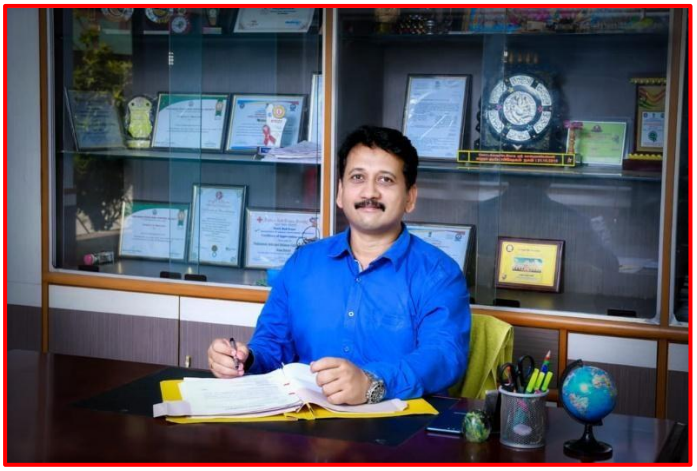
I have immense pleasure in writing this message on the occasion of the International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences.

This seminar will provide a platform to groom young scientists from all over the country and to bridge the researchers working in academia and other professionals through current technological trends. It is a high time to create research activities among the budding professionals.

May this seminar provide greater opportunities for every member of this specialty to learn more and let this learning be of immense help to the community at huge. I congratulate the organizers for their initiative and wish the seminar all success.

Tmt. Esaivani Sathiyamoorthy
Directress IC-CTBS -2025

Principal's Desk



Dr. R. Harikrishnaraj, Ph. D.
Principal & Convener

It gives me immense pleasure to be a part of this hosting team of International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences.

The seminar intends to bring together scientists, and research scholars from different disciplines to discuss concerns related to various techniques in science and technology. I take this opportunity to welcome all the delegates of the seminar. On behalf of **IC -CTBS-2025** whole team, I would like to thank all the authors, sponsors and keynote speakers for their support and co-operation.

The rapid development in technologies and changes in lifestyle impose various issues in many countries. The seminar **IC -CTBS -2025** has been crafted to challenge the hurdles and we are fortunate to have leading speakers to share their experience and perspectives to achieve smart solutions through their innovation.

It has been a team work and as a team I appreciate HODs, Coordinators Faculty members for giving their best to any task taken up at any given point of time. A warm and heartfelt thanks to Chief Guest, Keynote address, Plenary session chair, Panelist, delegates, author, co-author, participants and last but not the least my dearest students. I thank the publishers – Excellent Publishers for coming out with the ISBN book and Seminar Souvenir.

I hope the Seminar, Souvenir and the ISBN book is a culmination of knowledge and exchange platform for all.

Dr. R. Harikrishnaraj
Principal & Convener
IC -CTBS -2025

Dr. P. MUTHU KUMAR. M.Sc, M.Phil, M.Ed, M.Phil, M.A., Ph.D., SET,
ADMINISTRATIVE OFFICER

It gives me an immense pleasure to be a part of the International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences. I strongly believe that this seminar will provide tools and knowledge to overcome significant problems appearing in our industry and society by identifying innovative ideas and technologies introduced by the researchers and students.

The success of this seminar will encourage us in introducing many more initiatives for innovative trends in the coming years. I wish the **IC – CTBS - 2025** a great success.

Dr. P. MUTHU KUMAR
IC – CTBS -2025

Dr. M. Ramesh, M.Sc, M.Phil., Ph.D.,
Executive Officer

I am glad to be the part of the **International Conference on "Current Trends in Biological Sciences" during July 10 & 11, 2025 at Padmavani Arts and Science College for Women, Autonomous, Salem organized by Department Life sciences.**

The events in the conference are targeted towards researchers, practitioners, professionals, educators and students to share their experience, innovative ideas, issues, recent trends and future directions in field of Science and Technology.

Finally, I congratulate the team members and participant for their efforts in organizing and participating in this seminar and wish the seminar all the success.

Dr. M. Ramesh
IC – CTBS - 2025

INTERNATIONAL CONFERENCE

ON

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INTERNATIONAL CONFERENCE ON

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INVITED ABSTRACTS

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Advance Research on Microbial Biotechnology for Modern Organic Agriculture towards sustainable development goals

Kasem Soytong*

Research Institute of Modern Organic Agriculture (RIMOA), King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok, Thailand; Association of Agricultural Technology in Southeast Asia (AATSEA)

E-mail:ajksasem@gmail.com

Abstract

Microbial biotechnology has been developed as microbial prodcts used for modern organic agriculture. Research on natural products of Chaetomium species and other fungi for plant disease control are investigated since 1989. After years, a new broad spectrum biological fungicide from Chaetomium is the first discovered and patented as Patent No. 6266, International Code: AO 1N 25/12 and registered as Ketomium® mycofungicide for plant disease control in Thailand, Laos, Vietnam, Cambodia and China. Chaetoimum biofungicide and biostimulants are applied to implement integrated plant disease control. It is proved to be a biological agent for plant diseases which has been successfully integrated with other control measures for suitable disease control. Chaetomium biofungicide showed protective and curative effects in controlling plant disease and promoting plant growth. It has been successfully applied to the infested soils with integrated cultural control for the long-term protection against rice blast (Magnaporte oryzae), durian and black Pepper rot (Piper nigram L.) (Phytophthora palmivora), citrus rot (Phytophthora parasitica) and strawberry rot (Fragaria spp.) caused by Phytophthora cactorum, wilt of tomato (Fusarium oxysporum f. sp. lycopersici) , basal rot of corn (Sclerotium rolfsii) and anthracnose (Colletotrichum spp.) etc. Natural compounds from Ch. globosum, Ch. cupreum, Ch. elatum, Ch. cochliodes, Ch. brasiliense, Ch. lucknowense, Ch. Longirostre and other fungi are reported their potent for human and plant pathogens. Especially, Ch. siamense is a new species discovered as well as endophytic Chaetomium spp producing active metabolites. These new natural compounds are not only inhibiting human pathogens (anti-malaria, anti-tuberculosis, anti-cancer cell lines and anti-Candida albicans etc) but also plant pathogens as well. These active natural products from different strains of Chaetomium are developed to be nanofibres from active metabolites as a new discovery of scientific investigation which used to induce plant immunity, namely microbial nano-elicitors for inducing immunity in plants. The biodegradable nano-elicitors are developed to induce plant immunity through phytoalexin production in plants e.g. inducing tomato to produce alpha-tomaline against Fusarium wilt of tomato, capsidiol against chilli anthracnose, sakuranitin against rice blast, scopletin and anthrocyaidin against Phytophthora or Pythium rot Durian and scoparone against Phytophthora or Pythium rot of citrus etc. Natural products nano-elicitors constructed from active metabolites from Chaetomium spp and Trichoderma spp are being the new unique science for plant immunity. The other microbial products have also been developed as microbial fertilizers, microbial insecticides, microbial stimulats, microbial for bioremediation etc. These microbial products have contributed as agricultural inputs for modern organic agriculture for sustainable development goals (SDGs).

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Biogenic Glycolipids from Heavy Metal-Tolerant *Pseudomonas aeruginosa* Improve Phytoremediation Efficiency in Cowpea

Dr.S.Lalitha*

***Assistant Professor, Soil Biology and PGPR Lab, Department of Botany, Periyar University, Salem-11**

Abstract

A wide variety of **surface-active compound-producing microorganisms** were isolated from heavy metal-contaminated soils and screened for **amphiphilic metabolite production** using conventional assays such as the **foaming test, emulsification index (E24),** and **emulsification activity**. Among the isolates, **PAS2**, a Gram-negative bacterium, exhibited the highest activity and was selected for further investigation. Molecular identification through 16S rDNA sequencing confirmed the strain as *Pseudomonas aeruginosa*. The presence of genes **rhlB** and **rhlC**, which encode enzymes involved in the synthesis of **mono- and di-rhamnose-containing glycolipids,** was confirmed through PCR amplification. To enhance the yield of these **glycolipid biosurfactants,** various culture conditions were optimized, including **carbon and nitrogen sources**, their respective concentrations, **pH, incubation period,** and **inoculum density**. Structural analysis of the purified amphiphilic compounds using **NMR** and **GC-MS** validated their identity as **rhamnose-based glycolipids**. Subsequent pot culture experiments on **cowpea (*Vigna unguiculata*)** demonstrated that application of these **microbial surface-active agents** not only enhanced plant growth but also significantly reduced the uptake and accumulation of heavy metals in plant tissues.

Keywords: Rhamnolipid**,** *Pseudomonas aeruginosa,* **emulsification, glycolipids**

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Exploration of Associated Actinobacteria for Agricultural Applications

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Abstract

Increasing demand from the world's expanding population requires increased agricultural productivity. In addition, a sustainable and healthy agricultural production utilizing advantageous microbes for increased yield is required to counteract the negative effects of current agriculture techniques on the environment, human health, and food security. Although producing biomolecules of interest from these microorganisms with rich biosynthetic repositories is quite difficult, intensive research in related fields and the development of new genetic tools for improved microbial consortia are opening up new avenues for farmers and agriculturists to meet the growing demand for sustainable food production. Associated microorganisms have become a valuable tool in the fight against threats to the sustainability of agriculture. However, research has had difficulty utilizing the advantageous qualities of agricultural microbiomes to enhance crop performance, despite increased interest in optimizing microbial functions for crop yield, resource efficiency, and stress resistance. Here, we provide an overview of the associated bacteria from the salt pan, earthworm cast, and insect nest that have been found to have Plant Growth Promoting (PGP) qualities.We isolated and examined over fifty cultures from salt pan and earthworm cast to determine their PGP characteristics. Finally, we suggest areas of focus for future research that take a comprehensive approach to associated microbiomes as potential resources for a range of agricultural systems.

Keywords: Agriculture,microbes,associated bacteria,PGP,Earthworm cast and Salt Pan

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Phytochemical screening and GC-MS analysis of ethyl acetate root extract of Dioscorea oppositifolia L.

V. Kadirvelmurugan 1 * and S.Ravikumar 2

1 *Padmavani Arts and Science College for Women (Autonomous), Post Graduate and Research Department of Botany, Salem-636011, Tamil Nadu, India.
2 Post Graduate and Research Department of Plant Biology and Plant Biotechnology, Presidency College (Autonomous), Chennai - 600 005, Tamil Nadu, India.
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Abstract

Dioscorea oppositifolia L., commonly known as Cinnamon Vine (Malaiyankizhangu), is a tuberous and endangered medicinal shrub belonging to the family Dioscoreaceae. It is traditionally consumed as a functional food in southern Tamil Nadu, India. The present study aimed to carry out preliminary phytochemical screening and identify the bioactive constituents present in the ethyl acetate extract of D. oppositifolia root tubers using Gas Chromatography–Mass Spectrometry (GC–MS) analysis. The GC–MS profile revealed the presence of ten bioactive compounds: 4-Methylquinazoline, Cyclopentaneundecanolic acid, 5-Hydroxy-4′-methoxy-7-methylflavone, Oleic acid, 8,11,14 - Eicosatrienoic acid, Isopropyl stearate, Estra-1,3,5 (10)-trien-17α-ol, Quinazolin-4(3H)-one, Docosanoic acid, and 4-Piperidineacetic acid. These compounds were detected at retention times of 8.48, 17.05, 17.73, 18.78, 19.43, 20.28, 21.18, 22.35, 23.95, and 28.18 minutes, respectively. The presence of these phytoconstituents indicates that D. oppositifolia possesses a diverse range of medicinal properties, potentially validating its ethnopharmacological applications. Traditional medicine systems have used this plant to treat various ailments, including digestive disorders, respiratory issues, and skin conditions. Further studies are recommended to isolate, characterize, and evaluate the pharmacological potential of these compounds.

Key words: GC-MS analysis, Dioscorea oppositifolia, Phytochemical screening, ethylacetate extract.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

MEDICINAL PLANTS USED IN THE TRADITIONAL TREATMENT OF FEMALE INFERTILITY: A REVIEW

Rameesh Fathima, R., Kanimozhi, T. M and Priya, G *

**** Assistant Professor, Department of Zoology, Muthayammal College of Arts and Science (Autonomous), Rasipuram. 637 410, Tamil Nadu, India.***

**** Corresponding author mail id: priyapraba434@gmail.com***

Abstract

Infertility is a social challenge common among couples ranging from Asia and different parts of the world. Infertility occurs as result of malformation of the uterus, poor diet and illness. Medicinal plants used across regions in the world capable of healing female infertility. This article provides a world overview of medicinal plant activity from different regions across the globe. The study summarizes previous literature on the use of medicinal plants in female fertility treatments. Findings indicated the importance of traditional healers in woman's infertility. The traditional healers used materials prepared from herbs. Herbs are derived from plants and plant extracts of various natural resources, including plant leaves, bark, flowers, roots, fruits, and berries. Female infertility has been proven to respond well to herbal- based therapy. Women's infertility is a condition that is receiving more attention concerning medicinal herbs. The performance of the various medicinal plants depends on accumulation of bioactive ingredients. Modern plants have shown potential in enhancing female fertility through their various therapeutic properties and bioactive compounds. Overall, while there is promise in using plants for female fertility holds promise, further research and clinical trials are necessary to establish their safety and effectiveness. These herbs can be used as an alternative or supplemental therapy for female infertility.

Keywords: infertility, women's health, traditional medicine, fertility.

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Invited Abstracts

NATURE INSPIRED ALANGIUM SALVIIFOLIUM (L.F.) WANGERIN LEAF SOURCED SELENIUM NANOPARTICLES FOR MICROBIAL CONTROL

S. KARUNYA 1 AND V. BALAKRISHNAN 1 *
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Abstract

Selenium nanoparticles (Se NPs) were synthesized via a green method using Alangium salviifolium leaf extract as a reducing and stabilizing agent. The biosynthesis process involved mixing an aqueous leaf extract with a Selenium precursor under controlled conditions, resulting in the formation of Se NPs, as indicated by a characteristic absorption peak in the UV-Vis spectrum. The nanoparticles were further characterized by Fourier Transform Infrared Spectroscopy (FTIR), which confirmed the presence of functional groups from the leaf extract responsible for capping and stabilization. Field Emission Scanning Electron Microscopy (FESEM) and High-Resolution Transmission Electron Microscopy (HRTEM) with Selected Area Electron Diffraction (SAED) revealed that the Se NPs were predominantly spherical-shaped, with an average size ranging from 20-60 nm. X-ray Diffraction (XRD) analysis confirmed the crystalline hexagonal structure of the nanoparticles. The antibacterial activity of the synthesized Se NPs was evaluated against both Gram-positive and Gram-negative bacteria using standard assays. Results demonstrated significant inhibitory effects, suggesting that green-synthesized Se NPs possess potent antibacterial properties and hold promise for biomedical applications. This eco-friendly approach highlights the potential of plant-mediated synthesis for producing functional nanomaterials.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Synergistic effects of compost and plant growth promoting microbes on Chilli (Capsicum annuum L.) growth and soil health under greenhouse conditions

Authors: Grace Charles 1 , Sundaram Lalitha 1*

Corresponding Author: Dr. S. Lalitha

Department of Botany, Periyar University, School of Life Sciences, Salem-636 011, Tamil Nadu, India.

Abstract

This study explore the synergistic application of compost, plant growth-promoting rhizobacteria (PGPR), arbuscular mycorrhizal (AM) fungi, and PGPR+AM to enhance crop performance and soil health in Capsicum annuum L. (Chilli) under greenhouse conditions. Dairy compost was prepared from agricultural residues (coconut fiber, vegetable waste, banana leaves, and cow dung) and analysed for macro (N, P, K, Ca) and micronutrient (Fe, Mn, Zn, Cu) composition. Rhizospheric soils collected from agricultural fields in Salem District, Tamil Nadu, were used to isolate beneficial microbes, including Pseudomonas fluorescens and Trichoderma spp. These isolates were screened for key plant growth-promoting traits, including phosphate solubilization, siderophore production, indole-3-acetic acid (IAA), and antagonistic activity against phytopathogens. Greenhouse pot trials demonstrated that combined inoculation of PGPR and AM fungi, along with compost application, significantly improved growth, such as plant height, fresh and dry biomass, relative water content (RWC), and photosynthetic pigment concentrations compared to the control. Root colonization by fungi and bacteria was confirmed via scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Soil analysis revealed enhancements in macronutrient and micronutrient levels, and increased microbial population density in PGP-treated soils. These findings highlight the potential of integrated bioinoculant and compost strategies as sustainable alternatives to chemical fertilizers. The study highlights the significance of microbiome-enriched organic amendments in enhancing crop productivity and restoring soil fertility, especially in semi-arid regions affected by reduced soil health.

Keywords: PGP, Arbuscular Mycorrhizal Fungi, Compost, Soil Fertility, Chilli

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Gaba From The Gut: Unlocking Microbial Psychobiotics Through The Gut-Brain Axis And Advanced Analytical Profiling.

Prasannaa S *
Department of Biotechnology, St. Joseph's college, Trichy
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Abstract

Psychobiotics—beneficial microbes that influence brain function via the gut-brain axis—are a growing frontier in mental health therapeutics. Among their bioactive metabolites, Gamma- Aminobutyric Acid (GABA) is a key inhibitory neurotransmitter known for its anxiolytic and neurocalming properties. In this study, GABA production was explored using *Lactobacillus* strains isolated from various probiotic sources, including dairy-based and plant-based fermented foods. The isolates were cultured under optimized fermentation conditions to induce GABA biosynthesis. Initial screening for GABA was performed using Thin Layer Chromatography (TLC), followed by structural characterization via Fourier-Transform Infrared Spectroscopy (FTIR), which revealed characteristic functional groups confirming GABA presence. High-Performance Liquid Chromatography (HPLC) provided further confirmation and quantification of GABA produced by each strain. This multi-step analytical validation affirms the potential of probiotic Lactobacillus species as effective psychobiotic agents. The study reinforces the role of microbial metabolites in modulating neural pathways and supports the development of functional probiotic supplements for mental wellness.

Keywords:

GABA, *Lactobacillus*, Psychobiotics, Gut-Brain Axis, Analytical Techniques

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

From Water To Plate: Toxicological Effects Of Heavy Metals

Manoharan Saravanan 1,* And Vidhya Karunanidhi 2

1 Central Research Laboratory, Meenakshi Academy of Higher Education and Research Institute (Deemed University), Chennai - 600078 and Meenakshi Medical College and Research Institute, Enathur - 631552, Tamil Nadu, India.
2 Department of Physics, Sri Sarada College for Women (Autonomous), Salem -636016, Tamil Nadu, India.
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Abstract

Heavy metals (HMs) are most commonly present transition metals on earth. HMs are extensively manufactured by many industrial companies for the production of different types of commercial products. The main sources of HM entry into the environment are industrial activities, mining, agricultural practices, and combustion of fossil fuels. Various types of HMs are simply discharged/entered into the nearby aquatic ecosystems, where they can be exposed to different types of aquatic organisms including fish. Fish are extensively proving protein rich nutrients to most of the peoples in the world. The major routes of entry of HMs into the human body are water, food and air in the form of a single and combined mixtures. Some of the HMs plays vital roles in maintaining the normal physiological functions in living organisms. The HMs pollution in the (aquatic) environments is a serious issue due to their long-term toxicity, persistence, bioaccumulation, and biomagnification even at low levels of exposure. Exposure to HMs can lead to a range of adverse health effects, including neurological damage, developmental disorders, kidney damage, cardiovascular problems, cancers, oxidative stress, DNA damage, ultimately leading to cell death or dysfunction in human beings due to their cellular cytotoxicity by disrupting essential cellular processes and structures. Large scale production and usage of HMs should be controlled up to the required levels. Further, the implementation of proper guidelines, monitoring process and hazard risk assessment should be carried out in India to reduce the release of HMs into the environment and their toxic effects on living organisms including human beings.

Keywords: Heavy metals, Toxicity, Aquatic ecosystem, Aquatic organisms, Human, Physiological biomarkers.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Changes in the chemical compositions and biological properties of kombucha beverages made from black teas and pineapple peels and cores

Janani P R., Sriramani M., and Nirmala M
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Abstract

Several raw materials have been used as partial supplements or entire replacements for the main ingredients of kombucha to improve the biological properties of the resulting kombucha beverage. This study used pineapple peels and cores (PPC), byproducts of pineapple processing, as alternative raw materials instead of sugar for kombucha production. Kombuchas were produced from fusions of black tea and PPC at diferent ratios, and their chemical profles and biological properties, including antioxidant and antimicrobial activities, were determined and compared with the control kombucha without PPC supplementation. The results showed that PPC contained high amounts of benefcial substances, including sugars, polyphenols, organic acids, vitamins, and minerals. An analysis of the microbial community in a kombucha SCOBY (Symbiotic Cultures of Bacteria and Yeasts) using nextgeneration sequencing revealed that Acetobacter and Komagataeibacter were the most predominant acetic acid bacteria. Furthermore, Dekkera and Bacillus were also the prominent yeast and bacteria in the kombucha SCOBY. A comparative analysis was performed for kombucha products fermented using black tea and a fusion of black tea and PPC, and the results revealed that the kombucha made from the black tea and PPC infusion exhibited a higher total phenolic content and antioxidant activity than the control kombucha. The antimicrobial properties of the kombucha products made from black tea and the PPC infusion were also greater than those of the control. Several volatile compounds that contributed to the favor, aroma, and benefcial health properties, such as esters, carboxylic acids, phenols, alcohols, aldehydes, and ketones, were detected in kombucha products made from a fusion of black tea and PPC. This study shows that PPC exhibits high potential as a supplement to the raw material infusion used with black tea for functional kombucha production.

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Invited Abstracts

Microbial Modulation Strategies for Promoting Weight Gain in Agricultural Animals

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Abstract

The gut microbiota plays a critical role in the regulation of host metabolism, nutrient absorption, immune function, and overall growth performance in agricultural animals. Recent advances in animal nutrition and microbiology have revealed that targeted manipulation of the gut microbiome through the use of probiotics, prebiotics, synbiotics, fecal microbiota transplantation, and dietary interventions can significantly enhance weight gain and feed efficiency in livestock. This review explores the mechanisms by which microbial communities influence growth, including modulation of energy harvest, reduction of pathogenic bacteria, and stimulation of growth-promoting hormones. Special emphasis is placed on species-specific strategies for cattle, swine, and poultry, as well as the challenges and prospects associated with microbial interventions in large-scale production systems. Understanding and applying microbial modulation strategies holds substantial promise for sustainable animal agriculture by improving productivity while potentially reducing the reliance on antibiotics and promoting animal health.

Key words: Microbiome, probiotics, prebiotics, synbiotics, cattle, swine, and poultry.

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Invited Abstracts

Evaluation of In Vitro Antioxidant And Biochemical Composition of Sargassum Sp., From Ramanathapurum Coast.

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Abstract

In the present study aimed to investigate the phytochemical, biochemical composition, antioxidant of red seaweed *Sargassum sp.*, from Ramanathapuram coast, Tamil Nadu. The algal metabolites were extracted with Ethyl Acetate of extract was screened for the phytochemical analysis, biochemical composition and Total phenolic content by using Folin Ciocalteau method. Antioxidant Potential was assessed by DPPH method. The results were showed phytochemicals present in *Sargassum sp.*, were carbohydrates, tannins, saponinns, flavonoids, alkaloids, glycosides, cardiac glycosides, steroids, phenols, quinines, terphenoids and triterphenoids. The biochemical composition of the ethyl acetate extract of the red algae *Sargassum sp.*, has carbohydrate (38.69 ±0.43%) protein (15.37±0.04%) and lipid (9.37±0.21%) and it has the higher phenolic content (25.51±0.02 mg GAE) and increased DPPH radical scavenging activities (35.51±0.07%). The present study suggested that the ethyl *Sargassum sp.*, has potent phytochemical, biochemical composition and antioxidant assays. The bioactive components present in the *Sargassum sp.*, extract can be a promising source for pharmaceuticals.

Key words: Seaweed, biochemical, phytochemical, DPPH, antioxidant.

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Invited Abstracts

Biological applications of biosynthesized silver nanoparticles from the leaf extract of Daphniphyllum neilgherrense (Wight) K. Rosenthal.

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Abstract

Herbal medicines have gained lot of acceptance in the recent years because they have a relatively higher therapeutic window, less serious side effects. Nanomedicine has undergone impressive modifications and the development of new drugs with significant healthcare outcomes. Nano-derived biocompounds have been reported to exhibit significant biological and pharmacological activities. Silver nanoparticles (Ag-NPs) have distinctive characteristics that indicate nanoparticles could be used in a variety of medicinal applications. For the first time, the synthesis of Ag-NPs was done using leaf extract from *Daphniphyllum neilgherrense* (Daphniphyllaceae). UV-Vis spectroscopy, FT-IR, XRD, SEM and TEM studies were used to investigate the physico-chemical properties of the synthesized Ag-NPs which confirming their formation, size, morphology, and surface functionalization. The study examined the antimicrobial and cytotoxic properties of *Daphniphyllum neilgherrense* synthesized Ag-NPs. The synthesized Ag-NPs demonstrated significant inhibitory effects of antimicrobial activity against G^{+ve} and G^{-ve} bacteria as well as *Candida* species. The anticancer activity of the Ag-NPs was evaluated against human breast cancer cell line MDA MB-231. The Ag-NPs exhibited significant cytotoxic effects against the tested cancer cell line in a dose-dependent manner. Current study reveals that the Ag-NPs from leaf extracts of *Daphniphyllum neilgherrense* could be used to formulate nanoparticle based antimicrobial and anticancer drugs.

Keywords: Medicinal plant, Ethnomedicine, Nanomedicine, Antimicrobial activity, Anticancer properties.

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Invited Abstracts

Reclaiming Memory: The Therapeutic Promise of Coumarin in Neurodegenerative Disorders

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Abstract

The aim of this research is to report that the plant secondary metabolite coumarin, a benzopyrone compound can be used for Alzheimer's a neurodegenerative disease. At present there is no effective treatment available to completely cure various types of dementia. There are many medications that can help to control symptoms and to delay the progression of dementia. In general, level of acetylcholine is low in Alzheimer's patients, this level is not sufficient for normal neuro transmission; hence it is also easily hydrolyzed by the Acetylcholinesterase (AChE). The enzyme AChE is a member of α/β hydrolase protein superfamily plays a very important role in neurotransmission as it hydrolyzes Acetylcholine (ACh) into choline and acetate after its signal transmission. If it persists as it as ACh, it would stimulate the neuronal receptor continuously causing decline in cognition. The plant derivative coumarin compounds have properties of heterocyclic moiety and have significant AChE inhibitory activity. Hence this will act as the potential Acetylcholinesterase inhibitors (AChEI) with their possible neuroprotective ability. These coumarins will be the actively formulated drugs which can replace the synthetic drugs in the market by crossing the Brain Blood Barrier (BBB) in the human brain which ends up the formation of amyloid plaques (Aβ) and helps in the normal neurotransmissions without the interaction of AChE. Plant natural products have shown significant cognitive-enhancing activity in preclinical models, suggesting their potential as effective alternatives to synthetic drugs. The present study focus on the effects and the mechanisms of ACh and Acetylcholinesterase inhibitors (AChEI). This will help to cure mild to severe forms of dementia using coumarin derivatives in the form of drug in the old aged people.

Keywords: Coumarin, Acetylcholine, Acetylcholinesterase inhibitors, Brain blood barrier.

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Invited Abstracts

Bioremediation of pesticide (Chlorpyrifos) polluted soil by plants and microbes

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Abstract

Bioremediation can reduce pollution and decrease the impact of pesticides on the environment. One of the major organophosphorus pesticides is Chlorpyrifos (O, O-diethyl O- (3,5,6-trichloro-2-pyridyl) phosphonothioate). The extensive usage of chlorpyrifos has resulted in widespread contamination of the natural environment. In this investigation, *Tagetes erecta* (Asteraceae) is used for eradicating the toxicity of chlorpyrifos. The GC–MS of normally cultivated *T. erecta* plant recorded a total of 19 phytochemical compounds. The GC-MS results of the plants treated with chlorpyrifos showed that the phytochemical compounds present in the pesticides were dominated and supressed the plant's original compounds. After burning the chlorpyrifos treated plant, ash revealed the absence of chlorpyrifos peak in GC-MS analysis. So, the burning of chlorpyrifos treated plant is one of the effective methods to remove the toxicity of chlorpyrifos. This study suggested only use flowering plants due to the detrimental effects of pesticides. The toxicity of chlorpyrifos were fully reduced so it can be used as an alternative method to reduce the toxicity of the pesticides. Tolerant microorganisms were also identified through molecular analysis.

Keywords: Organophosphorus pesticide, Chlorpyrifos, Bioremediation, *Tagetes erecta*, Phytochemical compounds.

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Invited Abstracts

Antimicrobial Resistance : A Global Multifaceted Phenomenon

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Abstract

Antimicrobial resistance (AMR) is one of the most serious global public health threats in this century. The first World Health Organization (WHO) Global report on surveillance of AMR, published in April 2014, collected for the first time data from national and international surveillance networks, showing the extent of this phenomenon in many parts of the world and also the presence of large gaps in the existing surveillance. In this review, we focus on antibacterial resistance (ABR), which represents at the moment the major problem, both for the high rates of resistance observed in bacteria that cause common infections and for the complexity of the consequences of ABR. We describe the health and economic impact of ABR, the principal risk factors for its emergence and, in particular, we illustrate the highlights of four antibiotic-resistant pathogens of global concern – *Staphylococcus aureus, Klebsiella pneumoniae*, non- typhoidal *Salmonella* and *Mycobacterium tuberculosis* – for whom we report resistance data worldwide. Measures to control the emergence and the spread of ABR are presented.

Keywords:

Antimicrobial resistance, Global surveillance, Antibiotics, Veterinary medicine, MRSA, *Klebsiella pneumoniae*, Non-typhoidal *Salmonella, Mycobaterium tuberculosis*.

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Invited Abstracts

Phytochemical And Functional Properties Of Fruit And Vegetable Processing By-Product

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Abstract

Processing sustainability and the concept of zero waste discharge are of great interest for many industries. Every year, fruit and vegetable processing industries generate huge amounts of by-products, which are often intended for animal feed or discarded as waste, posing a problem to both environmental and economic points of view. However, to minimize the waste burden, the valorization of these residues received increased interest. In fact, fruit and vegetable by-products are an excellent source of valuable compounds, such as proteins, dietary fibers, lipids, minerals, vitamins, phenolic acids, flavonoids, anthocyanins, carotenoids, and pigments, which can be recovered and reused, creating new business prospects from a circular economy perspective. Understanding the chemical characteristics of these materials is a key concern for their valorization and the identification of their most appropriate intended use. In this study, the phytochemical and functional properties of fruit and vegetable processing by-products (peel and pomace) were investigated. Samples of different plants (i.e., apple, black and orange carrot, cucumber, kumquat, mango, parsnip, peach, black plum) were analyzed using chemical analytical methods and characterized using Fourier Transform Mid-Infrared spectroscopy (FT- MIR). The results highlighted their high nutritional composition in terms of protein, lipids, fiber, and ash, as well as bioactive and antioxidant profiles. These characteristics make these residues suitable as natural ingredients for the development of high-added-value products in food, cosmetic, and pharmaceutical industries.

Keyword:
Nutritional composition; bioactive compounds; phenolics; flavonoids; pigments; antioxidant capacity; FT-MIR spectroscopy

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Invited Abstracts

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Abstract

The spectrum of human pathogens and the infectious diseases they cause is continuously changing through evolution and changes in the way human populations interest with their environment and each other. New human pathogens most often emerge form an animal reservoir, emphasizing the central role that non- human reservoirs play in human infectious diseases. Pathogens may also re- emerge with new characteristics, such as Multidrug resistance, or in different places, such as west Nile virus in the USA in 1999, to cause New epidemics, most human pathogens have a history of evolution in which they frist emerge and cause epidemics, become Unstably adapted, re- emerge periodically, and eventually become endemic, with the potential for future outbreaks.

Keywords: Emerging infectious infectious diseases, pathogens, zoonosis, outbreaks, public health.

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Invited Abstracts

Role and effect of Organic Fertilizer on growth and yield of Tomato (Solanum lycopersicum L)

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Abstract

Organic agriculture is an ecological production system that promotes and enhance biodiversity, biological cycles, and soil biological activity. It is based on minimal use of off farm inputs and not to use chemical fertilizers to manage, restore, maintain & increase harmony.The study was conducted to evaluated the effect of different concentrations of fertilizers on tomatoes (Solanum Lycoperscon L) grown in a greenhouse. The study determined the effect of different doses of fertilizer on tomato yield by measuring the height, root length, shoot length, number of leaves, leaf area index, under different treatments, it aimed at the yield response of tomatoes to various fertilizer concentrations and determines the best dosages for increased yields. When comparing animal and plant organic fertilizers to other forms of organic fertilizers, we observed that tomato quality varied significantly. We also evaluated the impact of different cultivation methods, soil organic matter, total soil nitrogen, soil pH, and types of organic fertilizers on the tomato yield and quality. The results gave valuable information and direction for the use of organic fertilizers in greenhouse production. Organic production practices were found to significantly improve the soil.The result showed that the high concentration of inorganic fertilizer T3 had a positive significant result on tomato yield compared with other treatments applied in this experiment. It is resulted that, extract of organic product provides a useful resource which is beneficial for increasing the productivity of tomatoes. Organic based product is productive quality yielder and economically better for sustainable agriculture.

Key Words: Agriculture, Fertilizer, Productivity , Sustainable, Economically

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Invited Abstracts

Tuberculosis: Pathogenesis, Current Treatment Regimens and New Drug Targets

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Abstract

Mycobacterium tuberculosis (M. Tb), the causative agent of TB, is a recalcitrant pathogen that is rife around the world, latently infecting approximately a quarter of the worldwide population. The asymptomatic status of the dormant bacteria escalates to the transmissible, active form when the host's immune system becomes debilitated. The current front-line treatment regimen for drug-sensitive (DS) M. Tb strains is a 6-month protocol involving four different drugs that requires stringent adherence to avoid relapse and resistance. Poverty, difficulty to access proper treatment, and lack of patient compliance contributed to the emergence of more sinister drug- resistant (DR) strains, which demand a longer duration of treatment with more toxic and more expensive drugs compared to the first-line regimen. Only three new drugs, bedaquiline (BDQ) and the two nitroimidazole derivatives delamanid (DLM) and pretomanid (PMD) were approved in the last decade for treatment of TB—the first anti-TB drugs with novel mode of actions to be introduced to the market in more than 50 years—reflecting the attrition rates in the development and approval of new anti-TB drugs. Herein, we will discuss the *Mycobacterium tuberculosis* pathogenesis, current treatment protocols and challenges to the TB control efforts. This review also aims to highlight several small molecules that have recently been identified as promising preclinical and clinical anti-TB drug candidates that inhibit new protein targets in *Mycobacterium tuberculosis.*

Keywords: Tuberculosis, TB pathogenesis, latent TB, TB treatment regimens, mycobacterial drug targets, anti-TB drug candidates.

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Invited Abstracts

Managing Nutrition to Control Plant Disease

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Abstract

Mineral nutrients are routinely applied to boost crop Yields and improve overall plant health and quality. Their Judicious use in production agriculture, horticulture, and Environmental settings is critical for improved production Efficiency and a sustainable ecosystem. The nutrition of a Plant determines in large measure its resistance or susceptibility to disease, its histological or morphological structure Or properties, and the virulence or ability of pathogens to Survive. Mineral nutrients, in many situations, are the first and foremost line of defense against plant diseases and in- Fluence all parts of the disease "pyramid." Although there Is much still to be learned in managing the dynamic interactions between the plant, environment and pathogen, Nutrient manipulation through amendment or modification of the soil environment is an important cultural control for Plant disease and an integral component of production agriculture.

Keywords: Mineral nutrition, Pathogen, Resistance, Soil.

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Invited Abstracts

Phytochemical and Functional Properties of Fruit and Vegetable Processing By-Product

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Abstract

Processing sustainability and the concept of zero waste discharge are of great interest for many industries. Every year, fruit and vegetable processing industries generate huge amounts of by-products, which are often intended for animal feed or discarded as waste, posing a problem to both environmental and economic points of view. However, to minimize the waste burden, the valorization of these residues received increased interest. In fact, fruit and vegetable by-products are an excellent source of valuable compounds, such as proteins, dietary fibers, lipids, minerals, vitamins, phenolic acids, flavonoids, anthocyanins, carotenoids, and pigments, which can be recovered and reused, creating new business prospects from a circular economy perspective. Understanding the chemical characteristics of these materials is a key concern for their valorization and the identification of their most appropriate intended use. In this study, the phytochemical and functional properties of fruit and vegetable processing by-products (peel and pomace) were investigated. Samples of different plants (i.e., apple, black and orange carrot, cucumber, kumquat, mango, parsnip, peach, black plum) were analyzed using chemical analytical methods and characterized using Fourier Transform Mid-Infrared spectroscopy (FT- MIR). The results highlighted their high nutritional composition in terms of protein, lipids, fiber, and ash, as well as bioactive and antioxidant profiles. These characteristics make these residues suitable as natural ingredients for the development of high-added-value products in food, cosmetic, and pharmaceutical industries.

Keyword: Nutritional composition; bioactive compounds; phenolics; flavonoids; pigments; antioxidant capacity; FT-MIR spectroscopy

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Invited Abstracts

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Abstract

The spectrum of human pathogens and the infectious diseases they cause is continuously changing through evolution and changes in the way human populations interest with their environment and each other. New human pathogens most often emerge form an animal reservoir, emphasizing the central role that non- human reservoirs play in human infectious diseases. Pathogens may also re- emerge with new characteristics, such as Multidrug resistance, or in different places, such as west Nile virus in the USA in 1999, to cause New epidemics, most human pathogens have a history of evolution in which they frist emerge and cause epidemics, become Unstably adapted, re- emerge periodically, and eventually become endemic, with the potential for future outbreaks.

Keywords: Emerging infectious infectious diseases, pathogens, zoonosis, outbreaks, public health.

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Invited Abstracts

Human gut study questions probiotic health benefits

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Abstract

Recent explorations of the human gut microbiota suggest that perturbations of microbial communities may increase predisposition to different disease phenotypes. Dietary nutrients may be converted into metabolites by intestinal microbes that serve as biologically active molecules affecting regulatory functions in the host. Probiotics may restore the composition of the gut microbiome and introduce beneficial functions to gut microbial communities, resulting in amelioration or prevention of gut inflammation and other intestinal or systemic disease phenotypes. This review describes how diet and intestinal luminal conversion by gut microbes play a role in shaping the structure and function of intestinal microbial communities. Proposed mechanisms of probiosis include alterations of composition and function of the human gut microbiome, and corresponding effects on immunity and neurobiology.

Key words: Intestinal microbes, Probiotics, phenotypes, gut microbiome.

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Invited Abstracts

Microbial biopesticides: Opportunities and challenges

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Abstract

Pesticides based on microorganisms and their products have proven to be highly effective, species specific and eco-friendly in nature, leading to their adoption in pest management strategies around the world. The microbial biopesticide market constitutes about 90% of total biopesticides and there is ample scope for further development in agriculture and public health, although there are challenges as well.

This article reviews the various microbial biopesticides that are commercially available, the different approaches for their production and development, the recent technological advances and the challenges faced by the microbial biopesticide field in the future.

Key Words: Microbial biopesticides, Eco-friendly in nature, Microorganisms.

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Invited Abstracts

Soil Health Management And Microorganisms: Recent Development

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Abstract

One of the essential components for sustaining life on Earth is soil. It provides a diverse range of ecosystem services that are supported by soil processes and tasks carried out by soil biodiversity. One of the key elements in maintaining plant health and biomass output is the soil microbiome in particular. The control of soil microbial populations, both targeted and untargeted, seems to hold promise for enhancing food crop productivity, nutritive value, and sustainability over the long term. The acquisition of indicators that can be employed to assess the soil's existing status and afterwards create sustainable agricultural systems is one of the main goals of assessing soil health. This is because during the past few years, tremendous progress has been achieved in the creation of particular biomarkers and macromolecular probes, allowing for quick and accurate assessments of soil microbial populations. Recent years have witnessed an increase in the use of omics techniques, which enable the assessment of microbial phylogenetic diversity and functional information, to research changes in soil microbial diversity brought on by agronomic practices and environmental conditions. The study of soil microbial diversity, plant health, and the quality of derived raw materials will benefit from the application of these high- throughput technologies, strengthening the relationship between soil health, food quality, food safety, and human health.

Keywords: Soil microbiomes, Functional microbial diversity, Sustainability.

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Invited Abstracts

Forest Ecology and Ecosystem

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Abstract

A forest is an ecological system (biotic community) dominated by trees. Ecology is the study of ecological system and the environment. The primary objective of forest Ecology is to understand what controls the patters of distribution and abundance of different organisms in forests of the world. The relevance of forest Ecology to understanding biodiversity lies in the observations that forests dominate the natural landscape over much of the world and that forests harbor a large proportion of the world species.

Moreover, because forests are valuable to humans for the products and services that they provide – especially wood – many forest ecosystem are extensively manipulated and modified by human socities, often distrupting the natural ecological patterns in addition, many forests occur where climate and soil are suitable for intensive agricultural production and conversion of forests to farms results in Radical changes in the composition of the biota. Hence, detailed knowledge of forest Ecology is necessary to predict and ameliorate the effect of forest utilization and conversion on biodiversity.

Key word : Ecology, forest Ecology, species distribution, human impact, conservation.

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Invited Abstracts

Bioremediation of Textile Dyes Using Indigenous Bacterial Isolates

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Abstract

Textile industries release large amounts of colored wastewater into the environment. These dyes are harmful to aquatic life and difficult to remove by conventional chemical methods. Bioremediation is a natural and eco-friendly method that uses microorganisms to remove such pollutants. In this study, soil and water samples were collected from dye-contaminated areas. Bacteria were isolated using nutrient agar and tested for their ability to degrade dyes such as Congo Red and Methyl Orange. Among the isolates, one strain showed good dye removal capacity. The best-performing isolate was further tested under different pH, temperature, and dye concentration conditions. The highest decolorization was observed at pH 7 and 37°C within 48 hours. The bacteria were identified using staining and biochemical tests. This project highlights that indigenous bacteria isolated from polluted areas can be useful in cleaning dye-contaminated wastewater. It is a cost- effective, eco-friendly, and safe method that can help reduce pollution caused by textile industries.

Keywords: Bioremediation, Textile Dyes, Indigenous Bacteria, Congo Red, Decolorization.

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Invited Abstracts

Biopesticides for Sustainable Agriculture: A Review of Their Role in Integrated Pest Management

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Abstract

Biopesticides include living organisms or products derived from natural sources, like genes and metabolites or natural-identical synthetic sources, that can be used to control pests. They are valuable pest management tools in sustainable agriculture. They protect crops from a wide range of pests and diseases while exhibiting specific-ity against target organisms and with minimal environmental impact. Incorporation of biopesticides into integrated pest management (IPM) programs provides a more holistic approach for growers to maximize crop yields, reduce overreliance on chemical pesticides, safeguard agroecosystems, and enhance crop yield and quality. This review explores the different classes of biopesticides (including biochemical, microbial, and plant-incorporated protectants), their modes of action, and their potential to enhance IPM strategies. The prospects of integrating emerging biopesti-cide technologies, such as nano-biopesticides and RNA-based biopesticides, into the existing IPM programs are also discussed.

Keywords: crop protection, pest control, integrated pest management, resistance management, emerging technologies, natural sources

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Invited Abstracts

Bioremediation of Contaminated Water Using Indigenous Bacteria to Prevent Waterborne Diseases

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Abstract

Water contamination is a major public health concern in many developing regions, where untreated water is a primary source of waterborne diseases such as cholera, typhoid, and diarrhea.Waterborne diseases are caused by contaminated drinking water, particularly in rural and urban slums.This study focuses on the isolation and application of indigenous bacteria for the bioremediation of polluted water sources, with the aim of reducing microbial load and improving water quality for safe use. Water samples were collected from contaminated sites including sewage-influenced rivers and stagnant ponds. Bacterial strains were isolated using selective and differential media and screened for their ability to degrade organic pollutants, tolerate heavy metals, and inhibit pathogenic bacteria. Selected isolates demonstrating strong bioremediation potential were inoculated into contaminated water samples under controlled laboratory conditions. Over a period of treatment, significant reductions in Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), turbidity, and total coliform count were observed. The most effective bacterial strains were further identified using 16S Rrna sequencing. The results suggest that native bacterial strains such as *Pseudomonas spp., Bacillus spp*., and *Acinetobacter spp*. can be effectively used as bio-remediators to naturally purify water, providing a low-cost, eco-friendly alternative to chemical treatment methods. This approach not only contributes to water sanitation but also serves as a preventive measure against waterborne diseases in vulnerable communities.

Keywords: Bioremediatin,Indigenous bacteria,Waterborne diseases,Coliform reduction.

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Invited Abstracts

Formulation and Evaluation of Biopesticides from Azadirachta indica and Ocimum sanctum Against Agricultural Pests

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Abstract

The aim of this research is to evaluate the pesticidal efficacy of plant-based biopesticides formulated from Azadirachta indica (Neem) and Ocimum sanctum (Tulsi), two medicinal plants known for their insecticidal and antimicrobial properties. The excessive use of chemical pesticides has caused environmental pollution, pest resistance, and health hazards. In response, natural alternatives such as botanical extracts are gaining attention in sustainable agriculture. Fresh leaves of Neem and Tulsi were collected, shade-dried, and subjected to aqueous and methanolic extraction. The extracts were then screened for phytochemicals such as alkaloids, flavonoids, tannins, and saponins. Their insecticidal properties were tested against selected crop pests using laboratory-based bioassays. Pest mortality was recorded at different intervals (24, 48, and 72 hours), and the data was statistically analyzed to evaluate the effectiveness of the extracts.The results indicated that both plant extracts showed significant pesticidal activity, with the combination of Neem and Tulsi exhibiting a synergistic effect. The presence of active compounds contributed to pest mortality without harmful effects on non-target organisms. This suggests that these biopesticides can serve as effective and eco-friendly alternatives to synthetic chemical pesticides.The present study highlights the potential use of Azadirachta indica and Ocimum sanctum extracts in integrated pest management (IPM) strategies and supports the promotion of organic farming practices for safe and sustainable agricultural production.

Key words : Biopesticides, pest resistance, antimicrobial properties, phytochemicals.

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Invited Abstracts

Reclaiming Memory: Development of low cost paper based cancer detection strip

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Abstract

Early and accessible cancer detection remains a critical challenge in global healthcare, particularly in low- and middle-income countries where diagnostic infrastructure is limited. This study presents the development of a low-cost, paper-based cancer detection strip designed to enable rapid, point-of-care screening for specific cancer biomarkers. Utilizing a lateral flow assay (LFA) platform, the strip is functionalized with antibodies specific to cancer-associated antigens such as carcinoembryonic antigen (CEA) and alpha-fetoprotein (AFP). Upon interaction with a patient's biological sample (e.g., blood or urine), the strip yields a visible colorimetric signal within 10–15 minutes, indicating the presence or absence of target biomarkers. The device was fabricated using nitrocellulose membrane and cellulose paper, with gold nanoparticle- conjugated antibodies serving as the detection agent. The test demonstrated a detection limit in the nanogram per milliliter range, comparable to conventional ELISA methods but at a fraction of the cost. Stability tests confirmed shelf-life of up to 6 months without refrigeration. Clinical validation using de-identified patient samples showed high sensitivity and specificity. This affordable, user-friendly diagnostic tool holds promise for use in primary healthcare centers and remote settings, bridging the gap in cancer diagnostics. Its scalability, minimal equipment requirement, and rapid results could significantly improve early cancer detection, leading to better patient outcomes and reduced treatment burden.

Keywords: Paper-based sensor, cancer detection, low-cost diagnostics, colorimetric assay, point-of-care testing, biosensor, cancer biomarkers, nanoparticle conjugation, early cancer screening, healthcare accessibility.

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Invited Abstracts

Development of a Herbal Fabric Spray Using Ocimum tenuiflorum, Cymbopogon citratus,and Lavandula angustifolia Extracts For Fragrance and Antibacterial Action

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Abstract

Nowadays, many fabric sprays available in the market are made from chemical ingredients.These chemical sprays may cause health problems such as skin allergies and breathing issues.To reduce these harmful effects ,this project focuses on preparing a herbal fabric spray using natural plant extracts.In this study, Tulasi(Ocimum tenuiflorum) leaves, Lemongrass (Cymbopogon citratus) leaves, and Lavender essential oil are used to prepare an eco-friendly spray.These plants are well- known for their antibacterial properties and pleasent fragrance. The plant extracts were obtained by using simple aqueous(water-based)extraction and mixed with mild safe ingredients to make a spray suitable for fabric use. Lavender essential oil was added to improve the fragrance.This herbal spray can be used on various household fabrics like clothes, sofa covers, and curtains ,making them smell fresh and keeping them free from harmful microbes.The product is natural , and does not release harmful chemicals like VOCs (Volatile Organic Compounds),making it safe for both humans and the environment.

Keywords: Herbal fabric spray, Lavender oil, Antibacterial, Fragrance, Eco-friendly.

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Invited Abstracts

Development Of Biodegradable Insect-Repellent Packaging Using Vitex Negundo For The Protection Of Rice And Pulse

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Abstract

Post-harvest losses in stored grains such as rice and pulses are a major concern due to insect infestationsw, particularly by pests like tribolium castaneum and Sitophilus oryzae. Current practices rely having on synthetic pesticides, which pose significant risks to human health and the environment. In response, this study proposes the development of a biodegradable packaging material incorporating Vitex negundo, a traditionally used medicinal plant with known insect- repellent properties, as a natural alternative for grain storage production. Vitex negundo leaf extract-infused pper against common pests. The essential oils of V. negundo contain bioactive compounds such as caryophyllene, sabinene, and flavonoids, which hassve been proven effective as natural insect deterrents. The expected outcome is an eco-friendly packaging alternative that reduces pest damage while being safe for both humans and the environment.

Key words: Vitex negumdo, Insect-repellent packaging, Biodegradable materials, Stored grain pests, Post-harvest protection.

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Invited Abstracts

Development And Evaluation of Traditional Herbal Fumigation Tablets Form Leucas aspera and Solanum trilobatum

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Abstract

Indoor air pollution and microbial contamination are significant contributors to respiratory illnesses and infections. This study aimed to develop and evaluate fumigation tablets formulated from two traditional Tamil medicinal plants – *Leucas aspera* and *Solanum trilobatum* – known for their antimicrobial and respiratory health benefits. The herbal powders were blended with natural binders to prepare compressed tablets suitable for fumigation via burning or steam diffusion. Laboratory- based air sampling was conducted before and after fumigation using the settle plate method, and microbial load was quantified through colony – forming unit (CFU) counts. The extracts were further tested for antimicrobial activity using agar well diffusion assays against *E. coli*, *S. aureus*, and *Candida albicans*. Phytochemical screening confirmed the presence of alkaloids, flavonoids, and phenolics. The herbal tablets showed a significant reduction in airborne microbial load and notable zone of inhibition in- vitro. The product offers a sustainable, biodegradable, and culturally rooted alternative to chemical disinfectants. Further optimization for dosage standardization and long-term storage stability is recommended.

Keywords: Herbal fumigation, Indoor air disinfection, Natural antimicrobial, Steam therapy.

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Invited Abstracts

Repellent Effects Of Traditional Herbal Plants Against Solenopsis Invicta

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Abstract

Ants, as dominant social insects of the order Hymenoptera, pose significant threats by contaminating and damaging agricultural products and stored foods. The high cost and environmental hazards associated with synthetic insecticides necessitate eco-friendly alternatives. This study investigates the ant-repellent potential of methanolic and aqueous leaf extracts of three herbal plants: Coriandrum sativum (coriander), Ocimum basilicum (sweet basil), and Cymbopogon citratus (lemongrass). Leaves were shade-dried, powdered, and subjected to methanolic extraction. Phytochemical screening revealed the presence of alkaloids, terpenoids, phenolics, and quinones. Subsequent Gas Chromatography–Mass Spectrometry (GCMS) analysis identified key bioactive compounds, including aliphatic aldehydes (decanal, E2dodecanol, E2decenal), linalool, phytol, and oleic acid in coriander oil. Ant repellency assays were conducted under field conditions across varying extract concentrations. Experiments using Solenopsis invicta (red fire ants) demonstrated that even low extract concentrations exhibited significant repellency. Results indicated a clear dose-dependent relationship between extract concentration and ant deterrence, with higher concentrations yielding maximal repellency. The study confirms that phytochemicals present in these traditional herbs can effectively repel ants, offering a safer and more sustainable alternative to conventional insecticides. These findings support the integration of plant-derived formulations in pest management strategies, emphasizing their potential for developing environmentally benign ant control methods.

Keywords: Ant repellency, phytochemical screening, Coriandrum sativum, Ocimum basilicum, Cymbopogon citratus.

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Invited Abstracts

Recent Strategies for Bioremediation Emerging Pollutants: A Review for a Green and Sustainable Environment

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Abstract

Environmental pollution brought on by xenobiotics and other related recalcitrant compounds have recently been identified as a major risk to both human health and the natural environment. Due to their toxicity and non-biodegradability, a wide range of pollutants, such as heavy metals, polychlorinated biphenyls, plastics, and various agrochemicals are present in the environment. Bioremediation is an effective cleaning technique for removing toxic waste from polluted environments that is gaining popularity. Various microorganisms, including aerobes and anaerobes, are used in bioremediation to treat contaminated sites. Microorganisms play a major role in bioremediation, given that it is a process in which hazardous wastes and pollutants are eliminated, degraded, detoxified, and immobilized. Pollutants are degraded and converted to less toxic forms, which is a primary goal of bioremediation. Ex situ or in situ bioremediation can be used, depending on a variety of factors, such as cost, pollutant types, and concentration. As a result, a suitable bioremediation method has been chosen. This review focuses on the most recent developments in bioremediation techniques, how microorganisms break down different pollutants, and what the future holds for bioremediation in order to reduce the amount of pollution in the world.

Key words: Bioremediation; microbes; pollutants; environment; sustainable technologies.

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Invited Abstracts

Citric Acid Production Through Aspergillus Niger: From Fermentation Studies Using Sugarcane Molasses

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Abstract

The production of citric acid, a vital agricultural commodity utilized across various industries such as food, beverages, pharmaceuticals, agriculture, detergents, and cosmetics, predominantly relies on microbial fermentation, with *Aspergillus niger* accounting for approximately 90% of global production. In this study, we aimed to optimize the key factors influencing citric acid production, with a focus on strains, fermentation techniques, and carbon sources, particularly sugarcane molasses. *A. niger*, sourced from the Botany department, Biotechnology laboratories at Govt. College of Science, Lahore, was employed for citric acid production. The process involved inoculum preparation through spore collection from 3 to 5 days of cultured PDA slants. The fermentation medium, comprising sugarcane molasses with a 15% sugar concentration, was meticulously prepared and optimized for various factors, including magnesium sulfate, potassium ferrocyanide, time of addition of potassium ferrocyanide, ammonium oxalate, and calcium chloride. Our optimization results shed light on the significant impact of different factors on citric acid production. For instance, the addition of 0.4g/L magnesium sulfate led to a yield of 79%, while 2g/L potassium ferrocyanide, added at 24 h, achieved a yield of 70%. Remarkably, ammonium oxalate, at a concentration of 10 g/L, resulted in a notable 77% yield. Conversely, the addition of calcium chloride exhibited negligible effects on citric acid production, with the control group yielding most at 78%. Our study underscores the potential for optimizing molasses to enhance citric acid production by *A. niger* in submerged fermentation. These findings highlight the pivotal role of magnesium sulfate, potassium ferrocyanide, and ammonium oxalate in augmenting citric acid yields while emphasizing the minimal impact of calcium chloride. Ultimately, these insights contribute to advancing our understanding of microbial citric acid biosynthesis, providing valuable implications for industrial applications and future research endeavors.

Keywords: citric acid, submerged fermentation, sugar cane molasses, industrial applications.

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Invited Abstracts

Isolation, Identification And Growth Condition Of Calcite Producing Bacteria From Urea – Rich Soil

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Abstract

Bacterial Chemical Reactions, Such As Urea Hydrolysis Can Induce Calcium Carbonate Precipitation. The Induced Production Of Calcium Carbonate Formed By Microorganisms Has Been Widely Used In Environmental And Engineering Applications. The Present Study Aimed To Isolate, Identify And Optimize Growth Conditions Of Urease Positive Bacteria From Urea Rich Soil In Gaza Strip. Bacterial Isolates, Which Tolerated ≥10% Urea Concentration, Were Selected For The Investigation. Eight Isolates Recovered And Identified To Be Spore Forming, Urease Positive, Alkaliphile, Halotolerant, And Presumptively Belonged To Bacillus Species. All Isolates Showed Best Growth At Temperature 37°C, And Ph 9-9.5. After Exposure To UV Irradiation, Most Isolates Showed Improved Tolerance To Urea Concentration, However, Other Strains Showed A Decline In Their Adaption To Urea Concentrations. The Highest Tolerance To Urea Concentrations At All Exposure Intervals, When Compared With Wild Type. Moreover, All Isolates Precipitated Calcium Carbonate. The Locally Recovered Isolates Are Promising Contributors In The Process Of Calcite Biomineralizaion And May Be Utilized In The Remediation Of Concrete Cracks, Increase Of Compressive Strength Of Concrete, Decrease Water Permeability, And Solve The Problems Of Soil Erosions.

Key Words: Calcite Bio- Mineralization ,Microbial Induced Calcium Carbonate Precipitation (MICP) , Urease , *Bacillus Spp.*, Gaza Strip.

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Invited Abstracts

Antimicrobial Susceptibility Testing: A Comprehensive Review Of Currently Used Methods

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Abstract

Antimicrobial resistance (AMR) has emerged as a major threat to public health globally. Accurate and rapid detection of resistance to antimicrobial drugs, and subsequent appropriate antimicrobial treatment, combined with antimicrobial stewardship, are essential for controlling the emergence and spread of AMR. This article reviews common antimicrobial susceptibility testing (AST) methods and relevant issues concerning the advantages and disadvantages of each method. Although accurate, classic technologies used in clinical microbiology to profile antimicrobial susceptibility are time-consuming and relatively expensive. As a result, physicians often prescribe empirical antimicrobial therapies and broad-spectrum antibiotics. Although recently developed AST systems have shown advantages over traditional methods in terms of testing speed and the potential for providing a deeper insight into resistance mechanisms, extensive validation is required to translate these methodologies to clinical practice. With a continuous increase in antimicrobial resistance, additional efforts are needed to develop innovative, rapid, accurate, and portable diagnostic tools for AST. The wide implementation of novel devices would enable the identification of the optimal treatment approaches and the surveillance of antibiotic resistance in health, agriculture, and the environment, allowing monitoring and better tackling the emergence of AMR.

Key words: Antimicrobial drugs, Antimicrobial susceptibility testing, Antimicrobial resistance.

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Invited Abstracts

Analysis of Global Research On Malaria And Plasmodium Vivax

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Abstract

Background: Malaria is one of the infectious diseases of greatest interest to the scientific community And of greatest concern to international health authorities. Traditionally, the focus has been on *Plasmodium falciparum*, the parasite that causes the most severe form of the disease in Africa. However, in the last twenty years, the *Plasmodium vivax* parasite, responsible for a large number of cases in Latin America, the Middle East, South and Southeast Asia, the Horn of Africa, and Oceania, has also generated enormous interest due, among other things, to the published evidence that it can cause severe malaria. In this paper, the international scientific publication on malaria and *P. vivax* has been analyzed using the Scopus database to try to define global trends in this field of study. It has been shown that events such as the emergence of resistance to certain drugs can break a trend. The important role of non-malaria-endemic countries such as the USA or Switzerland in malaria research is also evident. Conclusions: International cooperation will be essential for the eradication of the disease. Moreover, in this sense, the general vision given by the bibliometric analysis of malaria caused by *P. vivax* is fundamental to paint the picture regarding the current situation and encourage international cooperation and control efforts.

Keywords: Malaria, *Plasmodium vivax*, chloroquine, *Plasmodium falciparum*.

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Invited Abstracts

Antimycobacterial Drugs As A Novel Strategy To Inhibit Pseudomonas Aeruginosa Virulence Factors And Combat Antibiotic Resistance: A Molecular Simulation Study

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Abstract

Antimicrobial resistance poses a severe threat, particularly in developing countries where the ready availability of drugs and increased consumption lead to improper antibiotic usage, thereby causing a surge in resistance levels compared to developed areas. *Pseudomonas aeruginosa*, an opportunistic pathogen, triggers various infection-related issues, occurring on occasions including chronic wounds, burn injuries, respiratory problems in cystic fibrosis, and corneal infections. Targeting the quorum sensing (QS) of *P. Aeruginosa* emerges as a strategic approach to combat infections caused by this bacterium. The objective of this study was to check the effect of antimycobacterial drugs against the potential QS targets in *P. Aeruginosa* and identify lead candidates. The antimycobacterial drugs were first examined for the toxicological and pharmacokinetic profile. By virtual screening through molecular docking, delamanid and pretomanid stood out as major candidates. The binding energies of delamanid and pretomanid with LasR were determined to be −8.3 and −10.9 kcal/mol, respectively. The detailed analysis of the complexes of lead compounds were examined through molecular dynamics simulations. The molecular simulations data validated a sustained interaction of lead drugs with target proteins (PqsR, LasI, and LasA) in a physiological environment. The negligible changes in the secondary structure of proteins in presence of hit antimycobacterial drugs further strengthened the stability of the complexes. These findings highlight the potential repurposing of delamanid and pretomanid, specifically in targeting *P. Aeruginosa* quorum-sensing mechanisms.

Keywords: Pathogenicity; Antimycobacterial drugs; *P. Aeruginosa*; virulence factor; molecular dynamics simulation; molecular docking

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Invited Abstracts

Advanced Wound Healing With Stimuli Responsive Nanozymes: Mechanism , Design And Application

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Abstract

Wound healing outcomes critically depend on precise regulation of oxidative and antimicrobial microenvironments. Traditional dressings have limited wound responsiveness, insufficient infection control, and limited treatment accuracy. In contrast, nanozymes, featuring enzyme-mimetic activities, tunable catalysis, and engineered sizes that balance catalytic site accessibility with tissue penetration, offer spatiotemporal control of reactive oxygen species (ROS) and pathogen elimination. This review systematically examines recent advances in stimuli-responsive nanozymes for wound management, focusing on their catalytic mechanisms and therapeutic specificity. These intelligent systems dynamically adapt catalytic behaviors (e.g., ROS scavenging, bacterial lysis) to physical stimuli (temperature, light, ultrasound) and physiological signals (pH, redox imbalance, ATP levels, microbial metabolites), leveraging size-dependent targeting mechanisms to ensure localized therapeutic effects while minimizing off-target damage. Current evidence demonstrates their multifunctional capacity to synergistically accelerate infection clearance, inflammation resolution, and angiogenesis. Future development should prioritize biosafety validation alongside size-effect standardization, stimulus specificity, and scalable manufacturing to advance personalized nanomedicine for refractory wounds.

Key words: Nanozymes, Redox imbalance, Microbial metabolites, Ultrasound.

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Invited Abstracts

Microbial Biotechnology: A Promising Implement For Sustainable Agriculture

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Abstract

Microbial biotechnology is a well-established branch of biotechnology, which include the application of microorganisms with emerging modern techniques of biotechnology for the development of sustainable agriculture. Microbial biotechnology deals with the manipulation through genetic engineering of living organisms or their components to produce valuable products for various applications. Classical agriculture farming equipment and practices are reaching their limits of effectiveness in increasing agricultural productivity. The chemical fertilizers, pesticides, herbicides, and other inputs have increased agricultural production, but simultaneously, cause adverse effects on soil productivity and environmental quality. The broad application of microbes in sustainable agriculture is due to the genetic dependency of plants on the beneficial functions provided by symbiotic cohabitants. Therefore, microbial biotechnology and its applications in development of sustainable agriculture and environmental health are attracting the attention of microbiologists and biotechnologists. India's large population is placing more pressure on natural resources like soil and water, and affecting our ability to produce sufficient food, feed, and fiber. Recently developed biotechnologies can provide appropriate new tools to find out the solutions of different specific problems of sustainable agriculture (Singh and Gupta, 2018). The aim of this study was to conclude the diversified useful applications of microbial biotechnology for the development of sustainable agriculture using different tools and techniques such as biofertilizers, biopesticides, and value additions in crops.

Key words: Genetic Engineering, Fertilizers, Pesticides, Herbicides, Biopesticides

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Invited Abstracts

Biofertilizers And Biopesticides From Waste: A Path Toward Sustainable Agriculture

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Abstract

The use of waste food materials and converting it into Biopesticides and Biofertilizer is the main aim of this project. First sample is Lemon peels which are waste food material; it can reuse as Biofertilizer and Biopesticide for plant and soil. Due to its acidic nature the insect and pests are not affect the plant. It also has beneficial Phytochemicals and Minerals which can helps in plant growth and improving quality of soil. Other sample is Sugarcane waste material from this we made liquid fertilizer by dipping waste into water and making growing media as well as fertilizer by sun drying and making powder from sugarcane waste sample. All of this byproduct contains many phytochemicals and minerals like Lipid, Protein, Carbohydrates, etc… Nitrogen, calcium, chloride, etc. By use of this Biofertilizer and Biopesticide the soil quality is improved properly.

Keywords: Biofertilizer, biopesticides, waste of food products, phytochemicals and minerals

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Invited Abstracts

An Overview On Impact And Application Of Microorganisms On Human Health, Medicine And Environment

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Abstract

Microorganisms or microbes are microscopic organisms that exist as unicellular, multicellular, or cell clusters. Microorganisms are widespread in nature and are beneficial to life, but some can cause serious harm. They can be divided into five major types: Bacteria, Archaea, Fungi, Protozoa, and Viruses. Microbes are everywhere in the biosphere, and their presence invariably affects the environment that they are growing in. Microorganisms are beneficial in producing oxygen in environment, decomposing organic material, medicine, providing nutrients for plants, and maintaining human health, but some can be pathogenic and cause diseases in plants and humans. They perform a key role and act as main engineers in governing all ecological processes. They act as universal catalyst and provide ecological transformations. Regardless of whether they influence human health and welfare favorably or unfavorably, microorganisms are capable of profound influences on life. That is to say, it is an integral part of our lives, and therefore acquiring knowledge about it should also be essential and the main thing.

Key words: Bacteria; Fungi; Protozoa; Viruses; Microbiological Analysis

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Invited Abstracts

Role of Organic Farming for Achieving Sustainability in Agriculture

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Abstract

Agriculture and farming have a long history. Agriculture is the main economic structure for many developed and developing countries. The modern agricultural practices affect the environment namely nutrient cycle, soil erosion, carbon sequestration, and many other ecological patterns. Organic farming is influential practice to minimize the environmental and ecological impact of sustainable development. Usage of more organic matters in agricultural practices can reduce the adverse effects on the environment by keep saving its natural cycles on recovery process and organic farming may enhance the food quality too. The organic farming may largely exclude the usage of chemical fertilizers pesticides, growth hormones and feed additives of livestock activities. A combination of organic farming and new technologies is of utmost importance to reduce the limitations and challenges of organic farming. The innovative methods and new approaches making new trends toward sustainability farming system and enhances the agricultural productivity, and quality of life of many farmers in an environmentally friendly way. In other words, organic farming mirrors the sustainability concepts of Global Agriculture.

Key words: Biofertilizer , Bibliometric analysis, Organic farming, Organic fertilizers, Sustainability, Sustainable development goals.

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Invited Abstracts

Biofertilizer For Crop Production And Soil Fertility

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Abstract

Modern agriculture involves usage of pesticides and chemical fertilizers with an essence of increasing the world's food production. Thus, these serve as a fast food for plants, causing them to grow more rapidly and efficiently. Fertilizers, though they are vital as a nutrient supplement to plants and comprised mainly nitrogen (N), potassium (K) and phosphorous (P), they also cause several health hazard. Researchers have found "Bio fertilizer" as an excellent alternative to chemical fertilizers which provide nutrients through the action of nitrogen fixation, solubilising phosphorus, and trigger plant growth through the synthesis of growth promoting essence. The study reviews these continuously accessible and ecofriendly nutrients, types and their potential for crop production based on relevant literature and research work carried out by numerous researchers.

Key words: Nutrients, bio-fertilizer, types, crop production, benefits.

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Invited Abstracts

New Study Offers Insights Into Designing Safe, Effective Nasal Vaccines

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Abstract

Most vaccines -- and boosters -- are injected directly into muscle tissue, usually in the upper arm, to kickstart the body's immune system in the fight against disease. But for respiratory diseases like COVID-19, it can be important to have protection right where the virus enters: the respiratory tract. In a new study, researchers found that nasal vaccine boosters can trigger strong immune defenses in the respiratory tract, even without the help of immune-boosting ingredients known as adjuvants. The findings, researchers suggest, may offer critical insights into developing safer, more effective nasal vaccines in the future.

Keywords: Vaccines, respiratory diseases, nasal vaccine boosters, adjuvants

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Invited Abstracts

Scientists Discover Natural Cancer-Fighting Sugar In Sea Cucumbers

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Abstract

Sea cucumbers, long known for cleaning the ocean floor, may also harbor a powerful cancer-fighting secret. Scientists discovered a unique sugar in these marine creatures that can block Sulf-2, an enzyme that cancer cells use to spread. Unlike traditional medications, this compound doesn't cause dangerous blood clotting issues and offers a cleaner, potentially more sustainable way to develop carbohydrate-based drugs if scientists can find a way to synthesize it in the lab.

Keywords: Unique sugar, Sulf-2, blood clotting, cancer-fighting, carbohydrate-based drugs

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Invited Abstracts

Millions of New Genes in Human Microbiome

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Abstract

A new study of the human microbiome has uncovered millions of previously unknown genes from microbial communities in the human gut, skin, mouth, and vaginal microbiome, allowing for new insights into the role these microbes play in human health and disease. The results are a significant jump in the amount of information available to scientists. This publication provides new insight into the changes in our microbiome over time and could lead to a greater understanding of the genetic differences that are unique to an individual's microbes.

Keywords: microbiome, human health, disease, individual microbes, genetic differences

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Invited Abstracts

Cowpox viruses: A Zoo Full of Viral Diversity and Lurking Threats

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Abstract

Cowpox viruses (CPXVs) exhibit the broadest known host range among the Poxviridae family and have caused lethal outbreaks in various zoo animals and pets across 12 Eurasian countries, as well as an increasing number of human cases. Herein, we review the history of how the cowpox name has evolved since the 1700s up to modern times. Despite early documentation of the different properties of CPXV isolates, only modern genetic analyses and phylogenies have revealed the existence of multiple Orthopoxvirus species that are currently constrained under the CPXV designation. We further chronicle modern outbreaks in zoos, domesticated animals, and humans, and describe animal models of experimental CPXV infections and how these can help shaping CPXV species distinctions. We also describe the pathogenesis of modern CPXV infections in animals and humans, the geographic range of CPXVs, anddiscuss CPXV-host interactions at the molecular level and their effects on pathogenicity and host range. Finally, we discuss the potential threat of these viruses and the future of CPXV research to provide a comprehensive review of CPXVs.

Keywords: cowpox virus; poxviruses; vaccinia virus; zoonosis.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Microbial Secondary Metabolites

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Abstract

The short history, explicit highlights and future possibilities of examination of microbial metabolites, including anti-infection agents and other bioactive metabolites, are summed up. The microbial birthplace, variety of creating species, capacities and different bioactivities of metabolites, remarkable highlights of their compound designs are talked about, chiefly based on factual information. The potential quantities of metabolites might be found later on, the issues of dereplication of recently disconnected mixtures just as the recent fads and possibilities of the exploration are likewise talked about. Instances of auxiliary metabolites incorporate anti-toxins, colors and fragrances. Something contrary to auxiliary metabolites are essential metabolites, which are viewed as crucial for the ordinary development or improvement of a life form. Available evidences had shown that the major source of secondary metabolite is microbial source, among that Bacilli is one of the important sources of Secondary metabolites.

Keyword: Secondary metabolite, source of secondary metabolites, secondary metabolite of plant, microbial metabolite, bacilli source of secondary metabolite

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Invited Abstracts

Microbial Fuel Cell : From Fundamentals To Applications

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Abstract

In the past 10–15 years, the microbial fuel cell (MFC) technology has captured the attention of the scientific community for the possibility of transforming organic waste directly into electricity through microbially catalyzed anodic, and microbial/enzymatic/abiotic cathodic electrochemical reactions. In this review, several aspects of the technology are considered. Firstly, a brief history of abiotic to biological fuel cells and subsequently, microbial fuel cells is presented. Secondly, the development of the concept of microbial fuel cell into a wider range of derivative technologies, called bioelectrochemical systems, is described introducing briefly microbial electrolysis cells, microbial desalination cells and microbial electrosynthesis cells. The focus is then shifted to electroactive biofilms and electron transfer mechanisms involved with solid electrodes. Carbonaceous and metallic anode materials are then introduced, followed by an explanation of the electro catalysis of the oxygen reduction reaction and its behavior in neutral media, from recent studies. Cathode catalysts based on carbonaceous, platinum-group metal and platinum-group-metal-free materials are presented, along with membrane materials with a view to future directions. Finally, microbial fuel cell practical implementation, through the utilization of energy output for practical applications, is described.

Keywords: Microbial Fuel Cell (MFC), electrochemical reactions, carbonaceous, platinum- group-metal-free materials

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Invited Abstracts

Microbial Interaction Mediated Programmed Cell Death In Plants

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Abstract

Food demand of growing population can only be met by finding solutions for sustaining the crop yield. The understanding of basic mechanisms employed by microorganisms for the establishment of parasitic relationship with plants is a complex phenomenon. Symbionts and biotrophs are dependent on living hosts for completing their life cycle, whereas necrotrophs utilize dead cells for their growth and establishment. Hemibiotrophs as compared to other microbes associate themselves with plants in two phase's, viz. early bio-phase and later necro-phase. Plants and microbes interact with each other using receptors present on host cell surface and elicitors (PAMPs and effectors) produced by microbes. Plant–microbe interaction either leads to compatible or incompatible reaction. PCD regulation is an outcome of plant–microbe crosstalk which entirely depends on various biochemical events like generation of reactive oxygen species, nitric oxide, ionic efflux/influx, CLPs, biosynthesis of phytohormones, phytoalexins, polyamines and certain pathogenesis-related proteins. This phenomenon mostly occurs in resistant and non-host plants during invasion of pathogenic microbes. The compatible or incompatible host–pathogen interaction depends upon the presence or absence of host plant resistance and pathogenic race. In addition to host–pathogen interaction, the defense induction by beneficial microbes must also be explored and used to the best of its potential. This review highlights the mechanism of microbe- or symbiont-mediated PCD along with defense induction in plants towards symbionts, biotrophs, necrotrophs and hemibiotrophs. Here we have also discussed the possible use of beneficial microbes in inducing systemic resistance in plants against pathogenic microbes.

Keywords: symbionts, hemibiotrophs, necrotrophs, pathogenic microbes.

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Invited Abstracts

Microbial Inoculants As Biofertilizers And Biopesticides

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Abstract

Bioinoculants are ecofriendly as they don't have any adverse effect on soil fauna and flora. These bioinoculants can also be used as biopesticides which do not have any residual effect on crop products. But the main problem with the bioinoculants is its quality, as the private agencies which supply various biofertilizers and biopesticides don't care for their quality parameters. The availability of good quality bioinoculants to the farmers is main hurdle in their success. There is lack of co-ordination between the extension workers and scientists. Due attention is needed regarding *Azotobacter, Azolla*, *Acetobacter*, *Trichoderma*, *Bacillus thuriengensis*, and Azospirillum and their application in various cereal and vegetable crops. These biofertilizers should be integrated with organic manures and chemical fertilizers to enhance the soil organic carbon and maintain sustainability in field and horticultural crops.

Keywords:

Biofertilizers. *Azotobacter Azospirillum* Biopesticides *Trichoderma Bacillus*.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Biofertilizer For Crop Production and Soil Fertility

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Abstract

Modern agriculture involves usage of pesticides and chemical fertilizers with an essence of increasing the world's food production. Thus, these severe as a fast food for plants, causing them to grow more rapidly and efficiently. Fertilizers though they are vital as a nutrient supplement to plants and comprised mainly nitrogen (N), potassium (k), and phosphorus (P) they also cause several health hazard. Researchers have found "Bio fertilizer" as an excellent alternative to chemical fertilizers which provide nutrients through the action of nitrogen-fixation solubilizing phosphorus, and trigger plant growth through the synthesis of growth promoting essence. The study reviews these continuously accessible and ecofriendly nutrients, types and their potential for crop production based on relevant literature and research work carried out by numerous researchers.

Keywords: pesticides, biofertilizer, nitrogen fixation, solubilizing phosphorous, health hazard

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Formulation and Evaluation of an Essential Oil-Based Anti- Mosquito Body Spray as a Natural Repellent

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Abstract

Mosquito-borne diseases such as malaria, dengue, and chikungunya continue to pose serious health threats in tropical and subtropical regions. Conventional chemical repellents, although effective, often raise concerns regarding toxicity, skin irritation, and environmental impact. This research focuses on the formulation and evaluation of a natural anti-mosquito body spray using essential oils with known insect-repellent properties. Essential oils from Citronella (Cymbopogon nardus), Lemongrass (Cymbopogon citratus), Eucalyptus (Eucalyptus globulus), Peppermint (Mentha piperita), and Neem (Azadirachta indica) were selected based on literature evidence and preliminary screening. Multiple formulations were prepared using these oils in varying concentrations, with ethanol as a solvent and glycerin as a moisturizing agent. The repellent efficacy of each formulation was tested using the arm-in-cage method against Aedes aegypti under controlled laboratory conditions. Key parameters including repellency percentage, duration of protection, and dermal tolerance were evaluated. Among the tested formulations, a blend containing citronella and neem oil (3:2 ratio) exhibited the highest efficacy, offering over 90% repellency for up to 180 minutes. The findings support the potential application of essential oil-based repellents as effective, skin-safe, and environmentally friendly alternatives to synthetic mosquito repellents.

Keywords: Essential oils, Citronella, Herbal insect repellent, Eco-friendly alternative, Aedes aegypti.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Biodiversity Studies Of Insect Fauna Order Coleoptera Of Namakkal, Tamilnadu

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Abstract

Beetles, which belong to the order Coleoptera, are among the most numerous groups of insects. Beetles are the most well-known group of insects, with more species than any other group of insects. There have been approximately 350,000 species described up until this point, and there are still many species that are waiting to be discovered. It may defend itself in two different ways: by using its tough & shell or by fleeing in the other direction. The beetles are able to be found in all natural settings, including aquatic habitats, trees up to and including their leaves and bark, flowers, and any plant tissue, including plants that have decomposed. Ground beetles have been utilized as bio indicators. Beetles have a number of fascinating characteristics, such as the fact that they are endopterygotes, which means they undergo complete metamorphosis, and that they contain air bubbles for the purpose of diving (water beetle) chemical defense for protection (Tenebrionidae), parasitism (Platypsyllus castoris). They reveal a wide variety of adaptations, such as camouflage (in the case of Chrysomelidae), mimicry (in the case of Cerambycidae), aposematism, chemical defense (in the case of Tenebrionidae), parasitism (in the case of Castor sp.), pollination (in the case of Cantharidae), mutualism (in the case of Ambrosia beetle), tolerance to extreme environments (in the case of Stenocara gracilipes), migration (in the case of Coccinellids), and many other adaptations. The Namakkal, which is located in the southwest of Namakkal, was the site of the survey. Agriculture and related industries provide a living for 70% of the people. According to the study, 30 species of beetles from nine families and various locations were found. Scarabaeidae shows the maximum species richness of 12 species followed by Chrysomelidae with 6 species, Coccinellidae with 3 species, Cerambycidae with 3 species, Tenebrionidae with 2 species very less number of butterflies were identified in families Dryphthoridae, Apionidae, Rhynchitidae, Rutelidae with 1 species. The rich diversity of beetles, especially the Scarabaeidae and Chrysomelidae in indicates a varied assemblage of floral species. The flora in Namakkal is a mixed type with herbs and shrubs and dung beetles are dominating the vegetation in the varies climate conditions. Beetles diversity varies with season. They are abundant for only a few months and rare of absent during other months of the year.

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Invited Abstracts

Medicinal Plants Used In The Traditional Treatment Of Female Infertility: A Review

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Abstract

Infertility is a social challenge common among couples ranging from Asia and different parts of the world. Infertility occurs as result of malformation of the uterus, poor diet and illness. Medicinal plants used across regions in the world capable of healing female infertility. This article provides a world overview of medicinal plant activity from different regions across the globe. The study summarizes previous literature on the use of medicinal plants in female fertility treatments. Findings indicated the importance of traditional healers in woman's infertility. The traditional healers used materials prepared from herbs. Herbs are derived from plants and plant extracts of various natural resources, including plant leaves, bark, flowers, roots, fruits, and berries. Female infertility has been proven to respond well to herbal- based therapy. Women's infertility is a condition that is receiving more attention concerning medicinal herbs. The performance of the various medicinal plants depends on accumulation of bioactive ingredients. Modern plants have shown potential in enhancing female fertility through their various therapeutic properties and bioactive compounds. Overall, while there is promise in using plants for female fertility holds promise, further research and clinical trials are necessary to establish their safety and effectiveness. These herbs can be used as an alternative or supplemental therapy for female infertility.

Keywords: Infertility, Women's Health, Traditional Medicine, Fertility.

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Invited Abstracts

Ameliorative Efficacy Of Ethanolic And Aqueous Extracts Of Couroupita Guianensis On Chlorpyrifos-Induced Hepatic Lipid Peroxidation In The Freshwater Fish, Labeo Rohita

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Abstract

The widespread use of Chlorpyrifos (CPF), an organophosphate pesticide, causes oxidative stress and liver damage in aquatic organisms. This study evaluated the protective efficacy of ethanolic and aqueous leaf extracts of *Couroupita guianensis* against CPF-induced hepatic lipid peroxidation in Labeo rohita. Fishes were divided into six groups (each containing 15 fishes), viz. control, CPF-exposed (0.25 µg/L), and four groups co-treated with CPF (0.25 µg/L) and either aqueous or ethanolic extracts at 200 mg/kg and 400 mg/kg body weight for 28 days. Lipid peroxidation was assessed by measuring malondialdehyde (MDA) levels in liver tissue. CPF exposure significantly increased MDA levels compared to the control (p<0.05), indicating oxidative damage. Both extracts provided dose-dependent protection by reducing MDA levels. However, the ethanolic extract showed greater efficacy, particularly at the 400 mg/kg dose, where MDA levels were nearly restored to control values. The enhanced performance of the ethanolic extract is attributed to its ability to solubilize a wider range of antioxidant phytochemicals. These findings suggest that while both aqueous and ethanolic extracts of *C. guianensis* offer protective effects, the ethanolic extract is more effective in alleviating CPF-induced hepatotoxicity in fish, making it a promising natural remedy for pesticide-induced oxidative stress in aquatic environments.

Keywords: Chlorpyrifos, *Couroupita guianensis*, Ethanolic Extract, Aqueous Extract, Lipid Peroxidation, Hepatoprotection, Labeo rohita.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Nature Inspired Alangium Salviifolium (L.F.) Wangerin Leaf Sourced Selenium Nanoparticles For Microbial Control

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Abstract

Selenium nanoparticles (Se NPs) were synthesized via a green method using Alangium salviifolium leaf extract as a reducing and stabilizing agent. The biosynthesis process involved mixing an aqueous leaf extract with a Selenium precursor under controlled conditions, resulting in the formation of Se NPs, as indicated by a characteristic absorption peak in the UV-Vis spectrum. The nanoparticles were further characterized by Fourier Transform Infrared Spectroscopy (FTIR), which confirmed the presence of functional groups from the leaf extract responsible for capping and stabilization. Field Emission Scanning Electron Microscopy (FESEM) and High-Resolution Transmission Electron Microscopy (HRTEM) with Selected Area Electron Diffraction (SAED) revealed that the Se NPs were predominantly spherical-shaped, with an average size ranging from 20-60 nm. X-ray Diffraction (XRD) analysis confirmed the crystalline hexagonal structure of the nanoparticles. The antibacterial activity of the synthesized Se NPs was evaluated against both Gram-positive and Gram-negative bacteria using standard assays. Results demonstrated significant inhibitory effects, suggesting that green-synthesized Se NPs possess potent antibacterial properties and hold promise for biomedical applications. This eco-friendly approach highlights the potential of plant-mediated synthesis for producing functional nanomaterials.

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Invited Abstracts

Evaluation of the Anticancer Properties of Senna uniflora Extracts Using the MTT Assay on A549, HepG2, MCF-7, and MDA-MB-231 Cell Lines

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Abstract

Cancer remains one of the leading causes of death globally, characterized by uncontrolled cell proliferation and resistance to apoptosis. The search for effective and less toxic treatments has turned attention toward natural plant-based compounds with therapeutic potential. The growing interest in plant-based medicines has prompted research into natural compounds with anticancer potential. This study evaluates the cytotoxic effects of the aqueous extract of Senna uniflora on four human cancer cell lines: A549 (lung), HepG2 (liver), MCF-7 (estrogen receptor-positive breast), and MDA-MB-231 (triple-negative breast cancer). Cell viability was assessed using the MTT assay at extract concentrations ranging from 12.5 to 200 µg/mL. Results showed a dose- dependent decline in viability across all cell lines. MDA-MB-231 cells demonstrated the highest sensitivity, with viability reduced to 70.53% at 200 µg/mL. HepG2 and A549 cells showed moderate responses, with viabilities of 82.62% and 90.08%, respectively, while MCF-7 cells exhibited the least sensitivity (92.66%). Compared to the standard drug control, the extract displayed relatively mild cytotoxicity. These findings suggest that Senna uniflora aqueous extract may have selective anticancer activity, particularly against aggressive breast cancer subtypes like MDA-MB-231. Further studies are recommended to isolate active compounds and investigate their mechanisms of action.

Keywords: Senna uniflora, cytotoxicity, MTT assay, aqueous extract, A549, HepG2, MCF-7, MDA-MB-231, anticancer activity, natural products

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Invited Abstracts

Mitigating Benzo[a]pyrene Pollution in Palk Bay: Insights from Mangrove Bacterial Consortia

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Abstract

Polycyclic aromatic hydrocarbons (PAHs), particularly the high-molecular-weight (HMW) and highly recalcitrant benzo[a]pyrene (BaP), are persistent environmental pollutants posing significant ecological and human health risks due to their hydrophobic, degradation-resistant, and mutagenic properties. This study investigates the potential of mangrove bacterial consortia from Karankadu, Palk Bay, India, for the biodegradation of BaP in saline marine environments. Bacterial isolates enriched from mangrove sediments demonstrated the ability to utilize BaP as their sole carbon and energy source.Three key isolates were identified: Bacillus cereus PVS01 (OQ954107), Achromobacter insolitus PVS02 (OQ95418), and Pseudomonas aeruginosa PVS03 (OQ954109). Individually, these strains achieved BaP degradation rates of 37%, 34%, and 24%, respectively, when exposed to an initial BaP concentration of 20 mg/L during a 10-day incubation in seawater (28 ppm NaCl). Notably, a bacterial consortium exhibited enhanced degradation, achieving 44% degradation of an initial 50 mg/L BaP concentration under the same conditions. Optimal degradation by the consortium was observed at 35°C, neutral pH, and 1.5% NaCl. This research highlights the significant potential of co-metabolism within a microbial consortium as an effective and viable strategy for the bioremediation of BaP contamination in seawater environments.

Keywords: PAH degradation, Benzo[a]pyrene, Karankadu mangrove, Consortium, Biodegradation, Microbial degradation, HMW Polycyclic aromatic hydrocarbons.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Fungal Menace to Korai Grass Mats: Identification and Biocontrol with Noni Extracts

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Abstract

This study investigates the critical issue of fungal contamination affecting the Korai grass mat industry in Tamil Nadu, which leads to economic losses, particularly during rainy seasons. Recognizing the significant anti-fungal and anti-microbial properties of Noni (Morinda citrifolia) fruit, this research aimed to identify the primary fungal species causing contamination and to evaluate the anti-fungal effectiveness of Noni extracts. The methodology involved isolating fungi from contaminated Korai grass mats and culturing them on Potato Dextrose Agar. Noni leaves were collected, surface sterilized, shade-dried, and ground into a fine powder. Extracts were then prepared using various solvents: propanal, methanol, ether, and aqueous solutions. The anti- fungal activity of these extracts was determined by observing the zone of inhibition. Results from the study identified Scedosporium boydii and Aspergillus flavus as key fungal contaminants. Enzymatic activity tests revealed that Scedosporium boydii exhibited positive amylase and lipase activity, while Aspergillus flavus showed positive amylase activity. Antifungal assays demonstrated that ethanol and methanol Noni extracts displayed resistance to the tested fungi, propanal extract showed moderate resistance, and the aqueous extract was susceptible. This eco-friendly and cost-effective study concludes that Noni extracts possess excellent in-vitro fungicidal activity, proposing a viable solution to mitigate microbial contamination and thereby enhance the profitability of Korai mat manufacturing and trading.

Keywords: Korai grass, Fungal contamination, Morinda citrifolia (Noni), Antifungal activity , Biodegradation, Mat industry.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Sea cucumber in cancer treatment

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Abstract

Sea cucumbers, marine invertebrates found on the seafloor, have gained attention in cancer research due to their bioactive compounds. Studies show that certain extracts from sea cucumbers can inhibit the growth and spread of cancer cells. These compounds, including triterpene glycosides, have demonstrated anti- tumor, anti-inflammatory, and immune-boosting properties in laboratory tests. Sea cucumber extracts may block cancer cell proliferation, induce apoptosis (cell death), and prevent angiogenesis (formation of new blood vessels in tumors). Though research is still ongoing, sea cucumbers show promising potential in cancer therapy.

Keywords: Sea cucumber, cancer, triterpene glycosides, apoptosis, anti-tumor, marine bioactive compounds, angiogenesis, cancer inhibition, natural therapy.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Green synthesis, characterization and antibacterial activity of silver nanoparticles using leaf extract of Adhatoda vasica against veterinary pathogens.

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Abstract

Silver nanoparticles are of much interest focusing on the unique properties like size, shape, optical, electrical and magnetic properties, it can be applied for antimicrobial applications. The synthesized silver nanoparticles of Adhatoda vasica the absorption peak is maximum at 437nm to 217nm. SEM image of synthesized silver nanoparticles of Adhatoda vasica is due to the interaction of organic capping molecules attached to AgNPs exhibits spherical structures with diameter of 2µm, 3µm and 20µm. The synthesized silver nanoparticles of Adhatoda vasica, FTIR spectrum indicated the clear peaks with (1539.89, 1558.51, 2338.13, 3674.57, 3688.06, 3710.52, 3749.50 cm -1). The antibacterial efficacy of the leaf extract of Adhatoda vasica synthesized silver nanoparticles shows a strong antimicrobial activity against veterinary pathogenic bacterial strains like *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Salmonella typhi and Klebsiella pneumonia*. The present investigation shows that gram positive bacterial strains exhibit more zone of inhibition maximum at 100µl and minimum at 25µl the recorded values were 5mm to 8mm.The gram-negative bacterial strains showed much lesser effect than the gram-positive bacterial strains the observed zone of inhibition was from 4mm to 8mm. The antibacterial activity of AgNPs can be explained due to the change in the cell membrane permeability or degradation of enzymes in bacteria. The zone of clearance observed at 12 mg ml -1 of AgNPs is 6mm.

Keywords: Silver nanoparticles, green synthesis, Adhatoda Vasica, antibacterial activity, *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Salmonella typhi and Klebsiella pneumonia.*

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

In Vitro Plant Tissue Culture: Processes, Factors and Applications in Crop Improvement-A review

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Abstract

Plant tissue culture techniques are versatile biotechnological tools integral to both fundamental research and applied plant sciences. These methods enable in vitro investigation of plant development, functional gene analysis, large-scale micropropagation, and the creation of transgenic plants with enhanced traits. They also support breeding, crop improvement, virus eradication, and germplasm preservation—especially in vegetatively propagated or endangered species. Successful tissue culture relies on critical factors including culture medium composition. phytohormone types and ratios (auxin, cytokinin, gibberellins), explant selection (meristem, shoot tip, leaf, root), and controlled light and environmental conditions .Recent research demonstrates that molecular signaling triggered by wounding, programmed cell death, and hormone cross-talk significantly influence organogenesis and somatic embryogenesis. Micropropagation, the preferred pathway for commercial plant production, follows sequential stages: explant initiation, proliferation, root formation, and acclimatization to ex vitro environments. Standardized protocols utilizing these phases ensure production of true-to-type plants in large quantities. Alternative methods—including callus culture, protoplast culture, embryo culture, and photoautotrophic micropropagation—expand applications from genetic transformation to metabolite synthesis and conservation. Applications span across industries: rapid multiplication of disease-free planting material, conservation of rare species, pharmaceutical bioactive compound production, and enhanced crop varieties through genetic engineering.

Key Words: Auxin, Cytokinin, Gibberellins, Micropropagation.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts *OP/03*

Medicinal Plants and Their Role in Nanoparticle Synthesis: A Review

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Abstract

Medicinal plants continue to serve as a cornerstone of primary healthcare across the globe, particularly in regions where access to modern medical services is limited due to economic, infrastructural, or cultural constraints. Traditionally valued for their therapeutic properties, these plants are now gaining prominence in the field of nanotechnology, especially for the green synthesis of nanoparticles. This eco-friendly and cost-effective approach eliminates the need for hazardous chemicals and energy-intensive processes typically used in conventional nanoparticle synthesis. Plant-mediated biosynthesis leverages a wide range of phytochemicals—such as flavonoids, alkaloids, terpenoids, and phenolics—that act as natural reducing, capping, and stabilizing agents in nanoparticle formation. Metal nanoparticles synthesized using medicinal plant extracts have shown significant promise in biomedical applications, particularly due to their potent antibacterial, antifungal, antioxidant, and anticancer activities. Recent advances have also highlighted their potential in targeted drug delivery, imaging, and diagnostics. This review emphasizes the dual role of medicinal plants in both therapeutic applications and nanobiotechnology, underlining their growing importance in the development of sustainable medical technologies.

Keywords: Medicinal plants, Green synthesis, Nanotechnology, Bio-nanoparticles, Antibacterial, Antifungal, Anticancer, Drug delivery.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Economic And Ethnobotanical Importance Of Banana (Musa Paradisiaca): A Multifunctional Crop-A Review

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Abstract

Banana (*Musa paradisiaca*), a member of the family Musaceae, is one of the most economically important fruit crops cultivated in tropical and subtropical regions worldwide. It serves as a staple food for millions, valued for its rich nutritional profile, including high levels of carbohydrates, dietary fiber, potassium, and essential vitamins such as B6 and C. Its year-round availability, short growth cycle, and adaptability make it a vital crop for food security and income generation, particularly in major producing countries like India, Ecuador, the Philippines, and Brazil. Beyond its role as a food source, nearly every part of the banana plant has significant utility. The leaves are traditionally used as biodegradable plates and cooking wrappers. The unripe fruits and flowers are consumed in various cuisines and are noted for their medicinal properties, including antidiabetic and digestive benefits. The pseudostem provides strong natural fiber increasingly used in the textile, rope, and paper industries, while its juice is employed in traditional medicine to treat kidney stones and urinary disorders. Banana peels are utilized in organic composting, as animal feed, and in the development of bio-fertilizers and cosmetics. Emerging studies also highlight the potential of banana-derived compounds in antimicrobial and antioxidant applications, supporting their use in nutraceuticals and eco-friendly innovations.

Key words: Musa paradisiaca, Banana plant, Economic botany, Nutritional value and Sustainable uses.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Edible Mushrooms as Functional Foods: Nutritional Profiles, Bioactive Compounds, and Therapeutic Potentials- a review

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Abstract

Edible mushrooms are increasingly recognized as functional foods due to their dense nutritional composition and diverse bioactive compounds. They offer a nutrient-rich profile characterized by low calories and fat, high-quality proteins, dietary fiber, B-complex vitamins, minerals (iron, phosphorus, potassium, selenium), ergosterol (pro-vitamin D), and essential amino acids. Key bioactives include polysaccharides (notably β-glucans and glycoproteins), phenolics, flavonoids, terpenoids, lectins, steroids, and ergothioneine, which collectively exhibit antioxidant, anti-inflammatory, immunomodulatory, antimicrobial, and antiviral effects. Numerous studies demonstrate mushrooms' therapeutic potential: β-glucan-rich extracts support antitumor and immune-enhancing activities; phenolic compounds provide oxidative protection; and clinical and preclinical research shows efficacy against metabolic syndrome, cancer, diabetes, obesity, cardiovascular diseases and neurodegeneration. Cultivation practices—particularly submerged fermentation and green extraction techniques—enable scalable production while preserving bioactive integrity and promoting sustainability. These mushrooms not only add nutritional and medicinal value to diets but also address global food security through resource-efficient cultivation. They are being integrated into functional food development (e.g., mushroom flours, extracts), nutraceuticals and pharmaceuticals . However, ensuring safety—especially in wild-harvested species—and optimizing extraction, dosage, and regulatory frameworks remain essential for broader therapeutic and commercial application. Edible mushrooms present a multidimensional asset bridging nutrition, health, and sustainability. Continued interdisciplinary research, advanced bioprocessing and rigorous clinical validation are critical to unlocking their full therapeutic and functional-food potential.

Key words: Edible mushrooms, Bioactive compounds,Nutritional profile, Cultivation.

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Invited Abstracts

Climate Change and Plant Distribution: Impacts, Ecological Consequences, and Adaptive Strategies

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Abstract

Climate change is one of the most pressing environmental challenges of the 21st century, significantly impacting ecosystems and biodiversity. One of its most critical effects is the alteration of plant distribution patterns. Shifts in temperature, precipitation, and the frequency of extreme weather events influence plant physiology and habitat suitability. As a result, many plant species are migrating to higher altitudes or latitudes in search of more favorable environmental conditions. These distributional changes can disrupt life cycle events such as flowering and fruiting times, altering where plants can successfully grow and reproduce. Climate change also facilitates the spread of invasive species, intensifying competition and increasing the vulnerability of endemic and specialized plants to extinction. These shifts may disturb existing ecosystems, alter species interactions, and affect the availability of resources for herbivores, pollinators, and human communities. The potential adaptation strategies and conservation methods that can help mitigate the negative impacts of climate change on plant communities. It also highlights the broader ecological consequences of climate-induced changes in plant distribution. Key approaches include assisted migration, habitat restoration, ex situ conservation, and the integration of climate-resilient practices in land management and policy frameworks. Understanding and addressing these dynamics is crucial for maintaining biodiversity and ecosystem stability in a changing climate.

Keywords : climate change, precipitation, biodiversity, conservation, plant distribution and ecosystem.

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Invited Abstracts

Red Seaweed as a Sustainable Source of Bioactive Compounds for Functional Foods and Pharmaceuticals"

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Abstract

Seaweed, especially red seaweeds, are fast-growing marine plants that are gaining attention for their use in food and medicine. They are rich in bioactive compounds that support health and are easy to grow without needing land or fresh water. Seaweed is already used in food for texture and nutrition, but it also offers natural compounds that can help prevent spoilage and improve food safety. For example, seaweed extracts can reduce harmful bacteria and stop histamine build-up in fish products. Red seaweeds, in particular, are a valuable source of special sugars called red seaweed polysaccharides (RSPs). These natural compounds have shown promising health benefits, such as boosting the immune system, helping with weight control, and acting as prebiotics that support gut health. However, more research, especially human clinical trials, is needed to better understand how RSPs work and how they can be used in large-scale food production. This review brings together current knowledge on how RSPs are extracted and purified, and how they function in the body. It also looks at the science behind their disease-fighting abilities. Despite their great potential, challenges like lack of detailed studies and efficient processing methods still limit their use in functional foods and medicine. In summary, red seaweeds are a promising, natural resource for improving human health through food and pharmaceuticals. Continued research and development will help unlock their full potential for future use in the growing bio economy.

Key words: Red seaweed, Bioactive compounds, Functional foods, Prebiotics and drug

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Invited Abstracts

"Phytochemical Profile & Therapeutic Potential of Withania somnifera: A Review"

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Abstract

Withania somnnifera, commonly known as Ashwagandha, is a prominent medicinal plant in traditional systems like Ayurveda and Unani. It is widely recognized for its antioxidant, anti-inflammatory, neuroprotective and anticancer properties. This review focuses on the phytochemical constituents of Ashwagandha and their associated bioactive potential. Phytochemical investigations of *W. somnifera* roots and leaves have revealed the presence of diverse bioactive compounds, primarily withanolides, along with alkaloids, flavonoids, saponins and phenolic acids. Withaferin A and withanolide D are among the most studied compounds, known for their significant pharmacological activities. These constituents have shown strong antioxidant capacity, helping to reduce oxidative stress by neutralizing free radicals in various in vitro and in vivo models. In addition, Ashwagandha exhibits potent anti-inflammatory effects through the downregulation of pro-inflammatory cytokines and inhibition of pathways such as NF-κB. Its anticancer activity is evidenced by the induction of apoptosis, inhibition of tumor cell proliferation, and suppression of angiogenesis in several types of cancer cell lines. Furthermore, its neuroprotective and anti-stress effects support its traditional use as a rejuvenating and cognitive-enhancing herb. Collectively, the broad range of phytochemicals and associated biological activities of *Withania somnifera* support its continued use in herbal medicine and highlight its potential for development into therapeutic agents targeting oxidative stress, inflammation, neurodegeneration and cancer.

Key Words: *Withania somnifera*, Withanolides, Antioxidant, Anticancer properties and Neuroprotection

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Invited Abstracts

Lichen Functional Traits and Ecosystem Responses to Environmental Change

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Abstract

Community ecology has undergone a significant transformation—from a primary focus on patterns in taxonomic composition to uncovering the underlying processes of community assembly through the lens of species' functional traits. The functional trait approach offers powerful advantages: it enhances generality across systems, improves predictive capacity—particularly in the face of environmental change—and bridges community assembly with ecosystem functions and services via the analysis of response and effect traits. Lichens, as complex symbiotic organisms, provide a unique and underutilized source of information for understanding how traits shape community structure and ecological function. Integrating lichens into mainstream ecological research using a trait-based framework opens new avenues for advancing both theoretical and applied ecology. Moreover, the trait approach offers significant potential for improving lichen conservation strategies by identifying traits linked to environmental tolerance, habitat specialization, and resilience.

Keywords: ecosystem services, effect traits, functional ecology, lichenised-fungi, life-history strategy, response traits.

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Invited Abstracts

Role of Algae in Wastewater Treatment

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Abstract

Algae have emerged as a sustainable and eco-friendly solution for wastewater treatment through a process known as phycoremediation. Microalgae and cyanobacteria such as Chlorella, Scenedesmus, and Spirulina have demonstrated significant efficiency in removing pollutants including nitrogen, phosphorus, heavy metals, and organic compounds from various types of wastewater. These algae absorb nutrients, support oxygen production through photosynthesis, and help reduce biological and chemical oxygen demand. Additionally, they contribute to the suppression of harmful microorganisms and generate valuable biomass that can be used for biofuels, fertilizers, and animal feed. Algal-based treatment systems are cost-effective, energy-efficient, and contribute to carbon sequestration. However, challenges such as seasonal variations, light dependency, and biomass harvesting still need to be addressed. With continued research and innovation, algae offer a promising green alternative for future wastewater management strategies.

Key Words: Algae,biofuels, fertilizers, animal feed and support oxygen

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Invited Abstracts

A Comparative Review of the Bioactive Profiles and Therapeutic Potentials of Kalmegh and Tulsi

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Abstract

Medicinal plants have long served as a foundation for traditional remedies and modern therapeutic development. Among them, *Andrographis paniculata* (Kalmegh) and *Ocimum tenuiflorum* (Tulsi) have gained considerable attention for their broad pharmacological activities, particularly their antioxidant and anticancer potential. This review consolidates current findings on the phytochemical composition and bioactivity of these two herbs. *Andrographis paniculata* is rich in diterpenoids, especially andrographolide, a key bioactive compound known for its strong antioxidant and anticancer properties. Andrographolide and its derivatives have demonstrated free radical scavenging activity in both in vivo and in vitro systems, showing potential in reducing oxidative stress and inhibiting cancer cell proliferation. Ocimum tenuiflorum, widely revered in Ayurvedic medicine, contains an array of bioactive secondary metabolites including rosmarinic acid, ursolic acid, oleanolic acid, eugenol and flavonoids. These compounds contribute to its potent antioxidant, anti-inflammatory, antimicrobial, and neuroprotective effects. Phytochemical screening of Tulsi leaf extracts confirms the presence of phenolics, flavonoids, alkaloids, saponins, tannins, and steroids. Various solvent extracts—particularly methanol and ethanol—have shown significant *in vitro* antioxidant activity using standard assays such as DPPH radical scavenging and ferric reducing antioxidant power (FRAP).

Key words: *Ocimum tenuiflorum ,Andrographis paniculata*, antioxidant, anticancer and phytochemical.

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Invited Abstracts

Rosemary (Rosmarinus officinalis L.): Phytochemistry, Therapeutic Potential, and Applications - A Review

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Abstract

Rosemary (*Rosmarinus officinalis* L.) is an aromatic, evergreen shrub native to the Mediterranean region and widely cultivated for its culinary, medicinal and ornamental uses. Belonging to the Lamiaceae family, the plant is rich in bioactive compounds such as essential oils (e.g., 1,8-cineole, camphor), phenolic acids (e.g., rosmarinic acid), and diterpenes (e.g., carnosic acid). These constituents contribute to its strong antioxidant, anti-inflammatory, antimicrobial, and neuroprotective properties. Rosemary has been traditionally used to enhance memory, stimulate digestion, and relieve muscle pain. Recent scientific studies have validated many of these traditional uses and also suggest its potential role in managing neurodegenerative diseases, metabolic disorders, and as a natural preservative in the food and cosmetic industries. This review summarizes the botanical characteristics, phytochemistry, health benefits, and applications of the rosemary plant.

Keywords: Rosemary, Rosmarinus officinalis, medicinal plant, essential oils, antioxidants, therapeutic uses.

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Invited Abstracts

Awakening the sleeping giant: Epstein–Barr virus reactivation by biological agents

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Abstract

Epstein–Barr virus (EBV) may cause harm in immunocompromised conditions or on stress stimuli. Various chemical agents have been utilized to induce the lytic cycle in EBV-infected cells. Various bacteria such as periodontal pathogens like *Aggregatibacter*, *Helicobacter pylori*, etc. Have shown to induce EBV reactivation either by triggering host cells directly or indirectly. Viruses such as Human simplex virus-1 (HSV) induce EBV reactivation by HSV US3 kinase while other viruses such as HIV, hepatitis virus, and even novel SARS-CoV-2 have also been reported to cause EBV reactivation. The eukaryotic pathogens such as *Plasmodium falciparum* and *Aspergillus flavus* can also reactivate EBV either by surface protein interaction or as an impact of aflatoxin, respectively. To highlight the underexplored niche of EBV reactivation by biological agents, we have comprehensively presented the related information in this review.

Key words : Epstein Barr virus , lytic cycle , EBV reaction, bacteria , virus

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Invited Abstracts

Antimicrobial Resistance: A Growing Serious Threat for Global Public Health

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Abstract

Antibiotics are among the most important discoveries of the 20th century, having saved millions of lives from infectious diseases. Microbes have developed acquired antimicrobial resistance (AMR) to many drugs due to high selection pressure from increasing use and misuse of antibiotics over the years. The transmission and acquisition of AMR occur primarily via a human–human interface both within and outside of healthcare facilities. A huge number of interdependent factors related to healthcare and agriculture govern the development of AMR through various drug-resistance mechanisms. The emergence and spread of AMR from the unrestricted use of antimicrobials in livestock feed has been a major contributing factor. The prevalence of antimicrobial-resistant bacteria has attained an incongruous level worldwide and threatens global public health as a silent pandemic, necessitating urgent intervention. Therapeutic options of infections caused by antimicrobial-resistant bacteria are limited, resulting in significant morbidity and mortality with high financial impact. The paucity in discovery and supply of new novel antimicrobials to treat life-threatening infections by resistant pathogens stands in sharp contrast to demand. Immediate interventions to contain AMR include surveillance and monitoring, minimizing over-the-counter antibiotics and antibiotics in food animals, access to quality and affordable medicines, vaccines and diagnostics, and enforcement of legislation. An orchestrated collaborative action within and between multiple national and international organizations is required urgently, otherwise, a postantibiotic era can be a more real possibility than an apocalyptic fantasy for the 21st century. This narrative review highlights on this basis, mechanisms and factors in microbial resistance, and key strategies to combat antimicrobial resistance.

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Invited Abstracts

Eco-Friendly Fabrication of Glochidion candolleanum Mediated Iron Oxide Nanoparticles: Antimicrobial and Anticancer Insights

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Abstract

The medicinal plant Glochidion candolleanum (Phyllanthaceae) has been used in various systems of traditional medicine in India, to treat snake bites, kidney troubles, oedema, stomach problems, fever and cough. However, G. candolleanum was not much explored previously in the field of nanomedicine. Hence, the present study was aimed to synthesis iron oxide nanoparticles using the ethanolic leaf extract of G. candolleanum. The spectral characterisations of green synthesised nanoparticles were observed using UV-Vis and FT-IR spectroscopy, microscopic characterisations such as SEM-EDAX and HR-TEM were done to observe their surface micro-morphology. XRD was done to know the crystalline nature of the green synthesised iron oxide nanoparticles. This spectral and microscopic characterisation confirmed the formation of G. candolleanum assisted iron oxide nanoparticles. The green synthesised iron oxide nanoparticles were highly effective against E. coli bacteria and C. tropicalis fungi. In vitro cytotoxic study of the iron oxide nanoparticles against MDA-MB- 231 breast cancer cells revealed significant anticancer activity with low IC 50 value. Findings of this study reveal that the G. candolleanum leaf ethanolic extract loaded iron oxide nanoparticles could be utilized as an antimicrobial and anticancer agent.

Keywords: Medicinal plants, Ethanolic extract, Fe 2 O 3 NPs, Human pathogenic microbes, Breast cancer cells.

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Invited Abstracts

Survey on Medicinal Plant Species Diversity in Sitheri Hills, Eastern Ghats of Dharmapuri District, Tamilnadu, India

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Abstract

Flora and fauna diversities are two facts components of biodiversity which covers the variety and variability of species. A survey was conducted to study the rare plants of Sitheri hills, Tamil Nadu, India. 91 Plants belonging to 45 Families, 90 Genusand 91 species were Documented Plants totally were under thorough investigation. Of these monocots are represented by 7 species belonging to 7 genera and 4 families while dicot contributed by 86 species belonging to 82 genera and 39 families, Ferns 2 families and 2 genera, Fungi 1 family and 1 Genera. Plant species were recorded and identified during the survey. The results show that the habitat of plants belongs to herbs, shrubs and tree species. But, we have observed only minimum tree species. Of these monocots are represented by 7 species belonging to 7 genera and 4 families, while dicots contributed by 87 species belonging to 82 genera and 39 families, Ferns 2 families and 2 genera, Fungi 1 family and 1 Genera. The study decipts that Sitheri Hills have different variety of plants distributed all over the mountain. Medicinal plants and their parts used Tribal peoples to cure different ailments such as Bronchitis, Jaundice, Diarrhoea, leprosy, fever, skin disease, diabetes, cancer, stomach disorders, tooth ache,antidote, eye disease, vaginal disorders, etc., were documented.

Keywords: Ethnobotany, Ethnomedicinal plants, Tribal Peoples, Sitheri Hills.

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Invited Abstracts

EXPLORATION OF BIOCTIVE COMPOUNDS FROM MARINE BACTERIA

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Abstract

In 1928, British microbiologist Alexander Fleming accidentally discovered penicillin, revolutionizing the treatment of bacterial infections. This success sparked the golden age of antibiotic discovery, peaking in the mid-1950s. Discovering new, effective antibiotics using modern methods can help solve this problem, especially by avoiding repeated discoveries of known compounds. Microorganisms from the ocean are different from land ones because they live in extreme conditions like high pressure, salt, low nutrients, and little light. The "OSMAC" approach shows that one microbe can make different useful compounds when grown in different conditions. Marine organisms produce a variety of novel bioactive compounds which has a therapeutic agents used for treating various infections. Bioactive compounds produced by marine Actinomycetes act as antibacterial and antioxidant that plays a major role in pharmaceutical applications. This study mainly focused on the secondary metabolite producing Actinomycetes to combat the problem of oral bacterial pathogens. Total 17 isolates were obtained from the marine soil and screened for antagonistic activity against oral bacterial pathogens. It was observed that 3 isolates were active against bacteria. Altogether 3 putative isolates were subjected to antibacterial activity using different solvent extraction method. Among these three crude extracts, the Ethyl Acetate extraction of MGR2 showing higher antibacterial activities. Out of 3 isolates only one isolate showed more activity against all the microbial pathogens. Potential isolate was identified as Streptomyces fradiae based on its morphological, cultural, biochemical features and also confirmed by 16s rRNA partial gene sequencing. The bioactive components obtained were extracted and later subjected to gas chromatography–mass spectroscopy (GC-MS) analyses for identification. The identified bioactive compound 2,4-di-tert-butylphenol was evaluated for in silico molecular docking against 3VMO of Streptococcus mutans showed the - 6.1 KCal/mol of minimum binding energy. Hence, they could be used as an alternative to antibiotics for treating several oral bacterial pathogens. The identified compound is used for the development of new drugs after completing the pharmacological studies.

Keywords: Marine bacteria, Oral pathogen, Ethyl acetate, Molecular docking and Gas

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Floricultural Therapy: Harnessing the Healing Power of Flowers for Mental and Emotional Well-Being

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Abstract

In an age where mental health challenges are increasingly prevalent, floricultural therapy has emerged as an innovative and effective natural method to support emotional well- being. Rooted in the inherent beauty and healing qualities of flowers, this therapeutic approach utilizes the colours, textures, and fragrances of blooms to ease stress, elevate mood, and foster mindfulness. Floricultural therapy includes a variety of engaging activities-such as flower arranging, gardening, and sensory interaction that promote mental clarity, relaxation, and self-expression. These activities provide a holistic sensory experience, stimulating sight, touch, and smell, which is particularly beneficial for individuals with cognitive impairments such as dementia. Beyond psychological benefits, floricultural therapy contributes positively to physical health by encouraging gentle movement, improving motor skills, and reducing blood pressure. It also fosters creativity and emotional resilience, enabling individuals to express themselves through floral design and nature-based activities. Additionally, group- based floral therapy sessions help reduce feelings of isolation, enhancing social connection and community bonding. Applications of floricultural therapy span diverse settings, including hospitals, mental health centres, senior living communities, and public welfare programs. Its integration into healthcare and therapeutic services highlights its growing recognition as a complementary practice in holistic wellness. By reconnecting individuals with nature and encouraging mindful interaction with flowers, floricultural therapy offers a nurturing, accessible, and uplifting path to better mental and emotional health.

Keywords: Floricultural therapy, mental health, stress reduction, flower arranging, sensory stimulation, dementia care, horticultural therapy, emotional well-being, therapeutic gardening, community healing

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Invited Abstracts

Optimization of ingredient compositions and process parameters for the development of hot extruded ready-to-eat (RTE) products using response surface methodology

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Abstract

Extrusion cooking is a versatile food processing technique that produces nutrient-rich products by applying high temperatures for a short duration. This method is particularly advantageous for preserving nutritional value compared to other thermal processing techniques that often cause significant nutrient loss. The present study aimed to manufacture high-quality ready-to-eat (RTE) extruded products using a twin-screw extruder, optimizing key extrusion components millet combination, corn grits, and soy chunks to achieve desirable physical properties. The effects of millet combo, corn grits, and soy chunks on moisture content, expansion ratio, and bulk density of the hot extruded RTE product were investigated using a three-factor, three-level Central Composite Rotatable Design (CCRD) within a response surface methodology framework. Optimization results revealed that the optimal formulation comprised 55g millet combo, 50g corn grits, and 20.48g soy chunks, yielding minimal moisture content of 7.75%, a maximum expansion ratio of 17.76, and a low bulk density of 0.26 g/cm^3. The desirability index of 0.77 indicated a strong agreement between the predicted and experimental values, confirming the robustness of the developed model. These findings demonstrate that extrusion settings can be precisely controlled using the developed model to produce extrudates with targeted functional and nutritional qualities. Consequently, the study concluded that high-quality, nutritious hot extruded RTE products can be effectively formulated using millet combo, corn grits, and soy chunks, contributing to the development of value-added cereal-legume composite foods.

Keywords: bulk density; extrusion; expansion ratio; millet; optimization; RTE.

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Invited Abstracts

Preparation And Comparison of Conventional With Compostable Mulch Films

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Abstract

Rising global food demand necessitates sustainable soil management solutions. The conventional films are effective at maximising plant yields, but are an environmental monolith in the guise of their non-biodegradable form and soil contamination. This study explores the production and comparative analysis of conventional (linear low-density polyethylene, LLDPE) and compostable mulch films as a solution to these challenges. The compostable films were made from polybutylene adipate-co-terephthalate (PBAT) and polylactic acid (PLA), enhanced with nano calcium carbonate($CaCO_3$) and neem-coated urea. These films were characterised by Fourier Transform Infrared Spectroscopy (FTIR), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and mechanical testing. The results indicated that incorporation of nano $CaCO_3$ improved the thermal stability, mechanical strength, and hydrophobicity. Biodegradable films exhibited higher environmental compatibility, including higher density in saline water and lower water vapour transmission rates. Field tests with Solanum lycopersicum (tomato) indicated that the films were more effective in conserving soil moisture and in weed control. These findings position biodegradable films as a viable, sustainable, eco-friendly alternative capable of providing the same agricultural returns.

Keywords: Compostable mulch films, polyethylene, nano calcium carbonate, neem-coated urea, soil moisture retention.

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Invited Abstracts

Polyethylene glycol (PEG) induced Drought screening of Traditional rice Varieties at Seed germination stage

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Abstract

Rice (*Oryza sativa L.*) is the staple food of more than half of the world population. But, the growth and yield of rice plant are severely affected by drought stress in rain- fed rice cultivating areas. In the present study, 51rice landraces were used for drought screening. This screening was done using a chemical called PEG during seed germination stage under laboratory condition. Screening at field- based drought tolerance screening is time- consuming and labor- intensive. Therefore, PEG chemical offers a simple laboratory-based method to simulate drought stress efficiently. Screening of rice genotypes were executed at 0%, 5%, 10%, 15%, 20%, 25% and 30% of PEG. In seed germination and plant growth promotion, we noted phenotypic variations under different PEG concentration. Rate of seed germination in different concentrations was cent percent except one genotype (TRV- 22). Rate of shoot length was measured in the range of 3.2 - 16.6cm (0%), 2 - 11.7cm (5%), 1.5 - 11cm (10%), 1.7 - 10cm (15%), 0.9 - 7.8cm (20%), 1-8cm (25%) and 0.8 - 6.2cm (30%) among genotypes. Likewise, the rate of root length was measured in the range of 0.3 - 8.5cm (0%), 0.8 - 5.7cm (5%), 0.2 - 12.5cm (10%), 0.5 - 8.5cm (15%), 0.2 - 6.5cm (20%), 0.1- 5.4cm (25%) and 0.1- 3.9cm (30%). In this task, 18 rice genotypes were selected as drought tolerant during seed germination up to 30% of PEG concentration from 51rice genotypes. Thus selected rice genotypes would be useful in rice breeding as a good genetic resource for drought tolerance in direct seed sowing method.

Key Words: Traditional Rice Variety, Drought stress, Polyethyleye Glycol(PEG), Seed germination and plant growth.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Documentation of Islamic Ethnobotanical Knowledge among the people of Gokilapuram, Theni District, Tamil Nadu, India.

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Abstract

An ethno botanical plant survey was conducted to explore the medicinal plant knowledge and their use among the community in the study area. The exploration of the ethnomedicinal survey includes 62 plant species belonging to 54 genera of 38 families practiced by the traditional healers of Gokilapuram, Theni district, Tamil Nadu, India. The traditional knowledge of people having reliable ethno medicinal expertise in the drug's formulation using available plants and its dosage practiced were documented. The suitable data were collected through questionnaires as well as informal personal interviews during the field trips in the study area. These data were documented from Jan 2024 to July 2024. The collected therapeutic plants were mostly used to cure skin ailments, jaundice, diabetes, headache, stomachache, wounds, and sexual disorders. The curative plants used by the local population are systematized sequentially, by their plant name, family name, nearby name(s), part(s) utilized, method of treatment, and their relating illness were documented. The conservation of the ethno medicinal practices as well as the plants are needed in order to cope up with the predominant illness. This has made us to revert the people's life back to the natural way of healing practice for the health enrichment in the future.

Key Words: Ethno-medicinal plants, Vaidiyers, Gokilapuram

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Invited Abstracts

Alleviation of Cr induced toxicity in *Gossypium hirsutum* L. by amendment of Fe- and Zn-doped biochar

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Abstract

Chromium (Cr) pollution in farmland poses a major threat to plant growth and agriculture yield and public health. Biochar (BC) has been recognised as an effective amendment for the remediation of heavy metal contamination in soil. Therefore, in the study aimed to investigate the positive impact of biochar on reducing Cr induced toxic effects in cotton seedlings (*Gossypium hirsutum* L.). The biochar, iron oxide-modified biochar (FeBC) and Zinc oxide-modified biochar (ZnBC) was prepared and evaluated to determine its effectiveness in improving cotton growth and reducing Cr uptake by cotton plants. In the poly grow bags experiment, varying levels of BC (0.5, 1.0, and 2.0%) FeBC (0.5, 1.0, and 1.5%) and ZnBC (0.5, 1.0, and 1.5%) were incorporated into Cr contaminated soil. The results demonstrated that FeBC was more effective in promoting plant growth by reducing Cr mobility in soil than ZnBC and biochar (BC). This study results showed that growth of cotton plants was improved by FeBC application at highest level (1.5 %) resulting in increased seed germination (82%), root length (9 cm), shoot length (24.5 cm), wet weight (89%) dry weight (80%) photosynthetic pigmentation, chlorophyll a (3.9%), chlorophyll b (4.1%), carotenoid (4.4%) were recorded under FeBC application in Cr (10 mg/kg) contaminated soils, respectively. The improved plant growth and reduced Cr accumulated with FeBC under Cr stress suggest that FeBC is a promising strategy to remediate Cr-contaminated soil and simultaneously stimulate sustainable making of leguminous plant crops in Cr-contaminated soils.

Key Words *Gossypium hirsutum* L, Chromium contamination, nano dopped biochar, Soil fertility.

EXCELLENT PUBLISHERS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Role and effect of Organic Fertilizer on growth and yield of Tomato (*Solanum lycopersicum L)*

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Abstract

Organic agriculture is an ecological production system that promotes and enhance biodiversity, biological cycles, and soil biological activity. It is based on minimal use of off farm inputs and not to use chemical fertilizers to manage, restore, maintain & increase harmony.The study was conducted to evaluated the effect of different concentrations of fertilizers on tomatoes (Solanum Lycoperscon L) grown in a greenhouse. The study determined the effect of different doses of fertilizer on tomato yield by measuring the height, root length, shoot length, number of leaves, leaf area index, under different treatments, it aimed at the yield response of tomatoes to various fertilizer concentrations and determines the best dosages for increased yields. When comparing animal and plant organic fertilizers to other forms of organic fertilizers, we observed that tomato quality varied significantly. We also evaluated the impact of different cultivation methods, soil organic matter, total soil nitrogen, soil pH, and types of organic fertilizers on the tomato yield and quality. The results gave valuable information and direction for the use of organic fertilizers in greenhouse production. Organic production practices were found to significantly improve the soil.The result showed that the high concentration of inorganic fertilizer T3 had a positive significant result on tomato yield compared with other treatments applied in this experiment. It is resulted that, extract of organic product provides a useful resource which is beneficial for increasing the productivity of tomatoes. Organic based product is productive quality yielder and economically better for sustainable agriculture.

Key Words: Agriculture, Fertilizer, Productivity , Sustainable, Economically

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Invited Abstracts

Arsenic-Tolerant Pseudomonas spp. Enhance Growth and Stress Tolerance in Cowpea under Arsenic Contamination

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Abstract

This study investigates the isolation, identification, and characterization of arsenic-tolerant rhizobacteria from contaminated soils in Mettur, a region affected by industrial pollution. Two bacterial strains, Pseudomonas alcaliphila (PAS1) and Pseudomonas aeruginosa (PAS2), were isolated and exhibited high arsenic tolerance, as determined by Minimum Inhibitory Concentration (MIC) analysis. Both strains were biochemically characterized and evaluated for plant growth-promoting (PGPR) traits, including phosphate solubilization, siderophore, ammonia, indole-3-acetic acid (IAA), and hydrogen cyanide (HCN) production, along with hydrolytic enzyme activities (amylase and protease). Taxonomic identity was confirmed by 16S rRNA gene sequencing. Pot culture experiments on cowpea (Vigna unguiculata (L.) Walp.) under arsenic stress revealed that inoculation with PAS1 and PAS2 significantly improved growth parameters such as biomass, shoot and root length, and relative water content. Dual inoculation exhibited a synergistic effect, surpassing individual treatments. Biochemical assays showed increased levels of photosynthetic pigments, flavonoids, carbohydrates, proteins, and antioxidant enzymes (POD and CAT), along with reduced lipid peroxidation (MDA levels) in dual-inoculated plants. These findings highlight the potential of PAS1 and PAS2 in enhancing arsenic tolerance and promoting plant growth, suggesting their applicability in microbe-assisted phytoremediation and sustainable agriculture under heavy metal stress conditions.

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Invited Abstracts

Polyethylene glycol (PEG) induced Drought screening of Traditional rice Varieties at Seed germination stage

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Abstract

Rice (Oryza sativa L.) is the staple food of more than half of the world population. But, the growth and yield of rice plant are severely affected by drought stress in rain-fed rice cultivating areas. In the present study, 51 rice landraces were used for drought screening. This screening was done using a chemical called PEG during seed germination stage under laboratory condition. Screening at field-based drought tolerance screening is time-consuming and labor-intensive. Therefore, PEG chemical offers a simple laboratory-based method to simulate drought stress efficiently. Screening of rice genotypes were executed at 0%, 5%, 10%, 15%, 20%, 25% and 30% of PEG. In seed germination and plant growth promotion, we noted phenotypic variations under different PEG concentration. Rate of seed germination in different concentrations was cent percent except one genotype (TRV-22). Rate of shoot length was measured in the range of 3.2 - 16.6cm (0%), 2 - 11.7cm (5%), 1.5 - 11cm (10%), 1.7 - 10cm (15%), 0.9 - 7.8cm (20%), 1 - 8cm (25%) and 0.8 - 6.2cm (30%) among genotypes. Likewise, the rate of root length was measured in the range of 0.3 - 8.5cm (0%), 0.8 - 5.7cm (5%), 0.2 - 12.5cm (10%), 0.5 - 8.5cm (15%), 0.2 - 6.5cm (20%), 0.1-5.4cm (25%) and 0.1 - 3.9cm (30%). In this task, 18 rice genotypes were selected as drought tolerant during seed germination up to 30% of PEG concentration from 51 rice genotypes. Thus selected rice genotypes would be useful in rice breeding as a good genetic resource for drought tolerance in direct seed sowing method.

Key Words: Traditional Rice Variety, Drought stress, Polyethyleye Glycol(PEG), Seed germination and plant growth.

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Invited Abstracts

PHYTOCHEMICALS, ANTIBACTERIAL STUDIES OF COPPER NANOPARTICLES SYNTHESISED USING Trachyspermum ammi seeds

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Abstract

Trachyspermum ammi (L) commonly known as "Ajwain". Also it is commonly refered as Carum Copticum. Is a herbal origin drug used in Unani system of medicine for centuries in various ailments. It is herbaceous annual plant belongs to family Apiaceae. Its native to Egypt and is cultivated in India, Pakistan, Iran, Afghanistan and Egypt. In India, mostly cultivated in Gujarat and Rajasthan, spontaneously grows in eastern regions of India. In the present study the phytochemicals, ash and moisture contents of Trachyspermum ammi seed powder was analysed. The green Copper nanoparticles of Trachyspermum ammi was synthesised. The antibacterial activity of copper particles of Trachyspermum ammi were analysed with 2 bacterial strains. The result showed that it is very effective against bacteria. The zone of inhibition were higher than the positive control. The present proven that the copper nanoparticles synthesised from Trachyspermum ammi have prominent antimicrobial activity. So it can be used as a promising nanomedicine for the treatment of lung disorders.

Keywords: Trachyspermum ammi, Phytochemicals, Copper Nanoparticles, antibacterial.

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

Essential Oil Composition and Antibacterial Activity of Naringi crenulata (Roxb.) D. H. Nicolson (Rutaceae)

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Abstract

The essential oil obtained from the leaves of *Naringi crenulata* (Roxb.) D. H. Nicolson (Rutaceae) was screened for its antibacterial properties and chemical composition. Gas Chromatography (GC) and Gas Chromatography–Mass Spectrometry (GC-MS) analyses of the essential oil revealed the presence of 30 compounds, representing approximately 100 % of the oil. Caryophyllene (36.57%) and Germacrene-D (11.52%) were identified as the major chemical components, followed by 2-Hexadecan-1-ol, 3,7,11,15-tetramethyl (9.97%), α-Humulene (9.43%), and Nerolidol (6.63%). The antibacterial activity of the essential oil from the leaves of *N. crenulata* was evaluated against various bacterial strains, including *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Salmonella typhimurium* and *Shigella flexneri*. The mean zones of inhibition produced by the essential oil in agar diffusion assays against the tested bacterial strains ranged from 7.3 mm to 26.3 mm. The Minimum Inhibitory Concentration (MIC) values ranged from 31.25 to 250 µg/ml, while the Minimum Bactericidal Concentration (MBC) values were between 62.5 and 500 µg/ml. The results of this study suggest that the essential oil from the leaves of *N. crenulata* has significant antibacterial potential and may serve as a natural antibacterial agent.

Key words: *Naringi crenulata*, Essential oil, GC- MS Analysis, and Antibacterial activity

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

BIODIVERSITY STUDIES OF INSECT FAUNA ORDER COLEOPTERA OF NAMAKKAL, TAMILNADU

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Abstract

Beetles, which belong to the order Coleoptera, are among the most numerous groups of insects. Beetles are the most well-known group of insects, with more species than any other group of insects. There have been approximately 350,000 species described up until this point, and there are still many species that are waiting to be discovered. It may defend itself in two different ways: by using its tough "shell" or by fleeing in the other direction. The beetles are able to be found in all natural settings, including aquatic habitats, trees up to and including their leaves and bark, flowers, and any plant tissue, including plants that have decomposed. Ground beetles have been utilized as bio indicators. Beetles have a number of fascinating characteristics, such as the fact that they are endopterygotes, which means they undergo complete metamorphosis, and that they contain air bubbles for the purpose of diving (water beetle) chemical defense for protection (Tenebrionidae), parasitism (Platypsyllus castoris). They reveal a wide variety of adaptations, such as camouflage (in the case of Chrysomelidae), mimicry (in the case of Cerambycidae), aposematism, chemical defense (in the case of Tenebrionidae), parasitism (in the case of Castor sp.), pollination (in the case of Cantharidae), mutualism (in the case of Ambrosia beetle), tolerance to extreme environments (in the case of Stenocara gracilipes), migration (in the case of Coccinellids), and many other adaptations. The Namakkal, which is located in the southwest of Namakkal, was the site of the survey. Agriculture and related industries provide a living for 70% of the people. According to the study, 30 species of beetles from nine families and various locations were found. Scarabaeidae shows the maximum species richness of 12 species followed by Chrysomelidae with 6 species, Coccinellidae with 3 species, Cerambycidae with 3 species, Tenebrionidae with 2 species very less number of butterflies were identified in families Dryphthoridae, Apionidae, Rhynchitidae, Rutelidae with 1 species. The rich diversity of beetles, especially the Scarabaeidae and Chrysomelidae in indicates a varied assemblage of floral species. The flora in Namakkal is a mixed type with herbs and shrubs and dung beetles are dominating the vegetation in the varies climate conditions. Beetles diversity varies with season. They are abundant for only a few months and rare of absent during other months of the year.

Key words: Beetles, Insect Fauna, Coleoptera, Namakkal

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Invited Abstracts

The implication of hs-CRP in managing type 2 diabetes mellitus

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Abstract

Diabetes mellitus (DM) is one of the leading and chronic progressive metabolic disorder threatening mankind. The most significant health concern of current era is diabetes mellitus and its complications. Inflammation plays a key role in the development of many systemic diseases such as DM, hypertension, cardiovascular disease and cerebrovascular accidents. Diabetes itself is risk factor for the inflammation, plays a crucial role in the development and progression of diabetes mellitus, which can be detected through the measurement of the levels of high-sensitivity C-reactive protein (hs-CRP). There are many inflammatory markers, one of the marker is CRP, which is an acute phase reactant produced by the liver and it is an extremely sensitive marker of systemic inflammation and also powerful indicator of cardiovascular disease. Among the various inflammatory biomarkers, hs-CRP has been extensively studied due to its sensitivity, cost effectiveness and prognostic value.CRP, the typical inflammatory biomarker produced in the liver, is regulated by adipocyte-derived proinflammatory cytokines, including interleukin-6 (IL 6) and tumor necrosis factor alpha (TNF- α).The hs-CRP is a useful inflammatory biomarker that can enhance cardiovascular risk stratification in type 2 diabetes. Incorporating hs-CRP into routine clinical assessment may help to identify high risk individuals early and guide timely preventive interventions.

Key words: Diabetes mellitus, hs-CRP, biomarker, type 2, inflammation

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PROCEEDINGS OF INTERNATIONAL CONFERENCE ON "CURRENT TRENDS IN BIOLOGICAL SCIENCES"

Invited Abstracts

The Antagonistic Effects of Monovalent and Divalent Mercury under the influence of Copper in Fresh Water Teleost Catla catla

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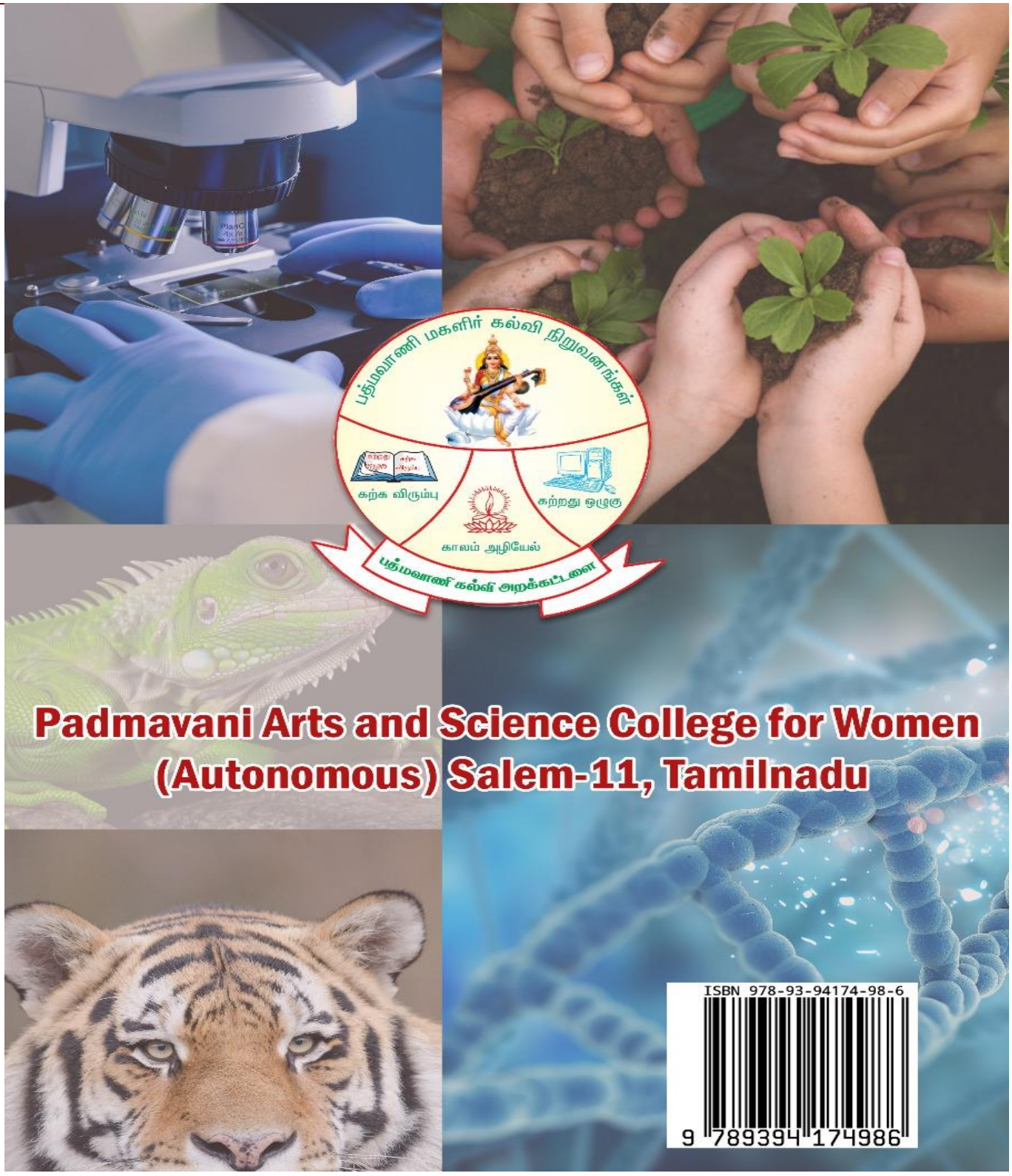
Abstract

Teleost fish Catla catla were used to study the toxicity of monovalent and divalent mercury Vs copper and LC50 96 hour value of the mercury I and II were studied. The various sub lethal concentrations of 0.1, 0.15, 0.2, 0.25 and 0.3 ppm were prepared with the addition of 10 ppb of copper. From the experimental animals, the tissues like muscle, liver and blood were collected and their biochemical constituents like glycogen and glucose were estimated. Mercury I and II combined with copper, the high antagonistic effect were noticed in mercury I than mercury II in the teleost fish.

Key words: Mercury, Copper, Catla catla, Antagonistic effect



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