PROCEEDINGS OF THE

INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT

(ICASSBRAED-2025)

7th & 8th August 2025

Organized by

DEPARTMENT OF BOTANY

Sri Vidya Mandir Arts & Science College

(Autonomous)

Katteri, Uthangarai, Krishnagiri - 636 902

Tamil Nadu, India.

In Collaboration With

SACRED HEART COLLEGE (Autonomous)

Tirupathur - 635 601, Tamil Nadu, India

EDITORS

Dr. V. Chinnadurai & Dr. V. Tamilselvan

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Patron	:	**Dr. N. Gunasekaran & Rev. Dr. D. Maria Antony RAJ., SDB**
Conveners	:	**Dr. V. Chinnadurai & Dr. I Niyas Ahamed**
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Dedicated
to
Global Agriculture…

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[Accredited by NAAC with 'A' Grade with CGPA of 3.27]
[Recognized 2(f) & 12(B) Status under UGC Act of 1956]
Katteri – 636 902, Uthangarai (Tk), Krishnagiri (Dt),
Tamil Nadu, India

Thiru. V. CHANDRASEKARAN **Date : 04-08-2025**
Founder & Secretary

Message

I am delighted to note that the PG Department of Botany Sri Vidya Mandrir Arts & Science College (Autonomous), Katteri in association with in Collaboration with PG and Research Department of Biochemistry Sacred Heart College (Autonomous) Tirupathur- 635601, Tamil Nadu, India is organizing **"INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ICASSBRED-2025)"** on 7th & 8th August, 2025.

The conference will intend to disseminate information to the researchers and to represent their ideas for future strategies. I hope the participants will be highly benefited, with its reach and depth of expertise speakers.

I wish the International Conference a grand success.

Thiru. V. Chandrasekaran

Chief - Patron, ICASSBRED-2025

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Tamil Nadu, India

Dr. N. Gunasekaran, M.A. M.Phil., Ph.D. **Date :** 05-08-2025
Principal

It is my great pleasure to know that the PG Department of Botany Sri Vidya Mandrir Arts & Science College (Autonomous), Katteri in association with in Collaboration with PG and Research Department of Biochemistry Sacred Heart College (Autonomous) Tirupathur- 635601, Tamil Nadu, India, organising the **"INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ICASSBRED-2025)"** on 7th & 8th August, 2025.

Life science is one of the important platforms to know about the biological aspects of life. Biology is the study of life. It is developed to study living organisms. It is an exceedingly broad and diverse subject which helps us to understand the life process and reveals the secret of life. The basic information about life science will reflect the soul of life. The still yet dynamic state of the field may be what motivates and excites researchers of multidisciplinary backgrounds working in the applied biology area. The changing environments of the present day are posing great challenges to sustaining agricultural productivity. The division of life science has been playing an essential role in deciphering functions and aspects of plants and animals that can cope with the changing adverse environment.

The proposed program of the conference will provide a platform for discussion on recent advances, identification of research gaps and preparation of the road of life sciences in different fields.

I hope that the **"INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ICASSBRED-2025)"** will provide new directions for translating knowledge of life sciences into improving research.

My best wishes for a great success of the International Conference.

Chairman, ICASSBRED-2025

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Tamil Nadu, India

CONVENERS

It is my pleasure to be a part of the organizing committee of **"INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ICASSBRED-2025)"** Organized by PG Department of Botany Sri Vidya Mandrir Arts & Science College (Autonomous), Katteri in Collaboration with PG and Research Department of Biochemistry Sacred Heart College (Autonomous) Tirupathur - 635601, Tamil Nadu, India, on 7th and 8th August, 2025. This International conference focuses on different fields of biological sciences and their applications towards the improvement of sustainable agriculture.

This International Conference will bring together scientists, researchers, academicians, and industrial experts across the nation to share their knowledge, expertise, and research findings in their various fields of life sciences through excellent presentations. I am indeed pleased to host this international conference bringing the recent developments in the field of life sciences. I hope that the deliberations and recommendations of the conference will certainly have a significant impact on the exploration of research in biological sciences towards their potential applications.

I am sure that the presentations by the eminent scientists and subsequent brainstorming technical sessions on different aspects of the themes proposed for this conference will enlighten the young researchers and participants. I wish the international conference a great success.

Dr. V. Chinnadurai **Dr. I NIYAS AHAMED**

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Tamil Nadu, India

ORGANISING SECRETARIES

We are delighted and honoured to welcome you to the **"INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ICASSBRED-2025)"** Organized by PG Department of Botany Sri Vidya Mandrir Arts & Science College (Autonomous), Katteri in Collaboration with PG and Research Department of Biochemistry Sacred Heart College (Autonomous) Tirupathur - 635601, Tamil Nadu, India, on 7th and 8th Auguist 2025. We believe we have chosen a theme that is most needed for the hour and has challenges to deal with.

ICASSBRED-2025 provides a wonderful opportunity for you to revive your knowledge base and explore the novelties in biological sciences. We hope that these conferences will offer plenty of networking opportunities, providing you with an opportunity to meet and collaborate with leading scientist and researchers throughout the world.

Various sessions of this conference include manifold with the keynote address five invited lectures and around sixty conceptual papers separated into oral and poster presentations for both days. We solace that you all will escalate us to bring eminent and proficient scientists throughout the country and the invite talks of the resource person.

The success of this conference depends on the hard work of every committee member and the active participation of the delegates. As organizing of this conference, we thank all the members of the committee, authorities of the institutions for their simultaneous support and all the participants who are going to make the occasion a great success. We feel grateful to the eminent scientists who are going to share their knowledge and expertise in this event.

With best wishes

Dr. V. TAMIL SELVAN **Dr. A POONGOTHAI**

PLENARY LECTURES

ABSTRACT NO	NAME AND DESIGNATION	TITLE
PL. 1	**Dr. MOHAMED ALI SEYED** Professor of Clinical Biochemistry, Department of Biochemistry, University of Tabuk, Tabuk 47713, Kingdom of Saudi Arabia	A New Paradigm in Drug Discovery and Development for human diseases: A Special Focus on Cancer.
PL. 2	**Dr. S. KALIAMOORTHY,** Scientist 'E', Botanical Survey of India, Southern Regional Centre, Yercaud	Plant Biodiversity and Conservation in India – with a special note on Rhododendrons
PL. 3	**Dr. SARAVANAN MUTHUPANDIAN, PhD.** Professor, Faculty of Applied Medical Sciences, University of Tabuk, Saudia Arabia.	Emerging Polymer-based 3-D Bioprinted Nanomaterials for Chronic Wound Healing
PL. 4	**Dr. ASHOK K PANDURANGAN, PhD** Associate Professor, School of Life Sciences, B.S. Abdur Rahman Crescent , Institute of Science & Technology, Vandalur-600048, Chennai, Tamil Nadu, India	Sphingadienes as a chemoprevitive agent against colon cancer: Possible mechanism of action
PL. 5	**Dr. P. ARUMUGAM, Ph.D., PDR.** Principal AVK Arts and Science Women's College, AVK Garden, No:194, Rajapalayam Main Road, Sankarankovil, Tenkasi District-627753.	"Liquid fertilizer and therapeutic potenital of Trubinaria conoides (J. Agardh) Kuetz"
PL. 6	**Dr. S. KUMARAN, Ph.D.** Assistant Professor & Head, Department of Botany, Government Arts and Science College, Harur-636903, TN. India.	Microbial enzymes and their industrial applications

Messages

MESSAGE

Aug 2, 2025

Wishes from Prof. Dr. Mohamed Ali Seyed, University of Tabuk

I am happy to learn that the Vidya Mandir Arts and Science College, Uthangarai, Krishnagiri in association with Sacred College, Thirupathur is organizing a two day International Conference on Applied Sciences for Sustainable Biological Resources and Eco-friendly Development (ASSBR-EFD-2025) from August 7th 8th, 2025 at Uthangarai, Tamil Nādu, India..

The Conference is scheduled to discuss on the evolving role of sustainable biological sources as a replenishable source of new drug leads. The multidisciplinary nature of biological research needs effective collaboration between researchers of various disciplines. Drug discovery and development is a complex process and requires a multidisciplinary approach, and it cannot be successfully carried out alone. Conference such as this can provide a platform for researchers in various disciplines to network and thus promote future collaborations in particular areas of expertise.The Conference also connects the ancient disciplines of medicine to the students and researchers of today.

Globalisation and technological advancements have strengthened the collaboration and cooperation among researchers and scientists around the world. This could be evidenced from the researchers, scientists, students and the industry meet to come out with products and solutions towards better living of all creatures. I also understand that the event has received good response from the concerned local participants and many research papers are to be presented in the conference in the form of oral and poster, plenary and invited lectures by experts from Saudi Arabia. The thrust on the participation of industry will add great value to the deliberations of the conference.

I am extremely happy to note that the Organising Team has done a commendable job to organize this international event and I compliment and appreciate them for this zealous effort and wish them meet a grand success.

Prof. Dr. Saravanan Muthupandian Ph.D.,
Professor
Faculty of Applied Medical Sciences

Date: July 25, 2025

Message

I am pleased to hear that a two-day International Conference on Applied Sciences for Sustainable Biological Resources and Eco-friendly Development (ASSBR-EFD-2025) will be held at Uthangarai, Tamil Nādu, India, from August 7th to 8th, 2025, by Vidya Mandir Arts and Science College, Uthangarai, Krishnagiri, in collaboration with Sacred College, Thirupathur.

Sustainable biological sources are set to be discussed during the conference as a potential new source of medicine leads. Researchers from diverse fields must work together effectively due to the interdisciplinary nature of biological research. It is impossible to accomplish the complicated task of therapeutics / drug development research without involving other disciplines. This kind of conference can bring together experts from different biomedical fields, giving them a chance to meet one another and maybe develop potential collaborations in their respective fields of study.Additionally, the Conference serves as a bridge between the modern health care sector and the more traditional medicine

Thanks to globalisation and technological advancement, scientists and researchers from all over the globe are now more likely than ever to work together. Proving this point would be a joint effort by industry, academia, and government to improve the quality of life for all living things. The event has been well-received by local participants, and the conference is set to feature several research papers delivered by researchers, including oral and poster presentations, plenary sessions, and guest lectures. The conference discussions will benefit greatly from a strong focus on participation from the industry.

I am delighted to share that the Organising Team members has done an excellent job in organizing this international event. I would like to express my gratitude and appreciation to them for their tireless efforts, and I hope that they achieve a great deal of success over the course of their accomplishments.

Sincerely,

(Prof. Saravanan Muthupandian)
Department of Medical Laboratory Technology,
FAMS, University of Tabuk,
Tabuk, Saudi Arabia

smuthupandian@ut.edu.sa
bioinfosaran@gmail.com

AVK ARTS AND SCIENCE WOMEN'S COLLEGE

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AVK Garden, No. 194, Rajapalayam Main Road
SANKARANKOVIL, Tenkasi District -627 753, Tamil Nadu. Cell : 7200845500

Dr. **P. ARUMUGAM**, M.Sc., B.Ed., Ph.D., PDR.,
Principal

Date : 04.08.2025

Message

It is my great honor and pleasure to write the conference wishes and participated as an invited speaker in an International Conference on Applied Sciences for Sustainable Biological Resources and Eco-Friendly Development (ICASSBRED-2025) jointly organized by the PG Department of Botany, Sri Vidya Mandir Arts & Science College, and the PG and research department of biochemistry, Sacred Heart College. In today's fast-evolving academic and professional scenery, it is essential for fostering interdisciplinary research, encouraging innovative thinking, and building a global community of knowledge seekers. We should appreciate the organizing institution and the organizer for their tireless efforts to bring such a grand academic initiative.

It gives me great pleasure to express my gratitude and congratulations to the editorial board, organizing committee, and all of the researchers whose work has resulted in the successful publishing of these International Conference Proceedings. These proceedings, in my opinion, have the potential to investigate an impressive combination of scholarly contributions, intellectual discourse, and international involvement. These proceedings speak volumes about the team's dedication and academic excellence.

I hope that the editorial and review committee includes high standards of publication and ensures that every submission meets quality, relevance, and originality. In addition, I am grateful to the professors, researchers, and students who shared their perspectives, as they have enhanced the volume and created new avenues for research and cooperation. It is heartening to watch young academics and seasoned academicians present side by side, demonstrating the fusion of knowledge and novel viewpoints. I sincerely believe that this conference will serve as a vital academic resource for years to come, encouraging future research, policy advancements, and educational innovation.

Sincere congrats to everyone who helped make this intellectual milestone possible, including the organizers, attendees, invitees, and donors.

P. A

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, य□□□□/NATIONAL ORCHIDARIUM & EXPERIMENTAL GARDEN, YERCAUD
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Dr. S. KALIAMOORTHY, M.Sc., M.Phil., Ph.D.
Scientist – E/In-charge

Date: 04.08.2025

Message

It is my honour and privilege to write this message for the Proceedings of the International Conference on Applied Sciences for Sustainable Biological Resources and Eco-Friendly Development (ICASSBRED-2025), jointly organized by the Post Graduate Department of Botany, Sri Vidya Mandir Arts & Science College (Autonomous), Katteri – 636 902, Uthangarai, Krishnagiri District, and the Post Graduate and Research Department of Biochemistry, Sacred Heart College (Autonomous), Tirupathur – 635 601, Tamil Nadu. The conference was held at the Linnaeus Auditorium, Sri Vidya Mandir Arts & Science College (Autonomous), from 7th to 8th August 2025.

I am deeply grateful to the organizers for the kind invitation to deliver a lecture at this prestigious event, which brought together scholars, researchers, and professionals from around the world.

Conferences such as ICASSBRED-2025 are of immense significance in today's context, as they provide an essential platform for the convergence of innovative ideas, interdisciplinary dialogue, and global collaboration. With growing concerns over biodiversity loss, climate change, and the sustainable use of biological resources, it is vital that the scientific community comes together to exchange knowledge, foster partnerships, and explore eco-friendly solutions to pressing environmental and societal challenges.

The conference successfully highlighted cutting-edge research in life sciences, biotechnology, environmental studies, and sustainable development. The papers compiled in this volume are a testament to the academic rigour, originality, and diversity of thought that characterized the event.

I extend my heartfelt congratulations to all contributors, and express my sincere appreciation to the editorial and organizing committees for their dedicated efforts in bringing out this compilation. I am confident that these proceedings will serve as a valuable reference for ongoing research and inspire future scholarly endeavours.

Dr. Ashok Kumar Pandurangan, PhD
Associate Professor
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MESSAGE

It is with great admiration and optimism that we welcome the distinguished scholars, researchers, innovators, and changemakers gathered for the International Conference on Applied Sciences for Sustainable Biological Resources and Ecofriendly Development (ICASSBRED-2025).

In an era where the balance between technological advancement and ecological preservation is more critical than ever, this conference stands as a beacon of interdisciplinary collaboration and visionary thinking. Your collective efforts to harness applied sciences for the sustainable management of biological resources and the promotion of ecofriendly development are not only commendable—they are essential.

May ICASSBRED-2025 serve as a fertile ground for exchanging transformative ideas, forging global partnerships, and inspiring actionable solutions that honor both scientific excellence and environmental stewardship. Let this gathering ignite innovations that transcend borders and empower communities to thrive in harmony with nature.

Together, let us shape a future where sustainability is not just a goal—but a way of life.
With warm regards and best wishes for a successful and impactful conference.
Thanking You

With regards

Dr. Ashok Kumar Pandurangan

Programme
Schedule

SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

Katteri - 636 902, Uthangarai, Krishnagiri, Tamil Nadu, India

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INTERNATIONAL CONFERENCE ON APPLIED SCIENCES FOR SUSTAINABLE BIOLOGICAL RESOURCES AND ECO-FRIENDLY DEVELOPMENT (ASSBRAEFD-2025)

07th& 08th August 2025

Organized by

PG DEPARTMENT OF BOTANY

PROGRAMME SCHEDULE

Venue: SVMC Auditorium

DAY- I (07.08.2025)	
TIME	**PROGRAM**
09.00AM	**Spot Registration**
10.00AM -11.00 AM	**INAUGURAL FUNCTION**
11.00 AM - 11.15 AM	**REFRESHMENT**
	SESSION – I
11.15 AM - 12.15 PM	**Dr. Mohamed Ali Seyed, Ph.D.** Professor of Clinical Biochemistry Department of Biochemistry, University of Tabuk, Tabuk -47713 Kingdom of Saudi Arabia. **Invited Lecture: 1** ***A New Paradigm in Drug Discovery and Development for human diseases: A Special Focus on Cancer.*** **Chair Person** **Dr. M. Manikandan** Assistant Professor, PG Department of Zoology Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
12.15AM - 01.00 PM	**LUNCH BREAK**
	SESSION – II
01.00 PM -02.00PM	**Dr. Saravanan Muthupandian, Ph.D.** Professor, Faculty of Applied Medical Sciences, University of Tabuk, Saudi Arabia. **Invited Lecture 2** ***Emerging Polymer-based 3-D BioprintedNanomaterials for Chronic Wound Healing*** **Chair Person** **Dr. K. M. Prabhu** Assistant Professor, Department of Physics Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai

02.00 PM – 02.15PM	**REFRESHMENT**
	SESSION – III
02.15 PM – 03.15 PM	**Dr. Arumugam, Ph.D., PDR.** Principal AVK Arts and Science Womens College, AVK Garden, Rajapalayam Main Road, Sankarankovil, Tenkasi-Dt **Invited Lecture: 3** ***"Liquid fertilizer and therapeutic potenital of Trubinariaconoides (J. Agardh) Kuetz"*** **Chair Person** **Mrs. J. Fathima** Assistant Professor, Department English Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai.
03.15 PM -03.40 PM	**Oral Presentation / Poster Presentation**
DAY- II (08.08.2025)	
TIME	**SESSION – IV**
10.00AM-11.00 AM	**Dr. S. Kaliamoorthy** Scientist-E National Orchidarium & Experimental Garden, Botanical Survey of India, Southern Regional Centre, Yercaud-636602. Salem District, Tamil Nadu. **Invited Lecture: 4** ***Plant Biodiversity and Conservation in India – with a special note on Rhododendrons*** **Chair Person** **Dr. P. Vino** Assistant Professor, PG Department of Botany Sri VidyaMandir Arts & Science College (Autonomous), Uthangarai
11.00AM- 11.15AM	**REFRESHMENT**
	SESSION – V
11.15AM–12.25PM	**Dr. Ashok K Pandurangan, Ph.D.** Associate Professor School of Life Sciences,B.S. AbdurRahman Crescent. Institute of Science & Technology, Vandalur, Chennai-600048. **Invited Lecture: 5** ***Sphingadienes as a chemoprevitive agent against colon cancer: Possible mechanism of action*** **Chair Person** **Dr. A. Mohammad Hussain** Assistant Professor, Department of Management Sri VidyaMandir Arts & Science College (Autonomous), Uthangarai**.**
12.25PM–01.15PM	**LUNCH BREAK**

	SESSION – VI
01.15PM–02.15PM	**Dr. S. Kumaran, Ph.D.** Assistant Professor & Head Department of Botany, Government Arts and Science College, Harur-636903, Tamilnadu, India. **Invited Lecture: 6** ***Microbial enzymes and their industrial applications*** **Chair Person** **Mrs. N. Pushpalatha** Assistant Professor PG Department of Botany Sri Vidya Mandir Arts & Science College (Autonomous), Uthangarai
02.15PM–02.30PM	**REFRESHMENT**
02.30PM–03.00PM	**Oral Presentation / Poster Presentation**
03.00PM – 3.40PM	**VALEDICTORY FUNCTION**

Invited Speakers Abstracts

A NEW PARADIGM IN DRUG DISCOVERY AND DEVELOPMENT FOR HUMAN DISEASES: A SPECIAL FOCUS ON CANCER

Mohamed Ali-Seyed

Department of Biochemistry, Faculty of Science, University of Tabuk, Kingdom of Saudi Arabia 71491

ABSTRACT

The treatment of most cancers is still inadequate, despite steady progress. The localization of photosensitizers in the sub cellular compartments during PDT plays a major role in the cell destruction; therefore, the aim of this study was to investigate the intracellular localization of Chlorin e6-PVP in malignant and normal cells. Our study involves the characterization of the structural determinants of subcellular localization of Photolon™, and how subcellular localization affects the selective toxicity of Photolon™ towards tumor cells. Using confocal laser scanning microscopy (CLSM) and fluorescent organelle probes; we examined the sub cellular localization in the murine colon carcinoma CT-26 and normal fibroblast (NHLC) cells. Our results demonstrated that after 30 min of incubation, the distribution of Photolon™ was localized mainly in the cytoplasmic organelles including the mitochondria, lysosomes, Golgi apparatus, around the nuclear envelope and in the nucleus but not in the endoplasmic reticulum whereas in NHLC cells, Photolon™ was found to be localized minimally only in the nucleus not in other organelles studied. The relationship between subcellular localization of Photolon™ and PDT-induced apoptosis was investigated. Apoptotic cell death was judged by the formation of known apoptotic hallmarks including, the phosphatidyl serine externalization (PS), PARP cleavage, a substrate for caspase-3 and the formation of apoptotic nuclei. At the irradiation dose of 1J/cm^2, the percentage of apoptotic cells was 80%, respectively. This study

provided substantial evidence that Photolon™ preferentially localized in the sub cellular organelles in the following order: Nucleus, mitochondria, lysosomes and the Golgi apparatus and subsequent photodamage of the mitochondria and lysosomes played an important role in PDT-mediated apoptosis CT-26 cells. Our results based on the cytoplasmic organelles and the intranuclear localization extensively enhance the efficacy of PDT with appropriate photosensitizer and light dose and support the idea that PDT can contribute to elimination of malignant cells by inducing apoptosis, which is of physiological significance. Besides, Dendritic cells (DCs) based immunotherapy and photodynamic therapy (PDT) offers great promise as a new alternative for cancer treatment. It has been postulated that the immune response to progressive tumors is insufficient due to a deficiency in afferent mechanisms responsible for the development of tumor reactive T cells. In order to address this issue, we aimed at addressing some of the important clinical challenges of colon cancer and to investigate the capacity of bone marrow-derived, cytokine-driven DCs pulsed with tumor lysates (TP-DCs) to elicit antitumor responses both in vitro and in vivo in combination with PDT. Conceptually this will be accomplished by reinfusion of ex vivo manipulated DCs. Our hypothesis is that using DCs pulsed with whole tumor lysates effectively prime the animals to reject subsequent lethal challenges with viable parental tumor cells. This strategy potentially lessens the possibility of tumor escape by the broader elicited immune response yet increases the potential to trigger T cell reactivity to those particular antigens, which results in actual tumor regression not only of targeted tumors but also of tumors at distant sites. The direct outcome of this study will allow characterizing the signals transduced in DCs when apoptotic or necrotic cellular materials are presented and enable to establish the optimal parameters for PDT induced cell death. Ultimately, this data will provide a basis for appropriate manipulation of DCs and help in the rational design of clinical trials combining PDT with DC-based immunotherapy for cancer.

EMERGING ANTIMICROBIAL RESISTANCE AND ALTERNATIVE THERAPEUTICS APPROACHES SPL.

FOCUS ON 3-D BIOPRINTED ANTIMICROBIAL NANOMATERIALS FOR CHRONIC WOUND HEALING

Saravanan Muthupandian [1,2]

Prince Fahad bin Sultan Chair for Biomedical Research, Faculty of Applied Medical Sciences, University of Tabuk, Tabuk, Saudi Arabia
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ABSTRACT

The emergence of Antimicrobial resistance is a growing threat for the health of people all over the world, which has led to research into alternative therapeutics approaches for combating AMR infection. The presence of chronic wounds is a significant challenge in contemporary medical care, since they frequently lead to extended patient suffering and an increase in the primary cause Pathogens that produce biofilms and are resistant to antimicrobial agents. Recent breakthroughs in 3D bioprinting technology have opened up new avenues for the development of novel treatment approaches. The talk discusses the potential of polymer-based drug-loaded green nanoparticles constructed via 3D bioprinting for chronic wound healing applications. We intend to create scaffolds that provide both structural support and controlled distribution of therapeutic drugs by incorporating biocompatible polymers and green nanomaterials. The unique properties of polymer-based nanoparticles improve treatment loading capacity and release patterns, allowing for more targeted treatment while decreasing systemic side effects. This work highlights 3D bioprinting's transformative role in regenerative medicine, as well as its potential to address chronic wound management concerns. Future study will focus on enhancing the formulation and evaluating the in vivo efficacy of these drug-loaded green nanomaterials in clinical applications.

Keywords: Antimicrobial resistance, Chronic wounds healing; 3D Bioprinting; Nanomaterials; Polymer

LIQUID FERTILIZER AND THERAPEUTIC POTENTIAL OF *TRUBINARIA CONOIDES* (J. AGARDH) KUETZ

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Marine macroalgae have been utilized as fertilizers for agricultural crops in coastal areas worldwide for many years. They can be applied in their entirety, as powdered seaweed manure, finely chopped, or as liquid extracts. *T. conoides* has also shown properties such as anticoagulant, anti-inflammatory, antiangiogenic, antiviral, antimetastatic, cytotoxic activity, and antioxidants. The present study aimed to utilize UV-Visible and FTIR spectroscopy to explore the effects of *T. conoides* as a seaweed liquid fertilizer on seed germination and its medicinal potential. To assess the impact on seed germination, avarai and black soybean seeds were treated with a liquid fertilizer derived from *T. conoides.* The results of the UV-VIS spectroscopic examination provide proof that the seaweed extract contains flavonoids. The primary peaks of the FTIR spectra were measured at 3351.6, 2096.8, 1630.1, 1022, 654.66, 597.28, and 559.02 cm-1. The seeds fed with seaweed liquid fertilizer grew twice as well as the untreated ones. Compared to avarai seeds, SLF successfully promotes black soya bean seeds. Either sex of mice was used in the in vivo studies. Fucoidan was administered (50,100,200 mg/kg) orally up to five days, and on the 6th day, 4-NQO was administered (7.5 mg/kg) by i.p. A result clearly shows that native control (H2O) and fucoidan alone in mice did not exhibit a significant effect on LPO, genetic damage in terms of 8-OHdG, micronuclei, comet, and apoptosis. The positive control group (4-NQO 7.5 mg/kg. i.p.) showed increase level of LPO (6.25 vs 1.3 µM MDA), 8-

OHdG (12 vs 4%), micronuclei about 6 fold, 5 fold of comet and 4 fold of apoptosis when compared to native control, 11.6 ± 2.07, 5.00 ± 1.58 and 4.14 ± 0.65 respectively. Fucoidan pretreatment significantly protected the 4-NQO induced genetic damage, that were regarded 77% decrease level of micronuclei and 96% comet at a dose of 200 mg/kg over the positive control. The results revealed that fucoidan significantly proved the anti-mutagenic effect by protecting 4-NQO-induced genetic damage in mice bone marrow cells in a dose-dependent manner. A similar trend was also observed in the HepG2 cancer cells. This pragmatic study further supported that it could be considered as a valuable food supplement and medicine for the protection of mankind from environmental toxicants.

SPHINGADIENES AS A CHEMOPREVITIVE AGENT AGAINST COLON CANCER: POSSIBLE MECHANISM OF ACTION

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Abstract

Sphingadienes (SDs), naturally occurring sphingolipids derived from soy and other sources, exhibit cytotoxic effects on colon cancer cells through an Akt-dependent mechanism and significantly reduce adenoma formation in *Apc^Min/+* mice. Since Wnt signaling plays a central role in colon carcinogenesis—particularly in spontaneous tumor development in *Apc^Min/+* mice and individuals with familial adenomatous polyposis—this study explored the influence of SDs on Wnt pathway activity. Oral administration of SDs led to a marked reduction in active β-catenin and its downstream targets, c-Myc and cyclin D1, within intestinal tissues of *Apc^Min/+* mice. In vitro, colon cancer cells treated with SDs showed diminished Wnt transcriptional activity, reduced nuclear localization of β-catenin, and lower levels of active β-catenin. Additionally, SD treatment decreased levels of phosphorylated (inactive) GSK3β in both mouse tissues and cancer cells. Importantly, the inhibitory effects of SDs on Wnt signaling were reversed by either expressing constitutively active myristoylated-Akt or chemically inactivating GSK3β with lithium chloride (LiCl), suggesting that SDs act through an Akt/GSK3β-dependent pathway. SDs also demonstrated additive cytotoxic effects when combined with inhibitors targeting the PI3K/Akt/mTOR pathway. A combination therapy using SDs and low-dose rapamycin further reduced visible polyp formation in *Apc^Min/+* mice and suppressed expression of Wnt target genes and mTOR pathway activation. The cytotoxic and pathway-inhibitory effects of SDs were shown to depend on protein phosphatase 2A

(PP2A) activity, as pretreatment with PP2A inhibitors okadaic acid or calyculin A reversed these outcomes. Collectively, these findings suggest that SDs suppress Wnt signaling via a PP2A/Akt/GSK3β-dependent mechanism, contributing to their potential chemopreventive role in intestinal tumorigenesis.

Keywords: Colorectal cancer, Sphingadienes, Chemoprevention, Wnt signaling, PP2A

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Abstracts

OP01

DIVERSITY ASSESSMENT OF ARBUSCULAR MYCORRHIZAL FUNGI ASSOCIATED WITH *GMELINA ARBOREA* AND *MELOCANNA BACCIFERA* IN ASSAM, INDIA

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ABSTRACT

Arbuscular Mycorrhizal (AM) fungi form symbiotic relationships with a wide range of plant species, playing a pivotal role in nutrient exchange, soil structure stabilization, and plant resilience. This study investigated the diversity and colonization dynamics of AM fungi associated with two ecologically and economically significant tree species: *Gmelina arborea* and *Melocanna baccifera*, within the semi-tropical conditions of the Silapathar Science College campus in Assam, India. Microscopic and morphological analyses revealed the presence of four AM fungal genera—*Glomus*, *Acaulospora*, *Scutellospora*, and *Gigaspora*—with *Glomus* emerging as the dominant genus across sampled root zones and soil profiles. Spores exhibited considerable variation in shape, wall architecture, pigmentation, and hyphal attachment patterns, reflecting a robust ecological adaptability. Notably, *G. arborea* showed significant root colonization (48%), while *M. baccifera* exhibited no observable colonization, a disparity potentially linked to host specificity or elevated soil phosphorus levels that suppress symbiosis. The differential colonization patterns underscore the importance of understanding host-fungi compatibility and environmental drivers influencing AM fungal associations. These insights have critical implications for sustainable forestry, particularly in optimizing seedling establishment and enhancing nutrient efficiency in degraded or nutrient-poor soils. Future research is recommended to isolate and characterize host-specific AM fungal strains to improve afforestation and ecosystem restoration practices globally.

Keywords: Arbuscular Mycorrhizal fungi, *Gmelina arborea*, *Melocanna baccifera*, fungal diversity, root colonization, sustainable forestry

OP02

EFFECTS OF *BEAUVERIA BASSIANA* ON *TENEBRIO MOLITOR* (COLEOPTERA: TENEBRIONIDAE) AND ITS IMPACT ON CATALASE AND GLUTATHIONE S-TRANSFERASE ENZYMES

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ABSTRACT

This study employed the insect bait method to isolate native entomopathogenic fungi (EPF) from soil samples. Additionally, the research examined fungi pathogenicity against different life stages of *Tenebrio molitor* respond to these native isolates in a laboratory setting. Results showed that isolated EPF was identified as *Beauveria bassiana* based on molecular techniques. The results of the insecticidal bioassay demonstrated that *B. bassiana* exhibited high pathogenicity against larvae (82.66 %), pupae (97.33 %), and adults (65.33 %). Among the developmental stages, the pupae were the most susceptible to *B. bassiana* at 9 days post-treatment. The probit analysis revealed low LC_{50} and LC_{90} values for larvae (1.8×10^{5} and 6.4×10^{10} conidia/mL), for pupae (2.7×10^{4} and 1.1×10^{8} conidia/mL), and for adults (1.3×10^{7} and 2.2×10^{16} conidia/mL). The biochemical enzyme analysis clearly showed that levels of the catalase enzyme decreased (1.53–0.7 µg/mL) at the highest concentration (1×10^{9} conidia/mL). In contrast, glutathione S-transferase enzyme levels increased (up to 8.3 µg/mL) at higher concentrations (1×10^{9} conidia/mL). However, higher doses of *B. bassiana* conidia showed enzyme more alterations in the larvae. This study clearly concluded that *B. bassiana* is a promising, cost-effective, pollution-free, and target-specific candidate for controlling the various developmental stages of *T. molitor*.

Keywords: Stored grains insect pest, Detoxification enzyme response, Antioxidant enzyme response, Phylogenetic tree construction, Entomopathogenic fungi, Mode of action

OP03

POPULATION STATUS, THREATS, AND CONSERVATION STRATEGIES OF *EULOPHIA MANNII* HOOK. IN MANAS NATIONAL PARK, ASSAM - A RARE KNOWN TERRESTRIAL ORCHID SPECIES

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ABSTRACT

The genus *Eulophia* belongs to the family Orchidaceae and comprises predominantly of terrestrial herbs with underground rhizomes or surface pseudobulbs; epiphytic species are rare. Globally, the genus *Eulophia* R.Br. comprises roughly 230 species. In India, around 30 species are represented, with 8 species reported from the state of Assam. The present study aimed to assess the total population status of *Eulophia mannii* using a direct count method, which involved counting all individual plants within the study area. A grid size of 250 m × 250 m was used for sampling. Individuals within each grid were categorized into three primary groups based on plant height: seedlings (<1 m), saplings (>1 m), and mature individuals (≥1.37 m). The population parameters—density, frequency, and abundance—were calculated using standard ecological formulas. In addition, the regeneration status of *Eulophia mannii* was evaluated. Based on the findings, the study suggests the need for strategic planning and conservation measures to ensure the protection and long-term survival of *Eulophia mannii* Hook.

Key Words: *Eulophia mannii*, Present Status, Distribution

OP04

A REVIEW- THE ROLE OF ALGAE-NANOPARTICLES IN ABIOTIC STRESS TOLERANCE MECHANISMS IN CROPS

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ABSTRACT

The global agricultural production continues to be negatively impacted by fluctuating climatic conditions, deteriorating genetic resources and the lack of rapid as well as efficient technologies required for the improvement of valuable crops. Among the climatic limitations, abiotic stresses such as drought, extreme temperatures and hypersaline soil conditions have caused major negative effects on the growth and yield of pulse legumes and cereals. Nanotechnology serves as one of the most sustainable and eco-friendly strategy to alleviate food shortage, boost crop productivity and plants' resilience to environmental stresses. Green synthesis of algae-based nanoparticles remains scantly reported, although several algal species demonstrated high economic and ecological value with the potential to change the face of modern agriculture. This review interrogated the role of algal-NPs as a sustainable agricultural strategy to improve crop growth and tolerance against abiotic constraints. However, the analyses made in this review suggest that algae-based nanomaterials hold a great potential in controlling critical metabolic processes while serving as an efficient and cost-effective agri-strategy in achieving high-quality yields, and increasing the plants' tolerance to abiotic stress factors when applied as biostimulatory compounds in crops.

Keywords ; *Abiotic stress, Algae, mechanism, crops, climate change*

OP05

REVIEW OF VARIOUS PRIMING APPROACHES FOR ABIOTIC STRESS MITIGATION IN CROPS

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ABSTRACT

Abiotic stresses, including drought, salinisation, extreme temperatures and heavy metal toxicity, combined with poor environmental conditions, are a major threat to the growth, development and productivity of crops. These stress factors interfere with plant physiological, biochemical processes, leading to reduced crop yields and threatening global food security. Innovative agronomic practices are necessary to mitigate the harmful effects of abiotic stresses. Different methods for tolerance to stress have evolved over time, through conventional breeding and transgenesis. In order to increase the resistance of plants to these stresses, priming strategies have emerged as a promising tool for improving the tolerance of plants to stress. This review examines different priming approaches that enable plants to better manage the subsequent exposure to stress. It also addresses the underlying mechanisms involved in increased activation of antioxidant systems, improved osmotic equilibrium, regulation of stress responsive genes. This review will explore several approaches for priming plants to enhance plant resilience to abiotic stresses.

Key words: Abiotic stress, crops, drought, physiological analysis

OP06

ETHNO BOTANICAL SURVEY OF MEDICINAL PLANTS IN YELAGIRI HILLS OF TAMILNADU

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ABSTRACT

Plants are the great source of food and medicine. In ancient days all the indigenous people use the plants as a source of medicine to cure various diseases. In the survey of medicinal plants in Yelagiri hills reported that the tribal people in this hills depends on the medicinal plants to lead their healthy and successful life.Yelagiri hills is located in Thirupathur District in Tamilnadu. The Malaiyali are the scheduled tribal community lived in the Yelagiri hills. There are 28 Medicinal plants were identified in the Yelagiri hills and these plants have many medicinal properties including anticancer, antidiabetic, antibacterial, antianalgesic etc. Lamiaceae and Apocyanaceae. Some plants species like *Andrographis paniculata, Azadirachta indica, Emblica officinalis, Withania somnifera, Phyllanthus amarus, Bacopa monnieri, Gloriosa superba, Solanum nigram, Asparagus racemosus, Ocimum sanctum and Curcuma longa* etc. These plants are belongs to the families of Lilaceae, Euphorbiacae, Solanaceae,etc. Tribal people uses the medicinal plants to treat jaundice, epilepsy, piles, wound, skin burning, cough, asthma, bronchitis, malnutrition, respiratory ailments, joint problems and etc. In the Ethano-botanical survey of traditional medicine and their usage with the tribal people reveals that 80% percentage of tribal people depends on the traditional plants for their life cycle disorders.

Keywords: Traditional medicine, Malaiyali tribes, Medicinal plants, Anti cancer, Yelagiri hills.

OP07

NETWORK PHARMACOLOGY AND MOLECULAR DOCKING OF NATURAL COMPOUNDS FOR NEURODEGENERATIVE DISEASES

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ABSTRACT

Neurodegenerative diseases (NDDs), such as Alzheimer's, Parkinson's, and Huntington's disease, are characterized by progressive neuronal dysfunction, oxidative stress, and protein aggregation, leading to severe cognitive and motor impairments. Despite extensive research, current treatments provide only symptomatic relief, highlighting the need for novel therapeutic strategies. Natural compounds derived from medicinal plants have gained attention due to their neuroprotective, anti-inflammatory, and antioxidant properties. This study integrates network pharmacology and molecular docking approaches to systematically explore the therapeutic potential of phytochemicals against NDDs. Network pharmacology was used to identify key molecular targets and pathways associated with neurodegeneration, including cholinergic signaling, tau phosphorylation, neuroinflammation, and mitochondrial dysfunction. Molecular docking simulations were performed to assess the binding affinity of selected phytochemicals with disease-associated proteins such as acetylcholinesterase (AChE), amyloid-beta (Aβ), α-synuclein, and tau protein. The results reveal strong binding interactions between bioactive compounds (such as flavonoids, alkaloids, and polyphenols) and neurodegenerative targets, suggesting their potential as multi-target drug candidates. Additionally, in silico ADMET analysis was conducted to predict their pharmacokinetics and drug-likeness. This study provides valuable insights into plant-based neurotherapeutics and lays the foundation for future experimental validation. Further in vitro and in vivo studies are essential to confirm the efficacy and safety of these compounds for potential clinical applications.

Keywords: Network pharmacology, molecular docking, neurodegenerative diseases, herbal drug discovery, computational biology, multi-target therapy.

OP08

EFFECT OF MICROPLASTIC, AN EMERGING THREAT TO WORLDWIDE SEAGRASS MARINE ECOSYSTEMS: A REVIEW

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ABSTRACT

Microplastic particles smaller than 5 mm in diameter are found throughout terrestrial, marine and freshwater ecosystems with potentially wide-ranging consequences. Microplastics adsorb metals and persistent organic pollutants from their surroundings; therefore, microplastic contamination contributes to the bioaccumulation of contaminants in food webs. Although widespread globally, there remains a lack of understanding about the magnitude of microplastics pollution and how particles may affect biodiversity in coastal ecosystems. Seagrasses are flowering plants that grow in the sea and develop large meadows in the intertidal and shallow zones, playing a crucial role as a blue carbon ecosystem that stores carbon in coastal and marine environments to mitigate climate change. Seagrass beds also provide highly productive ecosystems that offer many services, such as nutrient cycling, coastal protection, carbon sequestration and storage, and improved water quality. Microplastics also threaten global coastlines, affecting marine life, human health, and the ecosystem. Microplastics tend to accumulate metals and persistent organic pollutants from their surroundings; therefore, microplastic contamination contributes to contaminant bioaccumulation in food webs. This study seeks to evaluate how much microplastic pollution has accumulated in seagrass ecosystems around the world based on studies published over the past decade, review the function of seagrasses in marine ecosystems and how emerging pollutants may further affect a decline in seagrass ecosystem health,

describe the pathways for microplastics into seagrass ecosystems as well as their ecological effects and synergistic interactions with other pollutants, summarize consequences of microplastic pollution on seagrass ecosystems and their services, and finally review plastic history and future mitigation strategies to protect seagrass ecosystems and continue their roles in climate regulation, marine biodiversity, and other important services.

Keywords : Microplastic, Seagrass, marine biodiversity, climate change

OP09

DIRECT ORGANOGENESIS OF *PHYSALIS MINIMA* L. – AN IMPORTANT MEDICINAL PLANT

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ABSTRACT

In the present study, an effective micropropagation protocol of *Physalis minima L.* was carried out from the nodal explant. Shoot multiplication was successfully carried out using BAP and KIN. Two cytokinins (BAP and KIN) were tested but, BAP was found to produce more number of shoots compared with KIN. MS basal medium fortified with different concentrations of BAP. The 6 µM BAP was actively to produce maximum number of shoots 28.2 ± 3.45 with 100 % response for shoot induction and 13.24 ± 0.32 cm shoot length. Of the different concentrations of KIN were tested for shoot multiplication. The 8 µM KIN shows better result for 100% shoot induction frequency and maximum number of shoots 24.8 ± 1.82 with 10.84 ± 0.23 cm shoot length. Roots were induced from the isolated shoots using auxins (IBA and NAA). In the present study two auxins are tested, IBA was found to induce more number of roots. In 4 µM IBA induce the maximum number of 12.4 ± 2.66 roots per shoot and 7.22 ± 0.22 cm shoots length respectively. In the MS basal medium supplemented with 5 µM NAA was induce 10.4 ± 1.08 roots per shoot and 7.26 ± 0.14 of root length. The rooted plants were successfully transferred to the field through hardening and acclimatization.

Keywords : Micropropagation, Physalis *sps*, medicinal Uses, Explant

OP10

IN-VITRO PROPAGATION FROM NODAL EXPLANTS OF BLACK NIGHTSHADE (SOLANUM NIGRUM L.)

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ABSTRACT

In the present study, an effective in vitro regeneration protocol of Solanum nigrum L. was carried out from the nodal explant. Shoot multiplication was successfully carried out using BAP and KIN. Two cytokinins (BAP and KIN) were tested but, BAP was found to produce a greater number of shoots compared with KIN. Of the different concentrations of BAP was actively involve shoot induction frequency and to produce maximum number of 41.2 shoots in 6 µM BAP from nodal explants. Of the different concentrations of KIN was actively involve shoot induction frequency and to produce to produce maximum number of 34.8 shoots in 8 µM KIN from nodal explants. Higher frequency of shoot induction and proliferation were observed on MS basal medium supplemented with 2 µM - 10 µM of both cytokinins and combination of these hormones. Roots were induced from the isolated shoots using auxins (NAA and IBA). In the present study two auxins are tested, NAA was found to induce more number of roots. In 6 µM NAA induce the maximum number of 11.6 roots per shoot respectively. In the MS basal medium supplemented with 8 µM IBA was induce 10.4 roots per shoot. The well rooted plantlets are transferred to paper cup for hardening.

Keywords: In-vitro, Propagation, Nodal**,** cytokinin

OP11

ECO-FRIENDLY CONTROL OF *TUTA ABSOLUTA*: OVICIDAL POTENTIAL OF CAJEPUT ESSENTIAL OIL AND MOLECULAR DOCKING INSIGHTS

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ABSTRACT

The tomato leaf miner *Tuta absoluta*is a destructive pest that significantly affects tomato crop productivity worldwide due to its rapid reproduction and resistance to chemical insecticides. This study investigates the ovicidal properties of Cajeput essential oil (EO) as a natural and environmentally friendly approach to managing *T. absoluta*. It emphasizes the oil's effectiveness in reducing egg viability and its potential application in sustainable pest management strategies. Under controlled laboratory conditions, freshly laid eggs of *T. absoluta* were treated with EO at concentrations of 50, 100, 150, 200, and 250 ppm. Egg mortality was monitored over five days post-treatment. Results indicated a concentration-dependent increase in ovicidal activity, with the 50 ppm concentration achieving 92.5% egg mortality rate within 72 hours. Molecular docking analyses further examined interactions between Cajeput EO compound and egg shell protein. These findings highlight the potential of Cajeput EO as an effective and biodegradable biopesticide with minimal risk to non-target species. Future research should focus on large-scale field trials and formulation development to enhance its applicability in sustainable agriculture systems.

Keywords: *Tuta absoluta*, Essential Oil, Natural pest control, Sustainable agriculture, Integrated Pest Management (IPM), Eco-friendly insecticide

OP12

IN VITRO MICRO-PROPAGATION OF MEDICINALLY IMPORTANT IUCN VULNERABLE SPECIES OF *CHLOROXYLON SWIETENIA*

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ABSTRACT

Chloroxylon swietenia popularly known East Indian Satin Wood belong to the family Rutacea. The plant also well known as a folklore medicinal plant because this species used for various medicinal purpose such as used for the treatment of various ailment. This plant contain various chemical composition, in particular the plant leaf have more amount of flavonoid and phenolic compounds and used for many medicinal purposes. Due to regular collection of plant material for Ayurveda medicine, pharma industry and research persons it is included in IUCN red list category. So, regeneration of this species is needed for medicinal, research purpose and for ecological balance. Based on this view, the present work was carried out production of C. swietenia plantlet by micropropagation. Nodal explant produced callus on full strength MS basal medium supplemented with BAP (11.10 µmol/L) along with (NAA 2.68 µmol/L) and KIN (1.35 µmol/L). The percentage of callus formation 90 and this callus induction was within 20 days. The shoots were produced by sub-cultured callus by the PRG combination of BAP (11.10 µmol/L) + NAA (2.68 µmol/L) + KIN (1.135 µmol/L) with 24 shoots and shoot length (5.24±0.15 cm) from 20 days. The successful acclimatization of micropropagated plants were observed in decomposed coir waste: garden soil: garden soil combination. This study is a simple reliable, cost effective protocol reported for Chloroxylon swietenia an IUCN red listed vulnerable category plant species.

Keywords: Chloroxylon, Folklore medicinal, Micropropagation, Callus and acclimatization.

OP13

ENVIRONMENTAL AND BIOLOGICAL APPLICATION OF GREEN SYNTHESIZED SELENIUM NANOPARTICLE FROM LEAVES EXTRACT OF CHLOROXYLON SWIETENIA

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ABSTRACT

Selenium (Se) is a micronutrient, it is an essential element for human body for the function of growth, metabolism and hormone balance and that can potentially be used in the prevention and treatment of diseases. So the present work was aimed to synthesis selenium nanoparticle using Chloroxylon swietenia leave aqueous extract and analysis of antioxidant and photocatalyytic activities. Selenium metal solution was prepared by 1 mM selenium selenite metal dissolved in 100 ml double distilled water. The selenium nanoparticle was synthesised by 10 ml of Chloroxylon swietenialeave aqueous extract mixed with 90 ml selenium solution. The mixed selenium and plant extract solution was kept under dark room condition at 24 h incubation. The synthesised nanoparticle was confirmed by sharp peak appear in 340 nm of UV visible, seven various function group compounds identified in Fourier Transform Infra-Red (FTIR) spectroscopy, XRD with four major peaks 37˚, 44˚, 65˚, 75˚ at 2θ, and spherical shapes of selenium was observed in scanning electron microscope (SEM). The synthesised SeNP sample showed good antioxidant activity against DPPH, nitric oxide, hydrogen peroxide and ABTS free radicals. Among these antioxidant assays, the hydrogen peroxide methods was noticed maximum percentage of inhibition 78.66±0.52a. Similarly, the result of photocatalytic showed time based reaction and all the dyes were gradually reduced by sunlight irritation, in particular the photocatalytic capacity of this silver nanoparticles was observed maximum reduction at 24 h. Based on this results, the selenium nanoparticle potentially work as good antioxidant property and it involve to control dye based environment pollution.

Keywords: Silver, Chloroxylon swietenia, Nanoparticle, Selenium, Photocatalytic and antioxidant.

OP14

RECENT ADVANCES IN MUTATION BREEDING FOR CROP IMPROVEMENT: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Mutation breeding has emerged as a significant tool in modern plant improvement programs by generating novel genetic variations that are otherwise difficult to obtain through conventional breeding methods. The use of physical and chemical mutagens such as gamma rays and ethyl methanesulfonate (EMS) has led to the development of improved crop varieties with enhanced yield, stress tolerance and nutritional quality. Recent advancements in molecular biology, including the use of molecular markers, TILLING (Targeting Induced Local Lesions IN Genomes) and next-generation sequencing (NGS), have enhanced the precision, speed and efficiency of mutant detection and selection. Despite its success, mutation breeding faces challenges such as unpredictable mutation effects, low mutation frequency and the need for large population screening. This review highlights the latest developments in induced mutagenesis, successful case studies and the integration of mutation breeding with modern biotechnological tools, offering new opportunities for sustainable crop improvement.

Keywords: Mutation breeding, Induced mutagenesis, Crop improvement, Molecular markers, TILLING

OP15

DEVELOPMENT OF ORNAMENTAL AND HORTICULTURAL VARIETIES THROUGH MUTATION BREEDING: AN EMERGING FRONTIER

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ABSTRACT

Mutation breeding has opened new avenues in the development of ornamental and horticultural plant varieties by creating desirable traits such as novel flower colour, altered plant architecture, improved shelf life, disease resistance and abiotic stress tolerance. Unlike food crops, the aesthetic and market value of ornamentals often depends on distinct morphological traits, making them ideal candidates for mutation-induced variation. Physical mutagens like gamma rays and chemical agents such as EMS have been successfully employed in crops like chrysanthemum, rose, gladiolus, banana and citrus. Recent advances in molecular tools, including marker-assisted selection and genomic approaches, have accelerated the identification and characterization of useful mutants. This review provides an overview of techniques, mutagens, and notable success stories in ornamental and horticultural mutation breeding. It also discusses current challenges, such as somaclonal variation and genotype-specific responses and explores future prospects for commercial exploitation.

Keywords: Mutation breeding, Ornamentals, Horticultural crops, Induced variation, Gamma rays

OP16

SURVEY OF MEDICINAL PLANT SPECIES DIVERSITY IN KALRAYAN HILL, EASTERN GHATS OF DHARMAPURI DISTRICT, TAMIL NADU, INDIA.

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ABSTRACT

Medicinal plants are plants that are valued for their therapeutic properties and are used to treat or prevent diseases. Kalrayan hill are located in the semi-evergreen forest with the altitude ranging from 1000 to 3800 meters above mean sea level in the Attur taluk of Salem district in Tamilnadu state, South India. The malayalis are the tribal community living in the Kalrayan hill, and call themselves as malaikaran. These tribal people use the local medicinal plants to treat their disease. There are nearly 80 medicinal plants are reported in the Kalaryan hills to treat their dieases. The species belong to 74 genera and 41 families with a highest representative of five species belong to the family Asteraceae and four species belong to the family Asclepiadaceae, Caesalpiniceae, Fabaceae and Lamiaceae. Amaranthaceae, Apocyanaceae, Euphorbiaceae, Malvaceae, Liliaceae, Rutaceae and Solanaceae, Aristolochiaceae . The medicinal plants like *Abrus precatorius L.* (Crab's Eye), Acacia leucophloea (White Babul), *Aristolochia tagala Cham.* (Birthwort) , *Delonix elata L.* (White Gulmohur) , *Euphorbia hirta L.* (Euphorbia), *Madhuca longifoila (L.)* JFMacbr. (South Indian Mahuna) *Azima tetracantha Lam.* (Needle Bush), *Cardiospermum halicacabum L.* (Balloon Vine) are used to cure more than 36 types of disease. From this, 8 species were used to cure body cooling followed by 7 species used to cure skin diseases , 6 species used to cure fever and wound, 5 species used to cure cold and Stomachache, 4 species used to cure Diabetes and Headache , 3 species

used to cure Snake bite, 2 species used to cure Jaundice, Scorpion sting, Stimulant, Urinary diseases and White low, and 1 species was used to treat Anticancer, Antileprotic, Cough and Chest pain, Diaphoretic, Digestive disorder, Diuretic, Dysentery, Fungal diseases, Joint pain, Piles, Poisonous, Rheumatism, Scabies, Small pox, Stone disorder, and Ulcer.

Keywords : Medicinal plants, Kalrayan hills, Delonix elata L., Anti cancer, stone disorder.

OP17

A REVIEW - BIOMEDICAL APPLICATIONS OF EDIBLE MUSHROOM NANOPARTICLES

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ABSTRACT

Edible mushrooms were a group of large fungi that formed large fleshy fruiting bodies or mycorrhizal tissues that could be used for human consumption or medicine. mushrooms contain anti-microbial, antihypertensive, antiaging, and antioxidant properties in addition to their flavor. Edible mushrooms' high nutritional value is also thought to make them a significant source of bioactive substances and therapeutic benefits. In the field of nanotechnology today, edible mushroom extracts are used primarily as stabilizing, capping, and reducing agents during the synthesis of nanoparticles. This environmentally friendly, low-toxicity, and highly stable nanoparticle synthesis has found use in a variety of applications. In this review, with a focus on the steps involved in creating edible mushroom extracts, influencers, and characterization methods. Ag, Au, Se, and other nanoparticles produced by edible mushrooms have been gathered thus far. Additionally, describe the present state of edible mushroom synthesis application.

Keywords: Edible mushrooms, nanoparticles, biomedical application

OP18

EFFECT OF BIOFERTILIZER FOR INCREASING THE CROP PRODUCTION AND SOIL FERTILITY

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ABSTRACT

The use of bio-fertilizers is one of the important components of integrated nutrient management, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. The utilization of plant probiotics as a bio-fertilizer in agriculture has been recognized to benefit the growth of the plantS. Traditional formulations of bio-fertilizer have provided insight into the beneficial use of microorganisms in crops. Biofertilizers keep the soil environment rich in all kinds of micro- and macro-nutrients via nitrogen fixation, phosphate and potassium solubalisation or mineralization, release of plant growth regulating substances, production of antibiotics and biodegradation of organic matter in the soil Despite its advantage to the environment, the effectiveness of traditional bio-fertilizer is common as compared to chemical fertilizer. Thus, a variety of bio-fertilizer formulations have been developed to improve the success rate of bio-fertilizer in increasing plant productivity.Thus, the advantages and disadvantages of each formulation type have also been reviewed, emphasizing the perspective of biofertilizers cannot replace chemical fertilizers, but they can reduce the utilization of chemical fertilizers and support sustainable agricultural systems.

Keywords

Biofertilizers, Environment, Sustainable, Biodegradation

OP19

METFORMIN-3-HYDROXYFLAVONE, A NEW SCHIFF BASE COMPLEX MODULATES THE ACTIVITIES OF CARBOHYDRATE REGULATORY ENZYMES IN HIGH FAT DIET FED-LOW DOSE STREPTOZOTOCIN INDUCED TYPE 2 DIABETES IN EXPERIMENTAL RATS

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ABSTRACT

T2DM is a multifaceted endocrine disorder arises due to insulin resistance coupled with insufficient secretion of insulin from the pancreatic β-cells. Its prevalence is increasing alarmingly worldwide due to genetic and environmental factors. Among the various oral antidiabetic drugs widely used for the treatment of T2DM, metformin is considered as the first line of treatment to T2DM and backbone for combination therapy. However, at higher doses metformin induced lactic acidosis in addition to vitamin B12 deficiency. In order to circumvent the toxicity of metformin at high doses, an attempt has been made to synthesize a new metformin-3-hydroxyflavone complex. The Schiff base complex synthesized was characterized by various spectral studies such as FT-IR, Mass, 1H NMR and 13C NMR. The effect of oral administration of metformin-3-hydroxyflavone complex at a concentration of 20 mg/kg.b.w./rat/day to high fat diet fed-low dose STZ induced type 2 diabetes in rats was evaluated. The biochemical alterations such as fasting blood glucose, hemoglobin, glycosylated hemoglobin, plasma insulin and c-peptide observed in the diabetic rats were restored to near normal after treatment with the Schiff base complex. Additionally, the complex treatment regulates the activity of carbohydrate and glycogen metabolizing enzymes. The efficacy of the complex was comparable with metformin which was administration at a relatively high dose of 50 mg/kg.b.w./rat/day. The data

obtained evidenced the regulatory properties of metformin-3-hydroxyflavone complex in maintaining normoglycemia in experimental type 2 diabetes.

Keywords: Type 2 diabetes mellitus; High fat diet; Spectral characterization; Metformin-3-hydroxyflavone; Carbohydrate metabolizing enzymes

OP20

GC–MS PROFILING AND *IN SILICO* DOCKING ANALYSIS OF BIOACTIVE COMPOUNDS FROM *FICUS RACEMOSA*

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ABSTRACT

Ficus racemosa (family: *Moraceae*), widely used in traditional medicine, is known for its diverse pharmacological properties including antioxidant, anti-inflammatory, antidiabetic, and anticancer activities. In the present study, Gas Chromatography–Mass Spectrometry was employed to identify the phytochemical constituents of the methanolic extract of *Ficus racemosa*. The analysis revealed the presence of multiple bioactive compounds such as phytosterols, flavonoids, terpenoids, and fatty acid derivatives that are known to exhibit significant biological activities. Identified compounds were further subjected to in silico molecular docking to evaluate their potential binding affinity against selected target proteins associated with cancer progression and metabolic disorders. Docking simulations demonstrated strong interactions of major phytoconstituents with the active sites of proteins involved in cell proliferation, apoptosis regulation, and glucose metabolism, indicating their therapeutic relevance. Among the identified metabolites, compounds such as β-sitosterol, stigmasterol, and lupeol showed higher docking scores with key targets, suggesting their possible role as lead molecules. The study highlights the integrated application of GC–MS-based metabolite profiling and computational docking in exploring the drug-like potential of phytochemicals. Overall, the findings provide scientific insights into the pharmacological basis of *Ficus racemosa* and support its traditional use in herbal medicine. Further in vitro and in vivo validation is recommended to establish the therapeutic efficacy of the identified bioactive compounds.

Keywords: *Ficus racemosa*, GC–MS, Phytoconstituents and Molecular docking.

OP21

GC–MS ANALYSIS OF METHANOLIC PEEL EXTRACT OF *TRICHOSANTHES CUCUMERINA*

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ABSTRACT

Trichosanthes cucumerina (snake gourd) is a medicinally important plant traditionally used for its antioxidant, anti-inflammatory, and antidiabetic properties. In the present study, gas chromatography–mass spectrometry (GC–MS) analysis was carried out to identify the bioactive compounds present in the methanolic peel extract of *T. cucumerina*. The analysis revealed the presence of various phytoconstituents including alkaloids, fatty acid esters, terpenoids, phenolic compounds, and sterols that are known for their pharmacological relevance. Several compounds such as hexadecanoic acid, linoleic acid, stigmasterol, and phytol were identified, which are reported to possess antioxidant, antimicrobial, anticancer, and hypoglycemic activities. The results suggest that the methanolic peel extract of *T. cucumerina* contains diverse bioactive metabolites that may contribute to its traditional therapeutic uses. These findings provide a scientific basis for the medicinal potential of snake gourd peels and highlight the need for further in vitro and in vivo investigations to validate their pharmacological efficacy.

Keywords: *Trichosanthes cucumerina*, Bioactive compounds and Therapeutic potential.

OP22

PHYTOCHEMICAL AND PHARMACOLOGICAL ROLE OF DIOSMIN IN DIABETES MANAGEMENT

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ABSTRACT

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia and associated complications affecting multiple organs. Natural phytochemicals, especially flavonoids, have gained considerable attention as complementary therapeutic agents in diabetes management due to their antioxidant, anti-inflammatory, and insulin-sensitizing effects. Diosmin, a naturally occurring flavonoid glycoside predominantly found in citrus fruits, has been reported to exhibit diverse pharmacological activities including antihyperglycemic, antihyperlipidemic, and antioxidant properties. Phytochemical analysis of diosmin reveals its strong free radical scavenging capacity, ability to modulate oxidative stress markers, and its role in maintaining cellular homeostasis. Experimental studies have demonstrated that diosmin lowers fasting blood glucose levels, improves insulin sensitivity, and enhances glycogen storage in hepatic and muscular tissues. Furthermore, diosmin exerts protective effects on pancreatic β-cells, thereby preserving insulin secretion and reducing apoptosis induced by oxidative stress. It also plays a role in modulating lipid metabolism, reducing cholesterol and triglyceride levels, which contribute to improved cardiovascular health in diabetic conditions. Molecular insights suggest that diosmin regulates key pathways including glucose transporter (GLUT-4) translocation, inhibition of pro-inflammatory mediators, and upregulation of antioxidant enzymes such as superoxide dismutase and catalase. Collectively, these pharmacological properties indicate that diosmin has significant potential as a natural

therapeutic agent for the prevention and management of diabetes and its complications. However, further clinical trials and mechanistic studies are essential to establish its efficacy and safety for therapeutic applications.

Keywords: Diosmin, Phytochemical, Diabetes mellitus and therapeutic applications.

OP23

PHYTOCHEMICAL PROFILING AND ANTI-INFLAMMATORY ACTIVITY OF *CLEOME VISCOSA* LEAVES

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ABSTRACT

Cleome viscosa (family: Cleomaceae), commonly known as "wild mustard" or "tickweed," is a medicinal herb traditionally used in Ayurveda and folk medicine for the treatment of inflammation, fever, digestive disorders, and respiratory ailments. The present study was designed to evaluate the phytochemical composition and anti-inflammatory activity of *Cleome viscosa* leaves. Preliminary phytochemical screening of the methanolic leaf extract revealed the presence of bioactive secondary metabolites such as alkaloids, flavonoids, tannins, saponins, phenols, terpenoids, and glycosides, which are known to possess pharmacological potential. Quantitative estimations further confirmed significant levels of phenolics and flavonoids that contribute to antioxidant and anti-inflammatory effects. The anti-inflammatory activity was assessed using in vitro protein denaturation assay and membrane stabilization models, which demonstrated a concentration-dependent inhibition of denaturation and hemolysis when compared with standard diclofenac. The results indicated that the methanolic extract of *Cleome viscosa* leaves exerts significant protective effects against protein denaturation and stabilizes lysosomal membranes, suggesting a potential mechanism for its anti-inflammatory action. The observed biological activities could be attributed to the synergistic action of phytoconstituents such as flavonoids and terpenoids, which are known inhibitors of pro-inflammatory mediators. Overall, the findings provide scientific validation for the traditional use of *Cleome viscosa* as an anti-inflammatory agent and highlight its

potential as a source of natural therapeutic compounds. Further isolation and characterization of active principles, along with in vivo studies, are warranted to establish its clinical relevance in inflammatory disorders.

Keywords: *Cleome viscosa*, Phytochemicals and Anti-inflammatory activity.

OP24

GREEN SYNTHESIS OF COPPER NANOPARTICLES USING *PONGAMIA GLABRA* FLOWERS

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ABSTRACT

Nanotechnology has emerged as a promising field in biomedical and environmental research, with green synthesis of metal nanoparticles gaining importance due to its eco-friendliness, cost-effectiveness, and biocompatibility. In the present study, copper nanoparticles (CuNPs) were synthesized using the aqueous flower extract of *Pongamia glabra* as a natural reducing and stabilizing agent. The phytochemicals present in the flower extract, including flavonoids, phenolics, tannins, and alkaloids, played a vital role in the reduction of copper ions to nanosized particles. The formation of CuNPs was confirmed by a visible color change and further characterized by UV–Vis spectroscopy, which showed a strong surface plasmon resonance peak in the range of 560–580 nm, indicating the presence of stable copper nanoparticles. Additional characterization through FTIR analysis revealed the involvement of functional groups such as hydroxyl and carbonyl in nanoparticle stabilization, while XRD confirmed the crystalline nature of the CuNPs. SEM and TEM analyses demonstrated spherical and well-dispersed nanoparticles with an average size range of 20–50 nm. The biosynthesized CuNPs exhibited significant antioxidant and antimicrobial activities against pathogenic bacteria, indicating their potential application in pharmaceutical and biomedical fields. The study highlights the importance of *Pongamia glabra* flowers as a sustainable source for nanoparticle synthesis and opens avenues for the development of plant-mediated nanomaterials with therapeutic

relevance. Further investigations into toxicity, biocompatibility, and mechanism of action are recommended for future biomedical applications.

Keywords: *Pongamia glabra*, green synthesis, phytochemicals, antimicrobial activity, antioxidant potential, nanotechnology.

OP25

DEPLETION OF HEDGEROWS IN TAMIL NADU AND THEIR IMPORTANCE IN BIODIVERSITY CONSERVATION

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ABSTRACT

The present study was mainly focused on the degradation of hedgerows and their vital importance in biodiversity conservation, a special reference to Tamil Nadu. Hedgerows provide valuable resources for fodder for livestock, therapeutic plants, agricultural tools, hut making, fuel wood, and shelter for fauna, prevent topsoil erosion, restore groundwater levels, safeguard surrounding areas, and decrease global warming and other hazardous effects on the ecosystems. Hence, several indigenous flora and fauna diversity are severely affected and highly reduced their population through abolition of hedgerows in every year for increased urbanization activities in developing countries. In this present survey, a total of 115 plant species belong to 55 families and 76 genera of hedgerow plant species were documented in different regions of Tamil Nadu. Indeed majority of the climbing plants are now facing severe threats and their entire habitats are lost to reduction of natural hedgerows. Many farmers and landowners are unaware of the importance of hedgerows in maintaining biodiversity and ecosystem services. Hence, in the present investigation, we are addressing the drastic eradication of hedgerows in Tamil Nadu and their vital impact on natural resources for future generations.

Keywords: *Hedgerows, fodder, climber, depletion, climate change, Tamil Nadu, conservation.*

OP26

EFFECT OF ONION AND POTATO PEEL MIX FERTILIZER ON GROWTH AND YIELD OF *VIGNA MUNGO* L. PLANTS

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ABSTRACT

Organic farming is the method of cultivation and growing agricultural crops using biological pest control and fertilizers which are derived from animal and plant waste. The method was developed due to fact that chemical fertilizers have negative effect on ecosystem.Fertilizers are any organic or inorganic material of natural or synthetic origin that is added to soil to supply one or more nutrients essential to plant. Hence as an alternative to chemical fertilizer, natural fertilizers can be made from plant waste as these are also rich source of nutrients and minerals. Aims at making fertilizers as formulation that can be used for growing crops as alternative to chemical fertilizer. The waste such as green pea pods, Potato peel and onion peels can be used for the purpose of making natural fertilizer. Peels of Onion, potato peel, and Peas were formulated in the form of powder, extract and mixed formulation. Three different concentration of each were applied in soil as a natural fertilizer. Black gram seeds were used to test effect of natural fertilizer on growth of the plant. Plant growth was measured after four weeks of application of fertilizer. In-vitro seed germination was carried out by supplementing fertilizer in the form media. This if successfully implemented can also be used as one formulation media for in-vitro propagation of plants. Therefore, onion peel fertilizer improved plant yield. The use of organic onion, potato peel fertilizer mixture used as a plant growth booster is inexpensive, environmentally safe, and low-cost technology to improve the yields of small farmers.

Keywords: Fertilizer, Peels, Farmers , Organic farming.

OP27

GREEN SYNTHESIS OF ZINC NANOPARTICLES USING NEEM AND TULASI EXTRACT AND ITS ANTIMICROBIAL ACTIVITY OF PLANT MEDIATED ZNO NANOPARTICLES

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ABSTRACT

The green synthesis of ZnO nanoparticles has gained attention for being environmentally friendly and cost-effective. This study investigates the synthesis of Zinc nanoparticles using neem and Tulasi extracts, which serve as natural reducing and capping agents, with a focus on characterizing these nanoparticles and assessing their antimicrobial properties against oral pathogens. Neem and Tulasi extracts were prepared by heating their powdered forms in distilled water, followed by filtration. The extracts were then mixed with a Zinc oxide solution, and the reaction was stirred for 12 h. The resulting nanoparticles were characterized using UV–Visible spectroscopy, SEM, EDAX, TEM and XRD analysis. The antimicrobial activity of the nanoparticles was tested against four oral pathogens using the agar well diffusion method. Results: Successful synthesis of ZnO nanoparticles was confirmed by a color change and characterization analyses. The study demonstrates the effectiveness of neem and Tulasi extracts in the green synthesis of Zinc nanoparticles, which exhibited notable antimicrobial activity. This research underscores the potential of plant-mediated synthesis for developing eco-friendly antimicrobial agents

OP28

"PHYTOCHEMICAL PROFILING AND EVALUATION OF ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF CENTELLA ASIATICA LEAF EXTRACT"

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ABSTRACT

Centella asiatica (L.) Urban, a medicinal herb widely used in traditional medicine, has garnered attention for its antimicrobial properties. This study evaluates the antimicrobial activity of ethanolic and aqueous extracts of C. asiatica leaves against selected pathogenic microorganisms. Leaf samples were collected, shade-dried, powdered, and extracted using Soxhlet apparatus. The antimicrobial potential was assessed using the agar well diffusion method against *Escherichia coli*, *Staphylococcus aureus, Pseudomonas aeruginosa*, and *Candida albicans.* Results showed significant zones of inhibition, particularly with ethanolic extracts. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values confirmed the efficacy of the extract. Phytochemical screening revealed the presence of flavonoids, tannins, and saponins, which may contribute to the observed bioactivity. The findings support the traditional use of C. asiatica in treating microbial infections. It demonstrates broad-spectrum antimicrobial potential, making it a candidate for natural drug development. Further in vivo and formulation studies are recommended.

Keywords: *Centella asiatica,* drug, microbial infections

PP01

THE CONSEQUENCES OF CLIMATE CHANGE ON CROP PRODUCTION, CHALLENGES AND SOLUTIONS

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ABSTRACT

Climate change poses serious threats to agriculture and food security, and extreme weather events have reduced crop productivity worldwide. In the long run, the average global temperature will rise day by day and the sea level will rise by 0.6 to 1.1 feet in 2030. This unprecedented temperature increase has led to the incidence of heat waves, droughts, floods, and irregular patterns of precipitation. These changes have a dramatic impact on traditional agricultural cropping systems, productivity, and food security in the region and around the world. Changes in the climatic parameters can have significant effects on weeds, diseases, insect, and pests in a variety of ways, and can increase their geographic distribution, number of generations, and survival during winter. Therefore, the main challenge is to maintain crop production before climate change occurs. Therefore, climatic changes must be adapted to reduce the effects of crop production on agricultural crops. This review has briefly discussed the effects of climate change on agriculture and the future challenges of climate change on crop production.

Keywords: Climate Change, Challenges, Crops, Food security, Sustainable Agriculture

PP02

THE FUNCTION OF ORGANIC EXTRACTS AND INORGANIC COMPOUNDS IN REDUCING DROUGHT STRESS IN PLANTS: A REVIEW

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ABSTRACT

Global climate change has made drought conditions worse, endangering crop productivity and raising worries about food production. Basic changes in crop morphology, physiology, and biochemical characteristics are imposed by water scarcity. Therefore, in order to alleviate this issue and improve overall plant performance, it is essential to find environmentally friendly substitute solutions. Because they increase plant resilience, improve physiological processes, and lessen the negative effects of water deficit conditions on crop production, biostimulants have emerged as a promising substitute in this regard. In particular, humic acids, protein hydrolysates, seaweed extracts, and silicon are among the most recent studies on the use of organic extracts and inorganic compounds in crops that are impacted by drought.

Keywords: Climate Change, Organic Extracts and Inorganic Compounds, Drought

PP03

ROLE OF BIOSTIMULANTS ON ENVIRONMENTAL STRESS CONDITION IN PLANTS: A REVIEW

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ABSTRACT

Plant biostimulants, regardless of their nutrient content, are any material or microbe that is applied to plants to increase nutrient efficiency, increase resistance to abiotic stress, and/or improve crop quality. Commercial products are also regarded as biostimulants if they contain combinations of these substances or microbes. Based on scientific understanding of the nature, mechanisms of action, and impacts of biostimulants on crops and horticultural plants, the definition presented in this article was developed. Additionally, it seeks to make biostimulants more acceptable in future regulations, especially in the EU, by setting them apart from biocontrol agents, fertilizers, and pesticides. Several biostimulants, irrespective of their nutrient content, improve plant nutrition. One type of biostimulant is biofertilizer, which increases the efficiency of nutrient use and gives plants new ways to obtain nutrients. bacterial endosymbionts such as Rhizobium and mycorrhizal and non-mycorrhizal fungi are examples of microbial biostimulants.

Keywords: Plant biostimulants, microbes, Rhizobium, Biotic stress

PP04

BIOLOGICAL ACTIVITIES OF *CASSIA ALATA*- A REVIEW

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ABSTRACT

Senna alata is a medicinal herb of the Fabaceae family. It is distributed in the tropical and sub-tropical regions. The plant is traditionally used in the treatment of typhoid, diabetes, malaria, asthma, ringworms, tinea infections, scabies, blotch, herpes, and eczema. The review is aimed at revelation the ethnobotanical description and pharmacological activities of *S. alata*. Different parts of the plant are reported in folk medicine as therapeutic substances for the remediation of various diseases and infections. The extracts and isolated compounds displayed pronounced pharmacological activities. Display of antibacterial, antioxidant, antifungal, dermatophytic, anticancer, hepatoprotective, antilipogenic, anticonvulsant, antidiabetic, antihyperlipidemic, antimalarial, anthelmintic, and antiviral activities could be due to the array of secondary metabolites i.e., alkaloids, flavonoids, tannins and terpenoids derivatives. The review reveals the ethnobotanical and pharmacological activities of the plant and also justifies the ethnomedical claims. The significant medicinal value of this plant requires a scientific adventure into the bioactive metabolites which constitute various extracts.

Keywords: *Senna alata*, Fabaceae, bioactive metabolites and pharmacological activities.

PP05

SURVEY OF MEDICINAL PLANT SPECIES DIVERSITY IN THEERTHAMALI HILLS, EASTERN GHATS OF DHARMAPURI DISTRICT, TAMIL NADU, INDIA.

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ABSTRACT

A survey of medicinal plants was conducted in theerthamali hills of Eastern Ghats, Dharmapuri district, Tamil Nadu. The investigation revealed that a total of 100 plant species belong to 48 families were identified and documented and their usage to treat various ailments were also standard based on the medicinal properties of the parts of the plants. Medicinal plants and their parts used 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. When dominant life forms were analyzed, it was found that trees were dominant followed by herbs. Similarly, the family, Fabaceae was identified as the dominant family followed by Apocynaceae and Asclepiadaceae. The leaves of the plants were stood first to treat various ailments and disorders followed by roots and other plant parts. The present study revealed that researchers have been continuously being in search of the traditional knowledge about the uses of folk medicines from the local inhabitants and the medicinal practitioners, as they have no interest on their own safest traditional treatments in spite of attractive side effect causing allopathic medicines.

Key words: Theerthamali hills, Medicinal plants, leprosy.

PP06

BIOACTIVE COMPOUNDS OF ALGAE: REVIEW OF THEIR PROPERTIES AND MEDICINAL PROPERTIES

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ABSTRACT

Bioactive compounds derived from seaweed have attracted growing interest in pharmaceuticals, nutraceuticals and cosmetics because of their wide range of therapeutic properties. These natural molecules, which include polysaccharides, polyphenols, phlorotannins, carotenoids and pigments, have powerful antioxidant, anti-inflammatory, antiviral and anti-cancer properties. Algal bioactives are a safer and more sustainable option for drug discovery because they are often less toxic than synthesised compounds. This review highlights the structural diversity of algal biomolecules and their mechanisms of action, with particular emphasis on proven bioactivities as supported by recent studies. It also critically examines problems such as low bioavailability of compounds with high molecular weight such as fucoidans, variability in metabolite formation due to environmental factors and the limits of scalable extraction methods. Recent advances in nano-encapsulation, metabolic engineering and environmentally friendly extraction methods are being explored as promising strategies for increasing bioavailability and industrial applicability. By combining traditional knowledge with biotechnology innovation, this review highlights the underutilised potential of macroalgae to treat chronic diseases and the urgent need for standardised protocols to facilitate the clinical translation of bioactive substances derived from algae.

Keywords: Algae, bioactive substances, medicinal uses, traditional knowledge

PP07

SYNERGISTIC EFFECTS OF NANOPARTICLES AND MEDICINAL PLANT EXTRACTS IN DRUG DELIVERY SYSTEMS

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ABSTRACT

The integration of nanotechnology with phytomedicine has led to innovative drug delivery strategies with enhanced therapeutic efficacy, targeted delivery and reduced toxicity. Nanoparticles synthesized using medicinal plant extracts often termed green-synthesized nanoparticles offer a biocompatible, eco-friendly approach to drug delivery. These nanoparticles not only serve as carriers but also exhibit intrinsic bioactivities due to the phytochemicals capped on their surfaces. The synergistic interaction between metal or polymeric nanoparticles and plant-derived compounds enhances solubility, bioavailability, and controlled release of drugs, especially in cancer therapy, antimicrobial applications and anti-inflammatory treatments. This review highlights the mechanisms, synthesis methods and characterization of phytochemical-mediated nanoparticles and their performance in various drug delivery models. The paper also discusses challenges in clinical translation and regulatory perspectives, while emphasizing future directions for research in nanophytopharmaceutical systems.

Keywords: Green synthesis, Nanoparticles, Medicinal plants, Drug delivery, Synergistic effect

PP08

MICROPROPAGATION OF NODAL EXPLANTS IN CICHORIUM INTYBUS (CHICORY)- AN IMPORTANT MEDICINAL HERB

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ABSTRACT

In the present study, an effective micropropagation protocol of Cichorium intybus L. was carried out from the nodal explant. Shoot multiplication was successfully carried out using BAP and KIN. Two cytokinins (BAP and KIN) were tested but, BAP was found to produce more number of shoots compared with KIN. MS basal medium fortified with different concentrations of BAP. The 10 µM BAP was actively to produce maximum number of shoots 40.6 ± 2.23 with 100 % response for shoot induction and 10.16 ± 0.33 cm shoot length. Of the different concentrations of KIN were tested for shoot multiplication. The 15 µM KIN shows better result for 100% shoot induction frequency and maximum number of shoots 32.6 ± 1.11 with 8.82 ± 0.25 cm shoot length. Roots were induced from the isolated shoots using auxins (IBA and NAA). In the present study two auxins are tested, IBA was found to induce more number of roots. In 6 µM IBA induce the maximum number of 20.6 ± 1.24 roots per shoot and 8.42 ± 0.22 cm shoots length respectively. In the MS basal medium supplemented with 8 µM NAA was induce 18.4 ± 1.12 roots per shoot. The rooted plants were successfully transferred to the field through hardening and acclimatization.

Keywords: Micropropagation, Nodal, Explant, Medicinal Uses

PP09

IN VITRO PROPAGATION OF OLDENLANDIA CORYMBOSA L. – AN IMPORTANT MEDICINAL PLANT

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ABSTRACT

In the present study, an effective micropropagation protocol of Oldenlandia corymbosa L. was carried out from the nodal explant. Shoot multiplication was successfully carried out using BAP and KIN. Two cytokinins (BAP and KIN) were tested but, BAP was found to produce more number of shoots compared with KIN. MS basal medium fortified with different concentrations of BAP. The 10 µM BAP was actively to produce maximum number of shoots 20.6 ± 2.23 with 100 % response for shoot induction and 10.16 ± 0.33 cm shoot length. Of the different concentrations of KIN were tested for shoot multiplication. The 15 µM KIN shows better result for 100% shoot induction frequency and maximum number of shoots 19.6 ± 1.11 with 8.82 ± 0.25 cm shoot length. Roots were induced from the isolated shoots using auxins (IBA and NAA). In the present study two auxins are tested, IBA was found to induce more number of roots. In 6 µM IBA induce the maximum number of 17.6 ± 1.24 roots per shoot and 4.42 ± 0.22 cm shoots length respectively. In the MS basal medium supplemented with 8 µM NAA was induce 15.4 ± 1.12 roots per shoot.The rooted plants were successfully transferred to the field through hardening and acclimatization.

Keywords: Micropropagation, Nodal, Explant, Medicinal Uses

PP10

MEDICINAL PLANT-BASED NANOPARTICLES FOR WOUND HEALING AND SKIN CARE: AN EMERGING TREND

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ABSTRACT

The convergence of nanotechnology and traditional herbal medicine has revolutionized approaches to wound healing and dermatological care. Medicinal plant-based nanoparticles, particularly those synthesized through green synthesis methods, have gained significant attention due to their biocompatibility, enhanced bioactivity and eco-friendly production. Phytochemicals from plants such as *Aloe vera*, *Azadirachta indica*, *Curcuma longa* and *Centella asiatica* serve as reducing and stabilizing agents, leading to the formation of nanoparticles with potent antimicrobial, anti-inflammatory and antioxidant properties. These bio-nanocomposites promote rapid tissue regeneration, collagen synthesis and moisture retention making them highly effective in treating burns, cuts, ulcers and skin infections. This review explores the current advancements in plant-based nanoparticle synthesis, mechanisms of action in skin repair, delivery systems (gels, creams, dressings) and their potential in cosmetic and therapeutic dermatology. Challenges in standardization, toxicity evaluation and large-scale production are also discussed.

Keywords: Medicinal plants, Nanoparticles, Wound healing, Skin care, Green synthesis

PP11

ADVANCES AND PERSPECTIVES OF PLANT TISSUE CULTURE TECHNIQUES

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ABSTRACT

Plant tissue culture refers to growing and multiplication of cells, tissues and organs of plants on defined solid or liquid media under aseptic and controlled environment. The commercial technology is primarily based on micropropagation, in which rapid proliferation is achieved from tinystem cuttings, axillary buds, and to a limited extent from somatic embryos, cell clumps in suspension cultures and bioreactors. For a variety of basic and applied applications, including the study of plant developmental processes, functional gene research, commercial plant micropropagation, the creation of transgenic plants with particular industrial and agronomical traits, plant breeding and crop improvement, the removal of viruses from infected materials to produce high-quality, healthy plant material, the preservation and conservation of germplasm of vegetative propagated plant crops, and the rescue of threatened or endangered plant species, plant tissue culture techniques are the most widely used biotechnological tools. Additionally, metabolomics applied to tissue culture will facilitate the extraction and characterization of complex mixtures of natural plant products of industrial interest. General and specific aspects and applications of plant tissue culture and the advances and perspectives are discussed in this article.

Keywords: Plant tissue culture, micropropagation, Biological Applications, Advantages

PP12

ADVANCES AND PERSPECTIVES OF PLANT TISSUE CULTURE TECHNIQUES

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ABSTRACT

Plant tissue cultures are the core of plant biology, which is important for conservation, mass propagation, genetic manipulation, bioactive compound production and plant improvement. plant tissue culture techniques have been developed and used as a novel tool. Plant hormones rarely act alone, and for most processes at least those that are observed at the organ level many of these regulators have interacted in order to produce the final effect. Plant growth hormones play a critical role in regulating growth and development, particularly in inducing morphogenesis (formation of organs). Cytokinins, along with auxins, are essential for this process. Cytokinins promote cell division and, in combination with auxins, can direct the development of shoots or roots. This is a short review of the classical and new, natural and synthetic plant hormones and growth regulators (phytohormones) and highlights some of their uses in plant tissue culture.

Keywords: Plant tissue culture, growth hormone, cytokinin, Function

PP13

STEM CELL BANKING: A GATEWAY TO FUTURE REGENERATIVE THERAPIES

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ABSTRACT

Stem cell banking is a cutting-edge biomedical practice that involves the collection, processing, and cryopreservation of stem cells for potential therapeutic use. These cells, primarily obtained from sources such as umbilical cord blood, bone marrow, and adipose t issue, possess the remarkable ability to self-renew and differentiate into various specialized cell types. Their regenerative capacity holds immense promise for treating a broad spectrum of diseases, including blood disorders, immune deficiencies, certain cancers, and degenerative conditions. Stem cells can be stored for autologous use (by the donor) or allogeneic use (by a compatible recipient), making stem cell banking a valuable asset in personalized medicine. Public and private banking options are available, each with distinct benefits and limitations. Ethical considerations, regulatory frameworks, and public awareness continue to shape the growth of this field. As advancements in regenerative medicine and gene therapy accelerate, stem cell banking is expected to play a crucial role in the future of disease treatment and tissue engineering, offering hope for improved health outcomes and medical breakthroughs. Keywords: Stem cell banking, regenerative medicine, umbilical cord blood, hematopoietic stem cells

Keywords: regenerative medicine, Stem cell, biomedical

PP14

EVALUATION OF SILVER NANOPARTICLES FROM MOMORDICA CHARANTIA EXTRACT

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ABSTRACT

In the present study, investigates the phytochemical constituents and evaluates the antibacterial activity of leaf extracts Momordica charantia, silver nanoparticles were synthesized. A medicinal plant traditionally used in various therapeutic applications. UV Visible absorption spectroscopy, Fourier Transfer Infrared (FTIR) were used for characterization of synthesized silver nanoparticles. The results of phytochemical screening of leaf extracts of Momordica charantia revealed the presence of some secondary metabolites like alkaloids, carbohydrates, flavonoids, steroids, terpenoids, tannins, quinones, phenols and absence the bioactive compounds namely saponins and glycosides. The antibacterial activity was assessed using the agar well diffusion method against selected Gram-positive and Gram negative bacterial strains. These findings suggest that Momordica charantia possesses valuable phytochemicals with promising antibacterial properties, making it a potential source for the development of natural antimicrobial agents.

Key words: Momordica charantia, Nanoparticles, Antibacterial activity

PP15

PLANT PATHOLOGY AND MICROBIOLOGY

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ABSTRACT

Plant pathology and microbiology are critical disciplines that intersect to address the complex interactions between plants and microorganisms. This study explores the diversity, pathogenic mechanisms, and ecological roles of plant-associated microbes, with a particular focus on phytopathogenic fungi, bacteria, and viruses. Emphasis is placed on understanding host-pathogen interactions, disease development, and plant immune responses. Additionally, the beneficial roles of microorganisms—such as endophytes, rhizobacteria, and biocontrol agents—are examined for their potential in sustainable agriculture. Advances in molecular diagnostics, genomic tools, and microbiome analysis have significantly enhanced our ability to detect pathogens, monitor disease outbreaks, and develop effective management strategies. This integrated approach is essential for improving crop resilience, ensuring food security, and promoting environmentally friendly farming practices.

Keyword: Plant pathology, microbiology, host-pathogen interaction, plant immunity, beneficial microbes, biocontrol agents, endophytes, rhizobacteria, microbial ecology.

PP16

BENEFITS OF TRADITIONAL MEDICINE SYSTEM (FENNEL SEED)

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ABSTRACT

Traditional medicines (TRM) are widely used globally. Most TRM systems have a theoretical basis, a medical, a range of therapeutic modalities, an empirical approach to treatment, and a tradition of training. Extensive scientific research has been conducted and published on TRM. Fennel (Foneiculum vulgare) is cultivated throughout the world for its valuable essential oil and its application in different traditional medicine systems. Fennel seed is a rich source of volatile oil, with fenchone and trans-anethole as its major compounds. The unique health benefits of fennel are due to its antioxidant content. Aging-related diseases like heart diseases and cancer can be prevented by fennel seed oils, and it is remarkably used for health promotions. Gastrointestinal disease, diabetes, and hypertension can be conventionally treated by fennel. Fennel essential oil or its natural components such as anethole depict different activities like antifungal, insecticidal, and antibacterial activity. Fennel possesses antioxidant property, prophylactic activity, anti-inflammatory effect, antiallergic, and hepatoprotective activity and antispasmodic activity. Research continues to explore the other chemical components found in cold-pressed oil and their potential biologic activities.

Keywords: fennel seed and plant

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