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NATIONAL CONFERENCE ON CLIMATE CHANGE AND HEALTH

17th November 2023

CONFERENCE PROCEEDINGS



ORGANIZED BY PSG IMSR, PSGCP, PSGCON, PSGCOP

in Association with PSG Centre for Academic Research and Excellence (PSG CARE)

Editors

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SPEAKERS PROFILE



Dr. M. Dwarakanath, Former Director, DSTE and Member Secretary, Puducherry Pollution Control Committee, Visiting Faculty - DESM, BDU.

Topic: Climate Change and influence on health

Dr. M. Dwarakanath has served as Director DSTE and member Secretary of the Puducherry Pollution Control Committee, Puducherry, for six years. Earlier, he served with the Department of Environment, Government of Delhi for 22 years in various capacities. He has worked with NEERI, Nagpur, National Sugar Institute, Kanpur, and Ministry of water Resources, Government of India and Government of Delhi & Government of Puducherry. He has visited several countries Viz., Germany, Belgium, Netherlands, Italy, Singapore and Japan during his career. Presently, her serves as Expert Member in several Government of India R&D Committees. He has competed preparation of State Action Plan for Climate Change for puducherry region & integrated coastal Zone Management Plan (ICZMP) for Puducherry UT. Another feather in his cap is planning and establishment of Puducherry Science Centre & Planetarium & Innovation Hub at Puducherry.



Dr. K. Mahalinganathan, Former Scientist, National Centre for Polar and Ocean Research (NCPOR)

Topic: The science of Climate Change

Dr. K. Mahalinganathan, did his B. Sc (Geology) from Presidency College, Chennai, India and completed his post graduation M. Sc. (Applied Geology) at Indian Institute of Technology (IIT) Roorkee, after his PG graduation he went onto pursue Ph.D in Chemical and Stable Isotope Records of Antarctic Snow and its Implications on Palaeo-climate Studies in Goa University. After his PhD, He has worked as Project Scientist B, National Centre for Antarctic & Ocean Research, Goa, India. In this position in Cryospheric Science Division he involved in field activities in East Antarctica (MADICE) for 8 years. Then he promoted as Project scientist C at NCPOR, Goa India in the area of Polar Cryosphere and Ice Core Sciences for three years. He received a training from Centre for Ice and Climate, Denmark for Ice Core Analysis Techniques and the fields of glaciology, oceanography, climate modelling. In his 13 years of research experience he has been to Antarctica for 5 expeditions and Arctic and Himalayas. He has published his research work in journals and book chapters in various acclaimed national and international publications. He has presented his research outcomes in many national and international conferences.

PROGRAM

9.30 am	Prayer Song	
9.35 am	Welcome Address	: Dr. A. Jayasudha Principal PSG College of Nursing
9.40 am	About Conference	: Dr. Sudha Ramalingam Director, Research & Innovation PSG IMS&R
9.50 am	Felicitation	: Dr. M. Ramanathan Principal PSG College of Pharmacy
		Prof. R. Mahesh Principal PSG College of Physiotherapy
10.10 am	Chief Guest Address	: Prof. Dr. Rudramoorthy Director PSG CARE
10.25 am	Release of Conference Proceedings	
10.30 am	Poster Presentation (Tea)	
11.00 am	Plenary Session I	: Dr. M. Dwarakanath Former Director, DSTE and Member Secretary, Puducherry Pollution Control Committee, Visiting Faculty - DESM, BDU
11.45 pm	Plenary Session II	: Dr. K. Mahalinganathan Former Scientist, National Centre for Polar and Ocean Research (NCPOR)
12.15 pm	Valedictory & Prize Distribution	: Dr. T. M. SubbaRao, Principal, PSG IMS&R
		Prof. Dr. Rudramoorthy, Director PSG CARE
		Dr. Sudha Ramalingam, Director Research & Innovation, PSG IMS&R
12.25 pm	Vote of Thanks	: Dr. S. M. Habibur Rahman Professor & Associate Director (Research) PSG College of Pharmacy

Genetically Modified Foods and Climate Change: A National Perspective Merlin Veronika¹, Vijaya D²

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One of the challenges faced by the current food and agriculture industry is genetically modified foods. Due to the continuous debate in safety and sustainability of these engineered foods, policy makers and regulators have put in rigorous check points to ascertain the viability of genetic modification technology to solve the booming food crisis. At present the safety of genetically modified foods remains questionable mainly because of insufficient long term scientific data, and the vulnerability of the developing and developed countries to satisfy the food demands of their growing populations. Not only the respective government is facing this challenge but also the farming, animal husbandry and civil societies can feel the impact. The objective of this review is two-fold; first, we had attempted to present the Indian scenario of genetically modified food through the lens of regulatory bodies, policies and acts governing testing and commercial release. Secondly, the impact of genetically modified foods on climate changes. Literature review from open-source articles and public databases has been used to extract relevant information and presented in this work.

Keywords: Genetic engineering, genome editing, climate change, green house gases, regulatory bodies, agriculture

A Review on Continuous Glucose Monitoring in Diabetes management

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In the last two decades, the global prevalence diabetes has increased significantly, leading to various chronic complications and heightened morbidity and mortality. Regular assessment of glycemic control is crucial in diabetes management. Common techniques include self-monitoring of blood glucose and measurement of hemoglobin A1c. While SMBG helps evaluate therapy response, it has limitations such as providing singular measurements and dependency on patient adherence. HbA1c, reflecting average glucose levels, is a gold standard, but it doesn't capture glycemic fluctuations and can be unreliable in certain health conditions. Continuous glucose monitoring has become a valuable tool, offering insights into glycemic trends, time spent within the target range, and hypoglycemia. CGM data, despite a time lag with traditional blood glucose readings, provides comprehensive understanding over a 10–14 day period. CGMPs provide valuable insights into glycemic excursions and potentially hazardous fluctuations that might be overlooked with traditional SMBG.

Keywords. Continuous Glucose monitoring, Diabetes, Glycemic index, HbA1c, glycemic control

Exploring the Alternatives for Pharma Packaging Materials – Wealth from Waste Concept to Control Climate Changes

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Pollution from plastic containers has become a crisis globally, which result in global warming ultimately climate change. Throughout their lifecycle, plastics have a significant carbon footprint and emit 3.4% of global greenhouse gas emissions. Burning plastic releases harmful pollutants and emissions into the environment throughout every step of the process. The post-use of generated plastic waste has many adverse impacts on the environment if not processed and managed in a proper way. This review aims to discuss the lifecycle of plastic products used in pharmacy packaging under different categories, including polyvinylchloride (PVC-U), polypropylene (PP), high-density polyethylene (HDPE), and others. One such way in controlling climatic changes due to pollution caused by plastic is by utilizing the concept of wealth from waste. Waste sugar bagasse and wheat straw grass are burnt which emit toxic, harmful gases in our environment, they can be utilized for the alternatives to plastic bags and containers respectively which will also reduce air pollution and controls climatic changes.

Keywords: Sugarcane Bagasse, wheat straw plastic, global warming, climate changes.

Revolutionizing Breast Cancer Care: The Role of Artificial Intelligence in Detection, Prediction, and Personalized Treatment

Nithya.R, ManishaVenkatesan, Priyadharshini chandrabose, Nithya Kalyani Karuppiah Subbulakshmanan, Sangeetha Krishnan

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Breast cancer remains a significant global health concern, affecting millions of women worldwide. This review article explores the evolving landscape of breast cancer care, with a particular focus on the integration of artificial intelligence (AI) technologies. AI is transforming early detection, precise diagnosis, and personalized treatment strategies. We delve into the challenges and opportunities of leveraging AI in breast cancer research, with a comprehensive examination of data sources, preprocessing techniques, machine learning algorithms, and AI models tailored for breast cancer detection and prediction. Additionally, we discuss performance evaluation metrics, ethical considerations, clinical applications, and real-world case studies. Looking ahead, we examine emerging trends and future challenges in the field of AI-driven breast cancer research, emphasizing the need for ongoing investigation and improvements. The insights provided in this article aim to contribute to the continuous efforts to enhance breast cancer care and reduce its impact on women's lives.

Keywords: Breast cancer, artificial intelligence, early detection, diagnosis, personalized treatment, machine learning, data Preprocessing, AI models, clinical applications.

A Systematic Approach on Liposomes with Microsponges as Novel Drug Delivery System With Regards To Ecosystem

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Ecosystem such as temperature, air, light, humidity, water plays a vital role in Novel drug delivery system which also affects drug delivery and it is effectively alter the drug metabolism at various levels under the influence of pharmacogenomics, which interferes with pharmacokinetics of drug. It also occurs by work, behavior (smoking, poor diet, liquors etc.,) that can increase an individual risk of disease due to this stressful situation which makes the Novel drug delivery system resistant. In order to avoid this condition, we are aiming to develop a variable kind of systematic approach on liposomes with Microsponges this system which ensures a better therapeutic activity towards safety, efficacy, potency and toxic free effect because of its targeted drug delivery which improves bioavailability. It can be synthesized using a variety of natural or synthetic micro-molecular active ingredient with different size, structure, surface charge of nanoparticles along with suitable polymer type.

Keywords: Liposomes, Microsponges, NDDS, Ecosystem, Targeted drug delivery.

Phytoplastics Based On (PHB) Producing Transgenic Plants as an Alternative to Plastics: A Review

G. Siva Gokul, M. Pradeepkumar, S. Tina Deva Prarthana, V.E.Ida Christi PSG College of Pharmacy, Peelamedu, Coimbatore, Tamil Nadu

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In past several decades synthetic plastics were used which produced harmful effects on livingbeings and environment. Bioplastics are a long chain of monomers joined together by ester bond and are thus termed as polyesters. Polyhydroxyalkanoate (PHA) family is natural thermoplastic polyester and its variants have properties similar to petroleum-based plastics but are biodegradable. The most common type of PHA (Polyhydroxyalkonate) is PHB (Polyhydroxybutarate), an energy storage material in Microorganisms. 'Phytoplastic' is an innovative approach to produce PHB containing bioplastics from transgenic plants. Since PHA pathway already exists in some plants, upon introduction of 'Recombinant Technology Plasmid' concept the percentage yield of PHB in the plants increases. Modified genes encoding for 3ketothiolase, acetoacetyl-CoA reductase were induced in the desired plant source by the in planta method with the binary Ti- plasmid. The main objective of this study is to present the general information on various plants that can be modified to better PHB yield in transgenic plants. The transgenic plants were selected based on the review of scientific articles like scholar, pubmed, springer, etc. The study reviews on alternative source for plastics from plant material. Here, plants such as maize, thale cress, rapeseed, Siberian oilseed, sugarcane, oil palm and tobacco are selected for this study and reviewed for their PHB biosynthesis. Thus, transgenic modification of plants shows increase in percentage yield of PHB content. Thus we conclude that transgenic traits show increase in percentage yield of PHB content than in normal traits. Various plants can be modified to a better PHB yielding transgenic variety and can be commercialized to produce 'Phytoplastics'.

Keywords: Bioplastics, Polyhydroxyalkonate, Polyhydroxybutarate, transgenic plants.

E-Pharmacy Marketing Strategy for Generic Medicine

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Access to necessary healthcare services continues to be a major challenge, especially in rural and underserved communities in a time of technology improvements. A appstands out as a gamechanging way to close this gap and make high-quality healthcare available to everyone. Therefore we have designed user-friendly app, this app makes it easy to buy generic medications while maintaining high standards of quality. The app ensures the availability of a large selection of generic pharmaceuticals by utilizing a vast network of reliable suppliers and rigorous quality inspections. Users can explore, choose, and order their prescription medications easily from the comfort of their homes, saving them money, time, and effort.

The app's key features, which guarantee a seamless and secure user experience, include stock updates, secure payment methods, and doorstep delivery. The app also gives users useful drug information, empowering them to make decisions about their health that are well-informed. The E-Pharmacy app not only gives people the power to manage their own healthcare, but it also lessens the burden of high medical costs by democratizing access to generic medications. It has the potential to enhance overall community wellbeing, particularly in areas with constrained access to healthcare.

Keywords: E-pharmacy, generic drugs, affordable, high-quality healthcare, rural areas, userfriendly, medication information, and healthcare resources.

A Comprehensive Review on Jackfruit Composite Materials and Sustainable Applications A. Leelavathi, S.M. Arthi, M.S. Soorya, S. Malathi

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In recent years, there has been a growing interest in the development of sustainable materials to address the environmental challenges posed by conventional synthetic materials. Jackfruit (Artocarpusheterophyllus), a tropical fruit native to South and Southeast Asia, has emerged as a promising candidate for sustainable composite materials due to its abundant availability, low cost, and unique combination of mechanical and chemical properties. This review emphasizes the sustainable aspects of jackfruit composites, focusing on their biodegradability, renewability, and eco-friendly characteristics. The environmental impact and life cycle analysis of jackfruitbased materials are discussed, underlining their potential to reduce the carbon footprint associated with conventional materials. The latter part of the article highlights the wide-ranging applications of jackfruit composite materials. Case studies and examples from recent research demonstrate the practical feasibility and performance of these materials in real-world applications. Challenges and future perspectives in the development and commercialization of jackfruit composites are also discussed, emphasizing the need for continued research in areas such as processing optimization, scalability, and cost-effectiveness. In conclusion, this comprehensive review provides valuable insights into the burgeoning field of jackfruit composite materials, offering a holistic understanding of their synthesis, properties, and applications in material engineering.

Keywords: Jackfruit (Artocarpusheterophyllus), panels, composite material, biodegradable

Prominence of Artificial Intelligence in cancer therapy

Umaa Kuppuswamy, **Selsia**, Suhaina Fathima, Muthiah Ramanathan PSG College of Pharmacy, Coimbatore, Tamilnadu, India

A wonderful art of utilizing AI in health care to alleviate the effects of chronic diseases and to go hand in hand with the physicians for effective diagnosis has become the need of the day. There is a boom in the global market on the role of AI, especially in the Health Industry to the extent of 8 billion US dollars by 2026. This has accelerated to this extent due to better Machine Learning algorithms, cost effective hardware and availability of 5G. Saving time, quick personalized monitoring, minimal invasive methods, multi tasking and less human errors due to high precision are the insights deployed by AI technology. This article deals with the insights of AI exclusively in the diagnosis and the treatment of various types of cancers.

Key words: Algorithms, Personalized monitoring, Biomarkers, Patient outcome.

Comparative study of greener and traditional extraction for the identification of sustainable phytocompounds from *Simarouba glauca* leaves for health benefits ¹Vanitha Subburaj, Umaa K², Veintramuthu Sankar³ Email: <u>vanithas2002@gmail.com</u>

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Emerging advancement in the discovery of novel phytochemical compounds from natural sources is a significant milestone in modern healthcare, aiding in the prevention and management of diseases for a healthy well being. One of the biggest issue currently experienced is the climatic change and its impact on human illnesses can be overcome by the sustainability of potential phytochemicals. Simarouba glauca DC is an evergreen flower plant belonging to the family Simaroubaceae. The leaf decoction of SG has been reported to have anticancer, antimalarial, antiviral, antibacterial, and antihelminthic properties in traditional medicine due to the presence of quassinoids, alkaloids, flavonoids, glycosides, phenolic compounds, saponins, and fixed oils. The current study compares the best extraction efficiency from greener extraction compared to conventional extraction. Methanolic and aqueous leaf extracts of Simarouba glauca were prepared by greener extraction as well as conventional extraction method using 2^3 full factorial designs in order to optimize the maximum extraction efficiency in both the methods. The study found that the Ultrasonic Assisted Extraction had the highest extraction responses for both methanol (16% w/w) and aqueous (23% w/w) phases. The Soxhlet method produced good extraction responses for both methanol (13% w/w) and water (22% w/w). LC-MS/MS analysis identified the potential phytochemicals such as flavonoids and phenolic compounds (Hesperetin, Kaempferol, Fisetin and Dicaffeoyl quinolactone) in SG aqueous leaf extract. Similarly potential phytochemicals such as flavonoids, alkaloid, terpenoids, steroids and carotenoids were identified from SG methanol leaf extract. Names of compounds are as follows: Rotenone, Silybin B, Oleuropein, Okaramine C, Adonixanthin, Ginsenoside Rh3, 5, 6-Dihydroxylutein, Bovoside A, Germine, Apigenin 6-C-glucoside 8-C-arabinoside and Isofucoxanthinol. In futuristic study, the biological response of the identified potential phytochemicals from Simarouba glauca needs to be assessed for health benefits.

Keywords: *Greener extraction technique*, climatic change, phytochemicals, LC-MS/MS analysis, *Simarouba glauca*

Transforming Stroke Care: The Impact of Artificial Intelligence in Early Detection, Prediction, and Rehabilitation

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Yogaraj

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Stroke, often referred to as a "brain attack," is a critical medical emergency with the potential for severe consequences. This paper explores the significant role of artificial intelligence (AI) in revolutionizing stroke care by enhancing early detection, precise diagnosis, and innovative rehabilitation. It delves into AI applications in stroke risk prediction, early detection through medical imaging and wearable devices, and AI-assisted treatment and rehabilitation. Several studies and developments in these areas are discussed, highlighting AI's promising impact on stroke care. However, the paper also underscores the importance of addressing challenges related to data privacy, algorithmic biases, and ethical concerns. The integration of AI into stroke care holds the potential to improve patient outcomes and broaden access to quality care, ultimately shaping the future of stroke management.

Keywords: Stroke care, stroke risk prediction, artificial intelligence, wearable devices, machine learning,

AI for life: Trends in artificial intelligence for environmental health and sustainability

Arjunan Karuppiah¹, Preetham Anton Alphonse Rozzario¹, **Ridhu Varshini Jaganathan**

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Environmental health is the branch of public health that: focuses on the relationships between people and their environment; promotes human health and well-being; and fosters healthy and safe communities. Environmental health is a key part of any comprehensive public health system. Climate change is a global threat to humanity throughout world. The long-term changes in weather patterns and temperature have both direct and indirect impacts on lives worldwide. The branch of Artificial Intelligence (AI) which use machine system made up of complex algorithm which stimulate critical thinking and intelligence to perform cognitive function of humans such as making decision, reasoning, problem solving, reasoning, environmental interaction etc. In the present review we have focused the present and futuristic view of AI in environmental health and sustainability.

Keywords: Environment, environmental health, public health, health and safety, smoking, active and passive smoking, carbon monoxide, artificial intelligence

Awareness and perception of air pollution among people in a tertiary care hospital, Coimbatore, India

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Air pollution is a major public health problem in India with majority being exposed to high levels of particulate matter (PM) and other pollutants due to natural and anthropogenic activities leading to various health hazards. Awareness and perceptions among people against this global environmental threat is the cornerstone for any interventions. This study aims to evaluate the knowledge and perception on air pollution amongst people in a tertiary care hospital in Coimbatore, Southern India. This study was done among 154 hospital staff and patients of a tertiary care hospital using stratified sampling for a period of 3 months after obtaining ethics committee approval using semi-structured questionnaire. Data was entered in google forms. Descriptive statistics were represented in frequency and percentage. Majority of study participants were less than 35 years (63%), female (66.2%) and residing in urban areas (74%). 28.6% rated air quality in Coimbatore as hazardous. Major cause of air pollution as listed by the study participants were use of private vehicles (89%), industrial processes (80.5%) and construction activity (51.3%). 92.2% were aware that exposure to air pollution can affect health. 88% agreed that it is every citizen's responsibility to improve quality of air. Only 29.2% were aware of AQI and 33% were aware of particulate matter. 57% have mentioned that air quality has worsened now compared to last year. Majority of the participants were not aware about AQI and particulate matter. Enhancing awareness among people in hospital can serve as an important channel for communicating health effects of air pollution. Government should take action in improving the air quality by creating awareness about sources, AQI, health hazards of air pollution and implement strategies to reduce air pollution by encouraging community participation.

Keywords: Air pollution, awareness, perception, AQI, health effects

Influence of Artificial Intelligence in IV Infusion Therapy

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Intravenous (IV) infusion therapy is an essential medical operation in which a precisely implanted intravenous line or catheter is used to administer fluids, drugs, blood products, or nutrients directly into the patient's bloodstream. This technique facilitates the precise and rapid delivery of these medications by avoiding the digestive system and guaranteeing fast absorption by the body. Creation of an AI software tool to carry out the mechanical system's automatic shutdown via the integration of a manometer, a device that detects pressure variations, and sensors that send a signal and automatically shut off the open infusion tube with the help of a valve to remove pressure imbalances. Creation of an AI software tool that will enable the mechanical system to automatically shut off by signaling sensors using viscosity detectors

About Conference

Climate change is one of the major threats to humanity in the 21st century. From extreme heat waves to drought to intense hurricanes, it affects human health directly and indirectly. While worsening air pollution can cause an impact on cardiac and respiratory systems, climate change changes in vector behavior leading to newer disease epidemics. The role of health professionals in this catastrophe is paramount not just in treating the disease but also prevention and mitigation.

This one day conference aims to decipher the science behind climate change and also understand the health effects of the same. The experienced speakers who have worked in the field of environment would share their valuable insights on these aspects.

About Editors

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