INTERNATIONAL CONFERENCE

4TH GLOBAL CONFERENCE ON NATURAL PRODUCTS & AYUSH SYSTEM OF MEDICINE

THEME: "AYUSH 5.0 : Pharmacology, Digital Innovation and Sustainable herbal Resources for Global health"

10TH – 12TH APRIL, 2026

CONFERENCE PROCEEDING

Organised By

Experimental Pharmacology Lab (EPL),
Department of Pharmacology, PGIMER, Chandigarh

In Collaboration With

RCFC NR-1, National Medicinal Plants Board,
Ministry of AYUSH, Govt. of India
Tridev Aushdiya Podh Utpadak Farmer Society, Rohal

International Union of Basic and Clinical Pharmacology-
Natural Products (IUPHAR-NP)
Supported by Department of Health Research,
Ministry of Health & Family Welfare, GOI

#आयुष ज़िंदगी रहे खुश!!

Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh

Brief History

The PGIMER owes its inception to the vision of late Sardar Pratap Singh Kairon, the then Chief Minister of Punjab, and the distinguished medical educationists of the then combined state of Punjab, supported by the first Prime Minister of India Pt. Jawahar Lal Nehru who considered the institutions of scientific knowledge as temples of learning and the places of pilgrimage. The institute started in 1962 and Pt Jawahar Lal Nehru inaugurated the hospital now named "Nehru Hospital" on 7th July 1963. The Institute was originally under the Government of Undivided Punjab. After the reorganization of the state, the administrative control of the institute passed on to the Union Territory of Chandigarh in November 1966. The Institute became an autonomous body under the Act of Parliament in 1967 functioning under the Ministry of Health and Family Welfare, Government of India.

Mission Statement

PGIMER Chandigarh was mandated to provide high-quality patient care, attain Self- Sufficiency in postgraduate medical education, meet the country's need for highly qualified medical teachers in all medical and surgical disciplines, provide educational facilities for the training of personnel in all important branches of health activity, and to undertake basic Community-based research.

Mandate

PGIMER Chandigarh was conceived in 1960 as a centre of excellence that would endeavour to develop patterns of teaching in postgraduate medical education in as many branches as possible and attempt to produce specialists in several disciplines of medicine. It was also envisaged that these specialists would spread out in the country in various medical colleges and medical institutions and impart medical education of the highest standard to the students and set up a nucleus of excellence in their own institutions. The PGIMER was also given the responsibility to broaden the horizons of medical knowledge through intensive research in the field of health.

Department of Pharmacology, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh

The Department of Pharmacology was started in the year 1964 under the headship of Professor Ranjit Roy Chaudhury. The department is recognized for pioneering the first D.M Clinical Pharmacology course in the country during the year 1979 in collaboration with World Health Organization. Besides D.M, Clinical Pharmacology, the department also has M. D, M.Sc and PhD Pharmacology courses.
At present the department has seven faculty members.

Some regular contributions of the department in the years since its inception are:

1. Conduct of National Workshop of Clinical Pharmacology for the last 30 years. The workshop is noted countrywide for its curriculum which covers most of the aspects of clinical pharmacology and drug development process.
2. Quarterly publication of "Drugs Bulletin" for the last 30 years. The articles are aimed at general practitioners, academicians and students. The bulletin has been regularly covering review articles about various drugs and recent developments on the management of various diseases. It is affiliated to International Society of Drugs Bulletin.
3. The Clinical Pharmacology Unit, situated in the Nehru Hospital is a specialized state of the art unit for conducting phase I and also proof of concept studies.
4. Operating the drug Information Centre for the last 8 years. All information's pertaining to drugs and therapeutics may be obtained telephonically by contacting 2755245. An effort to provide evidence based reply to the query is made.
5. The Pharmacovigilance center is monitoring and reporting adverse drug events associated with the use of drugs in the hospital setting since 1st October 2010. Pharmacovigilance Centre is also serving as Regional Centre for training & Technical support for North India under The Ministry of Health & Family Welfare, Govt. of India.
6.

Besides the above, the department holds a track record of conducting basic and clinical research in various specialized areas and has been consistent in publishing the research findings in reputed indexed journals. In its efforts to promote evidence-based medicine, the department has produced systematic reviews on various topics in the last few years.

The alumini of the department have created a mark in the academic circle and in pharmaceutical industry. They are recognized both nationally and internationally.

Experimental Pharmacology Laboratory (EPL)

Experimental Pharmacology Laboratory (EPL) aimed to organize and undergo planning for the clinical and non-clinical study design, data, information, and facts for the advancement of knowledge in drug discovery and pharmacology, been established in 2009. The primary objective of EPL is to evaluate what questions need to be answered and so, the mission of EPL is to foster research in different specialties such as neurological conditions, CVS, GIT, Orthopedic, and anti-cancer. EPL's long-term ambition is to encourage novel and creative approaches to basic and clinical research problems and create awareness regarding drug development in India and abroad. Moreover, also organize different workshops and conferences for the students, residents, and faculty to foster their career and innovative horizon. The EPL has ongoing collaborations with various departments at PGIMER and Punjab University, Chandigarh, and NIPER, Mohali. EPL believes in teamwork which means the ability to work together toward a common vision. The goal of the team of EPL is to study brain-based cognitive functioning, and its disorders, enhance teaching and research mentoring in clinical and cognitive neuroscience, and evaluate therapeutic approaches for autism, Alzheimer's disease, Parkinson's Disease, celiac disease, and malaria. EPL focuses on establishing animal models and exploring the pathophysiology of various clinical ailments including Cerebral ischemia, Alzheimer's disease, Epilepsy, Autism, Malaria, Celiac disease, and Inflammatory Bowel Disease. EPL's capability to become a leader with the main motto is to develop and understand human behavior/condition and improve bench to bedside and vice versa research to serve humanity.

REGIONAL CUM FACILITATION CENTRE
NORTHERN REGION-1 JOGINDER NAGAR

Regional-cum-Facilitation Centre (Northern Region-1) RIISM, Jogindernagar (Mandi), National Medicinal Plant Board, Ministry of AYUSH, GOI

Regional cum Facilitation Centre for North India States [RCFC (NR-1)] of the National Medicinal Plants Board is situated at the Research Institute of Indian System of Medicine, Joginder Nagar, District Mandi, Himachal Pradesh. RCFC (NR-1) started its functioning in September 2017. The mandate of the center is to act as one stop to facilitate all the different stakeholders in the Medicinal Plants sector in the Seven Northern States viz., Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, Delhi, and Chandigarh. As a group, these Northern States exhibit great variation in climate, altitude, latitude, topography, and agroclimatic conditions which has a great impact on its floristic bio-diversity including Medicinal and Aromatic Plants (MAPs). Uttar Pradesh, Punjab, Delhi, and Haryana are typically tropical inclimate while Himachal, Uttarakhand, and Chandigarh are Sub-Tropical to extreme temperate in their climatic conditions. In this way, this region is highly enriched in its biodiversity of a large number of MAPs. During the last 4-5 years, RCFC NR-1, NMPB, Joginder Nagar has created a plate form to address the various issues for the benefit of the different stakeholders in this sector in the region.

Department of Health Research
Ministry of Health and Family Welfare
Government of India

Department of Health Research under the Ministry of Health & Family Welfare, Govt. of India

The President notified the creation of the Department of Health Research under the Ministry of Health & Family Welfare through an amendment to the Government of India (Allocation of Business) Rules, 1961 on the 17th September 2007. The Department of Health Research was formally launched on 5th October 2007 by the Minister for Science & Technology and Earth Sciences in a function presided over by the Minister for Health & Family Welfare, in the presence, inter-alia, of the Minister of State for Health & Family Welfare.

Department of Health Research (DHR) was created as a separate Department within the Ministry of Health & Family Welfare by an amendment to the Government of India (Allocation of Business) Rules, 1961 on 17th Sept, 2007. The Department became functional from November 2008 with the appointment of first Secretary of the Department. The aim of the DHR is to bring modern health technologies to the people through research and innovations related to diagnosis, treatment methods and vaccines for prevention; to translate them into products and processes and, in synergy with concerned organizations, introduce these innovations into public health system.

The following 10 functions (nine new functions, plus the function of administering the ICMR) have been allocated to the Department of Health Research:

1. Promotion and co-ordination of basic, applied and clinical research including clinical trials and operational research in areas related to medical, health, biomedical and medical profession and education through development of infrastructure, manpower and skills in cutting edge areas and management of related information thereto.
2. Promote and provide guidance on research governance issues, including ethical issues in medical and health research.
3. Inter-sectoral coordination and promotion of public- private – partnership in medical, biomedical and health research related areas.
4. Advanced training in research areas concerning medicine and health, including grant of fellowships for such training in India and abroad.
5. International co-operation in medical and health research, including work related to international conference in related areas in India and abroad.
6. Technical support for dealing with epidemics and natural calamities.
7. Investigation of outbreaks due to new and exotic agents and development of tools for prevention.
8. Matters relating to scientific societies and associations, charitable and religious endowments in medicine and health research areas.
9. Coordination between organization and institutes under the Central and State Governments in areas related to the subjects entrusted to the Department and for the promotion of special studies in medicine and health.
10. Administering and monitoring of Indian Council of Medical Research (ICMR).

आयुर्वेद शिक्षण एवं अनुसंधान संस्थान
Institute of Teaching and Research in Ayurveda
(राष्ट्रीय महत्व का संस्थान, आयुष मंत्रालय, भारत सरकार)
(Institute of National Importance, Ministry of Ayush, Government of India)
"बी" डिविजन पुलिस स्टेशन के सामने, गुरुद्वारा रोड, जामनगर - 361 008
Opp. B – Division Police Station, Gurudwara Road, Jamnagar – 361 008
https://itra.ac.in
I.T.R.A

Prof. Tanuja Nesari
Director, ITRA, Jamnagar, Gujarat

Key Message

It is a matter of great pleasure to extend my heartfelt greetings on the occasion of the *4th Global Conference on Natural Products & AYUSH System of Medicine, organized By Experimental Pharmacology Laboratory Department of Pharmacology, PGIMER, Chandigarh in collaboration with RCFC(NR-1) of Medicinal Plants Board, Ministry of AYUSH, Govt. of India, Tridev Aushdiya Podh Utpadak Farmer Society, Rohal, International Union of Basic and Clinical Pharmacology-Natural Products (IUPHAR-NP), Supported by Department of Health Research (DHR), Ministry of Health & Family Welfare, Govt. of India.* The theme, **"AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health,"** is both timely and visionary, reflecting the evolving landscape of traditional medicine in the modern era.

AYUSH systems have long been a cornerstone of holistic healthcare, offering safe, effective, and sustainable solutions. As we move towards AYUSH 5.0, the integration of advanced pharmacological research, digital technologies, and sustainable utilization of herbal resources will play a pivotal role in strengthening global health systems. This convergence will not only enhance scientific validation but also improve accessibility, quality assurance, and global acceptance of traditional medicine.

Natural products continue to serve as a rich reservoir for drug discovery and therapeutic innovation. It is essential that we adopt a multidisciplinary and evidence-based approach to harness their full potential while ensuring conservation and sustainability of our invaluable biodiversity.

I am confident that this conference will provide an excellent platform for researchers, academicians, clinicians, and industry experts to exchange ideas, foster collaborations, and explore innovative pathways for the advancement of AYUSH systems worldwide.

I extend my best wishes for the grand success of the conference and hope it contributes significantly towards shaping a healthier and sustainable global future.

Warm regards,

(Prof. Tanuja Nesari)
Director

Date : March 27, 2026

Prof. (Dr.) Rajeev Sood
Vice Chancellor

BABA FARID UNIVERSITY OF HEALTH SCIENCES, GOVT. OF PUNJAB
(A State University established under Act No.18 of 1998)
Sadiq Road, Faridkot -151203 (INDIA)
Phone No. +91-1639-256232, 256756 (O)
Email: officebfuhs@gmail.com
vcbfuhs@punjab.gov.in

Message

It is a matter of great pleasure to know that the *4th Global Conference on Natural Products & AYUSH System of Medicine* is being organized from 10–12 April 2026 at the Postgraduate Institute of Medical Education and Research, Chandigarh with the theme "AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health."

The AYUSH systems of medicine represent a rich legacy of traditional knowledge that has served humanity for centuries. In the present era, the integration of pharmacological research, digital technologies, and sustainable utilization of herbal resources offers a transformative pathway to strengthen evidence-based traditional medicine and expand its global relevance. Initiatives such as AYUSH 5.0 signify an important step towards modernizing traditional healthcare practices while preserving their scientific and cultural foundations.

Conferences of this nature play a vital role in bringing together scientists, clinicians, pharmacologists, researchers, policy makers, and industry experts to deliberate on emerging trends, share innovative research, and explore collaborative strategies for advancing natural product research and Ayush systems. The focus on sustainable herbal resources is particularly significant in ensuring the responsible conservation and utilization of medicinal plants for future generations.

I congratulate the Department of Pharmacology, PGIMER, Chandigarh, the National Medicinal Plants Board, Ministry of Ayush, Govt. of India, and all collaborating organizations for organizing this important global forum. I am confident that the deliberations and scientific exchanges during this conference will contribute meaningfully to strengthening the role of Ayush and natural products in achieving integrative, accessible, and sustainable healthcare worldwide.

I convey my best wishes for the grand success of the conference and hope it will inspire further research, innovation, and international collaboration in this vital field.

With Regards,

Prof. (Dr.) Rajeev Sood,
Vice Chancellor

Professor Valérie Schini-Kerth
Chair, IUPHAR Natural Products Section

Welcome words from Professor Valérie Schini-Kerth
Chair of the IUPHAR Natural Products Section

On behalf of the IUPHAR Natural Product Section, I warmly commend the 4th Global Conference on Natural Products & AYUSH System of Medicine, and I affirm our strong support for its theme "AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health."

This conference positions AYUSH and natural product research as pivotal drivers of global health, sustainability, and digital wellness, uniting scientific validation, biodiversity conservation, and policy insight to chart a future-ready roadmap.

We look forward to collaborative advances that bridge modern biomedicine with AYUSH systems, accelerating pharmacological innovations while upholding ethical stewardship of herbal resources.

I wish all attendees a stimulating and fruitful conference, with inspiring discussions and valuable outcomes.

March 14th, 2026

Professor Valérie Schini-Kerth
Chair, IUPHAR Natural Products Section

केंद्रीय आयुर्वेदीय विज्ञान अनुसंधान परिषद्
आयुष मंत्रालय, भारत सरकार

Central Council for Research in Ayurvedic Sciences
Ministry of Ayush, Govt. of India

प्रो. (वैद्य) रबिनारायण आचार्य, पीएचडी, डीऐससी
Prof. (Vaidya) Rabinarayan Acharya, PhD, DSc
महानिदेशक / Director General

Dated the 19th March 2026

Message

It gives me immense pleasure to extend my warm greetings and heartfelt congratulations to the Department of Pharmacology, PGIMER, Chandigarh, for organizing the **"4th Global Conference on Natural Products & AYUSH System of Medicine"** on the theme *"AYUSH 5.0: Pharmacology, Digital Innovation and Sustainable Herbal Resources for Global Health"* from 10th to 12th April 2026 at Chandigarh.

The theme "AYUSH 5.0" is itself a testimony to the sustained commitment of the Department of Pharmacology, PGIMER, which has, over successive editions of this conference, consistently championed the integration of natural product science with contemporary biomedical research — progressively elevating the scientific discourse with each iteration.

This global platform rightly emphasizes scientific validation, biodiversity conservation, and digital health innovation as foundational pillars of the AYUSH 5.0 roadmap. In an era of rapid advances in Artificial Intelligence, network pharmacology, and precision pharmatechnology, there is an urgent need for an integrative approach that brings premier institutes of national importance — such as PGIMER, AIIMS, IITs, and NIPERs — into active collaboration with Ayush research bodies. Institutions like PGIMER are uniquely positioned to lend scientific rigour and global credibility to Ayush validation, accelerating the journey from traditional wisdom to evidence-based therapeutics.

I am confident that the deliberations on drug standardization, medicinal plant resource management, digital health, and next-generation biopharma will inspire meaningful collaborative research and policy frameworks. I convey my best wishes to the organizers, faculty, and participants for the grand success of this conference and its continued contribution to holistic, evidence-driven healthcare for all.

(Prof. Vd. Rabinarayan Acharya)

Prof. Dr. N.J. Muthukumar
Director General
Central Council for Research in Siddha
(Ministry of Ayush, Government of India)
Tambaram Sanatorium, Chennai,
Tamil Nadu, Pin code – 600047.

KEY MESSAGE

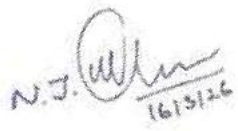
Natural products have served as the cornerstone of traditional medicine systems in treating various ailments for centuries and continue to inspire modern pharmacological research. Within the AYUSH framework, particularly in Siddha system of medicine, medicinal plants, minerals, and herbo-mineral preparations constitute a rich repository of therapeutic agents with immense potential for the management of both acute and chronic diseases. Scientific exploration of these natural resources, through contemporary research methodologies, is essential to validate their efficacy, ensure safety, and facilitate their integration into evidence-based healthcare.

The theme of the conference, *"AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health,"* is highly relevant in the present context, as it highlights the importance of integrating traditional knowledge with modern pharmacological research, digital innovations, and the sustainable utilization of herbal resources to address emerging global health challenges.

The growing global interest in integrative medicine underscores the relevance of AYUSH systems in addressing current healthcare challenges. Traditional Indian Medical systems such as Siddha emphasize a holistic approach encompassing preventive care, lifestyle regulation, and personalized treatment strategies. In this context, contemporary research on AYUSH systems not only supports the development of novel therapeutics but also strengthens the scientific foundation of traditional knowledge, thereby contributing significantly to drug development and holistic healthcare practices.

I appreciate the efforts made by the organizers for giving this valuable platform for academicians, clinicians, pharmacologists, and researchers to exchange ideas, share innovative findings, and discuss emerging trends in natural product research and traditional medicine. Such initiatives significantly contribute to bridging the gap between classical knowledge and modern scientific validation, thereby enhancing the credibility and global acceptance of AYUSH systems.

I extend my best wishes for the grand success of this Conference and hope that its proceedings will serve as a valuable resource for researchers, practitioners, and policymakers committed to advancing traditional medicine for the benefit of global health.



Prof. Dr. N.J. Muthukumar

Government of Punjab
Directorate of Ayurveda, Punjab
Sector-11D, Chandigarh

Email id: dayurvedapunjab@gmail.com Ph. No.0172-2743708

"It is a matter of great pride that the vibrant city of Chandigarh is hosting the 4th Global conference on Natural & AYUSH system of Medicine.

Punjab has proactively adopted technology, such as the E-Yog App, to make wellness accessible to every household.

The future of Ayurveda lies in Scientific Validation by Pharmacological research that integrates modern biomedicine with AYUSH Systems.

Punjab's agricultural strength is a vital asset for the global supply of sustainable herbal resources. So the focus should be on the 'Farm to Pharmacy' model.

March 16th, 2026

Dr. Raman Khanna,
Director Ayurveda, Punjab

S.A.S. NAGAR
प्रो. दुलाल पाण्डा
एफ.एन.ए., एफ.ए.एससी., एफ.एन.ए.एससी
निदेशक
Prof. Dulal Panda
FNA, FASc, FNASc
Director

राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान
NATIONAL INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH (NIPER)
(औषध विभाग, रसायन एवं उर्वरक मंत्रालय, भारत सरकार)
(Deptt. of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Govt. of India)
सैक्टर 67, एस.ए.एस. नगर (मोहाली)–160 062, पंजाब, भारत
Sector 67, S.A.S. Nagar (Mohali) - 160 062 Punjab, India

Message

It gives me immense pleasure to welcome all distinguished participants to the 4th Global Conference on Natural Products & AYUSH System of Medicine being organized from 10–12th April 2026 at PGIMER Chandigarh in collaboration with RCFC (NR-1) of the Medicinal Plants Board, Ministry of AYUSH, GoI; Tridev Aushdiya Podh Utpadak Farmer Society, Rohal; and the International Union of Basic and Clinical Pharmacology–Natural Products. The conference is supported by Department of Health Research (DHR), Ministry of Health & Family Welfare, Govt. of India

The chosen theme, *"AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health"*, reflects the evolving vision of integrating traditional wisdom with modern digital science. AYUSH 5.0 is not merely a framework—it is a call to action for researchers, practitioners, policymakers, and industry leaders to harness the power of pharmacology, digital technologies, and sustainability in advancing natural product research and healthcare delivery.

The future of global health lies in collaborative innovation. By strengthening farmer–scientist partnerships, promoting evidence-based pharmacology, and leveraging digital platforms, we can ensure that herbal resources are utilized responsibly and sustainably. This conference provides a unique platform to deliberate on these priorities, exchange knowledge, and chart pathways for impactful outcomes. I am hopeful that the interactions between delegates and experts will lead to the innovation roadmap for the benefit of healthcare ecosystem of the country.

I extend my heartfelt gratitude to all organizers and participants for joining hands in this endeavour. Together, let us reaffirm our commitment to advancing AYUSH systems and natural product research for the benefit of humanity.

Wishing the conference resounding success!

(Prof. Dulal Panda)
Director, NIPER Mohali

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PROF. VAIDYA KARTAR SINGH DHIMAN
VICE CHANCELLOR
Ph.D., M.D. (Ay.), CHM, FRAV

प्रो. वैद्य करतार सिंह धीमान
कुलपति

SHRI KRISHNA AYUSH UNIVERSITY,
KURUKSHETRA – 136118 (INDIA)
(Established by the Haryana State Legislature Act-25 of 2017)

श्री कृष्ण आयुष विश्वविद्यालय,
कुरुक्षेत्र – 136118 हरियाणा
(हरियाणा राज्य विधान सभा अधिनियम संख्या 25/2017 द्वारा स्थापित)

Prof. (Vd.) Kartar Singh Dhiman
Vice Chancellor, Shri Krishna AYUSH University, Haryana

Key Message

My warmest greetings to all participants, speakers, and organizers of the 4th Global Conference on Natural Products & AYUSH System of Medicine, Focused on the visionary theme "AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health." Organized By Experimental Pharmacology Laboratory Department of Pharmacology, PGIMER, Chandigarh in collaboration with RCFC(NR-1) of Medicinal Plants Board, Ministry of AYUSH, Govt. of India, Tridev Aushdiya Podh Utpadak Farmer Society, Rohal, International Union of Basic and Clinical Pharmacology-Natural Products (IUPHAR-NP)

As we navigate this transformative era in healthcare, AYUSH systems are evolving beyond traditional boundaries to emerge as scientifically validated and technology-driven pillars of global wellness. The concept of AYUSH 5.0 represents a harmonious convergence where ancient wisdom meets the precision of modern science and digital innovation, ensuring continued relevance in a rapidly advancing world.

Our collective mission rests upon three critical pillars: **Pharmacological Excellence, Digital Innovation, and Sustainability**. By elucidating the molecular and mechanistic basis of natural products, we bridge the gap between traditional empirical knowledge and evidence-based modern medicine, thereby ensuring safety, efficacy, and global acceptability. Concurrently, the integration of advanced technologies such as artificial intelligence, digital health platforms, and transparent supply chain systems has the potential to make AYUSH more accessible, efficient, and personalized.

Equally important is our responsibility towards the sustainable utilization and conservation of medicinal plant resources. The strength of AYUSH lies in nature, and safeguarding biodiversity through responsible practices is essential for ensuring long-term healthcare solutions for both humanity and the environment.

I extend my sincere best wishes for the successful conduct of this conference. May it foster meaningful discussions, inspire innovative research, and strengthen collaborative efforts toward advancing AYUSH systems for the benefit of global health. I wish all participants a rewarding and enriching experience.

24.3.26.

Prof. (Vaidya) Kartar Singh Dhiman

Ministry of AYUSH
National Medicinal Plants Board (NMPB)
Regional-cum-Facilitation Centre Northern Region-1 (RCFC NR-1)
Chandigarh, Delhi, Haryana, Himachal, Punjab, Uttar Pradesh & Uttarakhand
First Floor, COEDG Building,
Research Institute in Indian Systems of Medicine (RIISM)
Joginder Nagar-175015 District Mandi HP
E-mail: rcfcnorth@gmail.com, Tel: 01908-222333

Date: 01.04.2026

Foreword

It gives me immense pleasure to present this Foreword to the Abstract Book of the *4th Global Conference on Natural Products & AYUSH System of Medicine*. I extend my warm greetings to all participants, researchers, academicians, traditional knowledge holders, and healthcare practitioners whose collective efforts have made this conference a meaningful and impactful scientific gathering.

As a long-standing collaborator in this initiative alongside PGIMER Chandigarh, RCFC (NR-1), National Medicinal Plants Board, Ministry of AYUSH, is committed to fostering platforms that enable constructive dialogue between traditional knowledge systems and modern scientific advancements.

This Abstract Book is a reflection of the diverse and rich scientific contributions presented at the conference. It captures innovative research, interdisciplinary approaches, and emerging perspectives in the domain of natural products and AYUSH systems. I particularly encourage young scientists, innovators, and community stakeholders to draw inspiration from these contributions and actively engage in advancing evidence-based, inclusive, and sustainable healthcare solutions.

At RCFC (NR-1), our efforts remain focused on strengthening the scientific foundation of AYUSH through integration with modern pharmacology. Our initiatives in network pharmacology, AI/ML applications, and clinical research for repurposing AYUSH products underscore our commitment to validation, innovation, and global relevance.

Equally important are our initiatives in the conservation of Rare, Endangered, and Threatened (RET) species, ethnobotanical documentation, and promotion of sustainable cultivation practices under GACP/GFCP frameworks. These efforts are essential for ensuring long-term resource sustainability and ecological balance.

We also emphasize policy convergence, development of global standards, and strengthening of legal frameworks, while promoting grassroots entrepreneurship through SHGs and FPCs. Empowering women, youth, and tribal knowledge holders continues to be central to our vision of an inclusive and resilient AYUSH ecosystem.

I am confident that this Abstract Book will serve as a valuable resource for researchers, practitioners, and policymakers, and that the outcomes of this conference will contribute significantly to advancing a future-ready AYUSH 5.0 framework.

I extend my best wishes for the continued success of this initiative.

(Dr. Arun Chandan)
PI/NC formerly Regional Director

FACULTY OF INDIGENOUS MEDICINE – UNIVERSITY OF COLOMBO

Founded in 2023

Prof. Pathirage Kamal Perera BAMS, Master's Degree/ PhD in Pharmacology (Najing, P.R. China)

Trained and Certified in Research and Development of Products to Meet Public Health Needs (Japan) (Post Doc)
Trained and Certified in Pharmacovigilance and Drug safety – Uppsala Monitoring Center, Sweden

Founder Dean of Faculty of Indigenous Medicine Professor in Ayurveda Medicine, Consultant Physician, Department of Ayurveda Pharmacology, Pharmaceutics and Community Medicine

Prof. Pathirage Kamal Perera

"Traditional medicine systems represent a shared global heritage, with AYUSH offering a mature, codified framework grounded in long-standing clinical experience. Across countries, clinical trials in traditional medicine are increasingly demonstrating relevance for non-communicable diseases, mental health, healthy aging, preventive care and many more disease concerns. Methodological advancements such as adaptive designs, real-world evidence, and digital health integration are helping align traditional medicine research with international standards. However, global acceptance depends on collectively addressing challenges related to reproducibility, standardization, and regulatory convergence. International collaboration through joint trials, shared protocols, and data transparency is essential. Policy support is critical to move traditional medicine from parallel practice to mainstream health systems. Investment in capacity building, dedicated research funding, data governance frameworks, and public-private partnerships will enable scalable, evidence-based integration.

Platforms like this conference, hosted by PGIMER, Chandigarh, India foster the cross-cultural scientific dialogue needed to integrate traditional medicine into global evidence-based healthcare for sustainable and equitable health outcomes worldwide."

Kamal Perera

Professor (Dr.) Pathirage Kamal Perera

Prof. Akshay Anand

Herbal and natural products have been used in healthcare for thousands of years and remain important in improving global health. Before modern pharmaceuticals, people relied on plants and natural substances to treat diseases, and this practice continues today due to its accessibility, affordability, and cultural acceptance. As healthcare systems face rising costs, limited access, and increasing chronic diseases, herbal medicine offers a sustainable and inclusive alternative. Traditional systems such as Ayurveda, Traditional Chinese Medicine, and Unani have developed extensive knowledge of medicinal plants over generations. In many rural and resource-limited areas, these systems still serve as the primary form of healthcare. Herbal medicines are often locally available and affordable, making them especially valuable in developing countries where modern drugs may be costly or inaccessible. Herbal and natural products have contributed significantly to modern medicine. Many pharmaceutical drugs are derived from plant compounds, showing that traditional remedies can inspire scientific innovation. Today, integrative healthcare approaches combine herbal therapies with modern treatments to provide more holistic care, improving patient outcomes and overall well-being. In addition, herbal products play an important role in preventive healthcare. They often contain antioxidants and anti-inflammatory compounds that help strengthen the body's defenses and reduce the risk of chronic diseases. However, their use must be responsible, as improper use, drug interactions, or poor-quality products can pose risks. Scientific research, regulation, and public awareness are essential to ensure safety and effectiveness. Protecting traditional knowledge and ensuring fair benefits for indigenous communities are important ethical concerns. In US, a gap exists between traditional Ayurvedic framework and US regulatory framework. In Ayurveda, treatment is personalized and practitioner-driven, where prescriptions are given by an Ayurvedacharya and is customized, time-bound, and context-specific. However, in US, herbal products are usually sold as dietary supplements; they are mass-produced, standardized, and consumer-directed. The growing global market for herbal products creates opportunities for economic development but requires strong quality standards and regulation. Moreover, conservation of medicinal plants is also crucial, as many species are threatened by environmental changes and overuse. In conclusion, herbal and natural products remain a valuable part of global healthcare. With proper research, regulation, and sustainable practices, they can complement modern medicine, support disease prevention, and improve healthcare access while preserving cultural knowledge and biodiversity.

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Message

I am delighted to learn that the Department of Pharmacology at PGIMER, in collaboration with RCFC (NR-1) of the National Medicinal Plants Board (Ministry of AYUSH, Government of India) and Tridev Aushdiya Podh Utpadak Farmer Society, Rohal, IUPHAR-NP, is organizing the 4th Global Conference on Natural Products and AYUSH System of Medicine from 10th to 12th April 2026 in hybrid mode at PGIMER, Chandigarh.

In the context of the evolving landscape of global healthcare, the theme "AYUSH 5.0: Pharmacology, Digital Innovation and Sustainable Herbal Resources for Global Health" is both forward looking and highly relevant. It aptly underscores the convergence of traditional wisdom with modern pharmacology, digital transformation, and sustainable resource management. The conference is poised to serve as a dynamic platform to examine these intersections in depth, particularly through its focused sub-themes on drug standardization, safety and regulatory sciences, conservation and sustainable use of medicinal plant biodiversity, digital Ayurveda and knowledge systems, as well as innovation in next-generation AYUSH biopharma. Emphasis on global trade, policy frameworks and community empowerment further strengthens its holistic and impactful vision.

The breadth of the themes will undoubtedly encourage rich scientific dialogue and foster interdisciplinary collaboration among national and international stakeholders. I am confident that participating scientists, academicians, clinicians and research scholars will engage in meaningful exchanges, addressing contemporary challenges while advancing evidence-based integrative healthcare and phytopharmaceutical development.

This conference presents a significant opportunity to collectively shape resilient and inclusive healthcare systems rooted in innovation, sustainability and equitable access. The insights and recommendations emerging from these deliberations will contribute meaningfully to policy development and strengthen ongoing efforts to deliver affordable and quality healthcare.

I congratulate Prof. Bikash Medhi and his team at the Department of Pharmacology, PGIMER, Chandigarh, for their dedicated efforts in organizing this important global forum. I extend my best wishes to all participants for fruitful and intellectually enriching deliberations.

(Dr Shahid Rasool)

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Message from Organizing Chairman

I am delighted to extend my heartfelt gratitude to each one of you for your active participation and invaluable contributions to the **4th Global Conference on Natural Products & AYUSH System of Medicine**. Organized by the Experimental Pharmacology Laboratory (EPL), Department of Pharmacology, PGIMER, Chandigarh, this prestigious event marks a significant milestone in our collective journey towards advancing knowledge and fostering global collaboration in the field of natural products and traditional medicine. The conference, held from **10th to 12th April 2026**, brought together an esteemed gathering of researchers, academicians, healthcare professionals, policymakers, and industry experts from across the globe. The diverse range of presentations and discussions underscores the multifaceted dimensions of natural products and traditional systems of medicine, offering a comprehensive understanding of the latest advancements, innovations, and research breakthroughs in these domains. This year's conference places strong emphasis on key themes reflecting the evolving global healthcare landscape. It highlights the importance of integrative medicine in strengthening community healthcare and promotes the convergence of modern medicine with traditional healing systems for holistic and sustainable healthcare solutions. A significant focus is also placed on evidence-based clinical research, standardization, and the development of plant-based formulations, reinforcing the importance of scientific validation in traditional medicine practices.

The deliberations further emphasize the crucial role of natural products in addressing emerging global challenges such as antimicrobial resistance and the rising burden of non-communicable diseases. Additionally, the conference underscores the importance of promoting the Phyto-pharmaceutical sector through the utilization of high-value medicinal and aromatic plants, thereby fostering innovation, research, and industry collaboration at both national and international levels. I extend my sincere appreciation to the organizing committee, distinguished speakers, advisors, and all oral and poster presenters for their unwavering dedication and efforts in making this conference a grand success. Your contributions have transformed this event into a dynamic platform for intellectual exchange, academic excellence, and meaningful professional networking.

As we reflect upon the insightful discussions and the wealth of knowledge shared, let us continue to uphold the spirit of collaboration and remain committed to advancing research, innovation, and global partnerships in the field of natural products and AYUSH system of medicine. The abstract compendium, showcasing the pioneering research presented during the conference, stands as a testament to our shared vision of scientific progress and holistic healthcare advancement.

Prof. Bikash Medhi

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Message from Organizing Secretary

Greetings from PGIMER, Chandigarh!

Natural products have long served as the bedrock of therapeutic discovery, bridging ancient ethnomedicinal wisdom with the precision of contemporary pharmacology. Derived from plants, microbes, marine flora, and fungi, these secondary metabolites continue to fuel drug pipelines. Their development begins with sustainable sourcing guided by biodiversity hotspots, traditional knowledge systems, and ethical bioprospecting under frameworks like the Nagoya Protocol. High-throughput screening and AI-driven molecular docking now accelerate lead identification, transforming crude extracts into viable drug candidates within months rather than decades.Bioactivity profiling employs *in vitro* assays (cytotoxicity, enzyme inhibition, antimicrobial susceptibility) and advanced omics technologies metabolomics, proteomics, and transcriptomics to map molecular mechanisms. Stability, bioavailability, and toxicity are quantified using ADMET models and zebrafish or organ-on-chip platforms, ensuring only robust candidates advance to preclinical stages.The coherence of natural products with modern medicine is neither anecdotal nor oppositional; it is synergistic and evidence-based. Over 60 % of small-molecule drugs approved between 1981 and 2024 trace their origins to natural scaffolds. Aspirin (from willow bark salicin), artemisinin (*Artemisia annua*), and paclitaxel (*Taxus brevifolia*) exemplify how traditional leads, once validated through randomized controlled trials and meta-analyses, integrate seamlessly into standard-of-care protocols. Regulatory pathways such as the DCG(I), Ayush, FDA's Botanical Drug Guidance and EMA's traditional herbal medicinal product directive have formalised this integration, demanding rigorous standardisation, fingerprinting, and Good Manufacturing Practice (GMP) compliance. On behalf of the organizing committee of **4th Global Conference on Natural Products & AYUSH System of Medicine during 10th – 12th April 2026**, I extend our deepest gratitude to all distinguished speakers and experts who shared their groundbreaking research and clinical insights during this conference. Your presentations illuminated pathways from bench to bedside and inspired collaborative ventures across continents. To every delegate, poster presenter, sponsor, and volunteer who travelled to be here, thank you.

Your active participation, thoughtful questions, and vibrant discussions have made this gathering truly transformative. We look forward to translating today's ideas into tomorrow's therapies.

Thank you once again.

Dr Ajay Prakash

Dr. Deeksha Salaria
(Co-organizing Secretary)

Er. Rajan Rolta
(Co-organizing Secretary)

"Jai Hind"

We welcome all delegates Speakers & Experts to the 4th Global Conference on Natural Products & AYUSH System of Medicine, focoused on the theme "AYUSH 5.0: Pharmacology, Digital Innovation, and Sustainable Herbal Resources for Global Health." Building upon the remarkable success of our previous National Conferences held in June 2023 (20th–21st), April 2024 (19^{th}-21st), and April 2025 (18^{th}-20^{th}), this global gathering marks a significant milestone in our journey toward advancing knowledge, research, and innovation in the fields of natural products and AYUSH systems. This conference stands as a vibrant platform for researchers, practitioners, academicians, and industry experts to come together, exchange ideas, and foster meaningful collaborations. Your presence enriches this forum, contributing to a shared vision of promoting holistic health and sustainable healthcare solutions worldwide. As we engage in insightful sessions, thought-provoking discussions, and valuable networking opportunities, let us embrace the diversity of perspectives that each participant brings. It is through such collective effort and interdisciplinary collaboration that we can drive impactful progress. We encourage you to actively participate, share your insights, and build lasting connections that extend beyond this event. Your contributions are vital in shaping the future of global health and innovation in AYUSH and natural product research. On behalf of the organizing committee, we extend our sincere gratitude for your participation and support. May this conference inspire new ideas, strengthen collaborations, and leave you with lasting memories and valuable knowledge.

Dr. Deeksha Salaria

Er. Rajan Rolta

INDEX

OFOPNCDC1

Lactoferrin-Coated Magnesium Oxide Nanoparticles (MgO NPs) To Evaluate Their Potential Against Gastric Cancer

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Background: Gastric cancer ranks fifth in global incidence and fourth in mortality, driven by risk factors like *H. pylori* infection, EBV, genetics, diet, smoking, and alcohol. Conventional treatments cause toxicity, drug resistance, and poor targeting. Nanotechnology, including MgO nanoparticles for ROS-induced apoptosis in acidic tumors and lactoferrin (Lf) for receptor-mediated delivery, offers promise, but MgO-Lf in GC remains unexplored. **Materials and Methods:** MgO nanoparticles synthesized via co-precipitation of magnesium nitrate hexahydrate and NaOH, forming milky precipitates at pH 12.5, aged overnight. Lf coating used EDC/NHS activation, stirring overnight, purified by centrifugation. AGS cells cultured in DMEM+10% FBS at 37°C, 5% CO_2. Characterizations: DLS/Zeta (Malvern), UV-Vis (Shimadzu), FTIR (Agilent), in silico Mg-Lf docking (MIB server, PDB:1B0L). Antibacterial assay: agar well diffusion vs. *H. pylori* (ATCC 700392). **Results:** DLS showed uniform 4-10 nm (peak 6-8 nm) hydrodynamic size. UV-Vis confirmed Lf-MgO interaction via absorbance shifts <300 nm. FTIR displayed shifted peaks (O-H/N-H 3200-3400 cm^{-1}, C-O/N-H 1400-1600 cm^{-1}), verifying conjugation. In silico predicted Mg-binding residues (e.g., 216E/217D score 3.921; 626D/629D/630K score 3.845). MgO NPs inhibited *H. pylori* (1.2-1.4 cm zone vs. 1.6 cm Ankamycin; Mg salt 0.6-0.8 cm). MTT cytotoxicity performed. **Conclusions:** Synthesized MgO-Lf nanoparticles exhibit uniform size, confirmed conjugation, and anti-H. pylori activity, supporting nanocarrier potential. Preliminary data validate Mg-Lf interactions; further MTT assay shows MgO-Lf Nps has an great potential to fight against GC. **Keywords:** Nanoparticles, Antimicrobial & Gastric cancer.

OFOPNCDC2

Comparative Therapeutic Evaluation of Ethanolic Extracts of *Syzygium cumini* (Jamun) and *Trigonella foenum-graecum* (Methi) Seeds in a PCOS Rat Model.

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Background: Polycystic Ovary Syndrome (PCOS) is a multifactorial endocrine disorder characterized by hormonal imbalance, metabolic dysfunction, anovulation, and cystic ovarian morphology. Long-term use of conventional pharmacological therapies is associated with adverse effects, necessitating exploration of safer herbal alternatives. *Syzygium cumini* (Jamun) and *Trigonella foenum-graecum* (Methi) seeds possess antidiabetic, antioxidant, and hormone-modulating properties and may offer therapeutic benefits in PCOS management. **Materials and Methods:** PCOS was induced in female Wistar rats (2-3 weeks old; 80-100 g) using dehydroepiandrosterone (DHEA, 60 mg/kg b.wt.) with a high-fat diet for 21 days. Ethanolic seed extracts of Jamun (JSEE) and Methi (MSEE) were prepared, characterized, and administered orally

(Dose-I and Dose-II; 50 & 100 mg/kg b.wt., respectively) for 14 days, followed by metabolic, hormonal, and histological evaluations. **Results:** PCOS induction resulted in profound physiological dysregulation, characterized by significant ($p \leq 0.05$) elevations in body weight, glycemia, and hyperlipidemia alongside hepatic (SGPT, SGOT) and renal (urea, creatinine, uric acid) dysfunction, corroborated with histological findings. Classical PCOS profile was evidenced with significantly elevated LH, estrogen, and testosterone alongside suppressed FSH and characteristic ovarian histology. Conversely, treatment with JSEE and MSEE demonstrated dose-dependent therapeutic effects, significantly ($p \leq 0.05$) attenuating hepatotoxicity and nephrotoxicity while restoring hormonal equilibrium. MSEE-DII reversed PCOS-associated ovarian pathology, besides reducing hepatocyte vacuolization and glomerular congestion. **Conclusion:** JSEE and MSEE demonstrated substantial therapeutic potential in alleviating PCOS-associated metabolic and reproductive dysfunctions. Both improved hepatic and renal biomarkers, restored hormonal balance and ovarian structure, notably, MSEE-DII ($p \leq 0.01$) exhibited overall superior regenerative effects. **Keywords:** Polycystic ovary syndrome; *Syzygium cumini*; *Trigonella foenum-graecum*; Herbal therapy; DHEA-induced PCOS

OFOPNCDC3

Uterine Fibroids in the Light of Ayurveda: Understanding Granthi and Its Therapeutic Management

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Background: Uterine fibroids (leiomyomas) are the most common benign tumours of the female reproductive system and a significant cause of morbidity in women of reproductive age. The reported prevalence ranges from 4.5% to 68.6%, with nearly 25% of affected women becoming clinically symptomatic. In India, the prevalence of uterine fibroids is reported to be 37.65% in rural populations and 24% in urban populations. Despite the availability of surgical interventions, the absence of an effective and satisfactory conservative medical treatment necessitates exploration of alternative therapeutic approaches. In *Ayurveda*, uterine fibroids can be conceptually correlated with *Granthi*, a nodular pathology arising from vitiation of *Vata* associated with *Kapha*, and involvement of *Mamsa*, *Rakta*, and *Meda Dhatu*. **Materials and Methods:** This narrative review is based on an analysis of classical *Ayurvedic Samhitas*, modern medical textbooks, published research articles, and credible web-based sources. *Ayurvedic* concepts of *Granthi*, its *Samprapti*, and *dravya*-based therapeutic interventions were critically reviewed and correlated with the pathophysiology of uterine fibroids. **Results:** Although a direct description of *Garbhashaya Granthi* is not available in classical texts, *Ayurvedic* literature provides a comprehensive conceptual framework for understanding uterine fibroids. Several *Ayurvedic* dravyas with *Lekhana*, *Shothahara*, *Kapha-Vata Shamaka*, *Medoghna* and *Yonishulanashak* properties demonstrate potential in achieving *Samprapti Bhanga*, thereby aiding in symptom relief and disease control. **Conclusion:** Ayurvedic therapeutic management offers a promising conservative, holistic, and fertility-preserving approach for uterine fibroids. Further clinical and experimental studies are required to establish scientific validation. **Keywords:** Uterine Fibroids,

Leiomyoma, *Granthi*, *Garbhashaya Granthi*, *Ayurvedic Dravyas*, *Samprapti Bhanga*

OFOPNCDC4

Euglobals from Indian *Eucalyptus tereticornis*: qNMR-guided quantification and their neuroprotective potential

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Background: The genus Eucalyptus (Myrtaceae) comprises over 700 species, with *Eucalyptus tereticornis* widely distributed in India. Its leaves contain bioactive phloroglucinol derivatives, particularly euglobals, which are suggested to contribute to therapeutic potential. However, comprehensive isolation, quantification, and neuroprotective evaluation of these compounds remain limited. **Materials and Methods:** Leaf extracts of *E. tereticornis* were prepared using solvents of varying polarity, and an euglobal-rich fraction was obtained from the hexane extract. Bioactive constituents were isolated using semi-preparative and recycle RP-HPLC and characterized by NMR spectroscopy and mass spectrometry. Quantitative analysis of isolated and reported euglobals was carried out using quantitative NMR (qNMR). To assess the intrinsic role of the phloroglucinol scaffold independent of the terpene moiety, acylated and formylated phloroglucinol derivatives were synthesized. Neuroprotective activity was evaluated using the N2A (Neuro2a) cell line, with cytotoxicity assessed by MTT assay followed by neurite outgrowth analysis. **Results:** Several isolated euglobals and synthesized acylated phloroglucinol derivatives significantly promoted neurite outgrowth in N2A cells. Quantitative analysis of neurite-bearing cells and neurite length indicated promising neuroprotective effects for specific phloroglucinol derivatives. **Keywords:** Medicinal Plant, *Eucalyptus, NMR* & RP-HPLC.

OFOPNCDC5

Prevalence of obesity in healthcare workers at a tertiary care Ayurvedic hospital in Chandigarh – A cross-sectional study

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Background: Obesity is a major health problem, around the world. Obesity affects one, in eight adults worldwide. In India, NFHS-5 (2019–2021) reports that one fourth of the adults are overweight or obese. Healthcare workers (HCWs) try to promote health. But they are particularly vulnerable due to irregular schedules, stress and little physical activity. Within Ayurvedic institutions, obesity prevalence remains underexplored. This study aimed to estimate the prevalence of general and central obesity among HCWs at a tertiary care Ayurvedic hospital in Chandigarh and examine associated demographic, professional, lifestyle, and Ayurvedic factors. **Materials and Methods:** A cross-sectional study was conducted at a tertiary

care Ayurvedic Hospital, Chandigarh using stratified random sampling which include doctors, residents, nurses, therapists, diagnostics and pharmacy staff, administrative staff and supportive staff who were 18 to 65 years old of either sex. Anthropometric measures (BMI, waist-hip ratio) were recorded using WHO threshold. The study also recorded activity, sleep, diet along with prakriti assessment. Statistical analysis included descriptive statistics, chi-square tests, and logistic regression to identify predictors. **Results:** The calculated sample size was 70 participants. Primary outcomes include prevalence of general and central obesity overall and stratified by cadre, sex, age, and shift type. Regression models will report adjusted odds ratios for lifestyle and professional factors. Prakriti-based analyses will explore associations with obesity phenotypes and lifestyle modification. **Conclusion:** This study will quantify obesity burden among HCWs in an Ayurvedic hospital, highlight cadre-specific risks, and integrate Ayurvedic frameworks to guide culturally congruent workplace interventions. **Keywords**: Obesity, Healthcare workers, BMI, Waist-hip ratio, Prakriti, Lifestyle

OFOPNCDC6

Ayurvedic Management of Asrigdara (Abnormal Uterine Bleeding – Adenomyosis): A Case Report

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Background: Asrigdara, described in Ayurveda as excessive or prolonged menstrual bleeding, correlates with abnormal uterine bleeding (AUB) in modern gynecology. Adenomyosis, a benign condition characterized by ectopic endometrial tissue within the myometrium, is a major cause of AUB and commonly presents with heavy menstrual bleeding and dysmenorrhea. Menstrual disorders affect 25–30% of women, with adenomyosis showing a prevalence of 12–58%**. Case Discussion**: A 42-year-old female presented to the OPD with a three-year history of heavy menstrual bleeding associated with severe dysmenorrhea. She was a known case of adenomyosis with uterine fibroid and diabetes mellitus managed with insulin. The patient had taken progesterone therapy intermittently, with no significant symptomatic improvement, following which she opted for Ayurvedic management. Menstrual blood loss and quality of life were assessed using validated scales at baseline and post-treatment. Considering the chronicity and Vata–Pitta predominance, oral Ayurvedic medications were initiated, followed by three cycles of Yoga Basti after menses. Post-treatment assessment showed significant reduction in symptoms, marked improvement in quality of life, and regression of intramural fibroids. **Conclusion:** Ayurvedic management resulted in significant symptomatic relief and improvement in quality of life in a case of adenomyosis with fibroid. This suggests a promising role of Ayurveda in managing chronic abnormal uterine bleeding when conventional therapies provide limited benefit. **Key words:** Case report, Asrigdara, Adenomyosis, Uterine Fibroid, Shodhana Chikitsa.

OFOPNCDC7

Herb–Drug and Drug–Food Interactions: An Ayurvedic Perspective Based on Literary Evidence

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Background: Ayurveda emphasizes a holistic approach to health through the rational use of *Aushadha*, *Ahara* and *Vihara*. The simultaneous use of Ayurvedic herbs with modern pharmaceuticals, along with dietary factors, has increased in integrative healthcare settings. This has

raised concerns regarding herb–drug and drug–food interactions, which may alter therapeutic efficacy or lead to adverse effects. Classical Ayurvedic principles such as *Viruddha Ahara, Rasapanchaka*, *Prakriti* and *Agni* provide a conceptual framework to understand these interactions. **Methods:** A review of classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, along with relevant contemporary pharmacological and clinical literature, was conducted. Data related to dietary incompatibilities, drug properties, metabolic pathways, and reported herb–drug interactions were critically analyzed. **Results:** The review reveals that herb–drug and drug–food interactions in Ayurveda are influenced by factors such as *Rasa, Guna, Virya, Vipaka*, dosage, time of administration (*Kala*), and patient-specific variables. Certain Ayurvedic herbs may potentiate or inhibit drug metabolism, while inappropriate dietary combinations can impair *Agni*, leading to altered drug absorption and bioavailability. Classical concepts like *Viruddha Ahara* closely parallel modern interaction mechanisms, including enzyme induction, inhibition, and altered gastrointestinal function. Additionally, specific contraindications have been described for the administration of certain selected drugs. **Discussion:** Understanding herb–drug and herb–food interactions through Ayurvedic principles offers valuable insights for safer integrative practice. Incorporating traditional dietary guidelines and individualized treatment planning can minimize adverse interactions and enhance therapeutic outcomes. Bridging Ayurvedic wisdom with modern pharmacology may support evidence-based integrative healthcare and promote rational drug use. **Keywords:** Herb–Drug Interaction, Herb–Food Interaction, Ayurveda, *Viruddha Ahara*

OFOPNCDC8

Carcinogenic Potential of *Gara Visha* and its Prevention Through Ayurveda

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Background: According to Ayurveda, prolonged exposure to artificial or synthetic toxins is termed ***Gara Visha***, by nature this type of poison produces its effects after a long time to cause disease Cancer, a multifactorial disease marked by uncontrolled cell growth and systemic damage, is increasingly linked to long-term exposure to such environmental and dietary toxins. **Methods:** A conceptual study of classical Ayurvedic texts like (*Charaka Samhita, Sushruta Samhita*, *Ashtanga Hridaya* etc) has been done, along with a study of modern literature regarding carcinogenesis to compare it with the existing pathophysiology of oxidative stress, chronic inflammation, immunosenescence, as well as mutations at the genetic levels. **Results:** Continuous exposure of *gara visha* leads to disturbed ***Agni***, ***Ama*** formation, chronic inflammation, and immune suppression, creating conditions for abnormal cell growth.

Ayurvedic prevention focuses on ***Nidana Parivarjana*** (avoiding causes) and ***Shodhana*** therapies. ***Rasayana***, ***Agni-deepana–Ama-pachana***, and ***Vishaghna*/antioxidant herbs** help eliminate toxins and restore normal physiology. **Discussion:** The term *Gara Visha* offers an Ayurvedic theory on carcinogenesis by toxins. Ayurvedic measures in preventive oncology are mostly concerned with the processes of detoxification and rejuvenation and boosting the immune system. Such an association of Ayurveda with modern concepts of cancer prevention could lead to

an alternative approach toward cancer control. Such findings need to be supported by future research. **Keywords:** Ayurveda; Cancer & Garavisha.

OFOPNCDC9

Menstrual Disorders as Early Indicators of Lifestyle-Related Non-Communicable Diseases as per Ayurvedic Perspective: A Narrative Review

Dr. Garika

Background: Menstrual disorders such as oligomenorrhea, dysmenorrhea, menorrhagia, and irregular cycles are increasingly reported among adolescents and reproductive-age women. These disturbances often precede the clinical manifestation of lifestyle-related non-communicable diseases (NCDs) including obesity, metabolic syndrome, type 2 diabetes mellitus, and polycystic ovarian syndrome. Ayurveda describes menstrual abnormalities under Artavakshaya, Asrigdara, and Yonivyapad, attributing their origin to Agnimandya, Ama formation, and Dosha imbalance caused by faulty lifestyle practices. **Methods:** A conceptual and literary review was conducted using classical Ayurvedic texts such as Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, along with available contemporary literature on lifestyle-related NCDs and Pubmed indexed data. Nidana, Samprapti, and Dhatu involvement were critically analyzed to establish menstrual disorders as early clinical indicators of systemic metabolic derangements. **Results:** Analysis reveals that sedentary behavior, excessive intake of Guru, Snigdha, and Madhura Ahara, psychological stress, and improper daily regimen result in Santarpanottha Vyadhi. These factors primarily vitiate Rasa and Artava Dhatu, leading to early menstrual irregularities. Progressive involvement of Meda Dhatu and Vata-Kapha Dosha results in chronic metabolic disorders. Classical texts emphasize the role of Agni and Dosha equilibrium in maintaining menstrual health. **Discussion:** Menstrual disorders represent an accessible and early window for identifying women at risk of lifestyle-related NCDs. Ayurvedic interventions focusing on Dinacharya, Ritucharya, Ahara-Vihara regulation, Shodhana, and Shamana Chikitsa provide a comprehensive preventive approach. **Conclusion:** Early recognition and Ayurvedic management of menstrual disorders can significantly contribute to the prevention and control of lifestyle-related non-communicable diseases, underscoring their importance in predictive and preventive gynecology.

OFOPNCDC10

Integrative Ayurvedic Supportive Management of Angelman Syndrome - A Case Study

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Background: Angelman syndrome is a neurodevelopmental disorder caused by a pathologic lack of expression of the UBE3A gene on the maternal chromosome 15q11-13. It manifests with intellectual and developmental disabilities, a puppet-like ataxic movement and phenotype, as well as sleep disorders, and hyperactivity. **Materials and Methods:** A 7-year-old male child with global developmental delay, seizures, ataxic gait, speech impairment, sleep disturbance, drooling, and hyperactivity was evaluated clinically and neurologically. EEG, neuroimaging, developmental evaluation, and genetic testing, including whole-exome sequencing and MLPA, were carried out. Antiepileptic medications, Ayurvedic internal medications, and external therapies were all part of the child's care. **Results:**

The child's receptive speech, attention, sleep initiation and maintenance, drooling, stair climbing using an alternate leg pattern, and gait instability all improved after receiving Ayurvedic treatment. Over the course of treatment, the Gross Motor Function Measure (GMFM) score increased from 57% to 69%. **Conclusion:** Angelman syndrome is a genetically determined neurodevelopmental disorder for which no definitive curative treatment is currently available. Therefore, the main goals of management are to lessen the severity of symptoms and enhance functional abilities. Ayurvedic interventions consisting of internal medications and external therapeutic techniques help alleviate symptoms in areas like drooling, behaviour, sleep, and motor function. **Keywords:** Angelman syndrome, Ayurveda, Neurodevelopmental disorder.

OFOPNCDC11

AYURVEDIC MANAGEMENT OF ENDOMETRIAL POLYP (*YONI ARSHA)*: A CASE REPORT

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Background: Endometrial polyps (*Yoni Arsha*) are common gynecological condition characterized by localized overgrowth of the endometrial tissue, often presenting with abnormal uterine bleeding, intermenstrual spotting, infertility, or recurrent pregnancy loss. Conventional management mainly involves hormonal therapy or hysteroscopic polypectomy, which may be associated with hormonal side effects, procedural risks, and recurrence. In Ayurvedic practice, *Yoni Arsha* is managed through a conservative multidrug approach using classical formulations aimed at correcting *Dosha* imbalance and resolving abnormal tissue growth. This case highlights a successful outcome using Ayurvedic treatment in a patient with endometrial polyp. **Materials and Methods:** A single-case observational study was conducted on a 22-year-old female diagnosed with an endometrial polyp (*Yoni Arsha*) based on USG. Detailed history and menstrual pattern were assessed, and an Ayurvedic evaluation was done to determine *Dosha* involvement. The patient was treated with selected classical oral Ayurvedic formulations and followed up regularly. **Case report**: A 22-year-old female presented with a history of Painful menstrual bleeding for 5 months. Bleeding was moderate; clots were absent. She had history of one abortion and she wanted to conceive for child. A USG Pelvis was advised on 18 February 2025 revealed a small polyp in the endometrial cavity with mild colour flow in it. Oral ayurvedic medications were initiated after assessing the patient's condition. Patient came for proper follow-ups and took proper medications. Repeat USG in June showed a normal uterus with normal thickness of endometrium. She further consulted for her complaints of trying to conceive and took proper treatment after which she conceived in December 2025. **Discussion**: The case demonstrates how classical Ayurvedic formulations were effective in managing Endometrial Polyp. Our given medicines potentially supported complete regression of polyp. **Conclusion**: Long time management through ayurveda is effective in management of Endometrial Polyp **Keywords:** Yoni arsha & Endometrial polyp.

OFOPNCDC12

Choreoathetoid Cerebral Palsy Due to G6PD Deficiency–Induced Kernicterus: An Ayurvedic Case Study

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Background: Choreoathetoid cerebral palsy (CP) is a rare dyskinetic subtype resulting from basal ganglia injury. Bilirubin-induced encephalopathy secondary to glucose-6-phosphate dehydrogenase (G6PD) deficiency is an uncommon etiology in the present era. Management is challenging due to irreversible neurological damage and the risk of hemolysis triggered by infections, drugs, or thermal stress. Evidence regarding safe integrative approaches in such children is limited. **Materials and Methods:** A 1.5-year-old male child diagnosed with choreoathetoid CP secondary to G6PD deficiency–induced kernicterus was managed with individualized Ayurvedic therapy. The clinical condition was assessed based on developmental milestones, muscle tone, involuntary movements, and functional abilities. Treatment focused on *Vāta-pradhāna Majjā-dhātu duṣṭi* with careful avoidance of *Pitta prakopaka* factors. Antioxidant and Pitta-samana formulations such as Rajanyadi Cūrṇam and Guduchi Satva were employed to reduce oxidative stress and support antioxidant pathways, thereby minimizing hemolysis. Modified, age-appropriate Panchakarma procedures and internal medications were administered under close monitoring without triggering hemolysis. **Results:** Post-therapy, improvement in neck control, core muscle strength, and reduction in dystonic movements were observed. During intercurrent febrile episodes, Ayurvedic management did not precipitate hemolysis or adverse drug reactions. **Conclusion:** This case highlights the safe application of modified, Pitta-sparing Ayurvedic interventions in choreoathetoid CP due to G6PD deficiency–associated kernicterus, demonstrating meaningful functional improvement without triggering haemolysis. **Keywords:** Choreoathetoid cerebral palsy, Kernicterus, G6PD deficiency.

OFOPNCDC13

AYURVEDIC MANAGEMENT OF *ARTAVA KSHAYA*: A CASE REPORT

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Background: Gynecological problems are rising quickly in today's fast-paced and competitive world due to sedentary lifestyles, poor eating habits etc. The menstrual cycle is significantly impacted by changes in both physical and mental health. Menstrual disorders are becoming more common in gynecological practices, which is a sign of infertility and other issues. One prevalent menstruation disorder is *Artava kshaya.* As, *Artava* is *Updhatu* of *Rasa dhatu* and modification in *Ahara* leads to *dushti* of *Rasa* lead to *Artava dushti* leading to *Artava kshaya.* **Case Report:** A female patient of 20 years of age came to OPD of SDACH, Chandigarh Jaipur on 25th November 2023 with chief complaint of delayed menstruation with scanty flow since 6 months. **Methodology**: Detailed history with all necessary clinical, physical examination and laboratory investigations were carried out. No gross physical and chemical abnormality was found. All the laboratory investigations (including USG and hormonal analysis) were found to be normal. So the treatment was planned according to the symptoms. Diagnosis was made on the basis on the basis of presenting complaints was *Artava kshaya*. Patient was treated with *Nasthapushpanthak Rasa and Krishana Tila Kwath* for 3 consecutive cycles. Patient was kept on follow up for 3 cycle after cessation of *Nasthapushpanthak Rasa*. **Result:** Patient had got her menstruation regularly with normal

duration while taking medicine. Also the amount of flow was also improved and intensity of pain was reduced effectively from moderate to mild. Even after cessation of medicine she got her menstruation in 32 days with normal amount of flow. **Keywords:** *Artava Kshaya*, *Nasthapushpanthak Rasa*, *Krishana Tila Kwath,* Oligomenorrhoea, Hypomenorrhoea

OFOPNCDC14

Diet and Yoga in *Garbhini Paricharya*: A Public Health Review

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Background: *Garbhini Paricharya* is a classical Ayurveda antenatal care protocol that provides month-wise dietary and lifestyle guidelines aimed at ensuring optimal maternal and fetal health. Diet (*Ahara*) and Yoga constitute its core components, addressing the physiological, psychological, and nutritional demands of pregnancy. With rising maternal health challenges and increasing acceptance of integrative, preventive healthcare, reviewing these components is timely and relevant. **Materials and Methods:** A comprehensive review was conducted using classical Ayurveda texts including *Charaka Samhita*, *Sushruta Samhita*, and *Aṣhtanga Hṛdaya*, along with peer-reviewed contemporary literature on nutrition, Yoga, and maternal health. Classical dietary principles and Yoga practices recommended during pregnancy were reviewed and conceptually correlated with modern maternal care outcomes. **Results:** The review indicates that trimester-specific dietary recommendations support fetal nourishment, maternal strength and metabolic balance, while reducing the risk of pregnancy-related disorders. Appropriately adapted Yoga practices enhance musculoskeletal flexibility, respiratory efficiency, mental stability, and preparedness for labor. The combined application of diet and Yoga demonstrates a synergistic role in promoting maternal well-being and favourable pregnancy outcomes. **Conclusion:** Diet and Yoga in *Garbhini Paricharya* represent an integrative, preventive, and public health relevant antenatal care model. Their incorporation into maternal health programs can enhance antenatal care quality, promote self-reliance, and improve pregnancy outcomes while complementing existing public health systems. **Keywords:** *Garbhini Paricharya*, Antenatal care, Prenatal Yoga, Public Health

OFOPNCDC15

Integrative Management of Amyotrophic Lateral Sclerosis: A Case Report with one and half-Year Follow-Up

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Background: Amyotrophic Lateral Sclerosis (ALS) is a progressive neurodegenerative disorder characterized by gradual loss of motor function, muscle weakness, and declining functional independence, with limited disease-modifying treatment options. In the absence of a curative therapy, contemporary management is largely supportive and multidisciplinary, focusing on symptom control and quality-of-life improvement. From an Ayurvedic perspective, ALS can be conceptualized as Dhatu Kshaya Janya Vatavyadhi, a degenerative neurological condition associated with tissue depletion

and Vata imbalance. Emerging evidence suggests that integrative approaches, including Ayurveda and Yoga, may support functional ability, activities of daily living, and respiratory health. We report a case of ALS demonstrating sustained functional status following integrated Ayurveda and Yoga-based management. **Materials and Methods**: A 39-year-old male with Stage 3 ALS and a four-year illness duration, on standard therapy (riluzole), presented with progressive weakness in all limbs, wasting of thenar and hypothenar muscles, and reduced hand-grip strength. Integrative management based on Vatavyadhi chikitsa was administered, including herbal powder massage, oil massage, rice-bolus fomentation, and medicated enema (basti). A tailored Yoga program focusing on strength, balance, and functional mobility was also provided. Outcomes were assessed using the ALS Functional Rating Scale (ALSFRS), Functional Ambulation Profile (FAP), and hand dynamometry at baseline and follow-ups. **Results**: ALSFRS improved from 29 at baseline to 31 over 18 months, mainly in fine and gross motor domains. FAP remained stable at 57 over 18 months, indicating maintained gait function. Hand grip strength improved by 0.4 kg bilaterally. The ALS stage remained stable at Stage 3 throughout follow-up. **Conclusion**: Despite ALS being a progressive condition, integrative management was associated with preserved function and stable ambulation. These findings suggest that combining Ayurveda, Yoga, physiotherapy, and conventional care may help maintain functional status in ALS. Larger controlled studies are needed to explore the potential role of integrative therapies in ALS management. **Keywords:** Amyotrophic Lateral Sclerosis, Vatavyadhi, Integrative Medicine, Ayurveda, Functional Ambulation, ALSFRS

OFOPNCDC16

Protective effect of *Schleichera oleosa* (Lour.) Oken in CFA-induced arthritic rats

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Background: *Schleichera oleosa* (Lour.) Oken, commonly known as "Koshamra" in Ayurveda, has been traditionally used to manage pain, inflammation, and rheumatic disorders. Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by persistent joint inflammation and progressive destruction of cartilage. Owing to the adverse effects of conventional therapies, there is increasing interest in plant-based alternatives. This study investigates the anti-arthritic potential of *S. oleosa* bark extract and its solvent fractions. **Materials and Methods:** The methanolic extract (SOM) of *S. oleosa* bark and its fractions, *n*-hexane (SOH), ethyl acetate (SOE), *n*-butanol (SOB), and aqueous (SOA), were evaluated *in vitro* for cell viability, nitric oxide inhibition, and protein denaturation. The SOH fraction, exhibiting the most potent activity, was selected for *in vivo* evaluation in CFA-induced arthritic rats at doses of 200 and 400 mg/kg (oral). LC-HRMS profiling identified triterpenoids in SOH. Antioxidant activity, biochemical parameters, pro-inflammatory cytokines, and histopathological changes were assessed. A network pharmacology approach was also used to identify key molecular targets and signaling pathways. **Results:** SOH at 400 mg/kg significantly ($p < 0.01$) ameliorated arthritic symptoms, normalized hematological and biochemical parameters, and reduced oxidative stress. Notably, pro-inflammatory cytokines TNF-α, IL-1β, and IL-6 were markedly suppressed ($p < 0.001$), correlating with the molecular targets predicted through network pharmacology. **Conclusion:** The *n*-hexane fraction of *Schleichera*

oleosa (SOH) exhibits significant anti-arthritic activity, supporting its traditional use in the management of rheumatic diseases and highlighting its therapeutic potential as a plant-based alternative for RA treatment. **Keywords:** *Schleichera oleosa*; Rheumatoid arthritis; Triterpenoids; Anti-oxidant; Network pharmacology

OFOPNCDC17

Government of India Initiatives Integrating AYUSH in the Management of Non-Communicable Diseases (NCDs)

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Background: Non-communicable diseases (NCDs) are responsible for nearly 63% of total deaths in India, as reported by the World Health Organization. To promote traditional systems, the Government of India established the Ministry of AYUSH on 9 November 2014. Several national programs integrate AYUSH for NCD prevention and management. To evaluate Government-initiated AYUSH programs addressing NCDs and associated medicines. Objectives: To list national programs, To identify AYUSH medicines used in NCD management, To assess integrative healthcare benefits. **Materials and Methods:** Review of Government policy documents (2010–2024), programme reports, and AYUSH clinical guidelines. **Results:** The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched in January 2010; AYUSH co-location expanded after 2016. Medicines: Nisha Amalaki, Madhumehari Churna (Diabetes); Sarpagandha Vati, Arjunarishta (Hypertension); Ashwagandha, Guduchi (Cancer supportive care). The National AYUSH Mission (NAM) was launched on 15 September 2014 to strengthen AYUSH infrastructure and Health & Wellness Centres; medicines include Medohara Guggulu (Obesity), Triphala, Arjunarishta. The Ayushman Bharat Programme was launched on 23 September 2018, promoting comprehensive primary healthcare through Health & Wellness Centres, including AYUSH services and Yoga-based lifestyle modification. The International Day of Yoga was first observed on 21 June 2015, supporting NCD prevention through structured Yoga protocols. Integration has improved screening coverage, lifestyle adherence, glycemic and BP control at primary healthcare levels. **Conclusion:** Since 2010, structured government initiatives have institutionalized AYUSH within national NCD control strategies, enhancing preventive and integrative public healthcare delivery. **Keywords:** NPCDCS (2010), National AYUSH Mission (15 Sept 2014), Ayushman Bharat (23 Sept 2018), International Day of Yoga (21 June 2015), AYUSH medicines, NCD management.

OFOPNCDC18

Role of Ayurveda in the Management of Opioid Addiction: A Public Health Perspective

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Background: Opioid addiction is a major global public health concern, contributing to increased morbidity, mortality, and socioeconomic disruption. Chronic opioid use leads to physical dependence, psychological impairment, and social dysfunction. In Ayurveda, no direct correlation for substance abuse disorder is described; however, similar concepts are understood through *Madatyaya*, *Asatmya Indriyartha Samyoga*, and *Pragyaparadha*, involving disturbances of *Manas*, *Dosha*, and *Agni*. Exploring Ayurvedic approaches may provide holistic strategies for prevention and rehabilitation. **Methods:** This conceptual and narrative review is based on classical Ayurvedic texts

including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with contemporary scientific literature on opioid addiction. Ayurvedic principles related to addiction, mental health, detoxification, and rehabilitation were analyzed and correlated with modern perspectives on opioid dependence and withdrawal. **Results:** Ayurvedic management of opioid addiction includes *Nidana Parivarjana*, selected *Shodhana* therapies, *Shamana* medications, *Medhya Rasayana*, and *Satvavajaya Chikitsa* to restore *Dosha* balance, improve *Agni*, stabilize mental functions, and reduce withdrawal symptoms. Lifestyle modification, *Ahara-Vihara*, yoga, and counselling aid long-term rehabilitation and relapse prevention **Discussion:** An integrative Ayurvedic approach addresses the physical, psychological, and social dimensions of opioid addiction. Incorporating Ayurvedic principles into public health strategies may help reduce disease burden and support sustainable recovery. **Keywords:** Opioid addiction; Disease burden; Madatyaya; Satvavajaya Chikitsa; Public health

OFOPNCDC19

Green synthesis and antidiabetic evaluation of nano formulation

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Nanotechnology is the most efficient and novel way to treat various diseases like diabetes and cancer. In current study, HS-ZnO NPs (*Hedychium spicatum*-Zinc oxide nanoparticles) were made utilizing plant extract. The phytoconstituents present in plant extract help in stabilization and reduction of nanoparticles. Zinc acetate solution with alkali was employed to synthesize nanoparticles. The prepared nanoparticles were identified and characterized using various techniques like FTIR, DLS and UV-vis spectroscopy. Then HS-ZnO NPs are evaluated for numerous therapeutic activities like anti-inflammatory, antioxidant, antimicrobial, antidiabetic activity. It was examined that the ZnO NPs displayed better antidiabetic activity when compared to leaf extract of *Hedychium spicatum.* The amylase inhibition was found for plant extract and HS-ZnO NPs 61.32 ± 0.003 µg/ml, 69.08 ± 0.012 µg/ml respectively. Additionally, it demonstrated a significant ($p < 0.05$) falling off in blood glucose levels from day 21 to day 28 compared to a diabetic controlled group. The lipid profile of treated rats was improved by decreasing LDL, TC, TG and increasing HDL. The efficiency of HS-ZnO NPs was estimated in the existing study. **Key words:** Anti-diabetic, Acarbose, Leaves, Phytoconstituents, *Hedychium spicatum,* Zinc oxide nano particles.

OFOPNCDC20

Exploring the Molecular Mechanisms of Geraniol in Benzo(a)pyrene-Induced Lung Carcinogenesis

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Objective: Despite advances in our understanding of risk, development, immunological control, and treatment options for lung cancer, lung cancer remains the leading cause of cancer death all over the world. Geraniol is a naturally occurring monoterpenoid alcohol found in essential oils of plants such as rose, citronella, and lemongrass. In the present study, we have investigated the anti-cancer

effects of geraniol in benzo(a)pyrene (B(a)P) induced lung cancer in Swiss albino mice. **Methods:** B(a)P (50 mg/kg body weight) was given twice weekly for four successive weeks and left until 20 weeks to induce lung carcinoma in mice. Geraniol was supplemented to mice to determine its anti-cancer effect. **Results:** Oral supplementation of geraniol to mice inhibited the development of lung carcinoma by amending the changes in serum tumor markers, biotransformation enzymes, the levels of proliferative cell antigen, protein expressions of apoptotic and cell cycle regulators p53, Bcl-2, Bax, caspase-3, p21, CDK4, cyclin D and cyclin E respectively. The beneficial efficacy of geraniol was further confirmed by histopathological studies, immunohistochemistry and transmission electron microscopic studies. **Conclusion:** The findings of the present study reveal that geraniol could prevent the development of lung carcinogenesis in mice through its ability to regulate cell proliferation, apoptosis and cell cycle. **Key words:** Geraniol; Benzo(a)pyrene; lung cancer; cell proliferation; apoptosis; cell cycle

OFOPNCDC21

Phytochemical studies and *in vitro* antioxidant properties of selected medicinal plants

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Background: The present study was aimed at investigating the phytochemical and antioxidant properties of different types of extracts of ashwagandha roots, datura leaves, kalmegh leaves and ber leaves. **Materials and methods:** Different extracts were prepared and evaluated for different types *of in vitro* phytochemical and antioxidant properties. The phytochemicals such as phenols, flavonoids, tannin and non- tannin, β-carotene and lycopene contents were determined quantitatively. The antioxidant property of the extracts was evaluated using *in vitro* assays viz. ABTS. radical, DPPH radical and nitric oxide radical scavenging activity. **Results:** Total phenolic contents were maximum in 100 % methanolic extract of ber and tannin contents was more in the kalmegh extracts. The lycopene and β-carotene content were maximum in the extracts of ber. The total flavonoids content was more in methanolic extract of ber followed by methanolic extract of datura. All the extracts scavenged different *in vitro* radicals in a concentration dependent manner. The IC_{50} values revealed that 100 % methanolic extract of Ber followed by 50 % methanolic extract of datura were better scavengers of ABTS and DPPH radicals. The potential of scavenging the nitric oxide radicals was maximum in 100 % methanolic Ber extract. Different *in vitro* phytochemical and antioxidant parameters of different extracts of four plants revealed that 100 % methanolic extract of ber leaves and 50% methanolic extract of datura leaves have better potential than other types of plant extracts used in this study. **Conclusion:** The extracts may serve as promising natural antioxidant sources for therapeutic and nutraceutical applications for animal and human use. **Keywords:** Phytochemicals; Antioxidant activity; Extracts; Radical scavenging

OFOPNCDC22

The Impact of Behavior Change Communication Model on menstrual knowledge, practices and health of school going Adolescent Girls; Prospective Study Protocol

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Background: India has the largest adolescent population in the world, with every fifth person between 10 and 19 years old. National Health Survey (NFHS-5) reported 23% prevalence of unhygienic menstrual practices among young women. Increasing evidence associating menstrual disorders with poor dietary and lifestyle habits underscores the urgent need for preventive education strategies. Ayurveda recommends specific diet and lifestyle regimes during the menstrual phase of the cycle to maintain menstrual health and prevent disorders of the reproductive system. This study will investigate the impact of Ayurveda-based Behavior Change Communication (BCC) intervention on the Knowledge, Attitude, and Practices (KAP) of adolescent girls regarding menstrual health. **Methods:** The study aims to recruit 300 post-menarcheal females aged 14–17 years from 10 randomly selected schools in two districts of Himachal Pradesh. Participants will be divided into two cohorts. Group I will receive a BCC intervention integrating Ayurvedic principles with standard menstrual health management (MHM) guidelines, delivered via interactive sessions and educational materials at baseline, day 30, and day 60. Group II will receive standard MHM awareness and print materials exclusive of Ayurvedic advocacies. Investigators will measure the outcomes through validated, semi-structured questionnaires. The interactive session will last 1-1.5 hours, using a lecture, face-to-face discussion. **Results** and **Discussion:** Primary outcomes include change in menstrual KAP and self-reported menstrual disorders, evaluated from baseline to 90th day. The findings may serve as a pedagogical foundation for incorporating Ayurveda-based interventions into mainstream public health initiatives, offering a holistic, preventive approach to adolescent menstrual care.
Keywords: Adolescent, Ayurveda, menstrual health, Behavior change intervention

OFOPNCDC23

An Integrative Homeopathic–Behavioural Medicine Framework for Chronic Back-Pain Disorders in Older Adults: A Neuropsychosomatic and Systems-Pharmacology Perspective

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Background: Chronic back pain in older adults results from interacting biological, psychological, and behavioural factors that perpetuate long-term disability. Behavioural medicine highlights stress reactivity, emotional dysregulation, and maladaptive pain behaviours, while homoeopathy individualizes care based on constitutional and psychosomatic patterns. Integrating these approaches may enhance mind–body self-regulation and align with systems-pharmacology models in AYUSH medicine. **Methods:** A conceptual–translational framework was developed by synthesizing behavioural-medicine findings from doctoral research with homoeopathic principles of individualized susceptibility. Secondary analysis of psychosocial variables—stress reactivity, sleep disturbance, catastrophizing, and activity avoidance—was undertaken to identify behavioural markers relevant to homoeopathic case formulation. An outpatient action-research component explored the feasibility of combining

individualized homoeopathic management with behavioural self-regulation strategies including paced breathing, cognitive reframing, and graded activity. **Results:** Preliminary observations indicated improvements in subjective pain control, emotional stability, and functional engagement. Conceptual mapping suggested convergent mechanisms across both modalities, particularly modulation of HPA-axis activity, central sensitization, and neuroimmune balance. These findings support a functional homeopathic pharmacology model in which individualized remedies act as regulatory inputs within a broader neuropsychosomatic network. **Conclusion:** This integrative framework offers a patient-centred, low-cost approach to chronic back-pain management in ageing populations. It aligns with AYUSH systems-pharmacology paradigms emphasizing regulatory, network-based therapeutic action beyond reductionist molecular models and provides a foundation for future multicentric validation and interdisciplinary collaboration.
Keywords: Chronic back pain; Homoeopathy; Behavioural medicine; Neuropsychosomatic regulation; Systems pharmacology; AYUSH integrative care; Geriatrics.

OFOPNCDC24

Walking Two Worlds: Reflections of a Modern Medicine Physician Conducting an Ayurvedic RCT

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Background: Randomized controlled trials (RCTs) are foundational to modern medical research, yet applying this framework to traditional medical systems such as Ayurveda presents distinct challenges. As a physician trained in modern medicine, undertaking an RCT on an Ayurvedic preparation required not only methodological rigor but also a conscious re-examination of my own clinical assumptions. **Objective:** To reflect on the experience of conceptualizing and conducting a randomized controlled trial of an Ayurvedic formulation from the perspective of a modern medicine physician, focusing on intellectual, methodological, and professional learning. **Methods:** The study was designed as an RCT evaluating a standardized Ayurvedic preparation for a predefined clinical condition. While adhering to CONSORT and Good Clinical Practice guidelines, the protocol had to be adapted to accommodate Ayurvedic principles related to body types and effects, without changing the dosing and therapeutic rationale. **Reflections:** The process revealed tensions between reductionist biomedical outcomes and the holistic framework of Ayurveda. Challenges included standardization of herbal formulations, placebo selection, regulatory navigation, and communicating trial equipoise to participants with strong cultural beliefs. Equally transformative was the experience of engaging with an alternative epistemology of healing, which fostered humility, mutual respect, and interdisciplinary dialogue. **Conclusion:** Conducting an RCT on an Ayurvedic intervention as a modern medicine physician was both demanding and deeply reflective. It expanded my understanding of evidence, challenged disciplinary boundaries, and highlighted the potential of integrative research when approached with scientific rigor and openness. Such experiences may serve as a bridge between traditional and modern systems of medicine.
Keywords: Reflexive practice, Ayurveda, randomized controlled trial,

integrative medicine, interdisciplinary research

OFOPNCDC25

Paris polyphylla: Conservation, Phytochemical, Antioxidant and Antiproliferative Studies on Important Endangered Medicinal Plant of Eastern Himalayas

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Background: *Paris polyphylla* Sm., (family Melanthiaceae), is an important medicinal plant of Tibetan, and Traditional Chinese Medicine (TCM). The plant has been widely used in TCM for its analgesic, haemostatic and anticancer activities. The plant population in north east region of India is declining rapidly due to over exploitation, habitat destruction, and illegal trade. The species is currently listed as "vulnerable" in the IUCN Red List. **Materials and Methods:** The rhizomes of *P. polyphylla* were collected from Champhai district (NGC) of Mizoram and Basar (NGB) and, Tuting (NGT) areas of Arunachal Pradesh. The rhizomes were multiplied in the experimental farm of Department of Horticulture, Aromatic and Medicinal Plants, Mizoram University, Aizawl for ex-situ conservation. The rhizomes were evaluated for morphological variations, phytochemicals and, *in vitro* antioxidant and antiproliferative activity against HepG2 cell lines. **Results:** The morphological variation studies indicated that the rhizomes of accession collected from Mizoram were more in length (102.2 mm), girth (42.61 mm) and weight (66.30 gm) as compared to collections from Arunachal Pradesh. The dried rhizomes were extracted with 70% ethanol and then freeze dried. The phytochemical analysis of the ethanolic revealed the presence of alkaloids, flavonoids, phenols, saponins, tannins, and terpenoids. The quantitative phytochemical analysis of NGB showed higher presence of alkaloids (36.6 ± 13.44 mg AE/g) phenolics (15.80 ± 0.56 mg GAE/g), flavonoids (51.50 ± 9.01 mg QE/g) and tannins (32.94 ± 12.52 mg GAE/g) as compared to NGT and NGC. The highest saponins (75.26 ± 6.72 mg DE/g) concentration was observed in NGC. The ethanolic extract of NGB showed highest antioxidant potential, measured by DPPH assay with IC50 value of 330.21µg/ml. All three accessions exhibited potent antiproliferative activity against HepG2 cells. NGB showed better antiproliferative activity in MTT assay with more than 90 % inhibition at the concentration of 100 µg/ml. **Keywords:** *Paris polyphylla,* Conservation, Rhizome, Antioxidant, Antiproliferative

OFOPNCDC26

Isolation of bioactive compounds from *Wendlandia heynei* and their *in-silico* evaluation against *α*-galucosidase and *α*-amylase

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This study investigates the phytochemical constituents of *Wendlandia heynei* leaves and evaluates their potential antidiabetic activity through *in silico* approaches. The methanolic extract of the leaves was subjected to solvent-solvent partitioning followed by chromatographic separation to isolate major phytoconstituents. The aqueous fraction afforded four compounds identified as gardenoside **(1)**, scandoside methyl ester **(2),** chlorogenic acid **(3),** and rutin **(4)**. The structures of the isolated compounds were elucidated using spectroscopic techniques including ^{1}H NMR, ^{13}C NMR, and HPLC analysis. To explore their potential biological relevance, molecular docking studies were performed

against key carbohydrate hydrolysing enzymes, α-glucosidase and α-amylase, which are important therapeutic targets in the management of postprandial hyperglycaemia in diabetes mellitus. Docking analysis indicated favourable binding interactions of the isolated compounds with the active sites of both enzymes, suggesting possible inhibitory potential. The findings expand the phytochemical profile of *Wendlandia heynei* and highlight its bioactive constituents as potential leads for antidiabetic drug discovery.

OFOPNCDC27

Role of *Hingwashtak Churna* (a polyherbal formulation) in Propylthiouracil-induced Hypothyroidism in rats

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Background: Hypothyroidism is a common endocrine disorder associated with reduced thyroid hormone levels and impaired metabolism. Although levothyroxine remains the standard therapy, a subset of patients continues to experience persistent symptoms despite achieving biochemical euthyroidism, indicating the need for alternative or complementary therapeutic approach. *Hingwashtak Churna* (HC), a classical Ayurvedic polyherbal formulation, is traditionally used in thyroid disorders, but its experimental evidence remains limited. To evaluate the thyroid-stimulating activity of HC in propylthiouracil (PTU) induced hypothyroidism in rat model. **Methods:** Hypothyroidism was induced in Sprague-Dawley rats using PTU (8 mg/kg/day) for 30 days. After confirmation of hypothyroidism, animals received test drug for another 30 days. Thyroid function test (T_3, T_4, TSH), biochemical markers of liver and kidney function, lipid profile, oxidative stress markers and histopathology of thyroid gland were assessed. **Results:** PTU administration induced a significant decline in serum T_3 and T_4 with a marked elevation in TSH, confirming hypothyroidism. HC treatment resulted in a significant increase in serum T_4, a trend toward restoration of T_3, and partial normalization of TSH, indicating thyroid-stimulating activity. Histopathological study revealed partial restoration of thyroid follicular architecture in HC-treated animals. **Conclusion:** *Hingwashtak Churna* demonstrates thyroid-stimulating activity in PTU-induced hypothyroidism, supporting its potential as a complementary therapeutic approach in the management of hypothyroidism. **Keywords:** Ayurveda, *Hingvashtaka Churna*, Hypothyroidism & Thyroid

OFOPNCDC28

Preparation And Evaluation of Hybrid Nanoparticles for Postoperative Cataract Management

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Background: Global cataract prevalence is rising, with projections estimating 285 million cases by 2050. Although cataract surgeries are performed at a rate of 3,200 per 100,000 individuals, postoperative inflammation and pain remain significant clinical challenges. Nepafenac 0.1% suspension is commonly used to manage these complications; however, conventional eye drops suffer from poor aqueous solubility, short ocular residence time, and low bioavailability. **Materials and Methods:** This study utilised Nepafenac, Human Serum Albumin (HSA), and lipids, which were generously supplied as EX-Gratis samples. Nepafenac-loaded Lipid Polymer Hybrid Nanoparticles (LPHNs) were prepared using the desolvation method. A Quality by Design approach was implemented to optimize formulation parameters, to achieve consistent dosage and enhance drug bioavailability. The physicochemical properties of the nanoparticles were characterized by evaluating entrapment efficiency, particle size, surface morphology, and in vitro drug release. Furthermore, fluorescence spectroscopy and circular dichroism were employed to analyze HSA-lipid interactions, providing valuable insights into the formulation's molecular structure. **Results:** The optimized LPHNs demonstrated desirable properties, including high entrapment efficiency, uniform particle size below 100 nm, and a zeta potential of -25 mV, ensuring stability. In vitro studies showed cumulative release reaching approximately 83%. Furthermore, fluorescence spectroscopy revealed that maximum interaction occurred between DOTAP and HSA, while minimum interaction was observed between DSPC and HSA, providing insight into the molecular assembly of the nanoparticle formulation. **Conclusion:** The development of Nepafenac-loaded LPHNs represents a significant advancement in ocular drug delivery. This nanocarrier system effectively overcomes the limitations of conventional eye drops, offering improved bioavailability and enhanced patient compliance for post-cataract surgery management.
Keywords: Cataract, Nepafenac, Lipid Polymer Hybrid Nanoparticles (LPHNs), Ocular drug delivery, Postoperative inflammation, Quality by Design (QbD).

OFOPNCDC29

Individualized Homoeopathic Management in Creutzfeldt–Jakob Disease: A Case Series

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Background: Creutzfeldt–Jakob Disease (CJD), the human variant of "Mad Cow Disease," is a rare and fatal prion-related neurodegenerative disorder with no curative treatment available in conventional medicine. Current management is largely supportive, with an average survival of only a few months. Homoeopathy, through individualized prescriptions, may provide palliative benefits and improve patient outcomes even in such incurable conditions. **Case Summary:** This paper presents a case series of two patients diagnosed with CJD who were managed with individualized homoeopathic remedies. The first case, a 50-year-old male with coma, myoclonic jerks, and profuse perspiration, responded favorably to Veratrum album, with improvement in responsiveness, seizure reduction, and survival extended to more than two years. The second case, a 49-year-old female with progressive memory loss, emotional suppression, and jerky movements, showed stabilization and symptomatic relief under Staphysagria, surviving nearly a year despite an initial prognosis of three months. **Conclusion:** Though homoeopathy does not offer a cure for prion diseases, this case series highlights its potential role in improving quality of life, alleviating distressing symptoms, and extending survival in CJD. These findings emphasize the importance of individualized remedy

selection and open avenues for further systematic research on homoeopathy in rare neurodegenerative conditions. **Keywords:** Creutzfeldt–Jakob Disease, Prion Diseases, Homoeopathy, Veratrum album, Staphysagria, Case Series

OFOPNCDC30

Diversity, Distribution, and Indigenous Uses of Medicinal Flora In the Jyuni Watershed, Mandi District, Himachal Pradesh, North Western Himalaya, India

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The Jyuni Watershed, very rich in floristic diversity, has not been explored so far including medicinal flora. Therefore, present attempt has been made to explore the medicinal flora of the Jyuni Watershed. Utilizing a methodological framework of primary field surveys and secondary data analysis conducted between 2017 and 2024, the research involved the collection and taxonomic identification of medicinal flora across varying altitude. Taxonomic validation was performed with the help of regional floras. The study resulted identification of 722 plant species (representing 125 families and 375 genera), representing 475 herbs, 124 shrubs, and 111 trees. Of these, 320 species were utilized for the treatment of various diseases/ailments. Various plant parts such as roots/rhizomes/tubers, aerial parts, stem, bark, flowers, seeds, etc. were used. Distribution pattern of the medicinal flora was studied. The results revealed the decreasing pattern along an altitudinal gradient. Some prominent medicinal plants were *Berberis aristata, B. lyceum, Zanthoxylum armatum, Angelica glauca, Trillium govanianum, Podophyllum hexandrum, Bergenia cilita, Cinnamomum tamala, Swertia angustifolia, S. cordata, Taxus wallichiana, Hedychium spicatum, Valerian jatamansi, Centella asiatica, Salvia lanata, Skimmia laureola, Terminalia chebula,* etc. The native communities rely on these resources to treat various ailments/diseases such as lung and liver disorders, anemia, mental disorder, oncological issues, piles, and many others. Despite low direct exploitation, anthropogenic habitat fragmentation, climate change, and fire suppression threaten the ecological succession of these medicinal taxa. These findings necessitate integrated conservation strategies to conserve regional biodiversity and the **traditional ecological knowledge (TEK)** essential to local healthcare. **Keywords:** Jyuni watershed, Medicinal plants, Taxonomic validation, Diversity, Distribution, Indigenous uses, Himachal Pradesh.

OFOPNCDC31

Physiological Response to Pain During Physiotherapy in Patients with Temporomandibular Joint Disorders: An Indian Clinical Study

Dr. Muskaan Sandhu

Background: Temporomandibular joint disorder (TMD) is a prevalent musculoskeletal disorder, leading to pain and dysfunction with a significant impact on quality of life. Objective pain measurement is challenging in a developing country like India, where physiotherapy plays a significant role in treating musculoskeletal pain. The purpose of this study was to assess the physiological response to pain during manual physiotherapy among Indian patients with TMD and compare it with healthy controls. **Methods:** This was a prospective observational study conducted in the Department of Physiotherapy. A standardised manual muscle therapy of the masseter and temporalis muscles was performed on 30 subjects: 15 diagnosed with TMD and 15 healthy controls.

Physiological signals (i.e., electrodermal activity, EDA, and photoplethysmography-based blood volume pulse, BVP) were simultaneously measured using wireless wearable sensors. Pain perceptions were also recorded using a hand dynamometer (validated at an earlier session using graduated cuff pressures). The relationships between physiological responses, pain episodes, and health status were examined using linear mixed-effects models. **Results:** Large differences in EDA and BVP amplitudes were observed ($p < 0.05$) throughout physiotherapy between pain and no-pain intervals, which is indicative of sympathetic nervous system activation. Nevertheless, there were no significant differences between TMD patients and healthy participants, implying similar autonomic reactivity to manual pain stimuli. The Pain Grip responded well with the numerical rating of pain ($r = 0.78$), supporting it as a reliable self-report measure during therapy. **Conclusion:** The pain response to a painful physiotherapy: Health and TMD subjects. The physiological responses to painful physiotherapy conditions were similar in both healthy and Indian TMD groups, validating the use of healthy controls for studying future pain responses. Portable biosensors and hand dynamometry may enhance the real-time monitoring of pain in Indian physiotherapy clinics, enabling clinicians to titrate treatment intensity in a safe and objective manner.
Keywords: Temporomandibular joint disorder, Pain physiology, Electrodermal activity, Physiotherapy

OFOPNCDC32

Management of Sciatica (Gridhrasi) via Modified Dry Cupping with Nirgundi Patra Swaras

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Background: Sciatica, characterized by radiating pain from the lower back down the leg, significantly impacts quality of life and mobility. In Ayurveda, this condition correlates with *Gridhrasi*, a Vata-dominant disorder. While conventional treatments often rely on analgesics or surgery, Ayurvedic Panchakarma offers non-invasive alternatives to manage pain and inflammation effectively. **Objective:** To evaluate the clinical efficacy of a modified *Dry Cupping Therapy* combined with the topical application of Nirgundi Patra Swaras (Vitex negundo juice) in a patient suffering from chronic Sciatica. **Case Description**: A 35-year-old male* patient presented to the Department of Panchakarma at *LN Ayurveda College and Hospital* with complaints of sharp, radiating pain in the left lower limb, tingling sensations, and restricted walking distance for several months. Physical examination and clinical history confirmed a diagnosis of Sciatica. **Intervention:** The patient underwent a specialized treatment protocol involving: **Topical Application**: Freshly extracted Nirgundi Patra Swaras was applied to the affected lumbosacral and gluteal regions. Nirgundi was selected for its potent Vata-shamaka (Vata-pacifying) and Shothahara (anti-inflammatory) properties. Dry Cupping: Immediately following the application, dry cupping (vacuum therapy) was performed over specific trigger points. This was intended to enhance local blood circulation and facilitate the deeper absorption of the medicinal juice through the skin. **Results**: The patient reported significant symptomatic relief after the treatment course. Key outcomes included:A marked reduction in the intensity of radiating pain (assessed via Visual Analogue Scale), Improvement in the Straight Leg Raise (SLR) test angle, Reduced numbness and increased functional mobility. And No adverse side effects were observed during or after the procedure. **Conclusion:** The integration of Dry Cupping Therapy with Nirgundi Patra Swaras provides a synergistic effect that offers rapid relief in the management of Sciatica. This case highlights the potential of combining traditional Ayurvedic dravyas (medicinal substances) with mechanical therapies to enhance therapeutic outcomes in musculoskeletal disorders.
Keywords: Sciatica, Gridhrasi, Dry Cupping,

Nirgundi Patra Swaras, Vitex negundo, Panchakarma.

OFOPNCDC33

Cumin-Derived Phytochemicals: Isolation, Structural Characterization and HPLC Quantification with Anti-Breast Cancer Potential

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Background: Breast cancer is one of the most common and life-threatening cancers affecting women worldwide. Although several treatment strategies are available, many therapies are associated with adverse side effects, high treatment costs, and the development of drug resistance. These challenges highlight the importance of exploring safer and more effective therapeutic alternatives. Natural products from medicinal plants and dietary spices have long been recognized as valuable sources of biologically active compounds. *Cuminum cyminum* L. (cumin), a widely consumed spice, contains a variety of phytochemicals that may contribute to its therapeutic potential. **Materials and Methods:** Cumin seeds were extracted using a hydroalcoholic solvent system, followed by chromatographic separation to isolate individual phytoconstituents. The structures of the isolated compounds were characterized using spectroscopic techniques including ^{1}H NMR, ^{13}C NMR and mass spectrometry. Quantitative analysis of the major compounds present in the extract was carried out using HPLC. The biological activity of the extract was evaluated against breast cancer cells using an *in vitro* cytotoxicity assay. **Results:** Phytochemical investigation resulted in the isolation of flavonoid compounds including apigenin, luteolin, apigenin-7-O-glucoside, and luteolin-7-O-glucoside. Spectroscopic analysis confirmed the structural identity of these constituents. HPLC quantification revealed the presence of these compounds in appreciable amounts in the cumin seed extract. The extract exhibited dose-dependent cytotoxic activity against breast cancer cells, indicating the possible contribution of these flavonoids to the observed biological activity. **Conclusion:** The present study highlights *Cuminum cyminum* as a promising source of bioactive flavonoids with potential anti-breast cancer activity. These findings support further investigation of cumin-derived phytochemicals as potential candidates for natural product-based anticancer drug development. **Keywords** *Cuminum cyminum*, flavonoids, apigenin, luteolin, HPLC quantification, breast cancer.

OFOPNCDC34

Effect of *Bhallataka (Semecarpus anacardium* Linn.) in Breast Cancer Treatment: A Narrative Review

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Background: Breast cancer, particularly aggressive subtypes like triple-negative breast cancer, remains a major therapeutic challenge due to high recurrence and limited targeted therapies. *Bhallataka* (*Semecarpus anacardium* Linn.), a classical drug in Ayurveda and Siddha, is traditionally indicated in *Arbuda* and has gained research attention for its anticancer potential. **Methods:** A comprehensive review of published literature was undertaken using databases including PubMed, Scopus, and ScienceDirect, focusing on in vitro, in vivo, and clinical studies evaluating Bhallataka and its formulations in breast cancer. **Results:** *In vitro* studies demonstrate significant cytotoxic effects of *Bhallataka* extracts on breast cancer cell lines such as MCF-7 and T47D, mediated through apoptosis induction, mitochondrial dysfunction, calcium signaling, and modulation of Bax/Bcl-2 pathways. In vivo studies, including DMBA-induced mammary carcinoma models, show tumor growth inhibition, modulation of xenobiotic enzymes, and improved survival in tumor-bearing animals. Siddha formulations such as Semecarpus-based preparations (e.g., Kalpaamrutha) demonstrate normalization of biochemical parameters and anticancer effects in experimental models. Phytochemical studies identify active catechol derivatives with cytotoxic and chemosensitizing properties. However, clinical evidence remains limited, with most data derived from preclinical studies. **Discussion:** Bhallataka exhibits multimodal anticancer activity including cytotoxic, immunomodulatory, anti-inflammatory, and pro-apoptotic effects, supporting its traditional use in malignancy. While preclinical evidence is strong, well-designed clinical trials are required to establish its role in integrative breast cancer management. **Key words:** Breast cancer, *Bhallataka*, Semecarpus anacardium, *Kalpamrutha*

OFPPNCDC1

Development and Characterization of Bergenin Nanoparticles for Therapeutic Management of Adjuvant-Induced Arthritis

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Background: Bergenin, a colourless crystalline polyphenol derived from *Bergenia* species, exhibits potent anti-inflammatory and antioxidant properties with few adverse effects (MW 328.27 g/mol). Its low bioavailability and solubility, however, restrict its therapeutic use. Bergenin was incorporated into poly (lactic-co-glycolic acid) (PLGA) nanoparticles to enhance pharmacokinetics and anti-arthritic activity. **Materials and Methods:** Bergenin's compatibility and purity were verified by Preformulation tests (FTIR, melting point, calibration plot, pH, partition coefficient, and XRD). The formulation was optimized using Stat-Ease Design Expert 8.0.7.1 software, considering polymer concentration, probe sonication, and surfactant level as independent variables, while particle size, zeta potential, and entrapment efficiency were dependent variables. Bergenin-loaded PLGA nanoparticles were fabricated via the emulsion solvent evaporation method. The optimized formulation was subjected to *in vitro* characterization, and *in vivo* anti-arthritic activity was evaluated in adjuvant-induced arthritic Sprague Dawley rats, using indomethacin as a standard. **Results:** Bergenin's stability and purity were verified via Preformulation. The optimized nanoparticles exhibited a stable zeta potential, high entrapment efficiency, and appropriate size. Similar to indomethacin, they dramatically decreased paw edema and inflammatory markers *in vivo*. **Conclusion:** Bergenin-loaded PLGA nanoparticles were successfully developed via a simple, reproducible process, demonstrating improved pharmacokinetics and pharmacodynamics and enhanced anti-arthritic efficacy, supporting their potential as a natural therapy. **Keywords:** Bergenin, PLGA nanoparticles, emulsion solvent evaporation, anti-arthritic activity, optimization.

OFPPNCDC2

Formulation, Characterization, and Evaluation of *Jasminum humile* Leaf Extract-Based Nano-Emulsion for the Effective Management of Obesity

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Background: Obesity, a metabolic disorder involving excess fat accumulation and altered lipid metabolism, requires safer natural therapies. *Jasminum humile*, rich in bioactive compounds, shows anti-obesity potential. This study developed a *J. humile* leaf extract nano-emulsion to improve bioavailability and therapeutic efficacy. **Materials and Methods:** Soxhlet extraction of *Jasminum humile* leaves produced an ethyl acetate fraction rich in flavonoids, alkaloids, and phenolics, confirmed by TLC and LC–MS. The extract showed strong antioxidant activity (IC_{20} = 4.5 µg/mL). Nano-emulsions were prepared using Tween 80 and PEG-200 as surfactant and co-surfactant and optimized using Design Expert Software (Version 8.0.7.1). The optimized formulation exhibited a particle size of 325 nm, PDI 0.36, zeta

potential –24.4 mV, drug content 96%, and zero-order release kinetics. *In vivo* anti-obesity activity was evaluated in high-fat diet–induced Wistar rats. **Results:** *In vitro* pancreatic lipase inhibition (IC_{50} = 100 µg/mL) confirmed lipid metabolism modulation, while in vivo studies on high-fat diet–induced obese rats showed reduced body weight, improved lipid and glucose levels, and restored metabolic balance. **Conclusion:** The *J. humile* nano-emulsion showed strong antioxidant and anti-obesity effects, making it a safe and effective formulation for obesity management. **Keywords:** *Jasminum humile*, Nano-emulsion, antioxidant activity.

OFPPNCDC3

Advancements in Nanoparticles for Water Purification

Anju Bala

Microbial contamination of drinking water remains a serious public health concern, particularly in developing regions. The increasing resistance of microorganisms to conventional disinfectants necessitates the development of alternative antimicrobial strategies. In the present study, copper oxide (CuO) and zinc oxide (ZnO) nanoparticles were synthesized using the co-precipitation method and evaluated for their antimicrobial activity against bacterial isolates obtained from drinking water samples. The synthesized nanoparticles were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM), and UV–Visible spectroscopy. XRD analysis confirmed the crystalline nature of the nanoparticles, with average particle sizes of approximately 26 nm for CuO and 17 nm for ZnO. SEM images revealed relatively uniform morphology, while UV–Vis spectroscopy showed characteristic absorption peaks with band gap energies of 2.72 eV for CuO and 3.31 eV for ZnO nanoparticles. Four drinking water samples collected from Hamirpur district, Himachal Pradesh, were analyzed for microbial contamination. Bacterial isolates were identified using morphological, Gram staining, biochemical, and molecular methods. One dominant isolate was identified as *Perlucidibaca aquatica* through 16S rRNA gene sequencing. Antimicrobial activity was assessed using the agar well diffusion method. ZnO nanoparticles exhibited higher antibacterial activity with inhibition zones ranging from 20–28 mm, whereas CuO nanoparticles showed inhibition zones of 18–23 mm. The activity of ZnO nanoparticles was comparable to the standard antibiotic ampicillin (30 mm), while the negative control showed no inhibition. The study demonstrates that ZnO and CuO nanoparticles possess significant antimicrobial potential, with ZnO nanoparticles showing superior efficacy against waterborne bacteria. **Keywords:** ZnO nanoparticles, CuO nanoparticles, antimicrobial activity, drinking water, *Perlucidibaca aquatica*.

OFPPNCDC4

Macelignan: A novel inhibitor of Dengue Virus replication

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Background: The lack of a specific antiviral therapy for dengue fever necessitates the discovery of novel inhibitors. This study investigated the anti-dengue potential of Macelignan, a lignan isolated from Myristica fragrans (nutmeg mace), targeting key viral proteins. **Methods:** The compound was characterized via FTIR, NMR, and HRMS. Its inhibitory potential was first assessed

through in silico molecular docking against DENV NS3 protease (all four serotypes) and NS5 RdRp (serotypes 2 & 3). In vitro validation was performed in Huh7 and Vero cells. Cytotoxicity was determined (CC_{50}), and antiviral activity was evaluated through plaque reduction, qRT-PCR, Western blot (using DENV-specific antibodies against E, NS3, and NS5 proteins), and immunofluorescence assays across multiple treatment paradigms. **Results:** Docking revealed strong binding affinities, notably for DENV-2 NS5 (-8.9 kcal/mol). In vitro testing yielded a CC_{50} of 37 µM. Macelignan treatment resulted in significant, dose-dependent inhibition of DENV replication across all assays. Plaque assays showed a substantial reduction in viral titer, while Western blot and immunofluorescence confirmed decreased expression of viral E, NS3, and NS5 proteins. The compound was most effective when added during early infection stages. **Conclusion:** Our results demonstrate that macelignan effectively targets essential DENV proteins and inhibits viral replication. These findings establish macelignan as a promising lead compound for the development of a direct-acting antiviral against dengue virus.

OFPPNCDC5

QbD-Based RSM Optimization of Green Extraction of *Nyctanthes arbor-tristis* Leaves, with Metabolite Profiling

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Background: *Nyctanthes arbor-tristis* L. (night jasmine) is A medicinal plant traditionally employed in the management of inflammatory disorders, rheumatoid arthritis, and infectious diseases. Its leaves are a rich source of iridoids, phenylpropanoid glycosides, triterpenoids, and related compounds. But the use of scientifically optimised, green techniques remains underexplored. **Materials and Methods:** Green extraction of *N. arbor-tristis* leaves was optimized using microwave-assisted extraction (MAE) and probe-sonication-assisted extraction (PSAE). A Quality-by-Design (QbD)–driven Response Surface Methodology (RSM) approach was used to evaluate the influence of critical extraction parameters (temperature, power, and extraction time) on the response variables: (extraction yield, total phenolic content, total flavonoid content, and total antioxidant activity) and also to optimize the parameters that yield maximum efficiency and recovery of bioactive compounds. Metabolite profiling of optimised extracts was performed using HPLC-MS. **Results:** MAE significantly outperformed PSAE & conventional maceration, yielding higher extraction efficiency, compound recovery, and antioxidant activity while requiring lower solvent consumption, lower temperatures, and shorter extraction time. HRLC-MS analysis identified major bioactive compounds, including glycosides, terpenoids, phenolics and flavonoids. **Conclusions:** The QbD-based RSM approach efficiently optimized green extraction of *N. arbor-tristis* leaves, establishing MAE as a rapid, sustainable, and resource-efficient method for high-value phytochemical recovery with promising pharmaceutical and nutraceutical applications. **Keywords:** *Nyctanthes arbor-tristis,* Microwave-assisted extraction, Probe sonication-assisted extraction, Response surface methodology, Central composite design

OFPPNCDC6

QbD-based Development and Characterization of *Andrographis paniculata* extract-based solid dispersion for NASH therapy

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Background: Non-alcoholic steatohepatitis (NASH) is the progressive form of non-alcoholic fatty liver disease associated with obesity, insulin resistance and hyperlipidaemia, with progression to cirrhosis and hepatocellular carcinoma. Current therapeutic strategies are limited and not multi-targeted approach. *Andrographis paniculata* (AP), a traditional Ayurvedic plant, exerts hepatoprotective and anti-inflammatory activity may offer a multi mechanistic therapeutic approach for NASH management. **Materials and Methods:** A hydroethanolic extract of *A. paniculata* (APHEE) was prepared and characterized for the quantitative estimation of bioactive constituents, antioxidant activity, and quantification of marker compounds. *In silico* study using network pharmacology and molecular docking of AP phytocompounds were carried out against NASH targets (SIRT1, TNF-α, IL-6, PPAR-α, and FGF21). Four major bioactive constituents of *A. paniculata* i, e. andrographolide (AG), gallic acid (GA), chlorogenic acid (CGA), and caffeic acid (CFA), were standardized using HPLC. Solid dispersion formulation of plant extracts was developed and optimised using Quality by Design (QbD) approach. **Results:** APHEE was rich in diterpenoids and phenolics and exhibited potent antioxidant activity (DPPH IC_{50} = 63.52 µg/mL). HPLC analysis quantified high AG content (225.85 mg/g), CGA (54.58 mg/g), GA (2.31 mg/g), and CFA (0.945 mg/g). The optimized solid dispersion was found amorphous, nano-sized (123 nm), stable, and enhanced solubility and bioavailability. Docking studies revealed optimum binding affinities of the bioactives toward various NASH targets. **Conclusion:** *A. paniculata* shows significant multitarget potential against NASH. The QbD-optimized nano-phytoformulation improves stability and bioavailability, supporting its further development for preclinical investigation. **Keywords:** *Andrographis paniculata,* Non-alcoholic steatohepatitis (NASH), molecular docking, solid dispersion, Quality by Design.

OFPPNCDC7

An Ayurvedic Approach to Intimate Hygiene: Development of a Ayurvedic Vaginal Wash

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Background: One of the most important aspects of women's health is intimate hygiene. For all age groups, the vagina is the main entrance point for genital tract infections. *Acharyas* has mentioned *Mithyaachara* as a cause of *Yonivyapad*. In our *Shastras,* has mentioned two types of *Chikitsa* are mentioned - *Abhyantara Chikitsa* and *Sthanika Chikitsa. Abhyantra chiktsa* means administration of internal medications, and *Sthanika Chikitsa* refers to the treatment given locally. Which includes *Yoni Prakshalan, Yoni Pichu, Yoni Lepana, Yoni Poorana, Yoni Dhoopan, Yoni Varti* and *uttarbasti* in various *Yonivyapads.* Among these *Yoni Prakshalan* is widely used for *yonivyapad, Yonikandu, Artava dushti, yoni Paichhlya*

and *yoni srava.* These *Yoni vyapad* can also leads to infertility. Inadequate awareness regarding intimate hygiene, menstrual hygiene, use of pads, tampoons, menstrual cups, and inadequate sexual knowledge increase the risk of infections in female. Therefore, in the modern era, there is a need for ready-to-use and economical vaginal washes. The formulation was prepared using natural plant-based ingredients such as *Ashvatha, Udumbara, Palash, Vata* and *Nimba.* **Material and methods**: Ingredients selected for this mainly known as K*andughana, Kusthghana, Krimighana, Shothhara* and possess *Katu tikta kashyam rasa*. **Results**: The formulation was designed to maintain intimate hygiene, ensure gentle cleansing, and support the natural vaginal pH. **Conclusion:** The formulation was designed to provide an easy-to-use vaginal wash. **Keywords:** Vaginal wash**, genital tract infections, yoni prakshalan**

OFPPNCDC8

Mechanistic Understanding of Curcumin based Lipid derived Nanocarriers for the Effective Therapeutic Management of Acute Coronary Syndrome

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***Background*:** Acute coronary syndrome (ACS) represents a spectrum of life threatening cardiovascular conditions resulting primarily from atherothrombosis, characterized by plaque disruption, platelet activation or thrombus formation. For the last five decades, conventional antiplatelet agents (e.g. aspirin and P2Y12 inhibitors) have been the mainstay for chronic ACS management, however frequently associated with limitations including bleeding risk, variable patient response, and drug resistance. Such challenges advocate the judicious application of safer adjunctive therapies derived from natural phytoconstituents. Curcumin, a bioactive polyphenol possesses highly potent antiplatelet, anti-inflammatory, and antioxidant properties; however, its clinical translation gets restricted by poor biopharmaceutical attributes (i.e. poor solubility, low oral bioavailability, and rapid metabolism). Lipid derived nanocarriers offer effective delivery platform for natural molecules like curcumin to address such challenges via improving bioavailability, stability and targeted delivery in heart associated ailments such as ACS. **Methodology:** Standardized curcumin/turmeric extracts (≥95% curcuminoids) and nano-curcumin formulations evaluated in human clinical studies were included. Relevant cardiovascular and inflammatory outcomes associated with acute coronary syndrome were analyzed from the literature. **Results:** Clinical studies and meta-analyses demonstrate that curcumin significantly modulates platelet-related and atherothrombotic pathways by reducing inflammatory mediators (CRP, TNF-α, IL-6), oxidative stress, and thromboxane-dependent platelet activation. Curcumin loaded nanolipid carriers especially lipid based nanoparticles, consistently exhibit superior clinical outcomes compared to conventional mode of curcumin delivery via improved bioavailability, anti-inflammatory efficacy, and endothelial function in patients with coronary artery disease and acute cardiovascular risk. Further, the results from the preclinical and clinical literature studies indicate that curcumin loaded lipid derived nanocarriers could be the promising proposition to address the pharmacokinetic limitations of curcumin as a individual therapy as well as adjunct nanotherapeutic approach in conditions such as ACS. **Conclusion:** Evidence from the preclinical and human clinical data and meta-analyses, it can be clearly inferred that curcumin loaded nanolipid formulations may significantly improve the level of inflammatory

biomarkers, endothelial function, lipid profile, and platelet-related pathways relevant to atherothrombosis as well as a promising adjunctive nanotherapeutic strategy in ACS management. Nevertheless, large-scale, ACS specific clinical trials are still warranted to clinically validate their long-term safety in terms of antiplatelet action with respect to conventional antiplatelet therapies.
Keywords: *Non-communicable diseases; Acute coronary syndrome; Curcumin; Antiplatelet activity; AYUSH*

OFPPNCDC9

Therapeutic Role of Virechana in Ekakustha: A Case Study

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Background: Ekkushtha, described in Ayurveda, is often correlated with psoriasis in modern medicine. It is a chronic dermatological disorder marked by thick, rough, scaly, and reddish plaques. Skin diseases not only affect physical health but also exert a profound impact on psychological and social wellbeing, often leading to depression, social withdrawal, loneliness, and a diminished quality of life. The prevalence of such conditions is frequently linked to altered lifestyle practices such as poor hygiene, unhealthy dietary habits, emotional stress, and irregular sleep patterns. According to the World Health Organization, skin disorders are categorized as psychocutaneous illnesses, highlighting the close connection between the skin and mental health. Hence, addressing skin disease becomes a primary therapeutic goal.

In Ayurveda, Ekkushtha is classified under Kshudra Kushtha[1], with its pathogenesis attributed to the vitiation of Kapha and Vata Doshas with Pitta and Rakta dearrangement. Among the Panchakarma therapies, Virechana[2] Karma therapeutic purgation holds prime importance, as it effectively eliminates aggravated doshas, especially Pitta, from the body and thereby provides significant relief in conditions like psoriasis. **Aim:** The aim of this study is to evaluate the effectiveness of *Virechana Karma* (therapeutic purgation) in the treatment of *Ekkustha* (psoriasis). The study focuses on assessing the impact of *Virechana Karma* in alleviating symptoms, reducing the recurrence of the disease and improving the quality of life. **Materials and Methods**: This study involved the administration of Virechana Karma in a diagnosed case of Ekkustha. The clinical features of Ekkustha - Asvedanam (Absence of perspiration), Mahavastu (Extensive localization) & Matsyashakalata (fish-like scales) can be correlated with clinical features of psoriasis i.e. Auspitz sign, Candle grease sign, and Koebner's phenomenon. A 48-year-old male patient came to the Panchkarma OPD of Patanjali Ayurvedic College and Hospital, Haridwar, presenting with erythematous patches across the body. **Results:** The results indicated a significant reduction in the severity of *Ekkushtha* symptoms following *Virechana Karma*. Patient experienced marked improvements in the skin texture, with a decrease in scaling and thickness of lesions. The therapy also resulted in a noticeable reduction in erythema. Moreover, the follow-up assessments showed a lower rate of recurrence in patients who underwent *Virechana karma*. **Conclusion:** Virechana Karma serves as an effective Ayurvedic therapy for Ekkushtha (psoriasis), offering relief from symptoms and addressing the root dosha imbalance. By reducing recurrence and improving systemic balance, it proves valuable as a complementary approach, enhancing overall patient wellbeing and supporting integrative management of chronic skin disorders. **Keywords:** Ekkustha, Virechana, Psoriasis

OFPPNCDC10

Seasonal and Ritu-wise Variation in Psychiatric Emergencies: Implications for Preventive AYUSH Mental Health models

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Background: Seasonal variation influences biological rhythms and psychiatric vulnerability, and its association with psychiatric exacerbations has been well documented in mood and related disorders. Ayurveda conceptualizes cyclical physiological shifts through Shad Ritu and emphasizes prevention through "*Swasthasya Swasthya Rakshanam and Aturasya Vikara Prashamanam"*. Seasonal transitions are understood to modulate Bala, Agni, and Dosha balance, potentially increasing relapse risk in vulnerable individuals. However, empirical evidence examining psychiatric exacerbations using Ayurvedic seasonal classification remains limited. **Methods:** A retrospective observational study was conducted using registry data from the Psychiatric Short Stay Ward at National Institute of Mental Health and Neurosciences between 1 June 2023 and 31 July 2024. A total of 10,356 emergency visits across 427 days were analysed. Daily case counts were modelled using generalized additive models with negative binomial distribution, adjusting for day-of-week and time trends. Diagnosis-specific outcomes and severity markers including parenteral benzodiazepine use, antipsychotic administration, and admissions were examined. Ritu-based regression analyses mapped presentations to the six Ayurvedic seasons. **Results:** Significant non-linear seasonality was observed in total emergency presentations. Higher case volumes were noted during Varsha and Grīṣma, while Hemanta and Śiśira demonstrated comparatively lower presentations, consistent with seasonal variation in Bala. Bipolar manic episodes showed relative predominance during Grīṣma, whereas depressive episodes were more frequent during Varsha. Severity indicators also fluctuated seasonally, suggesting increased clinical acuity during high-risk ritus. **Conclusion:** Psychiatric emergencies demonstrate predictable seasonal clustering, indicating identifiable high-risk periods for relapse and increased clinical severity. From an Ayurvedic preventive perspective, structured implementation of Ritucharya, season-appropriate Ahara–Vihara modifications, and timely Śodhana interventions during Ritusandhi may contribute to stabilization in individuals with recurrent mood disorders. Seasonal Panchakarma procedures such as Vamana, Virechana, and Basti when appropriately indicated and clinically supervised, may serve as adjunctive preventive strategies in vulnerable populations.Integrating season-sensitive screening, anticipatory counseling, regular Yoga sessions and relapse-prevention planning within community mental health services reflects the foundational Ayurvedic principle of Swasthasya Swasthya Rakshanam (preservation of health in the healthy) and aligns with the preventive, predictive, and personalized vision of AYUSH 5.0.

OFPPNCDC11

Drug Repurposing of Fexofenadine Hydrochloride Through Development of Colon-Targeted Pellet Formulation for the Management of Inflammatory Bowel Disease

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Background: Inflammatory Bowel Disease (IBD), comprising Crohn's disease and ulcerative colitis, is a chronic relapsing inflammatory disorder of the gastrointestinal tract characterized by dysregulated immune responses and persistent intestinal inflammation. Despite the availability of current therapies such as corticosteroids, immunosuppressants, and biologics, their long-term use is often associated with adverse effects, high cost, and limited therapeutic efficacy. Therefore, the development of safer and more effective treatment strategies remains an important research priority. Drug repurposing has emerged as a promising approach for identifying new therapeutic applications of existing drugs with well-established safety profiles. Fexofenadine hydrochloride, a second-generation H1 antihistamine widely used for allergic conditions, has been reported to possess anti-inflammatory and immunomodulatory properties that may help regulate inflammatory pathways involved in IBD pathogenesis. **Materials and Methods:** Fexofenadine-loaded pellets were prepared using extrusion followed by the spheronization technique with suitable pharmaceutical excipients to obtain uniform particle size distribution and desirable flow characteristics. The prepared pellets will be coated with suitable polymeric coating systems to achieve delayed and controlled drug release targeting the intestinal region. The formulation is evaluated for physicochemical parameters including particle size distribution, flow properties, friability, drug content, and in-vitro drug release behaviour under simulated gastrointestinal conditions. **Results:** Preliminary formulation studies demonstrated satisfactory pellet characteristics, including acceptable flow properties, particle size distribution with 624.38 um, and drug content of 100.04%, with circularity, roundness, and elongation approximately equal to 1. Further coating and in-vitro release studies are currently in progress. **Conclusion:** The proposed colon-targeted pellet formulation of fexofenadine may represent a promising strategy for targeted drug delivery in the management of IBD and warrants further formulation optimization and pharmacological evaluation. **Keywords:** Fexofenadine hydrochloride, Drug repurposing, Inflammatory bowel disease, Pellet formulation, Colon-targeted drug delivery.

OFPPNCDC12

Alcoholic Neuropathy: Possible Mechanism And Future Treatment Possibilities

Roshan Nagar

Chronic and excessive alcohol consumption can lead to Alcoholic Peripheral Neuropathy, a painful condition that damages the nerves outside the brain and spinal cord. This nerve damage causes symptoms such as burning pain, tingling, numbness, and weakness in the arms and legs. The exact mechanism of how alcohol causes this nerve damage is not fully understood, but several factors are involved. These include Oxidative stress (free radical damage to nerves), activation of spinal cord microglia, and disturbance in the HPA axis and mGlu5 receptors. Nutritional deficiency, especially a lack of vitamin B1 (Thiamine), also plays a major role along with the direct toxic effects of Alcohol on nerve tissues. The best

treatment focuses on stopping alcohol completely, eating a balanced diet, and taking vitamin B supplements, mainly from the B group. However, if alcohol use continues, vitamins alone are not enough to improve symptoms. Understanding all these pathways helps in developing better therapies for both prevention and management of alcoholic neuropathy.

OFPPNCDC13

An Evaluative Study of *Sarpagandha* Synergism with *Jatamansi* and *Ashvagandhadyarishta*: A Comparative Review in Non-Communicable Disease Management.

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Background & Objective: Hypertension, clinically correlated with *Uccha Raktachapa*, is a critical Non-Communicable Disease involving the psychosomatic axis. While conventional monotherapy focuses on vascular relief, Ayurveda emphasizes *Tridosha-Samya*. This review establishes the Therapeutic Versatility of *Sarpagandha* (Rauwolfia serpentina) by analyzing its transition from a standalone drug to a sophisticated polyherbal triad, evaluating diverse dosage protocols identified in contemporary literature. **Materials & Methods:** This systematic meta-synthesis evaluates clinical datasets from 2018 to 2025, exploring *Sarpagandha* integration across varied dosage forms. The study analyzes the Variable Dose-Response Relationship identified in multiple review papers: *Sarpagandha Vati* (250 milligrams to 750 milligrams, twice daily), *Jatamansi Phanta* (20 milliliters to 40 milliliters), and *Ashvagandhadyarishta* (15 milliliters to 30 milliliters). A comparative matrix measured blood pressure fluctuations and *Manovaha Srotasa* modulation against Conventional Calcium Channel Blockers. **Results:** Evidence establishes that *Sarpagandha* exhibits Dose-Specific Bioavailability based on the vehicle (*Anupana*). Review papers indicate that lower dosages (250 milligrams) with *Jatamansi* (40 milliliters) target neurological pathways to neutralize Insomnia and Anxiety. Conversely, higher dosages with *Ashvagandhadyarishta* (30 milliliters) facilitate *Dhatu-Gatva* and Hypothalamic-Pituitary-Adrenal Axis stabilization. Unlike Conventional Calcium Channel Blockers which induce Pedal Edema, these protocols maintained a 100 percent safety record even at higher therapeutic ranges. **Conclusion:** *Sarpagandha* polyherbal evolution offers a superior, versatile framework. Strategically adjusting dosage forms provides a Personalized Medicine approach, bridging neurological stabilization and vascular health, outperforming conventional monotherapy. **Keywords:** Non-Communicable Disease, *Uccha Raktachapa*, Sarpagandha Versatility, Jatamansi, Ashvagandhadyarishta.

OFPPNCDC14

Ayurveda And Traditional Medicine in the Contemporary Healthcare System: Scientific Evidence, Challenges, And Future Perspective

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Background: Global healthcare systems are increasingly exploring the integration of Ayurveda and other traditional medical systems due to their holistic approach and effectiveness in managing chronic diseases. Ayurveda has a long-standing clinical tradition spanning thousands of years. However, integrating Ayurvedic practices into modern healthcare frameworks

presents challenges, including standardization of formulations, lack of harmonized regulatory documentation, and the need for stronger clinical evidence. **Material and Methods:** A systematic literature review was conducted using databases including PubMed, Google Scholar, and AYUSH-related sources. The review included studies evaluating Ayurvedic interventions, particularly randomized controlled trials (RCTs) and observational studies focusing on chronic disease management. **Results:** The review indicates a growing body of literature supporting the effectiveness of Ayurvedic interventions in managing chronic non-communicable diseases such as type 2 diabetes, cardiovascular diseases, arthritis, and mental health disorders. Many studies report positive therapeutic outcomes. Regulatory barriers and differences between Ayurvedic and biomedical research paradigms also affect integration efforts. Conclusion: The integration of Ayurveda with modern healthcare systems has the potential to improve chronic disease management and provide cost-effective treatment options. Strengthening clinical research, improving regulatory frameworks, and standardizing formulations are essential for successful integration. Keywords: Traditional medicine, clinical evidence, healthcare integration, herbal formulation, phytopharmacology, regulatory framework.

OFPPNCDC15

Gastro-retentive Microspheres of Yastimadhu: An Ayurvedic Drug Delivery Approach

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Background: Traditional Yashtimadhu (Mulethi) formulations face rapid 'Gastric Clearance,' limiting their 'Ropana' (healing) action on ulcers. This research redefines Ayurvedic delivery by engineering a Floating-Mucoadhesive Bio-composite. It aims to extend the 'Sthana-Samshraya' (stay at the site) of the drug, ensuring prolonged contact with the gastric mucosa. The dual mechanism addresses the inherent limitations of conventional Ayurvedic dosages by creating a stable micro-environment for ulcer healing. **Materials and Methods:** Standardized 'Ghan' (Extract) of G. glabra is encapsulated using 'Prakritik' Bio-polymers (Sodium Alginate and Chitosan/Guar Gum). The optimization followed a Quality by Design (QbD) framework to achieve zero-order release, utilizing Polyelectrolyte Complexation to protect the phytochemicals from acid degradation. Using Effervescent Ionic Gelation, we incorporate Sodium Bicarbonate as a gas-generating agent. Dropping this mixture into a Calcium Chloride bath creates porous microspheres that utilize 'Buoyancy' to float and 'Electrostatic Force' to adhere. **Results:** Optimized microspheres exhibit high Entrapment Efficiency (>85%) with a Floating Lag Time of 12 hours. The bio-polymeric matrix ensures robust Mucoadhesion (>70%) against gastric motility. In-vitro studies indicate a Sustained Release of Glycyrrhizin following Higuchi kinetics, providing a 12-hour therapeutic window for localized 'Ropana' (healing) of the gastric mucosa. **Conclusion:** This study establishes a 'Satvavajaya' between ancient wisdom and modern technology. By synchronizing physical buoyancy with biological adhesion, we enhance the 'Virya' (potency) of Mulethi, providing a scientifically validated, site-specific treatment for 'Parinama Shoola' (Peptic Ulcers). **Keywords:** Gastro-retentive Drug Delivery System, Dual-Action Microspheres, Glycyrrhiza glabra, Anti-ulcer Potential.

OFPPNCDC16

To Development and Evaluation of Herbal Nanoparticle-Loaded Hydrogel For Wound Healing

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Background: Eco-friendly, affordable alternatives to traditional medicine are required due to the high costs and environmental concerns associated with synthetic dressings. In this work, Lodhra nanoparticles are incorporated into a biodegradable alginate hydrogel carrier to create a stable, natural wound dressing. **Material and Methods:** To improve stability and regulate in vitro release, standardised Lodhra extract was encapsulated in chitosan nanoparticles using gelation. An adhesive hydrogel was produced by incorporating these nanoparticles into a sodium alginate solution and cross-linking them with calcium chloride. Particle size, encapsulation effectiveness, biodegradability, swelling ratio, and adhesion were among the characteristics. Hemocompatibility and cytocompatibility tests were used to validate safety, and in vitro fibroblast migration tests were used to evaluate efficacy. **Results:** Lodhra nanoparticles are expected to be small (below 200 nm) with high drug loading. The hydrogel is expected to break down naturally within two weeks. It should swell enough to absorb wound fluid and stick well to skin. Blood or skin cells shouldn't be harmed by the formulation. For two days, a gradual and continuous drug release is anticipated. When compared to plain gel, the hydrogel should dramatically increase fibroblast cell migration, indicating quicker wound healing. Studies on human skin should demonstrate that Lodhra compounds have good skin layer penetration. Conclusion: Plant-based bioactive hydrogels transform regenerative medicine, despite challenges in standardisation and scalability. Future directions include AI-assisted design, 3D bioprinting, and personalised hydrogels. **Keywords:** Plant bioactive, hydrogels, wound healing, phytochemicals, drug delivery, tissue engineering, natural polymers.

OFPPNCDC17

Integrative Management of Insomnia: A Review of *Tagar* (*Valeriana wallichii*) and Modern Neuro-Pharmacological Perspectives

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Background: Chronic Insomnia (*Anidra*) affects 30–35% of adults globally. While modern Sedative-Hypnotics (Benzodiazepines) provide symptomatic relief, they lead to GABA-receptor down-regulation and Rebound Insomnia. Ayurveda defines *Nidra* as a *Trayopastambha* (Pillar of Life), where *Anidra* is caused by *Vata-Pitta-Vriddhi* and *Tamo-Alpata* (depletion of stability). **Materials & Methods:** This Systematic Review analyzes secondary data from *Brihatrayi* (Charaka, Sushruta, Vagbhata) and clinical databases like PubMed (2015–2026). The study evaluates the Synergistic Model of *Satvavajaya Chikitsa* (Ayurvedic Psychotherapy) and Modern Sleep Hygiene. **Results:** Analysis confirms that *Tagar* (*Valeriana wallichii*) acts as a potent GABA-ergic agonist. Its active constituent, Valerenic Acid, inhibits GABA-transaminase, increasing synaptic GABA levels. This directly correlates with the *Vata-hara* and *Nidra-janaka* properties of *Tagar*, which stabilize the *Chala Guna* of *Vata*. Furthermore, the study links *Agni-Vaishamya* (Digestive dysfunction) with the Gut–Brain Axis, affecting the synthesis of

Serotonin (a precursor to Melatonin). **Conclusion:** Integrating *Tagar's Ushna-Virya* and *Snigdha-Guna* with modern CBT-I creates a non-addictive, Evidence-Based therapeutic framework. This manages both *Manasik* (Psychological) and *Sharirika* (Physiological) components of Insomnia more effectively than conventional monotherapy. **Keywords:** *Anidra, Tagar*, Gamma-Aminobutyric acid (GABA) - ergic Modulation, Valerenic Acid, *Trayopastambha*, Gut–Brain Axis, *Vata-hara.*

OFPPNCDC18

Exploring The Neuroprotective Mechanism of Ligusticum Wallichii Against Alzheimer's Disease Through Network Pharmacology and Molecular Docking

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Background: Alzheimer's disease is a progressive neurodegenerative disorder characterized by cognitive decline, neuronal degeneration, oxidative stress, and neuroinflammation. Current therapeutic options provide only symptomatic relief and do not effectively halt disease progression. Ligusticum wallichii, a well-known herb in traditional Chinese medicine, possesses various pharmacological activities including antioxidant, anti-inflammatory, and neuroprotective effects. Recent studies suggest that it may alleviate cognitive impairment associated with Alzheimer's disease; however, the precise molecular mechanisms underlying its neuroprotective activity remain unclear. Therefore, this study employed a network pharmacology and molecular docking approach to explore the potential mechanisms and therapeutic targets of Ligusticum wallichii in Alzheimer's disease. **Materials and Methods:** Bioactive compounds of Ligusticum wallichii and their corresponding targets were retrieved from the Traditional Chinese Medicine Systems Pharmacology Database. Alzheimer's disease-related targets were obtained from the GeneCards and Online Mendelian Inheritance in Man databases. Compound-target interaction networks were constructed using Cytoscape, and protein–protein interaction (PPI) networks were generated through the STRING platform. Functional enrichment analysis including Gene Ontology (GO) and KEGG pathway analysis was conducted using the DAVID database. Molecular docking studies were performed to validate interactions between active compounds and key protein targets, followed by in vitro experimental validation in Neuro-2A cells. **Results:** A total of seven bioactive compounds from Ligusticum wallichii were identified, interacting with 269 potential therapeutic targets related to Alzheimer's disease. Molecular docking analysis revealed that Myricanone, Mandenol, and Sitosterol exhibited stable binding affinities with key proteins including STAT3, HSP90AA1, and EGFR, with binding energies ranging from −4.04 to −5.87 kcal/mol. In vitro experiments further demonstrated that these compounds significantly downregulated the expression of STAT3, EGFR, and HSP90AA1 in Neuro-2A cells, suggesting their involvement in neuroprotective signalling pathways. **Conclusion:** This study highlights that Ligusticum wallichii exerts potential neuroprotective effects against Alzheimer's disease through multi-target interactions involving STAT3, EGFR, and HSP90AA1. The integration of network pharmacology, molecular docking, and experimental validation provides mechanistic insights into its therapeutic potential and supports its development as a promising multi-target agent for neurodegenerative disorders. **Keywords:** Ligusticum wallichii; Network pharmacology; Molecular docking; Alzheimer's disease; Neuroprotection.

OFPPNCDC19

The Emerging Concept of Type 3 Diabetes: Bridging Metabolic Dysfunction and Alzheimer's Disease

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Background: Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common cause of dementia worldwide. Emerging evidence suggests that impaired insulin signaling, chronic hyperglycemia, and metabolic dysfunction may contribute to the development and progression of AD. The concept of "Type 3 diabetes" has been proposed to describe brain-specific insulin resistance associated with neurodegeneration. This systematic review aims to evaluate existing literature to better understand the relationship between metabolic dysfunction and Alzheimer's disease and to highlight the potential role of Type 3 diabetes in AD pathogenesis. **Materials and Methods:** A systematic literature review was conducted using electronic databases such as PubMed, Scopus, and Google Scholar. Relevant articles published in recent years were identified using keywords related to Type 3 diabetes, insulin resistance, metabolic dysfunction, and Alzheimer's disease. Studies including clinical research, experimental studies, and review articles examining the association between metabolic abnormalities and AD were included. Articles were screened based on relevance, inclusion criteria, and quality of evidence. **Results:** The reviewed studies consistently demonstrate a strong association between insulin resistance, impaired glucose metabolism, and neurodegenerative changes characteristic of Alzheimer's disease. Evidence indicates that disrupted insulin signaling in the brain contributes to amyloid-β accumulation, tau protein hyperphosphorylation, oxidative stress, and neuroinflammation. Additionally, metabolic conditions such as Type 2 diabetes and obesity were found to increase the risk of cognitive decline and AD development. **Conclusion:** The findings support the emerging concept of Type 3 diabetes as a potential link between metabolic dysfunction and Alzheimer's disease. Understanding this relationship may provide new insights into disease mechanisms and open avenues for early diagnosis and therapeutic strategies targeting metabolic pathways. Further research is needed to clarify the clinical implications and potential treatment approaches. **Keywords:** Type 3 Diabetes; Alzheimer's Disease; Insulin Resistance; Metabolic Dysfunction; Neurodegeneration

OFPPNCDC20

Pharmacological Evaluation of Zingerone and its Nano-formulation Against Paracetamol Induced Hepatotoxicity in Rats

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In the current research work, isolation of zingerone from *Zingiber* officinale was carried out and evaluation of pharmacological potential of zingerone and its nano formulation against Paracetamol induced hepatotoxicity in rats was evaluated. Since zingerone has hepatoprotective effect in PCM induced hepatotoxicity in rats and further to increase its efficacy, the nano formulation was prepared. The Soxhlet extraction method was used for the preparation of methanolic extract of zinger rhizomes, chloroform, ethyl acetate fractions were prepared from

methanolic extract. The percentage yields of extract and fractions were noted. Phytochemical study of methanolic extract showed the presence of alkaloids and flavonoids. The separated fractions were evaluated for their in vitro antioxidant potential using DPPH assays. The in vitro results showed that chloroform fraction was active as compared to other separated fractions and further zingerone was isolated then zingerone and its nano formulation (nano emulsion) were further evaluated in PCM induced hepatotoxicity model in rats. The zingerone and its nano formulation (nano emulsion) were evaluated at different doses of 15, 30, 60 mg/kg and 5,10, 20 mg/kg. In the present study PCM (3g/kg) for 7 days was given which resulted in significant hepatic damage which further led to hepatotoxicity as demonstrated by pertinent biochemical and histopathological changes. PCM induced hepatotoxicity resulted in the significant increase in the level of hepatic biomarkers and level of oxidative stress markers in liver such as alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphate (ALP), albumin, triglycerides, cholesterol, Reduced glutathione (GSH), as compared to control group. Silymarin (50 mg/kg) was used as standard hepatoprotective drug. Furthermore, the nano formulation (nano emulsion) of zingerone at 20 mg/kg showed significant protection against PCM-induced damage to liver as compared to the isolated zingerone at 60 mg/kg as evident from the histopathological analysis and amelioration of hepatic parameters. It was concluded that the nanoemulsion of zingerone showed better protection than isolated zingerone, which may be due to its enhanced bioavailability and better targeting.
Keywords: Zingerone, Hepatotoxicity, Antioxidant, Nano-formulation.

OFPPNCDC21

Ayurvedic Approach in the Management of Anxiety Disorders (Chittodvega)

Sonia

Background: Anxiety disorders are among the most prevalent psychosomatic illnesses in the contemporary era, significantly affecting mental, emotional, and physical well-being. In Ayurveda, anxiety can be correlated with Chittodvega, a condition arising due to vitiation of Vata and Pitta Dosha along with imbalance of Manasika Doshas—Rajas and Tamas. The involvement of Manovaha Srotas Dushti and impairment of higher mental faculties (Dhi, Dhriti, and Smriti) play a crucial role in its pathogenesis. Increasing stress, lifestyle disturbances, and psychosocial factors act as major contributing causes. **Objective:** To critically analyze Ayurvedic concepts of Chittodvega and to explore the role of classical therapeutic approaches in the management of anxiety disorders. **Methods:** A comprehensive narrative review was undertaken from classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, along with published contemporary research articles. **Results:** Ayurvedic management emphasizes a multimodal approach. Satvavajaya Chikitsa focuses on controlling the mind and improving psychological resilience. Daivavyapashraya Chikitsa includes spiritual and supportive measures, while Yuktivyapashraya Chikitsa incorporates Medhya Rasayana drugs such as Brahmi, Ashwagandha, Shankhapushpi, and Jatamansi, known for their anxiolytic and neuroprotective properties. Panchakarma procedures like Shirodhara, Abhyanga, and Nasya help in pacifying Vata-Pitta and stabilizing mental functions. Additionally, Ahara (Satvika diet), Vihara (Yoga, Pranayama, proper sleep), and Achara Rasayana play a pivotal role in long-term management. **Conclusion:** The Ayurvedic

approach to anxiety disorders is holistic, addressing both the (psychological) and (somatic) aspects of the disease. By targeting the root cause and enhancing mental strength, it offers a safe, sustainable, and integrative strategy for effective management of anxiety disorders.

OFPPNCDC22

Decoding Prameha: A Cross-Disciplinary Insight into Contemporary Metabolic Disorders

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Background: Prameha, described extensively in Ayurvedic classics, represents a spectrum of metabolic and urinary disorders with close resemblance to contemporary conditions such as diabetes mellitus, obesity, and metabolic syndrome. Its multifactorial origin involving Tridosha imbalance and Dushya vitiation highlights a systemic metabolic dysfunction. **Materials and Methods:** A conceptual and comparative literary analysis was conducted using classical Ayurvedic texts including Charaka Samhita and Sushruta Samhita, along with contemporary biomedical literature on metabolic disorders. The etiopathogenesis (Samprapti), clinical features, and management strategies were critically analyzed and correlated with modern scientific mechanisms. **Results:** The study reveals that Prameha shares significant parallels with modern metabolic disorders, particularly in terms of insulin resistance, adiposity, sedentary lifestyle influence, and chronic inflammatory pathways. Ayurvedic descriptions of Kapha predominance, Meda dushti, and Kleda vriddhi align with current understandings of metabolic dysregulation. Preventive and therapeutic approaches such as Ahara, Vihara, and herbal interventions demonstrate potential in modulating disease progression. **Conclusion:** Prameha can be interpreted as an early holistic model of metabolic syndrome. A cross-disciplinary approach integrating Ayurvedic principles with modern biomedical insights may offer effective, personalized strategies for prevention and management of metabolic disorders.
Keywords: Prameha, Diabetes Mellitus, Metabolic Syndrome, Ayurveda, Insulin Resistance, Tridosha

OFPPNCDC23

Natural Compound-Based DMOAD Discovery for Osteoarthritis: Virtual Screening and Molecular Dynamics Simulation Targeting the TGF-β/NF-κB Signaling Pathway

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Background: Osteoarthritis (OA) is a progressive joint disease affecting approximately 240 million individuals globally and ranks as the eleventh leading cause of disability. Current therapies provide only symptomatic relief without altering disease progression. Diacerein, the only approved disease-modifying osteoarthritis drug (DMOAD), is limited by poor intestinal bioavailability and gastrointestinal toxicity. MMP13, IL-1β, Smad6, and Smad7 are established effectors of the TGF-β/NF-κB signaling axis and contribute to cartilage degradation in OA. Naturally derived anthraquinone compounds, including Aloe-Emodin

(NC1), Emodin (NC2), and Rhein (NC3), sourced from natural product libraries, share structural similarity with diacerein and may represent safer, promising DMOAD candidates. **Materials & Methods:** Crystal structures of MMP13 (PDB: 1ITB), IL-1β (PDB: 5BPA), Smad6, and Smad7 were obtained from the RCSB Protein Data Bank and processed using the Protein Preparation Wizard in Schrödinger Maestro with the OPLS4 force field. A curated natural compound library from the ZINC Natural Products and COCONUT databases was screened, and Aloe-Emodin, Emodin, and Rhein were shortlisted based on structural similarity to diacerein. These compounds, together with diacerein as a positive control, were prepared using LigPrep and subjected to hierarchical virtual screening (HTVS, SP, and XP docking with GLIDE) against all four targets. Apo-protein simulations served as reference controls. Binding free energies were calculated using MM-GBSA (Prime), and ADME/toxicity profiling was performed with QikProp. The top-ranked complexes underwent 100 ns all-atom molecular dynamics simulations using GROMACS, with trajectory analyses including RMSD, RMSF, radius of gyration, and hydrogen-bond occupancy. **Results:** Virtual screening identified Aloe-Emodin, Emodin, and Rhein as top-ranked compounds across all four targets, exhibiting favorable XP GlideScores and MM-GBSA binding free energies relative to diacerein. ADME profiling indicated drug-like properties, with improved predicted solubility and oral bioavailability compared to the positive control. The 100 ns molecular dynamics simulations demonstrated consistent ligand-induced conformational stabilization across all targets relative to their respective apo-proteins. For MMP13 (1ITB), Aloe-Emodin (RMSD: 0.168 Å) and Emodin (0.171 Å) provided the greatest stability compared to the apo-protein (0.196 Å). In IL-1β (5BPA), Aloe-Emodin exhibited the lowest RMSD (0.390 Å), while diacerein showed the highest fluctuation (0.485 Å). For Smad6, where the apo-protein was markedly unstable (3.24 Å), Rhein provided the strongest stabilization (1.25 Å), followed by Emodin (1.65 Å) and Aloe-Emodin (2.09 Å). In Smad7, Aloe-Emodin achieved the lowest RMSD (0.189 Å) compared to the apo-protein (0.33 Å). Overall, Rhein and Aloe-Emodin were the most consistent stabilizers across multiple targets. **Conclusion:** Screening of natural compound libraries identified Aloe-Emodin, Emodin, and Rhein as promising in silico DMOAD candidates capable of modulating the TGF-β/NF-κB pathway in osteoarthritis. Rhein demonstrated superior stabilization of Smad6, while Aloe-Emodin exhibited the strongest performance in IL-1β and Smad7 systems. These findings support their potential as lead compounds for subsequent in vitro and in vivo experimental validation. **Keywords:** Osteoarthritis, DMOAD, Aloe-Emodin, Emodin, Rhein, Diacerein, Virtual Screening, Molecular Docking, Molecular Dynamics, GROMACS, TGF-β/NF-κB

OFPPNCDC24

Identification and Computational Evaluation of Novel GPR56 Agonists for Depression: An Integrated *In-Silico* Approach

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Background: Depression is a multifactorial neuropsychiatric disorder with limited effective therapeutic targets. G protein-coupled receptor 56 (GPR56), a member of the GPCR family, has emerged as a novel target due to its role in neurotransmission and neuroinflammation. Downregulation of GPR56 is associated

with increased depressive severity, making it a promising candidate for drug development. **Objective:** To identify and evaluate potential GPR56 agonists using an integrated *in-silico* approach, followed by preliminary validation for their therapeutic potential in depression. **Methods:** The crystal structure of GPR56 (PDB ID: 7SF8) was prepared and validated. A library of 2,625 FDA-approved drugs and ~400,000 compounds from the ASINEX database were screened using structure-based virtual screening (HTVS, SP, XP) via GLIDE. Top hits were further evaluated using MM/GBSA binding energy calculations, pharmacokinetic profiling (QikProp), and toxicity prediction. Selected compounds underwent 100 ns molecular dynamics (MD) simulations using the Desmond module to assess stability and binding interactions. **Results:** Virtual screening identified several promising candidates, with pregnenolone emerging as a BBB-permeable lead from FDA-approved drugs. From the ASINEX library, four compounds demonstrated favorable toxicity profiles and pharmacokinetics. Among these, Compound 8 exhibited the highest stability in MD simulations (RMSD: 3.00 ± 0.32 Å) compared to control and apo forms. Reduced RMSF fluctuations indicated stable ligand-protein interactions, suggesting strong binding affinity toward GPR56. **Conclusion:** This study identifies novel GPR56 agonists with favorable pharmacokinetic and stability profiles. These findings provide a strong foundation for further in vitro and *in vivo* validation, supporting GPR56 as a promising therapeutic target for depression.

ONOPNCDC1

Hutchinson-Gilford Progeria Syndrome: Impact of Early Molecular Detection and Progerin-Targeted Modulation on Disease Progression

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Background: Hutchinson–Gilford Progeria Syndrome (HGPS) is a rare, fatal, non-communicable genetic disorder characterized by accelerated aging and early-onset cardiovascular disease. It results from a de novo mutation in the *LMNA* gene leading to production of progerin, a toxic lamin A variant that disrupts nuclear integrity and cellular function. **Materials and Methods:** A narrative review of peer-reviewed literature, clinical trials, and experimental studies was conducted to evaluate molecular pathogenesis, clinical manifestations, and therapeutic strategies targeting progerin accumulation, with emphasis on early molecular diagnosis. **Results:** Early genetic identification of *LMNA* mutations enables timely initiation of therapies aimed at reducing progerin toxicity rather than suppressing the essential *LMNA* gene. Farnesyltransferase inhibitors, particularly lonafarnib, demonstrated improvements in vascular stiffness, weight gain, and overall survival. Emerging antisense oligonucleotide and genome-editing approaches showed a substantial reduction of progerin expression in preclinical models. **Conclusion:** Although HGPS remains incurable, early molecular detection combined with targeted modulation of progerin production can significantly slow disease progression and premature aging-related complications. Progeria provides critical insights into aging biology and non-communicable cardiovascular disorders. **Keywords:** Progeria; *LMNA* mutation; Progerin; Early diagnosis; non-communicable disorders; Targeted therapy

ONOPNCDC2

Antileukemic potential of hydroalcoholic extract of *Fagonia cretica* L. on benzene-induced leukemia in rats

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Background: *Fagonia cretica* L. is a spiny herb that can cure cancers as shown in many studies. Its components are also used to treat cancer, it's efficacy in leukemic patients has been spread through word of mouth in different communities. Hence, the anti-leukemic potential of the hydroalcoholic extract of *F. cretica* was studied. **Method:** To establish the safe dose of *F.cretica*, an acute oral toxicity study was done according to OECD Guidelines 423. The antileukemic activity was evaluated in male Wistar rats. First, baseline parameters were analysed, and leukemia was induced by benzene (0.2 mL, IV) given 48 hourly for five weeks. Hematological parameters and peripheral smears were examined to confirm the induction of leukemia. Treatment was started in the test (hydroalcoholic extract, 140mg/kg, 195mg/kg, and 250mg/kg) and standard groups (cyclophosphamide) and continued for 4 weeks. After treatment, hematological analysis and peripheral smears observed, and animals were sacrificed; the spleen and liver were dissected, and their weight was taken and sent for histopathological assessment. **Results:** *F.cretica* was found safe at 5000 mg/kg. After benzene administration, leukemia induction resulted in significant anemia indices and leukocytosis ($P < 0.05$) in rats, all the parameters were altered, and WBCs

became irregular and large with a dominant nucleus. After treatment, *F.cretica* at all three doses restored the hematological parameters (p=0.5-0.0001) and cell morphology. The high dose showed a more significant effect and was comparable to cyclophosphamide. **Conclusion:** Based on the findings, it is concluded that *F.cretica* has antileukemic potential against benzene-induced leukemia in Wistar rats. **Keywords:** Anti-leukemic activity; Benzene; *Fagonia cretica*; Unani medicine.

ONOPNCDC3

Non-Communicable Diseases and Disorders

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Background: It is also known as chronic diseases, which do not spread from person to person. These illnesses take a long time to develop and do not present symptoms in the early stages. The main types of non-communicable diseases are Diabetes, Coronary Heart Disease, Stroke and Cancer, Chronic Respiratory Distress such as COPD and Asthma. Non-communicable diseases (NCDs) are primarily driven by a combination of personal lifestyle choices and the external conditions in which people live and work. The most common risk factors contributing to these conditions include socio-economic and environmental factors, such as living in poverty and navigating stressful physical or social environments. Frequent consumption of processed foods high in fats, sodium (salt), and refined sugars.Sedentary lifestyles (lack of physical activity), tobacco use, and the harmful consumption of alcohol. High levels of chronic stress. **Materials and Methods:** Screening is a process of identifying a disease condition among apparently healthy individuals who may be at increased risk of a disease or condition. For measurement of blood pressure, you will require a blood pressure (BP) apparatus (either digital or aneroid), and for measuring blood glucose, you will require a glucometer. For Coronary Heart Disease, we need to do an Electrocardiography and an Echo test. For cancers like oral cancer, an Oral Visual Examination is done once every 5 years. **Results:** In India, Non-communicable diseases (NCDs) have become a critical health challenge, accounting for 60% of the country's total mortality. The four major causes of Non-Communicable Disease deaths are: Coronary Heart Disease, Stroke, and Hypertension (45%), Chronic respiratory disease (22%), Cancers (12 %) and Diabetes (3%). Cancer screening efforts show a significant shortfall; according to recent national indicators, fewer than 5 per 1,000 people have undergone an Oral Visual Examination. In heart health screenings, ECG and Echo tests continue to uncover high rates of previously undetected cardiac abnormalities. Additionally, there is a visible trend of early-onset metabolic issues, with an increasing number of young adults (18–40 years old) reaching a BMI of 23 kg/m² or higher, signalling future health complications. **Conclusion:** Prioritising the mitigation of modifiable risk factors is the cornerstone of Non-Communicable Disease management. Given the long latency period of these conditions, early-stage interventions focusing on lifestyle modification represent the most economically viable strategy for improving public health outcomes." Early detection through routine screening remains a critical, yet often untapped, strategy in the fight against Non-Communicable Diseases. Because many chronic conditions, such as hypertension or early-stage diabetes, are 'silent' and show no symptoms.

ONOPNCDC4

Cervical spondylosis: As an emerging lifestyle disorder

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Background: Cervical spondylosis is a chronic, progressive degenerative disorder of the cervical spine involving the vertebral bodies, intervertebral discs, and associated ligaments, often leading to compromise of spinal canal contents. The condition commonly progresses with age and affects multiple cervical levels, with C6–C7 and C5–C6 being the most frequently involved segments. Epidemiological data indicate degenerative changes in approximately 25% of individuals below 40 years, 50% above 40 years, and up to 85% of those over 60 years of age. Traditionally considered an age-related disorder, cervical spondylosis is increasingly recognized as a lifestyle-related condition, with rising early-onset cases among individuals in their 20s and 30s. Contributing factors include prolonged use of electronic devices ("tech neck"), sedentary behavior, poor posture, and less physical activity. Ayurveda, the ancient system of medicine, emphasizes both preventive and therapeutic strategies in the management of musculoskeletal disorders. It offers a comprehensive approach to cervical spondylosis through the use of *Aushadhi* (herbal medications), *Panchakarma* therapies, and *Pathya–Apathya* (dietary and lifestyle modifications). **Materials and Methods:** This presentation reviews the definition, etiology, prevalence, and Ayurvedic management of cervical spondylosis, with emphasis on Panchakarma procedures and herbal formulations. Information was compiled from classical Ayurvedic texts, including *Saṃhitās* and *Nighaṇṭus*, as well as relevant modern scientific literature. **Results and Discussion:** Ayurvedic treatment protocols aim to disrupt *Doṣa–Dhātu–Duṣya Saṃmūrchana*, nourish bones and ligaments, and restore functional balance. Proper adherence to Pathya–Apathya guidelines may reduce recurrence and enhance long-term management, highlighting Ayurveda's role in addressing cervical spondylosis as an emerging lifestyle disorder.

ONOPNCDC5

An Ayurvedic Approach to Alcoholic Fatty Liver Disease Using Panchkarma and Shaman Therapy: A Case Study

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Background: Alcohol can produce a wide spectrum of liver diseases from fatty change to hepatitis, cirrhosis, liver failure and hepatocellular carcinoma. There is no standard protocol established for the treatment of Fatty Liver. Therefore, the present clinical study was undertaken to evaluate the efficacy of *Shaman Yoga* in the form of *Kwatha and Tablets*, along with *Panchakarma* intervention- *Anuvasana Basti* and *Niruha Basti* administered on alternate days following the *Kala Basti* regimen. **Material & Methods**: The patient **was selected** from the OPD of Mehr Chand D.A.V. Hospital Jalandhar. **Source of drugs:** *Yakrit-16 Compound Kwatha & Tablets were procured from D.A.V. Pharmacy, Jalandhar. Murchitt tila tail for Anuvasana basti and Kalmeghadi Niruha Basti was freshly prepared after proper identification of raw drugs.* **Assessment parameters:** Ultrasonography of abdomen & LFT was done before and after the treatment. **Results**: On ultrasonographic assessment, the findings before treatment revealed Grade I fatty liver. On repeat evaluation after treatment, the liver appeared normal on ultrasonography, indicating marked radiological

improvement. This was also supported by corresponding changes in liver function tests, which showed significant normalization of hepatic enzyme levels after treatment, reflecting overall improvement in liver function. **Conclusion**: Ayurveda medicine and therapies has gained popularity because of their safety, efficacy and cost effectiveness. In this case study positive results were significantly noticeable in both clinical and laboratory criteria. Thus, it can be concluded that *Kalmeghadi Niruha Basti* and *Yakrit*-16 Compound- *Kwatha* & Tablets plays a significant role in the management of AFLD. **Keywords**: Ayurved, Alcohol, Liver, *Yakrit*, *Basti*

ONOPNCDC6

Role of Rasayana Therapy in the Prevention of Non-communicable Disorders

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Background: Non-Communicable Diseases (NCDs) such as diabetes mellitus, cardiovascular disorders, obesity, neurodegenerative disorders, and cancer pose a significant global health challenge due to their chronic and progressive nature. Ayurveda emphasizes prevention through holistic care, with *Rasayana* therapy playing a central role in promoting longevity, enhancing Vyadhikshamatva, improving Agni, nourishing Dhatus, and preserving Ojas. The pathogenesis of NCDs can be correlated with Ayurvedic concepts such as *Santarpanajanya Vyadhi, Agnimandya, Ama* formation, *Dhatukshaya* and *Ojakshaya* which arise from improper *Ahara, Vihara*. This paper critically evaluates the preventive potential of Rasayana in NCDs, correlating Ayurvedic principles with modern concepts like oxidative stress, chronic inflammation, immune dysregulation, and aging. Rasayana therapy, combined with lifestyle modification and *Swasthavritta* provides a rational, cost-effective, and sustainable strategy for reducing the burden of Non-Communicable Diseases. **Materials and methods:** The present study is a narrative review and conceptual analytical study aimed at evaluating the preventive potential of Rasayana therapy in the management of Non-Communicable Diseases (NCDs) from an Ayurvedic perspective with supportive modern scientific correlations. Information was complied from classical ayurvedic texts and relevant modern scientific literature. **Result and Discussion:** Rasayana therapy prevents NCDs by improving Agni, reducing Ama, nourishing Dhatus, enhancing immunity, and counteracting oxidative stress, inflammation, and aging through holistic lifestyle integration.

ONOPNCDC7

Next-Generation Nanomaterials for Diabetes-Compromised Bone

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Bone regeneration is a complex and tightly regulated biological process involving osteoblasts, osteocytes, and osteoclasts. While bone generally exhibits strong self-healing potential, this capacity is significantly compromised under pathological conditions such as severe trauma, infections, tumors, and metabolic disorders including diabetes mellitus. Diabetes-associated bone impairment is characterized by chronic inflammation, oxidative stress, reduced angiogenesis, impaired osteogenic differentiation, and delayed fracture healing, thereby increasing the need for advanced bone regenerative strategies. Conventional bone grafting

approaches-autografts, allografts, isografts, and alloplasts—are limited by donor-site morbidity, immune rejection, limited availability, and inadequate biological performance, particularly in diabetic environments. Consequently, recent advances in bone tissue engineering have increasingly focused on nanomaterials and polymer nanocomposites as promising alternatives for bone regeneration under both normal and diabetic conditions. Nanomaterials, owing to their nanoscale dimensions (1-100 nm), high surface area, and tunable physicochemical properties, closely mimic the native bone extracellular matrix and promote enhanced cell–material interactions. Polymeric nanocomposites incorporating nanoscale fillers enable the recreation of bone's hierarchical architecture. Bioceramic/synthetic polymer nanocomposites, combining calcium phosphates or hydroxyapatite nanoparticles with biodegradable polymers such as PLGA and PCL, exhibit superior osteoconductivity, mechanical strength, and cellular responses, which are particularly beneficial for overcoming impaired osteogenesis in diabetic bone. Natural polymer–bioceramic nanocomposites based on collagen, chitosan, and silk fibroin offer excellent biocompatibility and support cell adhesion, while bioceramic reinforcement improves their mechanical stability. In addition, metal, metal oxide, and carbon-based nanomaterials—including gold, silver, zinc, calcium, hydroxyapatite, titanium dioxide, and carbon nanotubes—impart antioxidant, antibacterial, and angiogenic effects that help counteract diabetes-induced oxidative stress and inflammation. Overall, nanomaterial-based polymer nanocomposites provide tunable, multifunctional, and biomimetic platforms for enhancing bone regeneration, particularly in diabetic conditions.

Keywords: Bone Regeneration; Diabetic Bone Healing; Nanomaterials; Osteogenesis; Hydroxyapatite; Bioceramics; Angiogenesis; Tissue Engineering

ONOPNCDC8

Elucidating the Potential of Homeopathic Formulations in Modulating Bone Health

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Background: Osteoporosis is a bone loss disease that leads to lower BMD, and decreased bone strength. Homeopathy is an alternative medicine system. Despite the efficacy of homeopathic formulations in preventing osteoporosis, homeopathy remains one of the most controversial subjects due to lack of proper scientific evidences. Moreover, homeopathy comes under the umbrella of GOIs-AYUSH programme, which supports for more evidence-based research in alternative medicine domains. In the present study we investigated the anti-osteoclastogenic potential of selected homeopathic formulations (SHFs): *Symphytum officianale(SO)*, Calcarea carbonica(CC), Calcarea phosphorica(CP) & Calcarea fluorica(CF). **Materials and Methods:** RAW264.7 cell line was used to assess the effect of selected potencies of homeopathic formulations on cell viability via an MTT assay. For Osteoclasts differentiation, primary bone marrow-derived macrophages (BMMs) were

cultured in osteoclastogenic medium with or without 6C, 30C, 200 C potency of SHFs: *SO*, CC, CP and CF. TRAP & F-actin assay were performed to evaluate osteoclastogenesis. qPCR was also performed to evaluate the effect of HFs on gene expression. Finally, the effect on osteoclastogenesis was evaluated in an ovariectomised (OVX) mouse model. **Results:** We first evaluated the effect of HFs on the cell viability of RAW 264.7 cell line. TRAP & F-actin analysis showed that all formulations inhibited osteoclastogenesis, with 200C being the most potent inhibitor. Further, qPCR confirmed reduced expression of osteoclast-specific genes after HF treatment. Interestingly, these homeopathic formulations also suppressed osteoclastogenesis in OVX mouse model. HFs also Bregs & Tregs and suppressed Th17 cells in OVX mice. **Conclusion:** Taken together, our results for the first time establish the anti-osteoclastogenic potential of SHFs, thereby paving path for further research in exploring the bone health-enhancing potential of HFs in clinics. The results are thus in line with the GOI's mission of AYUSH-based therapies in the country. **Keywords:** *Homeopathy, Osteoporosis, Symphytum, Calcarea, Osteoclast, Immune cells*

ONOPNCDC9

Ayurvedic Perspective of Migraine: Types and Tridoshaja Chikitsa

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Background: Migraine is a common, chronic, and recurrent neurological disorder characterized by moderate to severe unilateral headache, often accompanied by nausea, vomiting, and sensitivity to light and sound. It is a leading cause of disability and reduced productivity worldwide. In India, migraine prevalence is particularly high, with one-year rates ranging from about 14% to over 27%, disproportionately affecting women, especially during their reproductive years. Despite its significant burden, migraine remains underdiagnosed and inadequately managed in many individuals. In Ayurveda, migraine can be correlated with *Ardhavabhedaka*, a condition predominantly involving *Vata dosha*, with variable participation of *Pitta and Kapha* based on clinical presentation. The concept of *Tridosha Siddhanta* offers a holistic framework for understanding migraine pathogenesis, highlighting *doshic* imbalance, nervous system hypersensitivity, and triggering factors such as sensory overload. **Materials and Methods:** This narrative review is based on analysis of classical *Ayurvedic Samhitas*, modern medical literature, and published research articles. **Discussion:** *Tridosh siddhant* is basic *siddhant* which use many different types of disease management in migraine very less and countable medicines are use, therefore with the help of *tridosh siddhant* it is easy to treat migraine patients as a personalized medicine. Migraine correlates with *Ardhavabhedaka* in *Ayurveda.Tridosha* involvement seen in migraine pathology.Nasya effectively reduces headache intensity.*Virechana* pacifies aggravated *Pitta* and *Vata*. *Vamana* beneficial in *Vata-Kaphaja* migraine. *Viddhakarma* provides immediate pain relief. *Shamana* drugs maintain *doshic* balance. *Yoga* and *pranayama* prevent recurrence. **Conclusion:** A *Tridosha*-based *Ayurvedic* approach provides a personalized and comprehensive strategy for long-term migraine management, with the potential to improve symptom control and overall quality of life. **Keywords:** Migraine**,** *Ardhavbhedak*, *Shirshool*, *Tridosh, Dosh pradhanya*.

ONOPNCDC10

Ayurvedic Management of Cerebral Palsy: A Conceptual Review

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Background: Cerebral palsy (CP) is a permanent, non-progressive disorder of movement and posture caused by injury to the developing fetal or infant brain. It is a leading cause of childhood disability, affecting about 2 per 1,000 live births worldwide. CP impairs motor function, growth, development, and quality of life, creating significant challenges for both children and caregivers. There is no cure, and treatment is primarily supportive. **Objective:** To evaluate the potential role of Ayurvedic treatment modalities in the management of cerebral palsy. **Methods:** A conceptual and literary review of Ayurvedic classical texts and contemporary medical literature was undertaken. It was analyzed based on its etiopathogenesis and clinical manifestations and correlated with Ayurvedic principles, particularly under the framework of *Vata Vyadhi*. The involvement of *Shiromarma* and *Vata Dosha* derangement was considered central to the neuromotor dysfunction observed in CP. While considering pathophysiology and management of Spastic CP it can be taken as *Avarana Janya Vata Vyadhi* (*Kaphavrita Vata*). Relevant Ayurvedic therapeutic approaches described for *Vata* disorders were reviewed. **Result**: Ayurvedic literature emphasizes *Panchakarma* in managing *Vata Vyadhi*, the key pathology in neurodevelopmental disorders. Therapies like *Abhyanga, Swedana, Nasya, Shirodhara, and Basti* pacify *Vata* and improve neuromuscular function. Along with this, *Rasaushadhi* (*Swarnaprashana, Kumarabharana Rasa*) and *Medhya Ghrita* formulations enhance cognition, immunity, strength, and growth, supporting holistic mental and physical development in children. **Conclusion:** Although cerebral palsy has no direct one-to-one correlation in Ayurvedic literature, it can be comprehensively understood as a *Vata Vyadhi*. Ayurvedic interventions aimed at balancing *Vata Dosha* may help improve functional abilities

ONOPNCDC11

An Ayurvedic Perspective on Medhya Herbs w. s. r. to Depression and Anxiety Disorders

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Background: Ayurveda defines health (*Swasthya*) as equilibrium of *Doshas, Dhatus, Agni, and Malas*, with overall mental-spiritual well-being. Mental stability depends on balance among the Manas Gunas—*Sattva, Rajas, and Tamas*. Classical texts describe disorders as disturbances of *Sharirika* and *Manasika Doshas*. *Vishada* and *Avsada* resemble depressive states, while *Chittodwega* correlates with anxiety. *Prana Vata* governs mental functions including intellect, memory, and emotional regulation, whereas *Sadhaka Pitta* is linked to cognition and processing. **Methods:** A conceptual review was conducted using classical Ayurvedic literature, chiefly the Charaka Samhita and its commentaries. Concepts analysed included *Prana Vata, Sadhaka Pitta, Pragya Aparadha, Manovaha Srotas*, and disease entities such as *Vishada, Avsada, Chittodwega*, and *Kaphaja Unmada*. References to Medhya *Rasayana* and

individual Medhya herbs were also examined for relevance in mental health. **Results:** Depression and anxiety are associated with vitiation of *Vata*, especially *Prana Vata*, leading to impaired memory, concentration, perception, and emotional control. Dominance of *Rajas* and *Tamas* with depletion of *Sattva* results in psychological instability. *Pragya Aparadha* and negative emotions further aggravate Dosha imbalance. Disturbance of *Sadhaka Pitta* contributes to emotional disorders and is linked with heightened *Rajas and Tamas*. Management includes Medhya herbs such as *Brahmi, Mandukaparni, Yashtimadhu, Ashwagandha, Shankhapushpi, and Jatamansi.* **Discussion:** Ayurveda interprets depression and anxiety as disorders involving dysfunction of *Prana Vata* and *Sadhaka Pitta* with imbalance of the Manas Gunas. Medhya herbs may help restore equilibrium, warranting further rigorous clinical validation. **Keywords:** Ayurveda; Depression; Anxiety; *Manas Gunas; Medhya Rasayana*

ONOPNCDC12

Beyond Addiction: Understanding Madatyaya as a Chronic Systemic Disorder (NCD)

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Background: Alcohol use disorder is commonly understood in modern medicine as a physical and neuropsychological condition. Ayurveda, however, describes *Madatyaya* as a disorder with deep systemic involvement affecting both body and mind. From the perspective of *Agada Tantra*, *Madya* (alcohol) is considered *Visha-tulya*, possessing poison-like properties that weaken *Ojas*, the core determinant of vitality and immunity. With the growing global burden of non-communicable diseases (NCDs), it becomes important to re-examine chronic *Madatyaya* not merely as addiction, but as a sustained state of metabolic and inflammatory toxicity. **Methods:** A comparative literary review was carried out using classical Ayurvedic texts such as the *Charaka Samhita* and *Sushruta Samhita*, along with selected contemporary toxicological and biomedical literature. The analysis focused on the *Visha gunas* of alcohol and their role in long-term systemic pathology. **Results:** The review suggests that prolonged alcohol consumption closely resembles *Dushi Visha*, characterized by latent persistence, cumulative toxicity, and delayed clinical expression. The *Tikshna*, *Sukshma*, and *Vikasi* properties of alcohol enable deep tissue penetration, resulting in *Dhatu dushti*, chronic inflammation, and progressive multi-organ dysfunction. These pathological changes parallel modern descriptions of alcohol-related NCDs such as liver cirrhosis, cardiomyopathy, and metabolic syndrome. **Discussion:** Viewing *Madatyaya* as a chronic non-communicable disease offers a broader and more integrative understanding of alcohol-related illness. The application of *Visha-pratishedha* principles along with *Ojo-vardhaka* and restorative therapies helps not only from abstinence but also in long-term systemic recovery and resilience. **Keywords**: *Dushi Visha*; *Madatyaya*; Non-Communicable Disease; *Ojas*

ONOPNCDC13

Prameha-Type 2 Diabetes Mellitus

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Background: Prameha us derived from root word Pra + Meha means, Mih Sechane. A condition characterised by excess urination which cardinal feature of Prameha. In modern prespective, Diabetes Mellitus has similar symptoms along with raised blood sugar levels. Type 2 DM linked with Obesity, Inactivity, Poor diet (Higher calories, trans fat, Processed food &

convince meals). In today's scenario, the incidence rate of DM in children & adolescent are raised. Incidences rate - 397 /100,000 person in 2021 reviews, Nationwide India is ranking 2nd in World. **Methods & Materials:** Management of Prameha is mentioned in Ayurveda as Preventive & Curative aspects. 1. Nishakathkadi kashayam, 2. Nishaamalaki kashayam, 3. Chandraprabha vati, 4. Amrutotthara kashayam, Along with Shodhana & Shamana Aushadhi Pathya apathya in Ahara-Vihara & Yogasana (Padahastasana, Setubandhasana, Vakrasana etc..) should be adopted. These Shamana aushadhi are in majority of Anti diabetic, Anti oxidative, Anti-inflammatory, Immuno modulator functions. **Results & Discussion:** Anti-diabetic, Anti-oxidative properties of Amalaki, Haridra are mainly useful for the management of Prameha-like conditions to manage blood sugar levels with kidney filtration rate. Management of all these symptoms at childhood & adolescent age will prevent from chronic complications. **Keywords:** Prameha, Diet, Ayurvedic Chikitsa, Anti diabetic & Anti Oxidative.

ONOPNCDC14

Asthma as a Major Non-Communicable Respiratory Disorder: A Review

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Background: Asthma is a chronic non-communicable respiratory disorder marked by airway inflammation, bronchial hyperresponsiveness, and reversible airflow obstruction. It represents a growing global health concern, particularly in developing nations, due to rising air pollution, urbanization, and lifestyle-related risk factors. **Materials and Methods:** This review was conducted through a systematic evaluation of peer-reviewed literature retrieved from databases including PubMed, Scopus, and Google Scholar. Studies addressing asthma epidemiology, immunopathogenesis, and therapeutic management were analyzed. **Results:** The analysis indicates that asthma pathophysiology is driven by immune-mediated inflammatory responses leading to airway narrowing and mucus overproduction. Standard treatment relies on inhaled corticosteroids and bronchodilators, while biologic therapies have emerged for severe and refractory asthma. Non-pharmacological approaches such as trigger avoidance and patient education significantly contribute to symptom control. **Conclusion:** Asthma continues to be a significant non-communicable disease with substantial morbidity. Effective long-term management requires early diagnosis, rational pharmacotherapy, and preventive strategies to improve clinical outcomes and quality of life. **Keywords:** Asthma, non-communicable diseases, Chronic respiratory disorder, Airway inflammation, Therapeutic management

ONOPNCDC15

Potential of Ashwagandharishta as a Medhya Rasayana in the Management of Alzheimer's Disease: A Conceptual Review

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Background: Alzheimer's Disease (AD), correlating with Smriti Bhramsha and Vataja Unmada, involves amyloid-beta accumulation and cognitive decline. Ayurveda attributes this to aggravated Vata, depleted Ojas, and impaired Agni. This study explores Ashwagandharishta, a fermented Rasayana, for its neuroprotective and intellect-promoting (Medhya) properties. **Materials and**

Methods: A conceptual review was conducted using classical texts like the Sarangadhara Samhita alongside modern preclinical data. The focus was on the synergistic effects of Withania somnifera and fermented co-ingredients (e.g., Arjuna, Manjishta) on symptoms of mild cognitive impairment. **Results:** Evidence suggests Ashwagandha-based formulations promote amyloid-beta clearance and enhance synaptic plasticity. As a liquid Arishta, the formulation offers superior bioavailability of bioactive Withanolides. Clinical insights indicate improvements in memory, spatial learning, and anxiety modulation by addressing the Vata-Pittahara requirements of the nervous system. **Conclusion:** Ashwagandharishta acts as a potent Medhya Rasayana that addresses the root Ayurvedic pathologies of AD—Vata imbalance and Ojas depletion. It serves as a viable supportive therapy for neuroprotection, though further large-scale clinical validation is necessary. **Keywords:** Ashwagandharishta, Alzheimer's Disease, Medhya Rasayana, Neuroprotection, Withania somnifera, Vata balancing.

ONOPNCDC16

Ethnomedical Uses and Practices of Medicinal Plants for Cancer Treatments by Traditional Sri Lankan Medical Practitioners in Galle, Kurunegala, and Kandy Districts, Sri Lanka

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Background: Cancer is a major public health concern in Sri Lanka, with a rising incidence and substantial physical, psychological, and economic burdens from conventional treatments, leading many patients to seek traditional, plant-based therapies. This study aimed to assess the ethnomedical uses, preparation methods, and challenges related to medicinal plants used for cancer treatment by traditional Sri Lankan medical practitioners (TSLMP) in selected districts. **Materials and Methods**: A descriptive cross-sectional study was conducted among 50 TSLMP who practice cancer treatment in Galle, Kurunegala, and Kandy districts. Purposive sampling was used to recruit participants. Data were collected using a pre-tested interviewer-administered questionnaire to gather information on sociodemographic characteristics, medicinal plants used for cancer treatment, sources of plant materials, methods of preparation and administration, treatment decision criteria, and perceived treatment outcomes. Data were analyzed using descriptive statistics and expressed as frequencies and percentages. **Results:** The most participants were male (78%) and aged 50–69 years (72%). The respondents were distributed by districts as 38 from Kurunegala (76%), 07 from Galle (14.0%), 05 from Kandy (10%). Overall, 30 medicinal plant species used for cancer treatment were identified. The most frequently reported plants were *Flueggea leucopyrus* (28%), *Moringa oleifera* (23%), and *Curcuma longa* (18.75%). Decoction was the most common method of preparation (78%), followed by pastes and powders. Oral administration was practiced by 40.32% of TSLMP. Treatment decisions were primarily guided by patient age (29%), clinical condition (23%), and presenting symptoms (43%), with one or two of these criteria rather than considering all factors simultaneously. Most TSLMP (64%) used only traditional treatment methods, while others used combined Sri Lankan traditional practices with Ayurveda or Western medication. Long-term symptom improvement was reported from 88% of the TSLMP. **Conclusion:** Uses and Practices of traditional Sri Lankan medicinal plants play a significant role in cancer management in Sri Lanka. Scientific validation, documentation, and integration

into mainstream healthcare are essential to preserve this knowledge and improve patient care. **Keywords:** Cancer treatments, Medicinal plants, Traditional medicine, Traditional healers.

ONOPNCDC17

Comparative Literature Analysis of *Kekiri* (*Cucumis* sp.) Varieties in Sri Lankan Texts and Indian Ayurvedic Texts

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Kekiri, a less familiar species of *Cucumis*, possesses notable medicinal value in the traditional medical systems of Sri Lanka and India. This study comparatively analyzes *Kekiri* varieties documented in Ayurvedic texts and Sri Lankan traditional sources, focusing on botanical identification, documentation frequency, and traditional therapeutic applications. A comprehensive analysis of more than 50 *Dravyaguna Nighaṇṭus*(classical lexicons of medicinal substances), pharmacopoeias, and botanical references. The 14 types of *Kekiri* varieties are mentioned in *Rāja Nighaṇṭu*. Among different forms of *Kekiri*, *Hin Kekiri* is most frequently cited in Sri Lankan traditional sources, while *Karkati* is most commonly referenced in Indian Ayurvedic literature. Indian texts describe over 20 varieties, reflecting greater diversity and variation in botanical nomenclature. The findings highlight the prominent role of *Kekiri* in the management of urinary calculi, with Sri Lankan traditions emphasizing a stronger therapeutic effect in *Sini Kekiri*. *Gon Kekiri* is also reported in several formulations used for *Geḍi Vaṇa Piḷikā* (Traditional wound care practice for abscesses) and *Sarpaviṣa* (snake venom poisoning) treatments. While significant similarities exist in medicinal applications across both traditions, notable differences are observed in varietal classification and botanical identification. This comparative analysis provides a foundational framework for future phytochemical and clinical investigations aimed at validating traditional claims. Further research into the phytochemical composition and pharmacological properties of *Kekiri* varieties is essential to explore their therapeutic potential and support the development of novel Ayurvedic and modern medicinal formulations. **Keywords:** *Kekiri*, *Cucumis* sp., Ayurvedic texts, Sri Lanka, India

ONOPNCDC18

Analytical Evaluation of Indian and Sri Lankan varieties of *Mustha (Cyperus rotundus)* as a Substitute for *Athividayam (Aconitum heterophyllum*)

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Background: The *Aconitum heterophyllum* (*AV)*) plant is mostly used for medicinal purposes in Ayurveda. In instances where AV is unavailable, *Cyperus rotundus (Mustha*) has been recommended as a substitute in classical Ayurvedic texts. There are two varieties of *Mustha*, one is Indian (IV), and the other is Sri Lankan (SV). This study focused on the suitability of *Mustha* as a substitute for AV. While analyzing the Differences between Indian and Sri Lankan varieties. **Materials and methods:** Dry samples of the plants were collected, authenticated, and subjected to methanol extraction. Analysis was conducted based on morphology, organoleptic properties, phytochemical properties, and chromatographic characters. **Results:** The tuber of AV is small and brown in colour. In comparison, the rhizomes of *Mustha* are larger, with the IV slightly bigger than the SV; the latter is distinguished by fine root hairs. All samples

are hard in texture. *Mustha* has strong odor than AV. Preliminary phytochemical screening revealed the absence of iodine in all three samples. However, AV and SV exhibited the presence of saponins and tannins, whereas these constituents were less prominent or absent in the IV. HPTLC analysis showed a broadly similar chemical profile across all three extracts. The first peak was common to all samples, while the final peak of both varieties of *Mustha* was similar, with the SV exhibiting a few additional distinct peaks. Overall, the chromatographic profile of AV showed greater similarity to the IV than to the SV. **Conclusion:** Although three samples exhibited similar characteristics, IV appears to be the most suitable substitute for AV, given its closer chemical similarity. However, SV contains certain distinct chemical constituents that need further studies. **Keywords:** *Kalanduru (Cyperus rotundus), Prathinidhi Dravya*

ONOPNCDC19

AI-Enhanced *In Silico* Multi-Target Anti-Cancer Screening of Natural Compounds and *In Vitro* Antioxidant Assessment of Corresponding Crude Extracts

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Brugmansia suaveolens is a medicinal plant known for its wide range of bioactive compounds with potential antioxidant and anticancer properties. The study aimed to evaluate the anticancer potential of Brugmansia suaveolens extracts through antioxidant assays and multi-target molecular docking analysis**.** In this paper, Leaves and flowers of *B. suaveolens* were sequentially extracted using n-hexane, ethyl acetate, and methanol and followed by Phytochemical screening and quantitative assays which helped to determine the presence and levels of secondary metabolites. GC–MS analysis identified major constituents, while antioxidant capacity was evaluated using DPPH and ABTS assays. Molecular docking using CB-DOCK 2 was performed to investigate breast, lung, and colorectal cancers, where the top three GC-MS-identified compounds from each extract were docked against ten cancer-related protein targets for each cancer type, including TP53, AKT1, MYC, ESR1, PTEN, and CCND1. The targets were selected based on their hub status from the protein–protein interaction network analysis. Leaf methanol and ethyl acetate extracts exhibited the highest phenolic (41.20 mg GAE/g) and flavonoid (160.54 mg RE/g) contents, respectively. The methanolic extract of *B. suaveolens* flowers showed the strongest radical scavenging activity (IC_{50}: 33.86 µg/mL), while the leaf n-hexane extract was the weakest (IC_{50}: 66.60 µg/mL). Docking results showed strong binding affinities of 10H-Phenothiazine with AKT1, ESR1, PTEN, and CCND1, and Hexacosane with ESR1.The findings suggest that *B. suaveolens* exhibits significant antioxidant potential and promising anticancer activity. 10H-Phenothiazine and Hexacosane emerged as key bioactive candidates warranting further *in vitro* and *in vivo* investigation in cancer therapeutics.

ONOPNCDC20

In vitro evaluation of antitumor activity of different solvent extraction of the root of *C. mimosoides* compounds on lung cancer cell line (NCI-H522).

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Background: *Caesalpinia mimosoides* Lamk is a small, spiny tropical tree or shrub found in countries like China, India, Myanmar, and Thailand. Traditionally, it has been used for food and medicinal purposes. Literature suggests plants possess antioxidant, antibacterial, antifungal, antiarthritic, analgesic, anti-inflammatory, and anticancer properties. The anticancer properties of the leaves of the C. mimosoides have been evaluated. Traditional healers in the northern Karnataka region have been using roots for cancer treatment. In this regard, a study is planned to investigate the scientific basis for this approach. **Materials and methods:** The effects of different solvent extracts (n-hexane, Methanol, Ethyl acetate, and aqueous) on cell viability in lung carcinoma cell lines (NCI-H522) were evaluated using the MTT assay according to the standard protocol. Other assays, such as the 5′-bromodeoxyuridine (BrdU) assay and the Acridine orange/ethidium bromide (AO/EB) double staining assay, are being evaluated to assess the effects of extracts on inhibiting the processes involved in the tumorigenic potential of the cell lines. **Results:** Cytotoxic effects have been demonstrated on the NCI-H522 cell line by the crude methanol extract, with the lethal concentration 50 (LC50) estimated to be around 172.94 mcg/mL, the crude hexane concentration to be around 160.913 mcg/mL, and the ethyl acetate extract to exhibit an LC50 concentration of around 184.81 mcg/mL. Results of the other assays will be presented. **Conclusion:** The in vitro evaluation of different solvent extracts from the root of *C. mimosoides demonstrated* cytotoxic effects on the NCI-H522 cell line, substantiating the in Silico results indicating the potential of phytochemicals to affect tumorigenic potential. **Keywords:** C. *mimosoides*, Cell viability assay, Cell proliferation assay.

ONOPNCDC21

Osmolytes as Natural Modulators of Protein Stability and Activity in Neurodegenerative Diseases

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Background: Neurodegenerative diseases represent a major non-communicable disorder characterized by progressive neuronal degeneration, where protein misfolding and aggregation act as central pathogenic drivers. These events disrupt cellular homeostasis, promote oxidative stress and lead to neurotoxic aggregate accumulation. Impairment of antioxidant enzymes, particularly catalase, further exacerbates neuronal injury, highlighting the need for safe, naturally occurring strategies that enhance protein stability and restore redox balance. Osmolytes are small, ubiquitously present organic molecules that stabilize protein structure and play a vital role in maintaining proteostasis under cellular stress. **Materials and Methods:** In this study, the protective effects of various

compatible osmolytes belonging to different classes: sugars, polyols, amino acid and methylamines were evaluated on Catalase, a key antioxidant protein. Various spectroscopic techniques (Fluorescence spectroscopy, UV-Vis, CD, DLS) were employed to study the aggregation kinetics, activity, thermal stability and structural analysis of the protein. Microscopic studies (TEM, Fluorescence microscopy) were performed to visualise the nature of protein aggregates upon osmolytes treatment. Molecular docking studies were conducted to analyse osmolyte-protein interactions and binding affinities. **Results:** Our results indicate that among the various osmolyte, methylamines have the best anti-aggregating property. They effectively shift the N – API equilibrium towards the left, enhance thermodynamic stability and preserved structural integrity of the protein. **Conclusion:** These findings provide strong biophysical and molecular evidence that natural osmolytes stabilize partially folded intermediates, modulate aggregation pathways and prevent neurotoxic aggregate formation, highlighting the therapeutic potential of osmolyte-based intervention in neurodegenerative disorders. **Keywords:** Neurodegenerative diseases; Osmolytes; Oxidative stress; Protein aggregation; Non-communicable disorders.

ONOPNCDC22

Unveiling the Therapeutic Potential of Caryota Urens: A Comprehensive Review

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Background: Caryota urens L., commonly referred to as fishtail palm, is a tropical plant belonging to the Arecaceae family and is indigenous to Southeast Asia. This monocarpic palm is recognized for its distinctive bipinnate leaves and singular trunk. It has been traditionally valued for its therapeutic properties across diverse cultural practices. The various parts of the plant, including its roots, leaves, and fruits, have been employed in traditional medicine to alleviate ailments such as rheumatism, fevers, snakebite, diabetes, and diarrhoea. Recent scientific enquiries have underscored the diverse pharmacological activities of Caryota urens, thereby confirming its traditional applications. The plant is replete with bioactive compounds, encompassing flavonoids, phenolic acids, saponins, and tannins, which collectively underpin its therapeutic potential. Conclusion: Noteworthy pharmacological properties are anti-inflammatory, antioxidant, antimicrobial, anti-diabetic and other activities of Caryota urens exhibit potential for developing novel therapeutic agents, capitalizing on their extensive pharmacological properties and rich traditional medicinal legacy. Keywords: Caryota Urens, Diabetes, Pharmacological Activities, Fishtail Palm, Kithul.

ONOPNCDC23

Non-communicable Diseases and Disorders

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Background: Non-communicable diseases and disorders (NCDs) are chronic conditions that do not spread from person to person and represent a major global health concern. Cardiovascular diseases, Diabetes Mellitus, cancers, chronic respiratory diseases, and metabolic and mental health disorders constitute the major categories of

NCDs. The rising prevalence of these conditions is largely attributed to rapid urbanization, lifestyle changes, and increased life expectancy. **Methods:** This abstract is based on a descriptive review of published literature, national health reports, and epidemiological studies focusing on the prevalence, risk factors, and prevention of non-communicable diseases. Emphasis was placed on identifying common lifestyle-related determinants and effective preventive strategies applicable at the community level. **Results:** The review revealed that NCDs are strongly associated with modifiable risk factors such as unhealthy dietary patterns, physical inactivity, tobacco use, alcohol consumption, chronic stress, and inadequate sleep. These disorders often develop gradually and remain undiagnosed until complications arise, leading to increased morbidity, reduced quality of life, and higher healthcare expenditure. Early detection, lifestyle modification, and health education were found to significantly reduce disease burden. **Discussion:** Prevention and control of non-communicable diseases require a comprehensive and multidisciplinary approach. Promoting healthy behaviors from childhood, strengthening community awareness programmes, and integrating preventive healthcare strategies are essential to reduce the long-term impact of NCDs on individuals and society. **Keywords:** NCD, Urbanisation

ONOPNCDC24

Asparagus racemosus (Shatavari), a wondrous poly-therapeutic herb

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Out of 27 known species of *Asparagus* in India, the *A. racemosus* (Shatavari) (efloraofindia, 2024), is known for its versatile uses in curing many human health diseases and thus called as "Queen of herbs" in Ayurveda. Being rich in isoflavones, alkaloids, flavonoids, and saponins it is adaptogenic in nature and widely used in treating problems related to reproductive, gastrointestinal, cardiovascular, renal, immunological, nervous, and diabetes, etc. Due to its phytoestrogenic characteristic, it is extensively used in curing menstrual disorders, menopausal symptoms, infertility and problems related to lactation. Several experimental studies also reveal its antioxidant and anti-inflammatory characteristics, hepatoprotective effects against alcohol and drug abuse, anxiolytic, neuroprotective, renal and cardioprotective nature. Additionally, the root extract of *A racemosus* exhibits anti-cancer potential on different cell lines, such as breast cancer (MCF-7), colon (HT-29), and kidney (A-498). Antidiabetic potential of shatavari has also been explored via various experiments on *Drosophila melanogaster.* The findings of the present study can further be used to formulate and standardize the dosages of *Asparagus racemosus* for various physiological disorders. **Keywords:** Shatavari, *Asparagus racemosus,* saponins, alkaloids, flavonoids, human health

ONOPNCDC25

High HDL, Lower Risk? Redefining Familial Hyperalphalipoproteinemia Through Genetics, Diagnostics, and Therapy

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Familial hyperalphalipoproteinemia (FHA) is an uncommon genetic disorder characterized by marked elevation in high density lipoprotein cholesterol (HDL-C) levels, which may paradoxically be associated with an increased risk of cardiovascular disease (CVD). Integrating genetic evidences with clinical evaluations may serve as a beneficial strategy to elucidate the paradoxical relationship between elevated HDL-C levels and cardiovascular disease, thereby improving understanding of pathophysiology as well as diagnosis. This review evaluates diagnostic procedures, potential assay inaccuracies, and analytical limitations that could jeopardize the accuracy and reliability of clinical interpretations. Furthermore, a detailed summary of the therapeutic avenues available for the treatment of FHA is also provided. A compilation of clinical manifestations about abnormal HDL-C levels in different underlaying conditions may provide information about its unique clinical characteristics clearly showcasing the diagnostic and therapeutic procedures for managing FHA. By bridging the gap between genetic knowledge and clinical applications, this review hopes to direct future studies on HDL-C targeted treatments that could address the paradox of increased HDL levels under different scenarios. These findings highlight the vital importance of refining diagnostic criteria and creating effective therapy techniques to improve outcomes. **Keywords:** Familial hyperalphalipoproteinemia, HDL cholesterol, cardiovascular disease, HDL paradox, Diagnostic evaluation.

ONOPNCDC26

Neuroprotective Pharmacological Mechanisms of Red Cabbage (*Brassica oleracea var. capitata f. rubra*)–Derived Anthocyanins and Isothiocyanates in Parkinson's Disease: A Scoping Review

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Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by dopaminergic neuronal loss, oxidative stress, and neuroinflammation. Red cabbage (*Brassica oleracea var. capitata f. rubra*), a cruciferous vegetable rich in anthocyanins and isothiocyanates particularly sulforaphane has emerged as a promising neuroprotective agent. Building on our previous systematic review which demonstrated neuroprotective effects of red cabbage in PD models, this scoping review aims to systematically map the underlying pharmacological mechanisms of red cabbage-derived bio actives in PD. A comprehensive literature search was conducted across PubMed, MEDLINE, Google Scholar, Sage Journals, ScienceDirect, and Taylor & Francis, including in vitro, in vivo, and clinical studies investigating anthocyanins, isothiocyanates, or sulforaphane in PD or related neurodegenerative models. Key pharmacological pathways were extracted and analysed, including antioxidant activity, anti-inflammatory effects, modulation of mitochondrial function, and activation of cytoprotective signalling pathways such as Nrf2 and NF-κB. Where

red cabbage-specific data were limited, studies on other cruciferous vegetables were included to support mechanistic insights. Analysis indicates that red cabbage-derived anthocyanins and isothiocyanates exert neuroprotective effects by reducing oxidative stress through Nrf2 pathway activation, inhibiting neuroinflammation via NF-κB modulation, and supporting dopaminergic neuron survival. These findings highlight the potential of red cabbage as a functional food for neuroprotective interventions in PD. Further preclinical and clinical investigations are warranted to validate these effects and optimize bioactive delivery. This review provides an integrative perspective bridging traditional dietary sources and modern neuropharmacology, emphasizing red cabbage as a natural, accessible, and promising intervention for PD management while elucidating the molecular pathways underlying its therapeutic potential. **Keywords:** Parkinson's disease, Red cabbage, Anthocyanins, Isothiocyanates or Sulforaphane, Neuroprotection

ONOPNCDC27

Structure–Activity Clues from Docking Studies of Novel Dibenzo[b,e][1,4]diazepin-1-one Derivatives at the GABAA receptor

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Benzodiazepines remain among the most widely prescribed central nervous system (CNS) agents for the management of anxiety, epilepsy, and insomnia; however, adverse effects and tolerance liabilities necessitate the development of improved analogs. In this study, a set of 10 dibenzodiazepin-1-ones analogs were evaluated for their binding affinity and drug-likeness properties targeting the classical α1–γ2 benzodiazepine binding interface of the human GABA A receptor. Molecular docking was performed using the cryo-electron microscopy structure (PDB ID: 6X3X), which contains a ligand resolved at the α–γ interface. The docking protocol was validated through re-docking of the co-crystallized ligand, ensuring structural reliability. All the 10 derivatives had binding energy higher than the native ligand, diazepam (-6.6kcal/mol) with BZD 2, 10, 7, 3, 5 and 8 having the highest binding energy of -11.2, -10.6, -10.3, -9.7 and -9.4 kcal/mol respectively. All the 10 passed the drug-likeness lipinksi's rule of five in the online ADMET 3.0 Lab server. Several analogs demonstrated favorable CNS drug-like characteristics, including predicted BBB permeability, acceptable QED values, and high plasma protein binding consistent with classical benzodiazepines but BZD 9 (-9.2 kcal/mol) was identified as the most balanced candidate, combining strong receptor affinity with desirable pharmacokinetic stability and reduced reactivity risk. These findings support BZD9 as a promising lead for further optimization, MD simulation and *in vivo* validation. **Keywords:** GABA A, Benzodiazepines, Positive Allosteric Modulator, molecular docking, ADME

ONOPNCDC28

Major Categories: Non-communicable Diseases and Disorders

Cardio-metabolic parameters, Drugs usage patterns and cost variation study of drugs used among type II diabetes patients: a tertiary care setting in Navi Mumbai

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Background: Type II Diabetes mellitus continues to rise in prevalence thought-out the globe, along with concomitant cardio-metabolic diseases. Therefore, screening of diabetic patients for cardiac as well as metabolic abnormality and Patterns of drugs used may be the need of the hour. **Objective:** To examine the cardiometabolic profile, prescribing practices, and cost variation of drugs used in diabetic patients. **Methods:** The study was conducted at MGM Medical College and Hospital after obtaining approval from the Institutional Ethics Committee. A total of 100 prescriptions were randomly selected and analyzed. For the cost variation analysis, drug price information was obtained from standard sources including CIMS, MIMS, and Drug Today. **Results:** Among total patients, Duration of the disease was found to be less than 5 years in 61.25 %, 25% (between 5-10 years) and 13.75% (more than 10 years). BMI was found to be ideal only among 56.25 % patients, 31.25% patients were found to be overweight and 12.5% were obese. The waist/hip ratio was found to be abnormal among 95% of the diabetic patients. Among diabetic patients, concomitant diseases encountered were hypertension (31.25%), dyslipidemia (5%), hypertension as well as dyslipidemia (7.5%). Total 226 Drug was prescribed and Average drug per prescription was 2.26. Among Total antidiabetic drugs, 90% were OHA (Oral Hypoglycemic drug) and 10% were Insulin. Metformin was common antidiabetic drug prescribed. Among Antidiabetic drug, Glimepiride (2mg) shows maximum price variation of 829.72%. Acarbose (25mg) shows least price variation of 83.12%. Metformin in common prescribed dose (500mg) shows price variation of 384.18%. **Conclusion:** Hypertension was the predominant co-morbidity present among diabetic patients. Metformin was common Oral antidiabetic drug prescribed. Glimepiride shows maximum price variation percentage. **Keywords**: Diabetes, Cardiometabolic, Drug usage pattern, Cost variation

ONOPNCDC29

Ayurvedic Approaches to Restoring Gut Microbiome Balance in Autism Spectrum Disorder: A Case Series

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder with onset in early childhood with features of impairment in social communication, social interaction and repetitive behaviors. In Ayurveda the clinical manifestations of autism can be corelated with the features of unmada spectrum disorder. Impaired digestive and metabolic functions are postulated as the root cause of *Unmada.* In a autistic child, intake of unhealthy dietetics can cause derangement in Agni and cause the indigestion, diarrhoea, abdominal bloating etc. The recent finding of the microbiota–gut–brain axis indicates the bidirectional connection between gut and brain, demonstrating that gut microbiota can influence many neurological disorders such as autism etc. **Materials and methods**: The present study will discuss the eight children of age group 3-12 years with autistic features. They all are having the complaints of digestion, reduced appetite, some of them have diarrhoea and constipation etc. Consider the treatment protocol in unmada , first to regularize the agni and bowel pattern through correct the functions of gutmicrobiota. Ashtachoornam, Brahmi ghritham etc with specific diet pattern (gluten and casein free diet) can reduce the GIT problems in autism and indirectly reduce the clinical features of autism. **Result**: Before and after treatment the symptom severity was assessed by using **Autism Treatment Evaluation**

Checklist (ATEC) and Childhood Autism Rating Scale (CARS). **Conclusion:** Here I am trying to establish the importance of maintaining the gut microbiota health for reducing the symptoms of ASD. **Keywords:** Autism spectrum disorder, Unmada, Gut microbiota, Agni

ONOPNCDC30

Effect of Shodhita Shilajatu and Rajata Bhasma on Anxiety – *A vitro* study

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Background: Shilajatu and Rajata are important mineral drugs having medhya property. There are studies available on effect of shilajatu on diabetes, obesity and anxiety also, Rajata bhasma have proven to increase the memory, concentration. The main aim of the study was to observe the effect of Shodhita Shilajatu and Rajata Bhasma on anxiety in mice. **Materials and Methods:** Shodhana of Shilajatu was carried out by suryatapi method/, Shodhana of Rajata was carried out according to classical texts by using taila,takra,gomutra, kanji, kulattha kwatha. Rajata Bhasma was prepared using Kumari swarasa Bhavana as per Ayurveda Prakasha. Organoleptic characteristics, ash value analysis, SEM analysis of Rajata and Shilajatu were carried out according to standards. Anti Anxiety activity was analyzed by using light and dark test, open and closed arm activity test on four group of mice. **Results:** Both Rajata and Shilajatu group rats have showed highly spent more time in light chamber 105.3±6.296, 114.8±6.215 respectively and open space against control group with Diazepam (94.0±2.39) and standard groups (30.5±1.50) $p<0.001$/ Locomotor activity was more in Shilajatu and Rajata Bhasma groups (429.2±3.73,437.7±6.31) when compared to Normal saline and Diazepam group (289.3±5.07,374.7±4.83). **Conclusion:** Rajata Bhasma and shuddha Shilajatu improved significantly the time spent in light chamber and locomotor activity when compared to normal saline and Diazepam groups of mice suggesting the good Anti Anxiety effect. **Keywords:** Anxiety, Rajata Bhasma, Shuddha Shilajatu, light chamber, locomotion

ONOPNCDC31

A 4-Dimensional Prakriti-Stratified Acne Management Model Using Natural Products: An Integrative Ayurveda Aesthetics Intelligence (AAI) Framework

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Background: Acne vulgaris is traditionally managed as a localized dermatological condition; however, emerging evidence recognizes it as a systemic, multi-factorial disorder influenced by metabolic dysregulation, chronic inflammation, lifestyle stressors, and hormonal imbalance. Conventional lesion-centric therapies often fail to prevent recurrence or address underlying systemic drivers, necessitating integrative, reproducible models grounded in both AYUSH principles and biomedical science. **Materials and Methods:** This study proposes a novel 4-Dimensional (4D), Prakriti-stratified acne management framework under the Ayurveda Aesthetics Intelligence (AAI) model. Acne is conceptualized as a systemic disorder and managed across four interlinked dimensions: **Aesthetics** (cutaneous manifestations, barrier integrity, inflammation), **AAYU** (metabolic-inflammatory axis), **GloFit** (lifestyle,

stress, and psychoneuroendocrine modulation), and **Yoniq Balance** (hormonal-reproductive regulation). Acne phenotypes, including adolescent, inflammatory, stress-related, and PCOS-associated acne, are further stratified based on Ayurvedic Prakriti (Vata, Pitta, Kapha, and dual constitutions). Evidence-informed oral and topical natural products are utilized as systemic modulators targeting root-cause pathways rather than isolated lesion suppression. **Results:** The AAI 4D framework enables individualized, mechanism-based interventions addressing both systemic drivers and cutaneous expression. Practice-based observations demonstrate improved recurrence control, enhanced patient-reported outcomes, and broader metabolic and psychosocial benefits beyond lesion count reduction. **Conclusion:** The AAI 4D Acne Management Model provides a structured, Prakriti-guided integrative approach aligned with AYUSH 5.0 principles, offering a scalable, reproducible pathway for translating natural product therapeutics into contemporary systemic disorder management. **Keywords:** Acne vulgaris; Prakriti stratification; Natural products; Integrative Ayurveda; AYUSH 5.0

ONOPNCDC32

Development of smart medicated terniary blended hydrogel patch for wound healing

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Background: Wound healing is a major concern in the global world. The rationale of the study is that existing wound hydrogel dressings fail to address adequately, at the same time, the requirements for controlled drug release over a sustained period, instantaneous wound monitoring, and biocompatibility, particularly for chronic and infected wounds whose pH changes serve as an acute gauge of wound healing. In addressing these disadvantages with a synergy-driven and multipurpose approach is this ternary blended hydrogel of okra mucilage, collagen, and carboxymethyl cellulose (CMC), incorporating hesperidin as a model drug and evaluating its comprehensive properties and efficacy. **Materials and Methods:** The hydrogel patch was formulated using solvent casting method with utmost care employing a blend of natural and semi-synthetic materials, each chosen for its individual contribution to the healing process. Characterization involved assessment of physical , mechanical and thermal properties ,invitro drug release kinetics, coloration response to varying pH levels and biological activities such as antioxidant , anti-inflammatory and antimicrobial effects . Invivo wound healing efficacy was evaluated using a rat excision wound model. **Results:** The Box-Behnken optimization successfully identified a formulation (R4) demonstrating desirable physical and mechanical properties suitable for wound patch. Characterization studies confirmed the successful incorporation of all the components .The fabricated patch derived from the okra fruit showed significant antioxidant ,anti-inflammatory and broad spectrum antimicrobial activities. **Conclusion:** The study successfully developed a multifunctionl, smart medicated hydrogel patch for advanced wound care therapy by combining natural polymers and natural pigment based indicator. **Keywords:** Wound Healing, Terniary Blended, Hydrogel Patch, okra mucilage.

ONOPNCDC33

Role of Ethanolic Root Extract from *Mallotus philippensis* in Prevention of Breast Cancer

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Background: Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. Breast cancer is the second most common cancer in women after skin cancer. Researchers continue to investigate the diverse array of secondary metabolites (e.g., alkaloids, flavonoids, polyphenols, terpenoids) found in plants for their potential anti-cancer properties, which could lead to the discovery of new therapeutic compounds. It includes plants or mixture of plant extracts to treat illness and promote health. In recent years, increasing scientific attention has been directed toward its potential role in cancer management, particularly breast cancer. One such plant is *Mallotus philippensis* which exhibits numerous anticancer activities. **Materials and Methods:** Phytochemical Screening, GC-MS Analysis and MTT Assay. **Results:** Phytochemical investigations of ethanolic extract of root of *Mallotus philippensis* have identified several bioactive constituent alkaloids, flavanoids, terpenoids and Phenolic compounds having the ability to inhibit breast cancer cell proliferation by inducing apoptosis. GC-MS analysis of ethanolic extract of root of *Mallotus philippensis* revealed the presence of medicinally valued components like Benzene propanoyl bromide, Heptanoic acid, 3,3-Bis-tert-butylsulfanyl-2-fluoro-acrylonitrile etc. The *In-vitro* cytotoxicity activity studies of the ethanolic root extract performed by using MTT assay method on MCF-7 cancer cell lines exhibited significant cytotoxic activity which was compared with the standard doxorubicin. **Conclusion:** Overall, *Mallotus philippensis* ethanolic extract of root represents a promising natural source for the development of novel breast cancer therapeutics. **Keywords:** *Mallotus philippensis*, Phytochemicals, Breast cancer, MTT Assay and MCF-7 cell line.

ONOPNCDC34

Globimetula Cupulata: A Potential Larvicide

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Background of the study: *Globimetula cupulata,*a parasitic shrub that grows widely in Nigeria, is commonly used in ethnomedicine to treat fever, malaria, high blood pressure and diabetes mellitus. This plant was investigated for probable activity against *Culex quinquefasciatus* larvae as there is currently no such report. **Materials and method:** The leaf, stem and flower of *G. cupulata* growing on *Leucaena leucocephala* were collected from the university's research farm. It was authenticated and deposited under reference number FPI 2469. They were air dried separately, weighed and macerated in methanol for 72 hours, filtered, concentrated *in vacuo* at 35°C and tested against the fourth instar larvae of Cx. quinquefasciatus. The most active extract was retaken in water and successively partitioned into n-hexane and ethylacetate. Each fraction was tested for activity. The larvicidal assay of each extract and partitioned fractions was carried out according to WHO, 2005 guidelines. The methanol extract of Nicotiana tabaccum

leaf and Tween 80 in water (0.2%v/v) were the positive and negative controls respectively. **Results:** After 48 hours of exposure, the flower extract was the most active, followed by the leaf while the stem was the least active. Also, throughout the period of exposure, the hexane and the ethylacetate fractions had comparable activities while the aqueous fraction was inactive. **Conclusion:** The methanol extract of *G. cupulata* flower has activity against the fourth *instar* larvae of *Cx. quinquefasciatus*. This activity is concentrated in the n-hexane and ethylacetate fractions. **Keywords:** *Globimetula cupulata, Culex quinquefasciatus*, flower extract, larvicidal activity

ONOPNCDC35

A case study on the management of *Danta pupputa* with special reference to acute alveolar abscess

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Background: *Danta Pupputa*, described in *Ayurveda* as a *Kapha–Rakta* predominant disorder, presents with painful gingival swelling and suppuration. Clinically, it correlates with an early-stage alveolar abscess, often secondary to untreated dental caries (*Krimidanta*). **Case Presentation:** A pediatric patient reported progressive pain and swelling in the premolar gingival region for one month, associated with poor oral hygiene and excessive intake of sugary foods. Based on *Nidana Panchaka* assessment, a diagnosis of *Krimidanta Janya Danta Pupputa* was established. **Intervention:** Management was carried out following principles described in the *Ashtanga Sangraha*, focusing on *Kapha–Rakta* pacification and local *Shodhana*. Treatment included herbal gargles, *Pratisarana* (topical applications), internal *Guggulu*-based formulations, dietary correction, and oral hygiene reinforcement. **Outcome:** Significant reduction in pain and swelling was observed within ten days, avoiding the need for surgical intervention. **Conclusion:** Early conservative *Ayurvedic* management may effectively treat *Danta Pupputa* and prevent disease progression.

ONOPNCDC36

Ayurvedic Strategies for Prevention and Management of Non-Communicable Diseases: A Holistic Approach

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Background: Non-communicable diseases (NCDs), including diabetes mellitus, hypertension, cardiovascular diseases, cancer, and chronic respiratory disorders, account for a major proportion of global morbidity and mortality. Rapid lifestyle changes, sedentary behaviour, unhealthy dietary habits, and psychosocial stress are key contributors to their increasing prevalence. Ayurveda, the traditional system of medicine of India, focuses on health promotion and disease prevention through balanced lifestyle practices and individualised therapeutic approaches. Classical Ayurvedic principles such as *Dinacharya* (daily regimen), *Ritucharya* (seasonal regimen), and *Ahara-Vihara* (diet and lifestyle practices) provide a structured framework for maintaining physiological balance and preventing chronic diseases. **Methods:** This study presents a conceptual review based on classical Ayurvedic literature and contemporary scientific publications related to the prevention and management of NCDs. Ayurvedic approaches were examined under four domains: screening, prevention, control, and management. Early screening was considered through assessment of

symptoms associated with *Ajirna*, *Udavarta*, and *Srotovaha Dushti*. Preventive strategies included adherence to individualised diet and lifestyle according to *Prakriti* (constitutional type) and *Vikriti* (current imbalance), along with practices such as *Dinacharya*, *Ritucharya*, *Sadvritta*, and *Achara Rasayana*. Therapeutic interventions included herbal medications, *Panchakarma* procedures, *Rasayana* therapy, yoga, and pranayama. **Results:** The findings suggest that Ayurvedic lifestyle guidelines contribute to improved metabolic regulation, better digestive function, and enhanced psychological well-being. Early recognition of physiological imbalances may help prevent disease progression. Integrative practices such as yoga, pranayama, and herbal therapies may further support risk factor reduction and long-term disease control. **Conclusion:** Ayurveda provides a holistic and preventive healthcare model for addressing NCDs through lifestyle modification, dietary discipline, and individualised therapeutic interventions. **Keywords:** Ayurveda, Non-communicable diseases, Dinacharya, Ritucharya, Lifestyle modification

ONOPNCDC37

Mitochondrial DNA with Advanced Gene Editing and CRISPR-Cas9 Technology

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Given the particularly strong focus on mitochondrial dysfunction, new-generation therapeutics for neurodegenerative disorders (NDDs) may expand beyond therapeutic improvement to focus on the underlying genetic foundations. The mutations or polymorphism in mitochondrial DNA play an important role in pathophysiology of neurodegenerative disorders, which include Parkinson's disease (PD) and Alzheimer's disease (AD). The challenging process of manipulating mitochondrial DNA has hindered conventional medical treatments, whereas technological advances are eliminating this limitation. Following the redesign of mitochondrial targeting, the CRISPR-Ca9 gene-editing system can be used as a scalpel biochemical DNA editing capable of precise modification. Accurate nucleotide-editing systems are in progress of knocking out or repairing faulty mtDNA. More modern technique intends to get back the conventional functionality of mitochondria while diminishing the concentration of defective mtDNA (heteroplasmy). Ultimately, Mitochondrial gene editing technologies hold promising potential for treating subsets of neurodegenerative disorders associated with pathogenic mitochondrial mutations. **Keywords:** Mitochondrial genome editing, CRISPR-Based therapeutics, Neurodegenerative disease mechanisms, Mitochondrial gene therapy, Precision mitochondrial medicine, Targeted mtDNA engineering.

ONOPNCDC38

Pharmacology as the Bridge of Integration in the Management of Non-Communicable Diseases and Disorders

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Background: Non-communicable diseases (NCDs) such as diabetes mellitus, cardiovascular diseases, cancer, and chronic respiratory disorders are the leading

causes of global morbidity and mortality. Their increasing prevalence requires integrative and sustainable healthcare strategies. Ayurveda emphasizes health preservation and disease prevention, as stated in the principle **"स्वस्थस्य स्वास्थ्य रक्षणं आतुरस्य विकार प्रशमनं च"** (Charaka Samhita, Sutrasthana 30/26). Pharmacology plays an essential role in bridging traditional Ayurvedic knowledge with modern biomedical science through scientific validation of medicinal substances. **Materials and Methods:** The present study is a conceptual review based on classical Ayurvedic literature and contemporary pharmacological research. Classical texts including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya were reviewed along with modern biomedical articles and reports from organizations such as WHO and the Ministry of AYUSH. Pharmacological properties of selected Ayurvedic medicinal plants were analyzed and correlated with Ayurvedic pharmacodynamic principles such as Rasa, Guna, Virya, Vipaka, and Prabhava. **Results:** Several Ayurvedic herbs demonstrate pharmacological activities relevant to the management of NCDs. Medicinal plants such as *Gymnema sylvestre*, *Momordica charantia*, and *Tinospora cordifolia* exhibit anti-diabetic effects, while *Curcuma longa*, *Withania somnifera*, and *Emblica officinalis* show antioxidant and anti-inflammatory properties. *Terminalia arjuna* and *Allium sativum* demonstrate cardioprotective actions. Adaptogenic herbs such as *Ashwagandha* and *Guduchi* enhance immunity and resistance to chronic diseases. **Discussion and Conclusion:** Integrative pharmacology connects Ayurvedic pharmacodynamic concepts with modern pharmacological mechanisms. Scientific validation of Ayurvedic drugs supports their safe and effective use in managing chronic diseases. Combining Ayurvedic principles with modern pharmacological research may contribute to sustainable strategies for the prevention and management of non-communicable diseases and strengthen evidence-based integrative healthcare. **Keywords:** Non-communicable diseases, Integrative pharmacology, Ayurveda, Herbal medicine, Pharmacological validation.

ONOPNCDC39

Ayurvedic Herbal Management of Bronchial Asthma with special reference to Adhatoda vasica (Vasaka)

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Background: Bronchial asthma is a chronic inflammatory disorder of the airways characterized by wheezing, breathlessness, chest tightness, and coughing. It is one of the major non-communicable respiratory diseases affecting a large population worldwide. In Ayurveda, bronchial asthma is correlated with Tamaka Shwasa, mainly caused by the vitiation of Vata and Kapha doshas leading to obstruction of Pranavaha Srotas (respiratory channels). Adhatoda vasica (Vasaka) is a well-known medicinal plant traditionally used for the management of respiratory disorders due to its bronchodilator, expectorant, and anti-inflammatory properties. **Material and Methods:** The present study is based on a review of classical Ayurvedic texts and published scientific literature related to bronchial asthma and Vasaka. Information was collected from Ayurvedic compendia, research articles, and pharmacological studies describing the therapeutic properties and active constituents of Vasaka. **Results:** Literature analysis indicates that Vasaka contains active alkaloids such as vasicine and vasicinone

which possess bronchodilatory, mucolytic, and anti-inflammatory effects. These properties help in reducing bronchial obstruction, easing expectoration of mucus, and improving respiratory function in patients with asthma. Conclusion: Vasaka shows significant therapeutic potential in the Ayurvedic management of bronchial asthma. Its pharmacological properties support its traditional use in managing Tamaka Shwasa and suggest that it may serve as a safe and effective herbal option for respiratory care. **Keywords:** Bronchial Asthma, Tamaka Shwasa, Vasaka, Adhatoda vasica, Ayurveda, Herbal Medicine

ONOPNCDC40

Ayurvedic Rasayana Drugs as Potential Immunomodulators in the Prevention of Non-Communicable Diseases: A Pharmacological Perspective

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Background: Non-communicable diseases (NCDs) such as cardiovascular disorders, diabetes mellitus, and metabolic syndrome represent a major global health burden. Chronic inflammation, oxidative stress, and immune dysregulation play significant roles in their pathogenesis. Ayurveda describes Rasayana therapy as a rejuvenative approach that enhances immunity, longevity, and tissue strength. Several classical Rasayana drugs are reported to possess antioxidant, anti-inflammatory, and immunomodulatory properties, which may help in preventing or delaying the progression of NCDs. **Materials and Methods:** A pharmacological review was conducted using classical Ayurvedic texts including Charaka Samhita and Sushruta Samhita along with modern scientific databases such as PubMed and Scopus. Selected Rasayana drugs including Withania somnifera, Tinospora cordifolia, Emblica officinalis, and Glycyrrhiza glabra were analyzed for their pharmacological actions, bioactive compounds, and experimentally reported immunomodulatory effects relevant to NCD prevention. **Results:** The analysis revealed that many Rasayana drugs demonstrate significant antioxidant activity, cytokine modulation, and enhancement of immune response. Experimental studies have shown their role in reducing oxidative stress, improving metabolic parameters, and modulating inflammatory pathways associated with chronic diseases. **Conclusion:** Rasayana drugs represent promising natural pharmacological agents with potential applications in the prevention and management of non-communicable diseases. Integrating Ayurvedic Rasayana concepts with modern pharmacological research may contribute to developing effective preventive healthcare strategies. **Keywords:** Rasayana, Immunomodulation, Non-communicable diseases, Ayurveda pharmacology, Natural products

ONOPNCDC41

Successful Management of Mandala Kushta: A Case Report

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Background: Mandala Kushta is one of the major types of Kushta described in Ayurvedic literature, characterized by circular, thick, erythematous, and scaly skin lesions. It is considered a chronic dermatological condition caused by the vitiation of all three doshas, predominantly Kapha and Pitta. The condition closely

resembles chronic plaque psoriasis in modern dermatology. Effective management is challenging due to its recurrent nature. **Materials and Methods:** A clinically diagnosed case of Mandala Kushta was studied. Detailed history, clinical examination, and Ayurvedic diagnostic parameters were recorded. The patient was treated with a combination of internal medications aimed at dosha pacification and detoxification, along with appropriate external therapies. Dietary regulation and lifestyle modifications based on Ayurvedic principles were also advised. The treatment was continued with regular follow-up assessments to monitor clinical improvement. **Results:** Significant improvement was observed during the course of treatment. The erythema, scaling, and thickness of the lesions gradually reduced. The itching and discomfort were completely relieved. By the end of the treatment period, the skin lesions had almost completely resolved without recurrence during the follow-up period. **Conclusion:** This case demonstrates that a properly planned Ayurvedic treatment protocol can effectively manage and cure Mandala Kushta. Early diagnosis, individualized therapy, and strict adherence to dietary and lifestyle recommendations play a crucial role in achieving successful outcomes. **Keywords:** Mandala Kushta, Kushta, Ayurvedic management, Skin disease, Case report.

ONOPNCDC42

Clinical Correlation of Melasma (Vyanga) in Ayurveda: A Case Study

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Background: In *Ayurveda,* the skin disorder *Vyanga* is classified under *Kshudra Rogas* (minor diseases) by all *Acharyas.* Although it is not life-threatening, it is a commonly observed and significant cosmetic concern. *Vyanga* mainly occurs on the *Mukhapradesha* (facial region) and is associated with the vitiation of *Vata and Pitta Doshas*. In modern dermatology, *Vyanga* can be correlated with Melasma. Melasma is characterized by hyperpigmented patches on the cheeks, upper lip, chin, nose, and forehead. It is more frequently observed in individuals with darker skin types. The condition predominantly affects females, with a female-to-male ratio of about 4:1. Its etiopathogenesis involves genetic predisposition, ultraviolet (UV) exposure, hormonal changes, certain medications like Phenytoin, and the use of cosmetics. **Aim:** To study the clinical feature diagnosis and management of Vyanga**. Materials and Method:** A diagnosed case of Melasma was selected from the clinical OPD, and detailed history, general and systemic examinations were carried out. Ayurvedic assessment of *Dosha*, *Dushya*, *Agni*, and *Srotas* was done, followed by appropriate *Shamana* therapies, and the response to treatment was evaluated clinically. **Results:** On the basis of collected data, efforts were made to throw light on the *Vyanga*, its *Hetu*, and its *Chikitsa*. **Discussion**: In *Ayurveda*, *Vyanga* is considered a minor ailment *Kshudra Rog* (minor ailment) but is recognized for its significant impact on quality of life, with psychological factors such *Krodha* (anger), *Shoka* (grief), and *Shrama* (exhaustion), often contributing to its development. Ayurvedic scholars, notably *Acharya Charaka*, attribute the pathophysiology of *Vyanga* (melasma) to aggravated *Pitta* and *Rakta* (blood). *Vyanga* is classified as a *Rakta Pradoshaja Vyadhi*, with *Rakta Dhatu* being primarily affected. Psychological factors like *Krodha, Shoka*, and *Shrama* (mostly Tamasik and related to the mind) along with dominant *Pitta* and *Vata*, disturb the *agni* residing in *Rasa Dhatu*. **Conclusion:** *Vyanga* is a *Kshudraroga*. Most of the Acharya's defined it is *Niruja*, but it is more painful

for the mind because it has major importance in society. *Nidana* of *Vyanga* is *Krodha*, *Shoka*, *Ayasa* and *Dosha* involve is *Vata* and *Pitta* and *Dushya* is *Rasa* and *Rakta*. According to modern science, *Vyanga* is correlated with melasma. **Keywords:** *Vyanga, Kshudra Rog*, Melasma, Hyperpigmentation.

ONOPNCDC43

A Cross-Sectional Analysis of the Association Between Prakriti and Cognitive Status Among Middle-Aged Adults

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Background: Healthy aging is defined as a lifelong process of optimizing opportunities for improving and maintaining the health, physical, social and mental well-being, independence, quality of life, and enhancement of a successful life transition.Healthy aging is a multidimensional concept that includes social, mental, and physical dimensions.Preparation for age-related changes is not restricted to old age itself, but should be a concern throughout life: middle-aged and even younger adults should also engage in preparation for changes that are expected to occur during later life. Prakriti is one of the very important principles and plays a very important role in the designing of lifestyle of a person for maintenance of health. Its determination is also important in diseased condition as it is essential in the prognosis and planning of treatment.In Ayurveda according to acharya susrutha vaya is classified as balya, madhya and vridha. Based on susrutha acharya classification of vaya-in madhyavaya from 40 year onwards degeneration starts.The objevtive of the study are To find out the relationship between Prakriti categories and cognitive status among middle age population in Chandigarh and To find out the prevalence of mild cognitive impairment in middle age population at Chandigarh across different Prakriti categories. **Materials and Methods:** In the study person with age group 40-60 years of both sexes are included and person with diagnosed dementia ,individuals with known psychiatric disorders, individuals with severe vision, speech, or auditory issues are excluded from the study. Total sample of study is 100.Based on inclusion and exclusion criteria samples has selected, after the selection Prakriti assessment has done by using standardized questionnaire developed by CCRAS.Cognitive status assessment done by using MMSE (Mini Mental State Examination),MONTREAL COGNITIVE ASSESSMENT(MoCA) and Trail Making Test-For assessing executive function.MoCA Score greater than 26 has categorized as Individuals with Normal cognitive impairment, 18-25 as mild cognitive impairment, 10-17 as moderate impairment and , 0-9 as severe impairment. **Results:** After the study it is observed that strong associations ($p < 0.05$) were observed between *Prakriti* types and cognitive impairment. **Vata Pitta** and **Vata Kapha** had significantly higher MCI rates (24% and 12%), aligning with Ayurvedic literature linking *Vata*-dominant types to faster cognitive decline due to their neurophysiological characteristics. Regarding the prevalence of MCI Over half the sample (55%) had MCI, underscoring a critical public health concern in middle-aged populations. **Discussion:** This study confirms a significant relationship between *Prakriti* types and cognitive status, with **Vata Pitta** individuals at highest risk. The high prevalence of MCI (55%) highlights the need for early screening and preventive strategies. **Keywords:** Prakriti, middle aged population,mild cognitive impairment, neurodegenerative changes.

OFOPCDAR1

Discovery of a Dual-acting phytochemical with antibacterial and wound-healing activities from a medicinal plant

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Ayurveda, the science of life, originated in India between 2500 and 500 BC as a holistic system of medicine, which harbours nearly 20,000 medicinal plant species extensively used across traditional healthcare systems.[1,2] Plant-derived extracts have long been central to traditional medicine across multiple civilizations. However, crude plant extracts may cause adverse effects, making the need for purification of bioactive compounds to minimize toxicity.[2] Despite the clinical success of plant-derived drugs such as quinine, artemisinin, vinca alkaloids, and withaferin, only a small fraction of bioactive phytochemicals has been isolated, underscoring the vast untapped potential of India's medicinal flora.[2] One such medicinal plant *Couroupita guianensis* (Nagalinga or cannonball tree), used in Ayurveda for treating various diseases, known for its biological activities, including antimicrobial effects.[3] We performed antibacterial activity-guided purification of its fruits and isolated an active compound, VY-DV-TRP, which was fully characterized using spectroscopic techniques. VY-DV-TRP exhibits multimodal antibacterial activity against a range of staphylococcal species, including multidrug-resistant strains. It strongly inhibits staphyloxanthin, a key bacterial reactive oxygen species scavenger, thereby increasing bacterial susceptibility to antibiotics and host immune defenses. In a murine infection model against multidrug-resistant *Staphylococcus aureus*, VY-DV-TRP demonstrated excellent wound-healing properties, outperforming the clinical drug fusidic acid. Additionally, it positively regulated growth parameters such as matrix metallo protease-9 (MMP-9) and vascular endothelial growth factor (VEGF), thereby promoting rapid tissue regeneration. Overall, these findings highlight the clinical translatability of VY-DV-TRP for the treatment of topical bacterial infections, either as a standalone or in combination with other bactericidal agents. Such strategies may enable effective wound resolution in a therapeutic landscape constrained by limited antibiotic innovation and the growing resistance to decades-old topical antibiotics. **Keywords:** Medicinal plants, *Couroupita guianensis*, Natural products, Antibiotic drug discovery, Dual-mode activity, Wound healing.

OFOPCDAR2

Time-Trend, Regional and National Prevalence of Vertical Transmission of HIV-1 in sub-Saharan Africa: A Systematic Review and Meta-analysis

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Background: Despite global efforts, mother-to-child transmission (MTCT) of HIV remains a significant challenge in sub-Saharan Africa, where 65% of the world's 39.9 million people living with HIV reside. Vertical transmission rates vary widely between regions and over time. We conducted a systematic review and meta-

analysis to estimate the overall, temporal, regional, and national prevalence of HIV MTCT in sub-Saharan Africa. **Material & Methods:** This research was conducted from June 2024 to May 2025, adhering to the PRISMA guidelines and protocol published in PROSPERO (CRD42025637989). We searched six databases (Medline, Embase, PubMed, ScienceDirect, Web of Science, and Cochrane Library), focusing on articles in English and French. We included cross-sectional, cohort, and case-control studies of HIV-positive pregnant women ≥ 18 years reporting MTCT prevalence. Two reviewers independently screened, extracted data, and assessed study quality (Joanna Briggs Institute and Newcastle Ottawa Scale). Pooled prevalence and 95% CI were calculated using a random-effects model in STATA 17. Heterogeneity (I^2), subgroup analyses (by period, region, country), sensitivity analysis, and funnel plots for publication bias were performed. **Results:** From 5 848 records, 48 studies (86,376 mothers; 2 875 104 infants) across 15 countries were included. The pooled MTCT prevalence was 7.0% (95% CI 5.2–9.4%; $I^2 = 99.1\%$, $p < 0.001$). Temporal trends showed a decline from 26.0% (1993–2000) to 8.0% (2001–2010) and 5.0% (2011–2023). Regionally, West Africa had the highest prevalence (12.1%; 95% CI 6.5–21.6%), Southern Africa the lowest (4.7%; 95% CI 2.6–8.1%). Nationally, MTCT ranged from 40.4% in Congo to 2.1% in Zimbabwe; Cameroon's pooled rate was 6.7% (95% CI 3.8–11.4%). Sensitivity analysis confirmed robustness; some publication bias and high heterogeneity persisted. **Conclusion:** Although MTCT rates have declined, the current 7.0% remains above the WHO target (< 5%). Significant regional and national disparities persist, highlighting the need for intensified, context-specific PMTCT interventions, improved ART coverage, and strengthened early infant diagnosis to achieve elimination goals. **Key words:** Vertical transmission, HIV/AIDS, Sub-Saharan Africa, Systematic review, Meta-analysis

OFOPCDAR3

In-Vitro Evaluation of Antimicrobial Activity of *Shwasakuthar Rasa* Against *Klebsiella pneumoniae*

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Background: *Shwasakuthar Rasa*, a traditional Ayurvedic herbo-mineral preparation, has long been used to treat *Shwasa* (respiratory ailments) and *Kasa* (cough). Its components feature *Ushna, Teekshna*, and *Kapha-Vata* pacifying traits, ideal for tackling infection-related breathing problems. As antibiotic resistance surges, threats like *Klebsiella pneumoniae* demand new options. We evaluated this formula's antibacterial potential against *K. pneumoniae* in a lab setting to bridge ancient wisdom with evidence-based medicine. **Materials and Methods:** This in vitro experiment used neutral agar media. We tested a clinically sourced strain of *Klebsiella pneumoniae* via the disc diffusion assay. Discs loaded with different doses of *Shwasakuthar Rasa* went onto bacteria-seeded plates, with standard antibiotics as benchmarks. Post-incubation, we measured inhibition zones to quantify activity. **Results:** *Shwasakuthar Rasa* produced clear zones of inhibition against *Klebsiella pneumoniae*, confirming strong antibacterial effects. Activity increased with concentration and matched the

performance of reference antibiotics. **Conclusion:** *Shwasakuthar Rasa* shows promising antibacterial action against *Klebsiella pneumoniae*, affirming its role in respiratory care. It holds potential as a supportive or substitute therapy amid resistance challenges, calling for deeper mechanistic research and clinical trials in holistic medicine. **Keywords:** Shwasakuthar Rasa; Klebsiella pneumoniae; Antimicrobial Activity.

OFOPCDAR4

Identification of Antibacterial Phytoconstituents From *Artemisia Annua*: An *In Silico* Approach

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Antimicrobial resistance (AMR) is a critical global health challenge, with *Methicillin-Resistant Staphylococcus aureus* (MRSA) responsible for persistent and hard-to-treat infections. This study aimed to identify potential antibacterial phytoconstituents from *Artemisia annua* using an in silico approach. A library of 113 phytochemicals was compiled and screened against key MRSA target proteins, including the 50S ribosomal subunit (PDB ID: 3VSL), using molecular docking with Schrödinger (Glide) and AutoDock. Top-ranked compounds were further analysed for protein–ligand interactions and evaluated for toxicity and drug-likeness using ProTox-II and SwissADME. Among the screened compounds, artemisinin demonstrated the highest binding affinity and favourable pharmacokinetic properties. Molecular dynamics simulations (10 ns) confirmed the stability of the artemisinin–protein complex, supported by consistent RMSD and RMSF profiles. Other compounds, including quercetin, luteolin, and kaempferol, also showed promising interactions. These findings highlight artemisinin as a potential lead candidate for developing novel anti-MRSA agents. This study demonstrates the utility of integrating molecular docking, ADME/toxicity prediction, and molecular dynamics simulations to accelerate natural product-based drug discovery.

OFOPCDAR5

An *In-Vitro* Evaluation of the Anti-Bacterial Activity of *Dhanyaka* (*Coriandrum sativum* Linn.) w.s.r to *Staphylococcus aureus*

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Background: Ayurveda emphasises padyachatushyam in which the drug (dravya) comes on the second highest order to treat a disease. Dravyaguna provides a conceptual framework for understanding medicinal plant properties, enabling their rational therapeutic use and systematic scientific validation in Ayurveda. Dhanyaka (*Coriandrum sativum* Linn.) has been cited by various ayurvedic lexicons for its therapeutic use in *shawasa* and *kasa* (respiratory diseases). **Aim and objectives:** The present study aims to evaluate it's *In-vitro* anti-bacterial activity of Dhanayaka (*Coriandrum sativum* Linn.) w.s.r Staphylococcus aureus by Agar diffusion method. **Material and methods** The agar diffusion method is a well-established screening technique for assessing a drug's inhibitory potential based on zone measurement. Dhanayka (*Coriandrum sativum* Linn.) will be procured and subjected to physicochemical characterization, followed by *in-vitro* biological evaluation for their anti-bacterial activity. **Result and conclusion** The present study is expected to establish standardized physicochemical parameters and demonstrate in-vitro antibacterial

activity of Dhanayaka (*Coriandrum sativum* Linn.), thereby facilitating scientific substantiation of traditional Ayurvedic knowledge through contemporary experimental validation. **Keywords:** Ayurveda, Dhanayka, anti-bacterial activity, shawasa, kasa, *Staphylococcus aureus*

OFOPCDAR6

A Case Study of Psoriasis *(Eka Kustha):* Ayurvedic Management Approach

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Background: Psoriasis is a chronic, immune-mediated inflammatory skin disorder characterized by erythematous, scaly plaques with a relapsing course. In Ayurveda, psoriasis closely correlates with *Kushtha*, particularly *Eka Kushtha*, which is described as a *Vata-Kapha* predominant disorder involving impairment of *Twak* (skin), *Rakta* (blood), *Mamsa* (muscle tissue), and *Lasika*. Ayurveda attributes the pathogenesis of *Eka Kushtha* to *Agnimandya,* formation of *Ama*, and vitiation of Doshas, leading to obstruction of *Srotas* and manifestation of skin lesions. Modern medicine explains psoriasis as an autoimmune condition involving hyperproliferation of keratinocytes and dysregulated immune responses. **Aim:** To evaluate the effectiveness of selected treatment plan on the selected case. **Materials and Methods:** A diagnosed case of psoriasis was selected from the clinical OPD, and detailed history, general and systemic examinations were carried out. Ayurvedic assessment of *Dosha*, *Dushya*, *Agni*, and *Srotas* was done, followed by appropriate *Shodhana* and *Shamana* therapies, and the response to treatment was evaluated clinically**. Results:** After the completion of treatment, significant improvement was observed in the patient with reduction in itching, scaling, erythema, and thickness of lesions. Overall skin condition and quality of life improved, with no major adverse effects noted during the treatment period. **Discussion:** Psoriasis (*Eka-Kuṣṭha),* is a chronic immune-mediated inflammatory skin disorder, clinically presenting as erythematous plaques with silvery scales, as observed in this case. It is a condition predominantly involving *Vata* and *Kapha doṣa* with *Rakta dushṭi*. Selected management plan was focused on initial *Shodhana* and followed by *Shamana,* and restoration of *agni* along with symptomatic relief. **Conclusion:** Results of the study shows ability of Ayurvedic management to control symptoms, prevent recurrence, and improve overall quality of life. **Keywords:** *Ekkushtha*, *Dosha*, Psoriasis, *Agnimandhya, Nidan Parivarjan*

OFOPCDAR7

A Clinical Case Series on *Kaphaja Yonivyapad* (*Trichomonas Vaginitis*): Ayurvedic Perspectives and Management

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Background: *Kaphaja yonivyapad* is one of the most common problem faced by the women all around the globe. The symptoms are vaginal white discharge, itching and mild pain in vagina. Management of this condition is by using *Ruksha, Katu, Ushna dravyas*. *Sthanika Chikitsa* such as *Yoni Prakshalana, Yoni Pichu*, *Yoni Varti* and *Yoni Dhoopana* have been mentioned and these modalities are found effective in treating *Kaphaja Yonivyapad.* **Materials and Methods:** Here is a case series of 3 patients with complaints of *Kaphaja Yonivyapad* selected from outpatient department of PTSR from SDACH. *Yoni dhawana with Karanja patra*

kwatha and Yoni pichu with nimba taila was advised along with oral medications like *Chandraprabha vati, Triphala guggulu, Gandhak rasayan* for 7 days. **Results and Discussion:** Patients got complete relief from *Yoni srava. Yoni kandu* and *Vedana.* 1 patient's pH was not changed to acidic. The *Dravyas* by its *Guna Karma is Yonidoshahara, Kandugna, Krimighana, Yonidoshahrita* properties which helps in treatment of *Kaphaja Yonivyapad*. **Conclusion:** The Ayurvedic approach aims to provide significant relief by correcting the imbalanced *Doshas* and preventing the onset of further complications. This study provided important information regarding the effectiveness of *Yoni dhawana with Karanja patra kwatha and Yoni pichu with nimba taila* along with oral medications proved to be effective in the management of *Kaphaja Yonivyapad*. Hence here is an attempt to use this as a protocol form and help the women kind as an easily available *Ayurvedic* drugs. **Keywords:** *Kaphaja Yonivyapad, Yoni dhawana, Yoni pichu, Sthanik chikitsa,* Case series

OFOPCDAR8

Synergistic Effects of Bacteriocins from *Staphylococcus epidermidis* and Bioactive Plant Extracts against Skin Pathogens

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The rising incidence of antimicrobial resistance among skin pathogens has created an urgent need for integrative, sustainable, and safer therapeutic alternatives. Conventional antibiotics often lead to resistance development and undesirable side effects, necessitating exploration of novel antimicrobial strategies. Bacteriocins produced by *Staphylococcus epidermidis*, a natural commensal bacterium of human skin, represent a promising class of ribosomally synthesized antimicrobial peptides characterized by targeted activity, high specificity, and low host toxicity. In parallel, medicinal plants used in traditional systems of medicine possess a diverse array of bioactive phytochemicals with well-documented antimicrobial properties, offering an additional natural resource for therapeutic development. The present study investigates the synergistic pharmacological interaction between bacteriocins derived from *S. epidermidis* and selected bioactive plant extracts against clinically relevant skin pathogens. Bacteriocins were produced under optimized culture conditions and subsequently purified using ammonium sulfate precipitation, dialysis, and cation exchange chromatography to ensure reproducibility, purity, and standardization. Bioactive plant extracts were prepared through controlled and standardized extraction protocols to maintain consistency of active constituents. The antimicrobial efficacy of individual agents and their combinations was evaluated using in vitro inhibitory assays to assess synergistic interactions. The combined bacteriocin–plant formulations demonstrated significantly enhanced antimicrobial activity compared to individual treatments, confirming a clear synergistic effect. This synergy enabled effective inhibition of skin pathogens at reduced concentrations, indicating advantages in terms of improved safety profiles, reduced cytotoxicity, and potential mitigation of antimicrobial resistance development. Overall, the study highlights pharmacology as a bridge integrating microbial and phytochemical approaches, providing scientific validation of traditional medicinal knowledge. **Keywords**: Bacteriocins; *Staphylococcus epidermidis*; Plant bioactive; Synergism; Skin pathogens; Antimicrobial resistance

OFOPCDAR9

Communicable Diseases in Ayurveda: A Conceptual and Preventive Approach

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Background: Communicable diseases are infectious diseases that spread from one person to another by pathogenic microorganisms and continue to be a major public health concern. Ayurveda, although developed before the discovery of microbes, described similar conditions using concepts such as Aupasargika Roga, Janapadodhwamsa, and Krimi Siddhanta, with emphasis on immunity, lifestyle, and environmental factors. **Materials & Methods**: Classical Ayurvedic texts including *Charaka Samhita* and *Sushruta Samhita*, along with their commentaries, were used as the primary source of information for this study. A descriptive and analytical review of Ayurvedic literature was carried out to understand the concept of communicable diseases, their mode of transmission, preventive measures, and management from an Ayurvedic perspective. **Results:** Ayurveda recognizes disease transmission through contact, respiration, and shared use of food, clothing, and living spaces. It highlights the role of individual immunity (Bala and Ojas), healthy lifestyle practices, and environmental balance in disease development. Preventive measures such as *Dinacharya, Ritucharya, Rasayana,* and *Sadvrutta* form the foundation of disease control. Conclusion: Ayurveda strengthens immunity and promotes prevention, while modern medicine provides diagnosis and treatment—together, they offer a complete and sustainable approach to managing communicable diseases. Keywords: Aupasargika Roga, Ayurveda, Immunity, Janapadodhwamsa, Prevention

OFOPCDAR10

Prevalence and Antibiotic Resistance profile of STI Pathogens and Anti-Gonococcal Activity of Selected Essential Oils

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Background: The rising antimicrobial resistance (AMR) among sexually transmitted infection (STI) pathogens poses a serious threat to effective disease management worldwide. As many STIs remain asymptomatic, their burden is often underestimated. Limited data are available on STI prevalence and resistance patterns in Anuppur and Shahdol districts of Madhya Pradesh. This study investigated occurrence of STI pathogen, antimicrobial susceptibility profiles, and the efficacy of selected essential oils as alternative antimicrobial agents. **Materials and Methods:** Vaginal / endocervical swab samples were collected from symptomatic women. STI pathogens were identified using real-time PCR for simultaneous detection of eight pathogens. Antibiotic susceptibility testing was performed on prevalent bacterial pathogen, and the antimicrobial activity of six selected essential oils was evaluated against multidrug-resistant isolates. **Results:** Overall, out of 110 samples, 85.45% tested positive for at least one STI pathogen. *Mycoplasma hominis* (67.27%) was the most prevalent, followed by *Ureaplasma urealyticum* (59.09%), *Ureaplasma parvum* (33.64%), HSV-1/2 (13.64%), *Neisseria gonorrhoeae* (8.18%), *Mycoplasma genitalium* (7.27%), and *Chlamydia trachomatis* (5.45%). STIs were most common in women aged 36–41 years. AST results showed multidrug resistance against prevalent pathogens. Nagarmotha essential

oil showed the lowest MIC against *Neisseria. gonorrhoeae*, followed by Eucalyptus, Palmarosa, Spearmint, and Tulsi. GC–MS analysis revealed Cyprene and Eucalyptol as the major compound of Nagarmotha and Eucalyptus oils, respectively. **Conclusion:** The study reveals a high burden of STIs and significant antimicrobial resistance among tribal women. Selected essential oils, particularly Nagarmotha and Eucalyptus, demonstrate promising potential as alternative therapies against MDR gonococcal infections. **Keywords:** STI, Antibiotic resistance, Essential Oils, MIC, GC-MS

OFOPCDAR11

Systems-Level Analysis of Food Spoilage Microorganisms and Preservation Technologies

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Food spoilage represents a major challenge to global food security, public health, and economic stability. It is primarily caused by the growth of spoilage microorganisms, enzymatic degradation, and physicochemical changes that occur during food processing, storage, and distribution. Microorganisms such as bacteria, yeasts, and molds utilize food nutrients, resulting in undesirable sensory changes including off-flavors, texture deterioration, discoloration, and reduced nutritional quality. In addition to quality loss, spoilage can increase the risk of foodborne illnesses if pathogenic microorganisms are present.To control spoilage and extend shelf life, various preservation techniques have been traditionally employed, including thermal processing, refrigeration, freezing, drying, fermentation, and the use of chemical preservatives. While these methods are effective, growing consumer concerns regarding synthetic additives and demand for minimally processed foods have encouraged the development of alternative preservation strategies. Recent research highlights the potential of natural preservatives derived from plant extracts, essential oils, organic acids, and bioactive compounds due to their antimicrobial and antioxidant properties. Emerging technologies such as hurdle technology, edible coatings, and nano-based delivery systems have further enhanced the effectiveness of preservation by targeting multiple spoilage mechanisms simultaneously. These approaches improve microbial control while maintaining food quality and sensory attributes. A comprehensive understanding of food spoilage mechanisms and the integration of sustainable preservation strategies are essential for reducing post-harvest losses, improving food safety, and meeting modern consumer and regulatory requirements. This presentation reviews the key causes of food spoilage and discusses conventional and emerging preservation techniques with an emphasis on natural and eco-friendly solutions. **Keywords:** Food spoilage, food preservation, microorganisms, natural preservatives, food safety.

OFPPCDAR1

Nanobiotechnological Strategies using Natural Product Derived

Nanomaterials to Combat Antimicrobial Resistance

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Background: The Therapeutic value of conventional antibiotics is threatened by antibiotic resistance (AMR), an increasing global health problem. Alternative treatment options are needed because of the rapid development of bacteria that are multidrug-resistant. By enhancing antibacterial activity with reducing toxicity and resistance development, nanobiotechnology in conjunction with bioactive substances provides promising options. **Materials and Methods:** Recent research on nanomaterials made from substances that are natural such as polysaccharides, proteins, plant extracts, and microbial metabolites are summarized in this review. The green synthesis methods, physicochemical characterisation, and the antimicrobial properties associated with natural product-based nanoparticles, such as metallic (silver, gold), polymeric, lipid-based, and carbon-based nanomaterials, were the primary focus of study. A comprehensive review of their interactions with cell walls of bacteria and biofilms was carried out. **Results:** Nanomaterials developed using plants showed broad-spectrum antimicrobial properties against resistant strains of both Gram-positive and Gram-negative bacteria. These tiny substances functioning by disrupting the membranes of cells, forming oxygen species that are reactive, reducing the formation of biofilms, and enhancing the delivery of drugs, among other ways. Compared to their synthetically produced alternatives, green- synthesized nanoparticles demonstrated enhanced biocompatibility as well as decreased negative environmental effects. When nanoparticles were mixed with current antibiotics, synergistic effects were seen, which enhanced the drugs effectiveness. **Conclusion:** AMR can be effectively and sustainably eradicated by nanotechnology-based solutions that use nanoparticles made from natural resources. Their ability for combating antibiotic resistance, environmentally friendly synthesis, and multifunctional methods highlight their possibilities for use in antimicrobial medications in future generations. However, the successful conversion into pharmaceutical use needs further in vivo research, toxicity evaluations, and clinical confirmation. **Keywords:** Antimicrobial resistance, nanobiotechnology, natural products, green synthesis, antimicrobial nanomaterials, biofilms

OFPPCDAR2

Emergency Department -Centric Antimicrobial Stewardship as a Strategic Hospital Administration Tool: Policy Integration, Audit Mechanisms, and the Role of Evidence-Based Natural Products in Containing Antimicrobial Resistance in Communicable Diseases"

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Background: Emergency departments (EDs) are the primary source for significant amounts of prescribed antibiotics, and antimicrobial resistance (AMR) is a significant threat to global health. The development of antibiotic-resistant organisms is greatly impacted by the inadequate or empirical use of antibiotics in emergency department environments. When integrated with hospital administration policies, emergency

department-centric antimicrobial stewardship programs (ED-ASPs) present an effective opportunity to maximize the use of antibiotics. Clinically proven natural substances have gained investigation as alternative or complementary treatment for infectious diseases that might reduce the need for antibiotics. **Materials and Methods:** The current research on emergency department antimicrobial stewardship strategies, hospital policy integration systems, feedback and audit mechanisms, and the role of herbal medicines with scientific proof in managing the spread of communicable diseases is reviewed in this summary. For evaluation of stewardship efficacy, administrative effectiveness, and AMR control outcomes, scientific literature with peer review, policy documents, and clinical trials were investigated. **Results:** Medical guidance, rapid diagnoses, prescription restrictions, and immediate evaluation feedback systems are examples of emergency department stewardship methods which have improved proper antimicrobial use and reduced unnecessary antibiotic consumption. Safety as well as sustainability have been enhanced through integration with hospital administration rules and regulations. When used in combination with standard medical treatment, scientifically verified natural therapies such as immune-modulating substances and plant-derived antimicrobials have the potential to improve infection management and reduce dependence on conventional antibiotics. **Conclusion:** Antimicrobial control focused on the emergency department is a major hospital administration method for combating AMR. In combination, policy integration, strong procedures for auditing, and careful consumption of scientifically proven alternatives may improve stewardship programs, enhance the health of patients, and support the prolonged containment of antibiotic resistance in infectious diseases. **Keywords:** Antimicrobial resistance, Emergency department, antimicrobial stewardship, Hospital policy, Audit mechanisms, Evidence-based natural products, Communicable diseases.

OFPPCDAR3

Communicable Diseases and Antimicrobial Resistance: A Growing Global Health Threat

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Communicable diseases remain one of the leading causes of morbidity and mortality worldwide, particularly in developing countries where healthcare infrastructure and sanitation facilities are limited. Infectious agents such as bacteria, viruses, fungi, and parasites continue to cause widespread outbreaks, posing serious socio-economic and public health challenges. In recent decades, the growing problem of antimicrobial resistance (AMR) has significantly complicated the prevention and treatment of these diseases. Antimicrobial resistance occurs when microorganisms evolve mechanisms to withstand drugs that were once effective against them. The irrational use of antibiotics, self-medication, incomplete treatment courses, and extensive application of antimicrobials in livestock and agriculture have accelerated the emergence of resistant strains. As a consequence, common infections are becoming difficult to treat, leading to prolonged illness, treatment failure, increased healthcare expenditure, and higher mortality rates. Drug-resistant tuberculosis, methicillin-resistant bacterial infections, and resistant malarial parasites are examples of major global threats. Effective control of communicable diseases in the era of AMR requires rational antibiotic stewardship, strict infection prevention and control practices, improved surveillance systems, public awareness,

vaccination coverage, and implementation of national and global action plans. A coordinated One Health approach integrating human, animal, and environmental health sectors is essential to combat this crisis sustainably. **Keywords**: Communicable Diseases, Antimicrobial Resistance (AMR), Antibiotic Stewardship, Multidrug Resistance, Public Health, One Health Approach, Infection Control.

OFPPCDAR4

Intracellular Dehydration Strategy for Persister Cell Eradication

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Background: Bacterial persister cells are phenotypic variants that survive antibiotic treatment without genetic resistance by entering a dormant metabolic state. Because most antibiotics target active cellular processes, persisters remain viable and can resuscitate after treatment, causing recurrent infections. Evidence suggests intracellular water balance and osmotic stress are critical for maintaining cytoplasmic stability, enzyme function, and minimal metabolic activity required for persister survival. **Materials and Methods:** A conceptual strategy termed *Programmable Intracellular Water Extraction (PIWE)* was proposed to induce controlled intracellular dehydration. The approach involves creating a hyperosmotic environment to trigger rapid water efflux through diffusion or aquaporin-mediated transport. Sequential events including cytoplasmic crowding, increased macromolecular density, protein aggregation, ribosomal dysfunction, and membrane phase transition were analyzed as mechanisms leading to loss of viability. The strategy includes osmotic priming, water-flux amplification via membrane permeability modulation and transient ion imbalance, followed by a low-dose antibiotic finishing step. **Results:** The proposed mechanism predicts that intracellular dehydration reduces molecular mobility and induces a glass-like cytoplasmic state, preventing recovery and resuscitation of persister cells. **Conclusion:** Targeting intracellular water homeostasis represents a novel biophysical approach for persister eradication and may complement conventional antibiotic therapy against persistent infections. **Keywords:** Persister cells, intracellular dehydration, osmotic stress, antimicrobial tolerance, PIWE strategy.

OFPPCDAR5

Communicable Diseases & Antimicrobial Resistance

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Background: In clinical practice, infections once easily treatable are increasingly showing poor response to standard antibiotics, reflecting the growing burden of antimicrobial resistance (AMR). This trend is now a major global public health concern. Irrational antibiotic use, self-medication, and poor adherence are key contributors. Ayurvedic concepts such as Janapadodhwamsa and Vyadhikshamatva emphasize community-level disease spread and the role of host immunity. **Materials and Methods**: This study is based on a review of recent scientific literature, including global and national AMR reports, along with clinical observations from common infections such as respiratory and urinary tract infections. Relevant Ayurvedic principles were also reviewed for their applicability in prevention and integrative care. **Results:** A rise in resistance to commonly used antibiotics in community-acquired

infections was observed. Indiscriminate antibiotic use and incomplete treatment courses were major contributors, leading to recurrence and prolonged illness. Impaired Vyadhikshamatva and Mithya Ahara-Vihara may predispose individuals to repeated infections. Ayurveda emphasizes immune enhancement through maintenance of Agni, prevention of Ama, and promotion of Ojas. Herbal drugs such as Ashwagandha, Guduchi, Neem, and Turmeric exhibit antimicrobial and immunomodulatory properties. Use of Rasa Aushadhis along with therapies like Panchakarma and Rasayana further support detoxification and long-term immunity. Conclusion: AMR is both a therapeutic challenge and a shift in disease patterns. Along with antibiotic stewardship and infection control, preventive approaches are essential. Ayurvedic principles such as Dinacharya and Ritucharya provide a holistic, integrative strategy to reduce disease burden and help mitigate antimicrobial resistance. **Keywords:** Antimicrobial Resistance, Communicable Diseases, Vyadhikshamatva, Antibiotic Stewardship, Integrative Medicine

OFPPCDAR6

ASU Drug Development and Natural Products: Translational Innovation and Intellectual Property Architecture

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Background: ASU (Ayurvedic, Siddha, and Unani) medication systems and natural products offer a pharmacologically rich and chemically varied resource for the development of new therapeutics. Despite a wealth of ethnomedical documentation, fragmented intellectual property (IP) methods and translational inefficiencies continue to limit their integration into evidence-based medicine. **Objective:** Innovation models, patent landscapes, and translational frameworks that regulate the development of ASU therapies derived from natural products are all severely examined in this study. **Materials and Methods:** A multidisciplinary approach was used, combining the evaluation of quality standards processes, a thorough study of the translational pharmacognosy literature, and scientometric patent analysis (2010–2025). Advanced techniques such as bioassay-guided fractionation, systems pharmacology modeling, metabolomic fingerprinting, and nano-formulation technologies were evaluated in comparison. **Results:** Increased protection for innovative medicine delivery systems, synergistic polyherbal formulations, standardized extracts, and green extraction technology is seen in patent trends. Scientific credibility and regulatory preparedness have increased because of mechanism-oriented validation employing molecular docking and pathway analysis. But because of phytochemical heterogeneity, insufficient multicentric clinical studies, a lack of regulatory harmonization, and the difficulties in safeguarding traditional knowledge without sacrificing ethical access, translational obstacles continue to exist. Quality-by-design (QbD), AI-assisted phytochemical screening, and defensive patent methods are examples of emerging innovation ecosystems that have the potential to accelerate translation. **Conclusion:** The confluence of stringent scientific validation, a well-organized patent architecture, and regulatory channels that are in line with policy is necessary for the

sustainable advancement of ASU drug innovation. Increased translational integration can maintain local knowledge sovereignty while boosting global competitiveness. **Keywords:** Translational pharmacognosy, ASU drugs, patent landscape, phytopharmaceutical innovation, quality-by-design, intellectual property governance.

OFPPCDAR7

Natural Product-Based Drug Discovery Against Drug-Resistant Malaria

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Background: Drug-resistant malaria remains a major global health challenge, significantly compromising the efficacy of current antimalarial therapies. Key molecular determinants of resistance include *Plasmodium falciparum chloroquine resistance transporter* (PfCRT), *Plasmodium vivax drug resistance protein* (PvDR), *Plasmodium falciparum CDC-like kinase 3* (PfCLK3), and host-associated efflux transporter *P-glycoprotein* (PGP). These targets play crucial roles in parasite survival, drug efflux, and resistance mechanisms. Natural products, owing to their structural diversity and biological relevance, represent a promising source of novel antimalarial agents. This study aims to identify potential natural compounds targeting these resistance-associated proteins through a comprehensive in silico screening approach. **Materials & Methods:** A comprehensive literature review was conducted to identify key resistance-associated targets including PfCRT, PvDR, PfCLK3, and PGP. Three-dimensional structures of these targets were obtained from publicly available databases or modeled where necessary. A curated natural product library was assembled using the LOTUS database along with additional natural compound repositories. Ligands were prepared and optimized using standard computational workflows, and protein structures were processed for docking studies. Hierarchical molecular docking (HTVS, SP, and XP docking with GLIDE) against all four targets.was performed using validated docking protocols to screen compounds against all selected targets. Binding affinities were assessed based on docking scores and interaction profiles, and top-ranking ligands were shortlisted for further evaluation. **Results:** Virtual screening identified several natural compounds demonstrating favorable binding affinities across the selected targets. Multiple ligands exhibited strong docking scores against PfCRT, PvDR, PfCLK3, and PGP, suggesting potential inhibitory activity against key resistance pathways. Interaction analysis revealed stable binding conformations involving critical active site residues, indicating the ability of these compounds to modulate target function. Notably, certain ligands showed multi-target binding potential, highlighting their possible role in overcoming multidrug resistance. Overall, the identified compounds demonstrated promising drug-like characteristics and target engagement profiles. **Conclusion:** This study highlights the potential of natural products as promising candidates for combating drug-resistant malaria

through multi-target inhibition. The identified ligands targeting PfCRT, PvDR, PfCLK3, and PGP warrant further validation in preclinical experimental models, including in vitro and in vivo studies. These findings provide a foundation for the development of novel, effective, and resistance-resilient antimalarial therapies. **Keywords:** Drug-Resistant Malaria, PfCRT, PvDR, PfCLK3, P-glycoprotein, Natural Products, LOTUS Database, Molecular Docking, Virtual Screening, Antimalarial Drug Discovery

ONOPCDAR1

Evaluation of Antimicrobial Potential of Selected Medicinal Plants of Himachal Pradesh

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Background: Himachal Pradesh has rich diversity in medicinal plants, and many of its species are used to treat infections and other ailments. With rising antimicrobial resistance there is a growing need to explore such plants for new, natural antimicrobial agents. Scientific evaluation helps verify their traditional uses and identify bioactive compounds responsible for antimicrobial activity. Simple *in vitro* techniques like cold percolatin along with agar well diffusion technique provides an effective approach for assessing the antimicrobial potential of these plants. **Material and methods:** Fresh medicinal plants were collected from different regions of Himachal Pradesh, washed, shade-dried and powdered. Plant extracts were prepared using the cold percolation method, followed by filtration and prepration of stock solution. Selected bacterial cultures were used to evaluate antimicrobial activity. The antimicrobial potential of the extracts was evaluated using the agar well diffusion method and zones of inhibition were measured to determine activity. **Results:** Screening of ten medicinal plants was carried out and were subjected to check antimicrobial activity by agar well diffusion method. These plants were tested against six pathognic bacteria. *Acorus calamus* showed maximum antimicrobial activity against *Pseudomonas aeruginosa* in petroleum ether extract. **Conclusion:** Medicinal plants are a promising source of natural compounds that can help combat antibiotic-resistant of microorganisms against antibiotics. **Keywords:** Medicinal plants, Antimicrobial activity, Agar well diffusion , cold percolation.

ONOPCDAR2

Molecular Docking Analysis of Siddha Medicinal Compounds in the Context of Antimicrobial Resistance

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Background: Antimicrobial resistance (AMR) has emerged as one of the most critical global health challenges, severely limiting the effectiveness of existing antibiotics and threatening the successful management of infectious diseases. The discovery of novel antimicrobial agents targeting resistance mechanisms has therefore become a major research priority. Siddha medicine, a traditional system of medicine practiced in South India, encompasses a rich repository of medicinal plants with documented antimicrobial properties. However, the molecular basis of their activity against resistant pathogens remains largely unexplored. To evaluate the interaction of selected Siddha medicinal compounds with key molecular targets associated with antimicrobial resistance using molecular docking techniques. **Materials and Method:** Phytochemical constituents of selected Siddha medicinal plants were identified through literature survey and compound databases. Three-dimensional structures of target proteins involved in antimicrobial resistance pathways were retrieved from the Protein Data Bank. Molecular docking is

performed using appropriate docking software to assess binding affinity, interaction patterns, and stability of ligand–protein complexes. **Results:** Several Siddha-derived compounds will demonstrate strong binding affinity toward resistance-related protein targets, indicating their potential to inhibit critical antimicrobial resistance mechanisms.

Conclusion: The findings suggest that Siddha medicinal compounds possess promising molecular interactions with antimicrobial resistance targets. Molecular docking serves as an effective preliminary approach for identifying potential lead molecules from traditional medicine. These results provide a scientific foundation for further experimental validation and development of novel antimicrobial agents derived from Siddha pharmacopoeia.
Keywords: Molecular docking, Siddha medicine, Antimicrobial resistance, Phytochemical compounds, Drug-resistance

ONOPCDAR3

Immuno-Antimicrobial Potential of Guduchi (*Tinospora Cordifolia*) Against Drug-Resistant Tuberculosis: Ayurvedic Approach

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Background: Drug-resistant tuberculosis (DR-TB) is a growing global health concern, characterized by limited treatment options and high morbidity. Ayurveda emphasizes enhancing host immunity alongside controlling pathogens. Guduchi (Tinospora cordifolia), a classical Rasayana herb, is traditionally indicated for Vyadhikshamatva (immunity) and infection management. Its pharmacological actions suggest potential as an immuno-antimicrobial agent in DR-TB. **Materials and Methods:** A literature-based review and Dravyaguna analysis were conducted focusing on the properties of Guduchi. Classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita) were examined for rasa, guna, virya, vipaka, and karma, while contemporary research was analyzed for phytochemical constituents, immunomodulatory activity, and antimicrobial potential against Mycobacterium tuberculosis, particularly drug-resistant strains. **Results: Dravyaguna Perspective:** Guduchi's Tikta (bitter) and Kashaya (astringent) Rasa, Laghu (light) and Snigdha (unctuous) Guna, Ushna Virya, and Madhura Vipaka contribute to Rasayana and Jwaraghna (anti-pyretic) effects. **Immunomodulatory Action**: Enhances macrophage activation, NK cell activity, and Th1 immune response. **Antimicrobial Effects**: Bioactive compounds such as berberine, tinosporaside, and alkaloids exhibit inhibitory effects against Mycobacterium tuberculosis in in vitro studies. **Clinical Potential**: Acts as a host-directed therapy, strengthening immunity while supporting conventional anti-TB treatment. **Conclusion:** Guduchi exhibits a dual role as an immunomodulator and antimicrobial agent, supporting its traditional use in infection management. Integrating Dravyaguna principles with modern research highlights its potential as an

adjunctive therapy in drug-resistant tuberculosis, offering a complementary strategy to improve host defense and treatment outcomes. **Keywords:** Guduchi, Tinospora cordifolia, Drug-resistant tuberculosis, Immunomodulation, Dravyaguna, Antimicrobial, Rasayana.

ONOPCDAR4

Agnimandya and Ama in Communicable Diseases: An Ayurvedic Basis for Chronic Infections and Antimicrobial Resistance.

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Background: Communicable diseases continue to be a major health problem worldwide. This situation has become more serious due to antimicrobial resistance (AMR), where infections do not respond properly to medicines. Many infections become long-lasting, recurrent, or difficult to treat, showing the limits of treatment approaches that focus only on killing microorganisms. Ayurveda explains disease from a host-centered view using the concepts of Agni (digestive and metabolic power) and Ama (toxic substances formed due to improper digestion). These concepts help in understanding disease persistence and treatment failure. To explain the role of Agnimandya (weak Agni) and Ama in communicable diseases and relate these concepts to modern mechanisms of antimicrobial resistance. **Methods**: Classical Ayurvedic texts such as Charaka Samhita and Ashtanga Hridaya were studied. Their concepts were correlated with modern scientific explanations like reduced immunity, biofilm formation, poor drug penetration, and antimicrobial resistance. **Results**: Weak Agni leads to the formation of Ama, which is heavy, sticky, and obstructive in nature. Ama blocks body channels (srotas) and lowers Vyadhikshamatva (immunity). This environment supports the survival of microorganisms, leading to chronic infections and reduced response to medicines. Ama shows similarities to microbial biofilms, which protect microbes from drugs and reduce drug effectiveness, promoting repeated drug use and resistance development. **Conclusion**: The concepts of Agnimandya and Ama provide a useful framework to understand chronic infections and antimicrobial resistance. Ayurvedic management focuses on improving digestion (Agnideepana), removing Ama (Amapachana), clearing channels (Srotoshodhana), and strengthening immunity (Rasayana). Integrating these principles with modern antimicrobial strategies may help in effective and sustainable management of AMR. **Keywords**: Agnimandya, Ama, Communicable Diseases, Antimicrobial Resistance, Ayurveda

ONOPCDAR5

Integrative Network Pharmacology and In Vitro Evaluation of the Potential Anti-Tubercular Mechanisms of *Polyalthia suberosa* (Roxb.) Thwaites Leaf Extract

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Background: Tuberculosis (TB) remains a major healthcare exception due to the development of drug-resistant

Mycobacterium tuberculosis (MTB). *Polyalthia suberosa* is traditionally known for antimicrobial activity; although, its anti-tubercular potential and host-driven molecular mechanisms still not well interpreted. **Materials and Methods:** Three different leaf extracts of *Polyalthia suberosa* were prepared using hexane, chloroform and methanol. Quantitative phytochemical profiling of all extracts was performed using gas chromatography-mass spectroscopy (GC-MS). *In viro* anti-tubercular activity was assessed by Microplate Alamar Blue Assay (MABA) against *Mycobacterium tuberculosis* (Vaccine strain, H37RV strain). Major bioactive compounds were subjected to network pharmacology analysis to predict the potential MTB protein targets and associated protein cascades. Protein-protein interaction networks were constructed, and key targets were evaluated through molecular docking to estimate binding affinity. **Results:** From the three extracts, the hexane extract evidenced more sensitivity at a concentration of 12.5 µg/mL, while chloroform and methanol evidenced at 25 µg/mL. GC-MS elucidation identified more lipophilic phytochemicals including n-hexadecanoic acid, octadecanoic acid, phytol and so on. Network pharmacology predicted interactions with essential MTB proteins. Molecular docking demonstrated favourable binding energies of selected ligands with key MTB targets, supporting a potential mechanism. **Conclusion:** This integrated *in vitro*, GC-MS and network pharmacology research suggests that *Polyalthia suberosa*, especially in hexane extract, possesses promising anti-tubercular leads. The finding provides mechanistic insights and supports the further validation of these phytochemicals as synthetic alternative for anti-TB agents. **Keywords:** *Polyalthia suberosa;* Tuberculosis; Network pharmacology; Molecular docking; Proteins

ONOPCDAR6

Ayurvedic Perspective on Communicable Diseases: A Literary Review

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Background: Communicable diseases continue to pose significant challenges to global health. Ayurveda describes such conditions under concepts like *Aupasargika Roga*, *Sankramika Roga*, *Krimi*, and *Agantuja Vyadhi*, emphasizing modes of transmission, host factors, and preventive measures. Classical texts highlight the role of immunity, hygiene, and ethical conduct in disease prevention. This study aims to critically analyze the Ayurvedic understanding of communicable diseases and its relevance in the present context. **Methods:** A qualitative literary review was undertaken using classical Ayurvedic texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with authoritative commentaries. References related to etiology (*Nidana*), transmission, pathogenesis (*Samprapti*), prevention, and management were systematically reviewed. **Results:** Ayurveda acknowledges transmission through physical contact, respiration, shared food, and close proximity, analogous to modern infection pathways. Reduced *Vyadhikshamatva*, *Dosha* imbalance, and poor personal and social hygiene are identified as predisposing factors. Preventive measures such as *Dinacharya*, *Ritucharya*, *Sadvritta*, isolation, and *Rasayana* therapy are emphasized. Management focuses on strengthening immunity, purification therapies, and herbal drugs with antimicrobial and immunomodulatory actions. **Conclusion:** The Ayurvedic approach to communicable diseases reflects a holistic and preventive healthcare model. Its principles show strong concordance with

modern public health strategies, indicating potential for integrative application.
Keywords: Communicable diseases, Ayurveda, Aupasargika Roga, Vyadhikshamatva, Rasayana, Prevention

ONOPCDAR7

Bioactivity of *Youngia Japonica* (L.) Dc. Plant Extracts against Clinical Pathogens

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Youngia japonica (L.) DC. has been mentioned in various traditional plant based remedies. It has been examined for the phytochemical, elemental details and antibacterial activity during the present study. Aqueous and ethanol extracts of the whole plant powder have revealed the presence of various phytoconstituents. Two GPB (*Enterococcus faecalis; Staphylococcus aureus*) and two GNB (*Escherichia coli; Pseudomonas aeruginosa*) pathogenic bacteria have been selected to understand the bioactivity of different extracts. A dose of 34.605mg/ml and 46.200mg/ml of ethanol extract have shown activity. A 14mm zone of inhibition has been recorded against *Pseudomonas aeruginosa*. FT-IR spectroscopy has interpreted the functional groups related to the phytochemicals through infrared absorption spectrum. WD-XRF spectroscopy has depicted the elemental profile (both qualitative and quantitative) of the plant sample. The presence of phytoconstituents (primary and secondary metabolites) and elements of medicinal importance in this species has supported its use in traditional medicines. Further studies can describe the specific chemical compounds and its significance.
Keywords: Bacteria, Elements, FT-IR, Medicinal, Phytoconstituents, Taxa, WD-XR

ONOPCDAR8

Phytochemical Investigation of The Antimalarial Properties of *Anthocleista Vogelii* in Mice

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Stem barks of *Anthocleista vogelii, Bligha sapida, Voacanga africana* and *Momordica charantia* leaf have been used in the treatment of malaria in Nigeria. This study evaluated the *in vivo* antimalarial activities of the methanol stem bark extracts of these plants, identified the most active plant; isolated and characterized one of its constituents. The dried and powdered plant materials were separately macerated in methanol and concentrated *in vacuo*. The extracts were tested *in vivo* using prophylactic, chemosuppressive and curative antimalarial tests and the most active plant was identified.

Bioactivity-guided purification was carried out on the most active plant from which a constituent was isolated using chromatographic methods and characterized using spectroscopic methods. All the extracts elicited good antimalarial activity. *A. vogelii* was identified as the most active plant and its n-hexane fraction, AVH, as the most active partitioned fraction. Bioactivity-directed purification of the n-hexane fraction yielded successive most active sub-fraction, AVH5 (79%) and AVH5d (76%). Further column purification of AVH5d gave isolates from which AVH5d_4a was characterized as a triterpene identified as ethyl betulinate. The study justified the antimalarial usage of the four ethnomedicinal plants. *Anthocleista vogelii* was identified as the most active plant with ethyl betulinate as a constituent of the plant.

Keywords: Malaria, prophylactic, chemosuppression, curative, *Anthocleista vogelii*

ONOPCDAR9

Evaluation of Quorum Quenching and Antibiofilm Activities of Leaf Extracts of *Terminalia Mantaly* H.Perrier (Combretaceae) Against *Pseudomonas aeruginosa*

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Background: Antimicrobial resistance (AMR) is the silent pandemic of the 21st century, in that pathogens increasingly resist the antimicrobial agents that are being used to treat them. Due to this increasing challenge, non-antibiotic strategies that would not exert section pressure on the pathogens promise to be an alternative to curb this problem. Plant biodiversity houses a plethora of bioactive compounds that could selectively attenuate virulence. **Materials and Methods:** Crude extracts of *Terminalia mantaly* were obtained by maceration. The minimum inhibitory concentration (MIC) was determined using the broth microdilution method and crystal violet assay was used to test the antibiofilm activity of the extracts against *Pseudomonas aeruginosa* clinical isolates. Quorum quenching activity of the extracts was assessed via inhibition of pyocyanin, pyoverdine and rhamnolipid production. **Results:** The MIC values ranged from 0.312-10 mg/ml. Ethyl acetate crude extract was most active. The methanol crude extract disrupted mature biofilm by 23%. The minimum quorum sensing inhibitory concentration of the extracts ranged from 0.039-1.25mg/ml. Ethyl acetate extract had the best pyocyanin inhibitory activity at 0.312mg/ml with 85% inhibition. Pyoverdine inhibition was 36.5% at 0.312mg/ml, and inhibited rhamnolipid by 45% at 0.039mg/ml. The results obtained indicate that the ethyl acetate extract had the highest activity. Both extracts showed antibiofilm and quorum quenching activity. **Conclusion:** These results signify the potential of *Terminalia mantaly* leaf extracts as source of bioactive compounds for the development of anti-virulence agents against *P. aeruginosa*. **Keywords:** antimicrobial resistance, biofilm, anti-

virulence, quorum sensing, quorum quenching.

ONOPCDAR10

Green Synthesis of Silver Nanoparticles: Exploring Their Antimicrobial, Antioxidant, and Anti-Inflammatory Properties

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Green synthesis of silver nanoparticles using plant extracts offers an eco-friendly, cost-effective, and sustainable approach for biomedical applications. This study employed *Tridax procumbens* ethanol root extract to synthesize silver nanoparticles, which were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), ultraviolet–visible (UV-Vis) spectroscopy, Fourier-transform infrared (FTIR) spectroscopy, and energy-dispersive X-ray (EDX) analysis. Characterization confirmed the formation of predominantly spherical, crystalline, and uniformly distributed nanoparticles, indicating successful green synthesis. Phytochemical analysis of the ethanol extract revealed the presence of alkaloids, proteins, flavonoids, phenolic compounds, and carbohydrates, while saponins and tannins were absent. These bioactive compounds served as reducing and capping agents during nanoparticle formation, contributing to stability and biological activity. Antimicrobial activity of the synthesized nanoparticles was evaluated against *Pseudomonas aeruginosa* and *Escherichia coli* at concentrations ranging from 20–100 µg/mL, with maximum inhibition observed against Pseudomonas aeruginosa at 100 µg/mL. Antioxidant potential was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, total phenolic content, and reducing power assays, demonstrating moderate activity, with DPPH inhibition ranging from 22.8% to 29.6%. Anti-inflammatory activity, evaluated using the human red blood cell (HRBC) membrane stabilization assay, exhibited dose-dependent protection, with the highest efficacy observed at 100 µg/mL, comparable to the standard drug diclofenac. These findings confirm that *T. procumbens*-mediated silver nanoparticles exhibit significant antimicrobial, moderate antioxidant, and anti-inflammatory activities. The nanoparticles' efficacy at higher concentrations, combined with their stable, spherical morphology and bioactive capping, underscores their potential as safe and effective agents for therapeutic and biomedical applications, particularly in combating multidrug-resistant pathogens, oxidative stress, and inflammation.
Keywords: *Tridax procumbens*; Silver nanoparticles (AgNPs); Green synthesis; Antimicrobial activity; Antioxidant properties

ONOPCDAR11

Integrating Biosensor Technologies with AYUSH Diagnostics: Bridging Traditional Wisdom and Modern Science

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The AYUSH system—comprising Ayurveda, Yoga, Unani, Siddha, and Homeopathy—emphasizes holistic health and preventive care. However, its diagnostic approaches often rely on subjective interpretation, limiting reproducibility and global acceptance. Biosensor technologies, known for their precision, rapid detection, and objectivity, present an opportunity to enhance AYUSH

diagnostics by bridging traditional wisdom with modern scientific validation.This review draws upon published literature from PubMed, Scopus, and AYUSH research repositories to evaluate biosensor applications relevant to AYUSH practices. Studies on electrochemical, optical, and nanotechnology-enabled biosensors were analyzed, focusing on their roles in herbal medicine quality control, biomarker detection, and physiological monitoring during yoga and other AYUSH therapies.Evidence highlights the utility of biosensors in detecting phytochemicals, ensuring the authenticity of herbal formulations, and monitoring biomarkers such as cortisol and heart rate variability. Electrochemical biosensors have demonstrated effectiveness in validating Ayurvedic medicines, while wearable biosensors align with yoga-based diagnostics by tracking respiration and stress reduction. Nanobiosensors further enhance sensitivity and specificity, offering pathways for standardization and personalized treatment within AYUSH therapies. Integrating biosensors into AYUSH diagnostics can strengthen evidence-based validation, improve quality assurance, and foster global credibility. Key challenges include identifying standardized biomarkers, establishing regulatory frameworks, and promoting interdisciplinary collaboration between modern scientists and AYUSH practitioners. Addressing these issues will be critical for advancing integrative healthcare. Biosensors hold transformative potential in bridging AYUSH diagnostics with modern science. Their integration can enhance diagnostic accuracy, support personalized and preventive care, and promote global acceptance of AYUSH systems as credible, scientifically validated healthcare approaches. **Keywords:** Biosensors; AYUSH diagnostics; Electrochemical biosensors; Nanotechnology-enabled biosensors; Herbal medicine quality control.

ONOPCDAR12

Solid Phase Peptide Synthesis of Short Defensin-Like Peptide and Corresponding Metal Complexes for *In-Silico* and *In-vitro* Antimicrobial Study

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The global rise in antimicrobial resistance has accelerated the development of novel membrane-active peptides with therapeutic potential. In this study, an amphiphilic pentapeptide, Lys-His-Trp-Gly-Leu was rationally designed and evaluated in-silico wise to investigate its interactions with representative microbial membrane lipids. The strategic incorporation of cationic (Histidine and Lysine) and hydrophobic (Tryptophan and Leucine) residues was intended to enhance electrostatic attraction and promote membrane association. Molecular docking simulations were conducted to assess binding interactions with key anionic and neutral lipid components of bacterial and fungal membranes including Cardiolipin,Phosphatidylinositol,Phosphatidylserine,Phosphatidylglycerol and Glucosylceramide The peptide exhibited weak though favorable binding affinities, with the strongest interaction observed for cardiolipin (–2.8 kcal/mol), followed by glucosylceramide (–2.5 kcal/mol) and phosphatidylglycerol (–2.3 kcal/mol). Comparable affinities were obtained for phosphatidylserine and phosphatidylinositol (–2.3 kcal/mol), indicating predominantly electrostatically driven interactions consistent with membrane-targeting peptides. Although lipid docking only does not fully replicate the dynamic and heterogeneous nature of biological membranes, the observed

interaction profile supports the rational amphiphilic design strategy and suggests potential membrane engagement. These findings provide a computational basis for further structural refinement, advanced membrane simulations, and subsequent experimental evaluation to determine antimicrobial efficacy and selectivity. **Keywords:** antimicrobial peptide, in silico study, molecular docking, membrane interaction, amphiphilic design, lipid targeting.

ONOPCDAR13

Evaluation of antimicrobial and anti-quorum sensing potential of *Skimmia anquetilia* from high altitude areas of Himachal Pradesh

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Background: *Skimmia anquetilia* is a himalyan medicinal plant which is found at an altitude of 2500m to 3200m. It has been traditionally used as a medicine for small pox and in air purification by people living in rural areas. In present study it has been evaluated for its potential antimicrobial and anti-quorum sensing activities. **Material and methods:** Seasonal variation studies of *Skimmia anquetilia* were carried out by collecting the plant in different seasons i.e. summer, winter, rainy and autumn seasons. Antimicrobial potential of plant was carried out by testing different concentration of plant extract against pathogenic bacterial culture according to disc diffusion assay. The anti-quorum sensing potential of plant extract was evaluated *against Chromobacterium violaceum, Serratia marcesens* and *Pseudomonas aeruginosa*. Green synthesis of gold and iron nanoparticles was carried out by 4mM gold chloride and 20mM solution of ferrous sulphate solution to which 5% of plant extract was added and incubated at 60 °C and 80 °C respectively. **Results**: *Skimmia anquetilia* showed good antimicrobial potential in summer season and highest in rainy season. Nanoparticles were successfully synthesized by green synthesis approach. Nanoparticles were further characterized by XRD, FE-SEM, EDS and EDS-mapping. **Conclusion:** S. antiquelia showed good anti-bacterial and anti-quorum potential and hence, could be considered as future alternative to the antibiotics with further research. **Keywords:** Quorum-sensing, nanoparticles, seasonal variations

ONOPCDAR14

Electrochemical Biosensors to Quality Control of Ayurvedic and Herbal Medicines

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The foundation of the AYUSH healthcare system is Ayurvedic medicines and herbal medicines with their holistic and preventive methods. The inconsistency in raw materials, the non-standardized biomarkers and adulteration problems, however, present a challenge to quality control. The sensitivity, selectivity, and quick response of the electrochemical biosensors would make it an interesting solution to the authenticity and safety assurance of herbal preparations. The present review synthesizes the current developments of the electrochemical biosensor used in the area of quality control of herbal medicines. PubMed, Scopus, and AYUSH repositories literature were analyzed, centered on biosensors designs, nanomaterial integration, and usage in detecting

phytochemicals, identifying adulterant-related problems, and pharmacological validation. Research has identified the efficacy of electrochemical biosensors in the identification of bioactive alkaloids, flavonoid, and polyphenols. The sensitivity of nanostructured electrodes is increased, whereas the specificity of herbal metabolites of enzyme-based biosensors is increased. Portable biosensors platforms have been designed to test material on site in a fast manner to ensure authenticity and avoid adulteration. The addition of microfluidics and wearable devices to them further increases their diagnostic possibilities. The quality control of Ayurvedic and herbal medicine can be revolutionized by electrochemical biosensors which can offer objective, reproducible and cost-effective instruments. Problems continue to exist in the standardization of biomarkers, the scaling of biosensor production and regulatory compliance. Cooperation among the biosensor engineers, pharmacologists, and the AYUSH practitioners is required to develop laboratory discoveries into clinical and business uses. Electrochemical biosensors have a transformational potential in checking and standardization of Ayurvedic and herbal medicines. They can build credibility, patient safety and promote global adoption of traditional medicine systems through their inclusion into the AYUSH quality control systems. **Keywords:** Electrochemical biosensors; Ayurvedic medicine; Herbal medicine quality control; Nanotechnology; Phytochemical detection

ONOPCDAR15

Studies on the Effect of Solvent Extraction on the Antibacterial Activity of *Baliospermum solanifolium* Leaves and Their Synergism with Conventional Antibiotics

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The emergence of antimicrobial resistance poses a significant global threat, rendering conventional antibiotics ineffective. In light of this challenge, there is a growing interest in exploring medicinal plants as alternative sources of antimicrobial agents. The present study focuses on *Baliospermum solanifolium*, a traditionally used medicinal plant known for its therapeutic properties. Different extracts (ethanolic, methanolic, and aqueous) from *B. solanifolium* leaves were prepared and screened for their antibacterial activity against *Escherichia coli*, *Bacillus subtilis*, *Klebsiella pneumoniae*, and *Staphylococcus aureus*. Among the tested extracts, the ethanolic extract showed the most promising results, with the lowest minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC), particularly against *Klebsiella pneumoniae* and *Escherichia coli*. Additionally, the plant extracts showed good synergism when tested in combination with antibiotics, as evidenced by increased zones of inhibition compared to their activities. *B. solanifolium* possesses potential antibacterial activity, which is attributed to its diverse bioactive composition. This plant can be developed into a drug candidate for treating bacterial infections after conducting detailed follow-up studies. **Keywords:** *Baliospermum solanifolium*, antibacterial activity, drug resistance, minimum inhibitory concentration, synergistic activity.

OFOPIPTR1

Algal Bioremediation of Sewage Wastewater and Simultaneous Carbon Sequestration

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This study evaluates the performance of native mixed microalgal strains comprising cyanobacteria, Chlorella, blue-green algae, and diatoms in a closed 800 L photobioreactor for simultaneous bioremediation of sewage wastewater and biological carbon sequestration. The consortium was cultivated directly in raw sewage wastewater, with CO_2 supply regulated to maintain an optimal pH of 6.5–7.5, promoting enhanced photosynthetic efficiency and nutrient assimilation under controlled aeration and illumination. During the exponential growth phase, the algae exhibited remarkable nutrient removal efficiency: complete nitrogen utilization (80–90 ppm to 0 ppm), 70–90% phosphorus reduction, 50–70% ammonia removal, and 40–60% decrease in chemical oxygen demand (COD). These results demonstrate the superiority of native strains in treating high-strength wastewater compared to synthetic media like BG-11. Concomitantly, substantial CO_2 fixation was achieved, with uptake rates of 1.8–2.2 g CO_2 per gram of dry algal biomass. The high biomass productivity positions the system as a promising third-generation biofuel feedstock, offering opportunities for integration with existing lignocellulosic biorefineries. This integrated approach advances circular economy principles by valorizing municipal waste, reducing greenhouse gas emissions, and addressing key challenges in scaling sustainable, low-carbon biofuel production. **Keywords:** Microalgae, Bioremediation, Sewage wastewater, Nutrient removal, Carbon sequestration, Circular economy, Third-generation biofuels

OFOPIPTR2

Bioactive-Guided *Tinospora cordifolia* Hydrogel as a Natural Product–Based Therapeutic Platform for Burn Wound Healing

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Background: Burn wounds are highly susceptible to infection, oxidative stress, and prolonged inflammation, often leading to delayed healing. Natural products with multi-target pharmacological activity offer a promising alternative to conventional therapies. *Tinospora cordifolia*, a well-known Ayurvedic medicinal plant, possesses potent antimicrobial, anti-inflammatory, and antioxidant properties, making it an ideal candidate for wound-care formulations. **Materials and Methods:** A superabsorbent composite hydrogel was developed using bacterial cellulose and gelatin as the structural matrix and loaded with a bioactive-guided fraction of *Tinospora cordifolia* leaves. The extract was obtained by ethanolic extraction followed by phytochemical screening, total phenolic and flavonoid estimation, HRMS, and FTIR analysis. The optimized hydrogel was evaluated for physicochemical properties, swelling behavior, mechanical strength, antimicrobial activity, and in vivo wound healing efficacy using a Wistar rat burn wound model. **Results:** Phytochemical analysis confirmed the presence of flavonoids, alkaloids, phenolics, and terpenoids, validating the

therapeutic potential of the extract. The optimized hydrogel exhibited excellent swelling capacity, sustained drug release, and suitable mechanical integrity. Significant antimicrobial activity was observed against *Staphylococcus aureus* and *Escherichia coli*. In vivo studies demonstrated enhanced wound contraction, accelerated re-epithelialization, reduced inflammatory cell infiltration, and improved collagen deposition in extract-loaded hydrogel–treated groups compared to control and marketed formulations. **Conclusion:** The study establishes *Tinospora cordifolia*–loaded hydrogel as a scientifically validated natural product–based therapeutic system that integrates traditional Ayurvedic wisdom with modern biomaterial science. This bioactive platform holds strong translational potential for advanced wound care. **Keywords:** *Tinospora cordifolia*, Natural products, Hydrogel, Burn wound healing, Antimicrobial.

OFOPIPTR3

A Synergistic Antimicrobial Composition Comprising *Callistemon citrinus* Essential Oil and Ciprofloxacin for Enhanced Control of gram-negative bacterial Infections.

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The rapid rise of antimicrobial resistance among Gram-negative bacteria has become a major global health challenge, significantly reducing the effectiveness of commonly used antibiotics such as ciprofloxacin. Pathogens including *Escherichia coli* and *Pseudomonas aeruginosa* possess intrinsic and acquired resistance mechanisms that complicate treatment outcomes. This study investigates a novel antimicrobial strategy combining *Callistemon citrinus* (bottlebrush) essential oil with ciprofloxacin to enhance antibacterial efficacy and enable antibiotic dose reduction. Essential oil extracted from *Callistemon citrinus* leaves was evaluated for its intrinsic antibacterial activity and for its interaction with ciprofloxacin using standard in vitro antimicrobial assays. A series of formulations were prepared in which the proportion of essential oil was increased while the antibiotic content was gradually reduced. Antibacterial activity was assessed using the agar well diffusion method against representative Gram-negative bacterial strains. The essential oil demonstrated notable antibacterial activity on its own and exhibited mild synergistic or additive effects when combined with ciprofloxacin. Several combinations produced antibacterial effects comparable to or slightly greater than the antibiotic alone, despite a reduced antibiotic component, indicating effective dose-sparing potential. Importantly, no antagonistic interactions were observed. This plant–antibiotic combination represents a promising adjunct strategy for enhancing the efficacy of existing antibiotics while minimizing their required dosage. The integration of plant-derived bioactive compounds with conventional antimicrobial agents may contribute to reduced drug-related toxicity, delayed resistance development, and more sustainable management of Gram-negative bacterial infections. **Keywords:** Antimicrobial resistance, Antibiotics, *Callistemon citrinus*, essential oil, Gram-negative pathogens, Dose reduction strategy.

OFOPIPTR4

Beetroot attenuates neuroinflammation via modulation of NO/HSPs/NF-kB pathway in thermally-compromised rats

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Background: Regular heat exposure results in hyperthermia in humans and animals, characterized by thermoregulatory disturbances, specifically targeting brain tissues. After that, cerebral hemodynamics were compromised alongwith inflammatory insults (activation of IL-6/TNF-α/NF-κB), resulting in an altered status of heat shock proteins (HSPs) and a decline in enzymatic activity (endothelial nitric oxide synthase) responsible for nitric oxide (NO) synthesis.This rodent-based study aims to evaluate the neuroprotective efficacy of nitrate-rich beetroot against heat-stressed rats by regulating the inflammatory (NO/HSPs/NF-κB) cascade observed in the study. **Material and Methods:** To induce stress in rats, a temperature-controlled (42-45°C) chamber was used for 75 minutes daily for 4 weeks. Weekly observations of core physiology were performed. Behavioral testing was conducted for the assessment of neurobehavioral impairments, and biochemical measures were used to assess the oxidative stress profile. However, for the estimation of stress-related inflammatory changes, alongwith pro-apoptotic, HSPs, brain-derived neurotrophic factor (BDNF) assessments, gene and protein-based assay techniques were used. **Results:** Chronic heat exposure significantly increased oxidative stress-induced inflammation, with marked alterations in HSPs, corticosterone, and decreased BDNF, leading to severe neuronal injury. Beetroot (100/250/500mg/kg/*p.o.*) as an intervention statistically and dose-dependently deactivates the NF-κB/TNF-α/IL-6 pathway, reduces oxidative stress-induced endothelial impairment (eNOS-NO), associated with normalization of HSPs, corticosterone, and BDNF levels. Moreover, beetroot improves neurobehavioral impairments by suppressing anxiety, pain, depressive behaviour, and enhancing memory performance. **Conclusion:** Hyperthermia is characterized by various molecular derangements. We observed that beetroot significantly improves the neurovascular integrity and provides neuroprotection by deactivating the NO/HSPs/NF-κB pathway.
Keywords: Neuroprotective, Thermoregulatory homeostasis, Beetroot, Heat shock proteins, Nitric oxide, Inflammatory markers.

OFOPIPTR5

Evaluation of mineral, phytochemical and pesticidal potentials with GC-MS profiling of crude hydroethanolic extract and fractions derived from a medicinal plant Teucrium quadrifarium Buch.-Ham. ex D. Don

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Background: The growing environmental and health concerns caused by the use of synthetic pesticides call for a shift towards eco-friendly, plant-derived products. Teucrium quadrifarium Buch.-Ham. ex D. Don is an underutilized plant species, which still has its biological potential under-explored. **Material and methods:** The present study aimed to examine the mineral composition, presence of plant metabolites and the pesticidal potential of crude hydroethanolic extract and its fractions: chloroform fraction, ethyl acetate fraction, n-butanol fraction, and aqueous fraction of *T. quadrifarium*. Further followed by the identification of phytocompounds in the bioactive fraction by the GC-MS technique. **Results:** The mineral analysis revealed significant amounts of Nitrogen (2.32%), Potassium (12846.16 mg/Kg), Calcium

(9268.27 mg/Kg), Iron (119.17 mg/Kg), and Sodium (146.48 mg/Kg) content. Preliminary biochemical analysis confirmed the presence of major plant metabolites, including phenols, flavonoids, tannins, terpenoids, alkaloids and saponins. Contact and fumigant toxicity assay revealed that the n-butanol fraction possess highest pesticidal potential against Sitophilus oryzae (L.). The GC-MS profile of the n-butanol fraction identified phytoconstituents, including α-terpineol. **Conclusion:** It is a plant of high potential that possesses significant mineral content along with inducing phytochemical-based pesticide activity against *S. oryzae*. Hence, the plant can be used as a source of botanical pesticide, which may help reduce overdependence on synthetic agrochemicals and play a part in sustainable agriculture. **Keywords:** Teucrium quadrifarium Buch.-Ham. ex D. Don, phytochemicals, Sitophilus oryzae (L.), mineral analysis, GC-MS

OFOPIPTR6

Copigmentation-Based Stabilization of *Rhododendron arboreum* Anthocyanins for Industrial Applications

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Anthocyanins (ANS) are naturally occurring, water-soluble flavonoid pigments that impart red to purple coloration to fruits, flowers, and vegetables and possess notable antioxidant, anti-inflammatory, antidiabetic, and anticancer activities. Increasing demand for clean-label and sustainable ingredients has promoted their use as natural alternatives to synthetic colorants in food, pharmaceutical, and cosmetic applications; however, their widespread utilization is limited due to their poor stability under processing and storage conditions, including sensitivity to heat, light, oxygen, and pH. Addressing this challenge, the present study focuses on intermolecular copigmentation of *Rhododendron arboreum* ANS with five phenolic acids, two flavonoids, and three amino acids using combined experimental and theoretical approaches. Copigment addition induced significant hyperchromic (0.26–0.55 nm) and bathochromic shifts (6.6–14.2 nm), leading to enhanced color intensity and stability. Stability was systematically evaluated under storage (4°C and 25°C), light exposure, oxidation, and thermal stress through chromaticity analysis, anthocyanin content, kinetic studies, and structural simulations. Among all copigments, naringin exhibited the strongest copigmentation effect, providing superior thermostability and the highest half-life (3.39–1.24 h at 90–160 °C). Copigmentation efficiency followed the order cyanidin-3-*O*-arabinoside > cyanidin-3-*O*-galactoside > cyanidin-3-*O*-rhamnoside. Molecular docking and steered molecular dynamics further confirmed naringenin as the most favorable copigment, stabilized predominantly through π–π stacking and hydrogen-bonding interactions. **Keywords:** Anthocyanins, Copigmentation, *Rhododendron arboreum*, Color stability, Molecular dynamics

OFOPIPTR7

Mahanimbine Rich *Murraya koenigii* Leaf Extract as a Sustainable Herbal Approach for Burn Wound Healing

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Background: Burn injuries pose a significant global health burden, highlighting the need for effective and sustainable wound-healing therapies. Medicinal plants offer multi-target biological activity with favorable safety profiles. *Murraya koenigii* (curry leaf) is a renewable herbal resource rich in carbazole alkaloids, particularly mahanimbine, known for its antioxidant, anti-inflammatory, and wound-healing potential. **Materials and Methods:** *Murraya koenigii* leaf extract (MKLE) was prepared by Soxhlet extraction and characterized using flash chromatography, UV–visible spectroscopy, and high-resolution mass spectrometry. Total phenolic and flavonoid contents were quantified, and antioxidant and anti-inflammatory activities were evaluated using standard in vitro assays. MKLE was incorporated into a bacterial cellulose–Carbopol composite hydrogel optimized by response surface methodology. The formulation was assessed for pH-responsive swelling, sustained release, and in vivo burn wound-healing efficacy. **Results:** UV–visible analysis showed a characteristic absorption peak at ~285 nm, while mass spectrometry confirmed mahanimbine (m/z ≈ 338) along with quercetin and koenigine. High phenolic and flavonoid contents correlated with strong antioxidant activity. The extract demonstrated concentration-dependent membrane stabilization, indicating anti-inflammatory potential. The optimized hydrogel exhibited pH-responsive swelling and sustained release suitable for burn wound conditions. In vivo studies showed accelerated wound contraction, enhanced collagen deposition, improved angiogenesis, and complete tissue regeneration within 21 days. **Conclusion:** Mahanimbine-rich *Murraya koenigii* extract, delivered through a bacterial cellulose Carbopol hydrogel, represents a promising and sustainable therapeutic strategy for advanced burn wound healing. **Keywords**: *Murraya koenigii*, Mahanimbine, Herbal Pharmacology, Sustainable Medicine, Burn Wound Healing.

OFOPIPTR8

Arbuscular mycorrhizal Fungi Consortium Enhances Safety and Bioactive Quality of Cadmium-Stressed Cocoa Medicinal Organs

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Background: Cocoa (Theobroma cacao L.) leaves, roots, bark and beans are traditionally used in African herbal decoctions and functional foods for managing malaria, painful menstruation, hypertension and related inflammatory conditions, due to their high phenolic and flavonoid contents. However, cadmium (Cd) contamination threatens the safety and quality of these plant materials. **Materials and methods:** Young cocoa plants grown under Cd stress (200 mg/kg soil) were inoculated with a consortium of four arbuscular mycorrhizal fungal (AMF) strains and compared with non-mycorrhizal controls. Cadmium accumulation was quantified by ICP-MS, while flavonoids, total phenolics and antiradical activity were assessed using standard biochemical assays (DPPH). **Results:** AMF inoculation reduced Cd accumulation from 161 to 104 mg/kg in leaves (-35%) and from 168.12 to 114.15 mg/kg in roots (-32%). Flavonoids increased by 6%, total phenolics by 3%, and antiradical activity was maintained and slightly enhanced (+1%) compared to controls. **Conclusion:** AMF consortia

enhance cadmium detoxification while preserving bioactive quality in cocoa medicinal organs, with potential benefits for bean safety, sustainable traditional medicine and soil biodiversity conservation. **Keywords:** AMF; cocoa medicinal plants; cadmium detoxification; flavonoids; soil biodiversity

OFOPIPTR9

"Promotion of Herbal and Medicinal Plants Sector in Northwestern Himalaya by Earning Carbon Credits from Voluntary Carbon Market by the Farmers"

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Northwestern Himalaya States consisting of Jammu and Kashmir, Leh-Ladakh, Himachal Pradesh and Uttarakhand having a geographical area of 3,29,032 sq. km in which Jammu and Kashmir including Leh Ladakh constitutes about 67.5% of the area followed by 17% and 15.5% by Himachal Pradesh and Uttarakhand respectively. The Himalaya is the major hotspots of about 1750 medicinal Plants in India. The western Himalaya has a reserve of about 1000 medicinal plants. The present market of herbal and Ayurvedic products in India was reported USD 5902 million in the year 2024 which is likely to rise to USD 26, 794 million by the year 2030 with a CGAR of 28.7% as per Grand View Research (2024). The Herbal and Medicinal Plants are important source of livelihood for the rural folk of this region, but the major benefits of this sector are reaped by the agents, traders and pharmaceutical industries. The farmers are found always in the losing side. It is high time that the Farmers, SHGs, FPOs and Cooperatives working in this region should register the Herbal and Medicinal Plants Cultivation area and farms with some registered companies working in India to earn additional Carbon Credits from global voluntary carbon market (VCM) which is of USD 887 billion in year 2025 as per Grand View Research (2025). This will help the farmers to earn better income from the market including additional income from selling carbon credits to VCM. The agriculture scientists and extension officials should develop various agroforestry cum medicinal plants models suiting to the farmers in this region. **Keywords:** Herbal and Medicinal Plants, Carbon Credits, Voluntary Carbon Market and Livelihood, Agro-forestry models

OFOPIPTR10

Assessment of Drug Utilization and Potential Herb–Drug Interactions in an AYUSH Outpatient Department: A Cross-Sectional Study

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Background: Data on the concurrent use of Ayurvedic and allopathic medicines in AYUSH outpatient settings remain limited, although such practice may have implications for potential herb–drug interactions. Understanding drug utilization patterns and factors influencing concurrent medicine use is important for patient safety. To assess drug utilization patterns in an AIIMS Bhopal AYUSH outpatient department (OPD) and to evaluate the extent and determinants of concurrent allopathic medicine use with implications for potential herb–drug interactions. **Methods:** A cross-sectional drug utilization study was conducted among 156 patients attending an AYUSH OPD. Data on demographics, morbidity profile, prescribed medicines, dosage forms, routes

of administration, and concurrent allopathic medicine use were collected. Polypharmacy was assessed, and associations between concurrent medicine use and age, gender, and disease category were analyzed. **Results:** Concurrent allopathic medicine use was observed in **26.9%** of patients, while 73.1% received Ayurveda alone. Tablets were the most frequently prescribed dosage form (57.1%), and the oral route predominated (82.5%). The mean number of medicines prescribed per patient was 4.36 ± 1.89, with polypharmacy observed in **42.9%** of cases. No statistically significant association was found between concurrent medicine use and age or gender ($p > 0.05$). However, disease category showed a statistically significant association with concurrent allopathic medicine use at the disease-indication level ($p < 0.001$), with higher concurrent use in metabolic/endocrine and neurological/sleep disorders. **Conclusion:** Concurrent allopathic medicine use occurs in a substantial proportion of AYUSH OPD patients and varies significantly by disease category. These findings emphasize the need for systematic screening of potential herb–drug interactions and integrated prescribing practices to enhance patient safety. **Keywords:** AYUSH, Drug utilization study, Concurrent medicine use, Herb–drug interactions, Polypharmacy, Outpatient department.

OFOPIPTR11

A Label-Based Market Survey of Herbal Soaps Available in the Indian Market

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Background: The Indian personal care market has witnessed a growing demand for herbal soaps, driven by consumer preference for plant-based ingredients and their integral role in traditional healthcare systems. Despite widespread availability, systematic documentation of label-declared information for such products remains limited. The present study aims to conduct a label-based market survey of herbal soaps available in the Indian market, with emphasis on formulation components, declared claims, and regulatory classification mentioned on the label. **Materials and Methods:** A total of 25 commercially available herbal soap products were surveyed based on product packaging images obtained from offline retail sources and official online listings. Data were manually extracted from soap labels, including brand name, product variant, herbal ingredients, base materials, declared claims, total fatty matter (TFM) or grade (where mentioned), and price per 100 g. **Results:** The survey revealed that turmeric, neem, sandalwood, aloe vera, basil, and vetiver were the most commonly declared herbal ingredients. Base materials predominantly included coconut oil, palm oil, castor oil, and vegetable oil-based soap noodles. Several soap products claimed benefits such as skin protection, antimicrobial action, glow enhancement, and moisturization. Most soaps were classified under the Ayurvedic or herbal

category, although labeling practices varied across manufacturers. **Conclusion:** The study highlights diversity and inconsistencies in label declarations among herbal soaps marketed in India, particularly regarding claim terminology, regulatory classification, and declaration of quality parameters such as TFM or grade. The findings underscore the need for clearer and more standardized labeling practices, including transparent disclosure of the proportion of herbal ingredients, which could improve consumer understanding, comparability, and informed decision-making within the herbal personal care sector. **Keywords:** Ayurveda, herbal soaps, label-based market survey, Indian personal care products, total fatty matter

OFOPIPTR12

Postpartum Depression and the Role of Yoga: An Ayurvedic Perspective

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Background: Postpartum depression (PPD) is a common yet underdiagnosed mental health disorder affecting women after childbirth, with significant impact on maternal well-being, infant care, and family health. Modern medicine recognizes hormonal fluctuation, stress, and psychosocial factors as key contributors. Ayurveda conceptualizes postpartum mental disturbances under Sutika Manasika Vikara, attributed to Vata Prakopa, Dhatu Kshaya, Ojas Kshaya, and mental stress (Manasika Abhighata). Yoga, as a mind–body intervention, is an integral component of Ayurvedic lifestyle management and holds promise in the prevention and management of PPD. **Methods:** A conceptual review was conducted using classical Ayurvedic texts such as Charaka Samhita, Ashtanga Hridaya, and Sushruta Samhita, along with yogic literature including the Yoga Sutras of Patanjali. Relevant modern literature on postpartum depression and yoga-based interventions was also reviewed to establish conceptual correlations. **Results:** Ayurvedic texts emphasize the vulnerability of Sutika due to aggravated Vata and depleted Rasa and Ojas, predisposing to anxiety, fear, sadness, and sleep disturbances. Yogic practices such as Pranayama, Dhyana, gentle Asanas, and relaxation techniques help regulate the autonomic nervous system, reduce stress hormones, and enhance mental resilience. These effects correlate with Ayurvedic goals of Vata Shamana, Manas Prasadanam, and Ojas Vriddhi. Yoga acts as a safe, non-pharmacological, and culturally acceptable intervention that complements Ayurvedic postpartum care (Sutika Paricharya). Its holistic action addresses both psychological and physiological components of postpartum depression. **Conclusion:** Integration of yoga with Ayurvedic principles offers an effective preventive and therapeutic approach for postpartum depression, emphasizing mental health restoration and overall maternal well-being.

OFOPIPTR13

Sustainable Synergistic Antibacterial Application of *Callistemon citrinus* and Cypress Berries Essential Oils in Natural Cosmetic and Dermal Care.

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The cosmetic and personal care industry is undergoing a major transition toward sustainable, non-toxic, and naturally derived ingredients driven by consumer safety concerns and increasing regulatory restrictions on synthetic preservatives. Microbial contamination remains a critical challenge in cosmetic formulations, particularly in water-based and dermal products, necessitating effective yet skin-compatible antimicrobial systems. This study presents a sustainable, plant-based antibacterial composition derived from the

synergistic combination of essential oils extracted from *Callistemon citrinus* (bottlebrush) and Cypress berries. The essential oils were obtained through eco-friendly distillation techniques and evaluated individually and in combination for antibacterial activity using standard in vitro assays against representative Gram-positive and Gram-negative bacteria relevant to cosmetic spoilage and skin infections. Results demonstrate that *Callistemon citrinus* essential oil exhibits strong intrinsic antibacterial activity, while Cypress berries essential oil contributes complementary antimicrobial effects. When combined, the two oils display enhanced antibacterial performance compared to individual oils, indicating a synergistic or additive interaction. The formulation showed broad-spectrum efficacy against organisms commonly associated with cosmetic contamination and dermal conditions, including *Escherichia coli*, *Pseudomonas* spp., and *Bacillus* spp. This essential oil blend offers a promising natural alternative to synthetic preservatives, aligning with clean-label, green chemistry, and sustainability principles. Its biodegradable, skin-compatible nature supports application in a wide range of cosmetic and dermal products such as creams, cleansers, deodorants, and hygiene formulations. The proposed composition addresses industry demand for effective, eco-friendly antimicrobial solutions while enhancing consumer safety and supporting sustainable cosmetic innovation. **Keywords:** Cosmetic, Essential oil synergy, Antibacterial activity, Cosmetic microbiological safety, Sustainable cosmetic formulations.

OFOPIPTR14

Network Analysis of Co-Occurring Ayurvedic Pharmacological Properties Across Classical Herbs: A Proposed Gephi-Based Computational Mapping

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The pharmacological properties of *Ayurvedic* herbs are multifaceted; however, interrelationships between *Guna, Rasa, Vipaka*, and *Veerya* are not well examined computationally across exhaustive databases. Structured Excel datasets in *Ayurvedic* herbs will be converted to Gephi-compatible nodes.csv, containing unique terms such as *Laghu, Tikta, Ushna*, etc., and edges.csv, which contain representations for weighted co-occurrences derived from PivotTable analyses. Networks will be subjected to ForceAtlas2 layout, degree centrality assessment, and modularity clustering in order to gain an understanding of property synergies. The expected results are that central hubs would link *Ushna Veerya* with *Katu Vipaka* and *Tikta Rasa*, represented by high edge weights and modular *Guna* clusters like *Laghu-Rooksha* at $Q > 0.4$, which could be scaled up to the whole inventory of herbs. This methodology will bring forth polyvalent *Ayurvedic* patterns that can then form a baseline for future *Ayurvedic* studies, hence bridging classical texts with systematic computational analysis. **Keywords:** *Ayurvedic* pharmacology, co-occurrence network, Gephi visualization.

OFOPIPTR15

Comparative Analysis of PAL and PPO Activities and Secondary Metabolite Profiles in Fresh and Commercial Samples of *Silybum marianum*

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Milk thistle (*Silybum marianum*) is a medicinal plant recognized for its high content of phenolic compounds, notably flavonolignans, flavonoids, and simple phenolic acids, which contribute to its significant antioxidant and hepatoprotective activities. This study aimed to characterize the biochemical composition and to assess the activities of key enzymes-phenylalanine ammonia lyase (PAL) and polyphenol oxidase (PPO)—involved in phenolic biosynthesis in various plant parts and commercial extracts across different growth stages. Plant samples, including leaves, stems, flowers, seeds, and commercial extracts, were collected monthly over a six-month period, and assayed using standard protocols for biochemical and enzymatic analyses. Results showed that PAL and PPO activities peaked at the third and fourth months of growth, respectively, then declined. The aerial parts of the plant, containing stem and leaves, exhibited higher enzymatic activity than flowers, seeds, or commercial extracts. Total phenols and flavonoids increased with plant age, while carotenoids, chlorophylls, and β-carotene showed distinct temporal patterns. Notably, commercial extract demonstrated negligible enzyme activity and generally lower levels of bioactive compounds, namely, total phenols, flavonoids, anthocyanins, carotenoids, and chlorophyll. Study limitations include limited sampling frequency, absence of environmental data assessment, and lack of individual phenolic profiling or bioactivity assays. Future research should employ advanced metabolite identification, assess additional enzymes and gene expression, integrate environmental monitoring, and directly evaluate biological activities. These findings provide insight into the dynamic biochemical profile of milk thistle and highlight areas for further investigation to optimize its medicinal use. **Keywords:** *Silybum marianum*, Phenylalanine ammonia-lyase, Polyphenol oxidase, Secondary metabolites, Developmental stages, Hepatoprotective compounds.

OFOPIPTR16

Ayurveda-Inspired Production of Bioactive Natural Pigments for Development of Functional Foods and Health Applications

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Background: Plant-derived pigments—including carotenoids, anthocyanins, betalains, and chlorophylls—represent an important class of bioactive compounds with dual functionality as natural colorants and potent nutraceuticals. These phytochemicals contribute to sensory enhancement while exhibiting antioxidant, anti-inflammatory, anti-cancer, and metabolic regulatory properties. Despite their therapeutic relevance, challenges remain in improving extraction efficiency, stability, and bioavailability. Emerging green technologies offer sustainable approaches to harness these compounds for functional food and nutraceutical applications. **Materials and Methods:** Recent studies employing ultrasound-assisted extraction (UAE), supercritical fluid extraction (SFE), and other eco-friendly bioprocessing techniques were reviewed to understand advances in

pigment isolation and purification. Characterization of extracted pigments was performed using analytical and metabolomics-based approaches. Their stability, gastrointestinal fate, and gut microbiota interactions were assessed through in vitro digestion models. Pharmacological potential was evaluated using a range of in vitro cell culture assays and in vivo models relevant to oxidative stress, cancer, diabetes, and gout. Bioavailability enhancement strategies, including nanoformulations, encapsulation, and delivery system optimization, were also examined. **Results:** Green extraction technologies demonstrated higher efficiency, reduced solvent usage, and improved recovery of bioactive pigments compared to conventional methods. Characterized pigments showed strong antioxidant and anti-inflammatory capacity, along with notable cytoprotective and anti-cancer effects in cell-based models. Enhanced delivery systems significantly improved stability and bioaccessibility during digestion. Several pigments exhibited modulatory effects on gut microbiota composition and metabolite production, suggesting a synergistic role in metabolic health. In vivo studies showed promising therapeutic impacts, including reduced oxidative stress, improved glycemic control, and inhibition of tumor progression. **Conclusion:** Plant-derived pigments hold significant potential as next-generation nutraceuticals due to their multifunctional bioactivity and compatibility with sustainable extraction processes. Integration of green technologies, nanotechnology, and metabolomics can greatly improve their bioavailability and translational applicability. These findings support the development of functional foods, beverages, and nutraceutical formulations targeting chronic diseases such as cancer, diabetes, and gout. Overall, plant pigments represent a promising class of natural compounds for advancing personalized nutrition and health-promoting interventions.

Keywords: Fruits and vegetables; Pigemnts; Bioactive compounds; Antioxidants; Cancer

OFOPIPTR17

To investigate the therapeutic potential of *Pinus wallichiana* bark extract gel in wound healing

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Background: Chronic and non-healing wounds, particularly diabetic and pressure ulcers, represent a major clinical and economic burden due to delayed repair, infection, and limited efficacy of existing therapies. Natural products derived from ASU (Ayurveda–Siddha–Unani) systems offer promising alternatives; however, inadequate standardization and translational validation hinder their advancement into patentable therapeutics. **Materials and Methods:** This study reports the development and translational evaluation of a novel topical phytopharmaceutical gel formulated from *Pinus wallichiana* bark extract. Phytochemical profiling and HPLC studies were performed for extract standardization. Molecular docking studies were conducted to elucidate regenerative mechanisms. Optimized gel formulations were evaluated for physicochemical stability, safety, antioxidant, anti-inflammatory, antimicrobial, and *in vivo* wound healing efficacy using a rat excision wound model. **Results:** Phytochemical analysis confirmed quercetin as a key bioactive constituent along with palmitic, oleic, and linoleic acids, supporting reproducible formulation development. Molecular docking demonstrated strong binding affinity of quercetin toward TGF-β receptors,

suggesting a mechanistic role in tissue regeneration. *In vivo* studies revealed significantly enhanced wound contraction and accelerated epithelialization. Histopathological evaluation confirmed fibroblast proliferation, neovascularization, collagen deposition, and restoration of normal skin architecture. **Conclusion:** The study provides a scientifically validated and translational framework for *Pinus wallichiana* as a novel, mechanism-based, and patent-ready ASU-derived wound healing formulation**.** These findings support its further development as a safe, effective phytopharmaceutical for managing chronic and infected wounds, with strong potential for intellectual property protection and clinical translation.

OFOPIPTR18

Comparative pharmacognostic and phytochemical study of two sources of Kadamba *Neolamarckia cadamba* (Roxb.) Bosser) and Dharakadamba - *Adina cordifolia* (Roxb.) Hook.f. ex Brandis) collected from different *Desa*.Exploring regional influence.

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Background: The drug *Kadamba* is regarded as highly potent for health maintenance and is traditionally attributed with good pharmacological properties. According to the classical description, *Kadamba* belongs to *Anoopadesa*. The examination of *Bhoomidesa* (Geographical) is emphasized in classical literature as being as essential as the examination of *Athuradesa* (Patient-related attributes). The variation in *Desa* and soil composition influences the flora they support and determines the qualitative and functional properties of medicinal plants. The leaf and bark samples from two primary sources of Kadmaba - *Neolamarckia cadamba* (Roxb.) Bosser and Dharakadamba- *Adina cordifolia* (Roxb.) Hook.f. Ex Brandis were collected from 3 different Desa (terrain types) and subjected to pharmacognostic evaluation (microscopy & powder preparation) followed by a comparative phytochemical study. **Methods**: The collection, pharmacognostic, qualitative phytochemical, and physicochemical analyses of 12 samples were performed under standard protocols to ensure the authenticity. A qualified taxonomist confirmed Botanical identification, and voucher specimens were preserved at KFRI. **Results**: An assessment of 12 samples revealed slight variations in organoleptic and macroscopic features, along with differences in tissue organization, cell layering, and idioblast occurrence. All samples exhibited similar phytochemical constituents and inorganic elements, with a noticeable variation in relative concentration, especially with Alkaloids, Flavonoids, Sterols & Phenols. **Conclusion**: The variations observed in the organoleptic, microscopic examination, and degree of composition of two sources and parts in phytochemical analysis are likely attributable to edaphic factors, particularly differences in land type, as well as ontogenic and positional influences. **Keywords**:*Kadamba*, *Dharakadamba*, *Desa*, Microscopy, Compounds.

OFOPIPTR19

HPTLC and Preliminary Phytochemical Analysis of rhizome of *Pancratium triflorum* Roxb.: An ethnomedicine of Kani tribes of Kerala

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Background: *Pancratium triflorum* Roxb. is a perennial, bulbous herb belonging to the family Amaryllidaceae. It is a wild, geophytic plant commonly found in dry, sandy, and rocky habitats of India, Sri Lanka, and parts of Southeast Asia. The plant is characterized by its long, linear leaves and distinctive white, fragrant flowers, usually borne in clusters of three—hence the name *"triflorum"*. Various tribal groups like Kani tribes of Kerala use the rhizome externally for managing Plantar fascitis, wound healing, as supportive management in snake bite etc. Standardisation of the rhizome has not been done so far. For standardizing rhizome, HPTLC and phytochemical analyses were carried out. **Materials and Methods:** HPTLC and physico-chemical analysis of *Pancratium triflorum* rhizome were conducted. Alcoholic extraction (reflux) of rhizome was done for phytochemical analysis. The best fingerprint for HPTLC analysis was obtained using Toluene: Ethyl acetate: Formic acid (1: 7: 0.1). **Results and Conclusion:** In Phytochemical analysis, the presence of Saponins, Tannins, terpenoids, phenols, alkaloids, flavonoids, glycosides, carbohydrates, proteins were confirmed. The peaks in the HPTLC fingerprint profile correlate to its different phytoconstituents and can be utilized to standardize the drug. **Keywords:** *Pancratium triflorum* Roxb., HPTLC, Phytochemical, Standardization, Ethnomedicine

OFOPIPTR20

Innovative Herbal Formulations to cure (i) peripheral Neuropathy & (ii) Osteoarthritis which provide sustainable cure/relief for 3-5 years by taking a 3 months course of these formulations orally

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Background: *Our family is involved in Ayurvedic Treatment and Research for continuing 6 generations. My uncle (maternal) Dr. Devendra Nath Naik (MBBS, DTCD) was a senior Allopathic Doctor and worked 5 years as Deputy Director, Healt, Govt. of Odisha.*
Materials and methods: Only safe herbs are used in these two formulations without using any Schedule E (1) drug and Heavy Metals / Rasaushadhis. **Results: Peripheral Neuropathy -** 85% of the patients got sustainable relief in the age group of 50-80 who continued for taking 3 months of course. The chronic sufferers who had taken Corticosteroids previously did not get satisfactory relief. Similarly some diabetics got partial relief. Osteoarthritis – 80% of the patients who took our therapy for 3 months within 2 years of beginning of their symptoms of Arthritis got sustainable relief for minimum 3 years. But the patients, whose body weight increased or took climbing of stairs frequently, did not get satisfactory relief. **Conclusion:** Further scientific evaluation and validation needed for these two unique herbal formulations.

OFOPIPTR21

A New Nor-Sesquiterpene, Khusynoic acid and Other Non-Volatile Anticancer Compounds from *Vetiveria zizanioides* Root

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This work explores cytotoxic non-volatile compounds from *Vetiveria zizanioides* roots. The root extract afforded a new *nor*-sesquiterpene (an azulene derivative) named khusynoic acid **(1),** *p*-coumaric acid **(2),** tricin **(3)**, tricin-7-*O*-*β*-*D* -glucoside **(4),** tricin-5-*O*-*β*-*D*-glucoside **(5)** and stigmasterol 3-*O*-*β*-*D* -glucoside **(6).** The structures of these compounds were

elucidated by spectroscopic technique (1D NMR, 2D NMR, Mass), where compounds **1, 4** and **6** are reported for the first time. The crude extract, solvent-partitioned fractions, and isolated compounds (**1, 3, 4, 5**, and **6**) were screened for *in-vitro* cytotoxic activity against the HCT-116 (human colon cancer) cell line. In parallel, total phenolic content (TPC), total flavonoid content (TFC), antioxidant activity (DPPH and ABTS assays), and HPLC profiling gave comprehensive insight into the phytochemical profile. Among all fractions, *n*-butanol fraction exhibited the highest levels of phenolics, flavonoids, and antioxidant activity while *n*-hexane fraction showed highest cytotoxic potential (IC_{50} = 105.23 µg/mL). Compound **5** showed the most potent cytotoxic effect (IC_{50} = 10.29 µg/mL), while compounds **1** (45.28 µg/mL), **3** (20.22 µg/mL), **4** (48.95 µg/mL), and **6** (36.02 µg/mL) also showed significant activity. The study highlights the cytotoxic potential of *V. zizanioides* roots and its non-volatile constituents, with compound **5** showing the highest activity. The molecular docking of isolated compounds was also performed against anticancer protein targets. The study expanding the phytochemical profile of the plant together with exploring its bioactivity.

OFOPIPTR22

Phytochemical Investigation of Selected Traditional Medicinal Plants for Neurological Disorders

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Background: Neurological disorders are the leading cause of disability and the second leading cause of death worldwide, with mortality increasing by 39% over the past three decades. Most neurodegenerative diseases involve multiple interconnected molecular mechanisms. Therefore, therapeutic strategies that target several pathways simultaneously are more effective, highlighting the potential of natural products. The *Ayurvedic Formulary of India* documents nearly 50 classical formulations for neurological disorders; however, many of their herbal ingredients remain chemically uncharacterized despite documented ethnopharmacological use. Based on their occurrence in such formulations, three plants *Sesbania grandiflora*, *Anisomeles malabarica*, and *Strobilanthus ciliatus* were selected for the present study. **Materials and methods:** All three plants were collected from the western ghats region of Keralam and Tamil Nadu. Extracts were prepared by maceration using various solvents, followed by chromatographic methods to isolate individual phytoconstituents. The structure elucidation of the isolated compounds were done using spectroscopic techniques including ^{1}H NMR, ^{13}C NMR and mass spectrometry. Evaluation of the neuroprotective efficacy of the plant extract and the isolated compounds using N2a cell line is under process. **Results:** Primary screening for phytoconstituents using TLC and HPLC of two plants have been done. Quantitative analysis of Total Phenolic Content and Total Flavonoid Content of all extracts have been done. From the methanol extract of *Sesbania grandiflora* 7 compounds were isolated, including Stigmasterol, kaempferol, *Kaempferol 3-O-β-D-rutinoside,* Kaempferol 3-*O*-*β*-D-sophoroside, Stigmasterol 3-*O*-*β*-D-glucoside and characterization of other 2 are under process. **Conclusion:** The study aimed to identify the phytoconstituents responsible for the neuroprotective effects of these plants. In *Sesbania grandiflora*, kaempferol glycosides were identified as the major class of compounds, which are a strong class of antioxidant compounds, that may contribute to the neuroprotective

activity of the plant. **Keywords:** Ayurvedic Plants, Neuroprotection, Isolation, Kaempferol glycosides.

OFOPIPTR23

Temperature-Optimized Extraction of Tropical Tasar (*Antheraea mylitta*) Pupal Oil: An Innovative Insect-derived Natural Product with Pharmacological Potential

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Background: Natural products have long served as valuable sources for pharmacological agents due to their diverse bioactive compounds. In recent years, insect-derived products have gained attention as sustainable and novel natural resources with potential therapeutic properties. Tropical tasar (*Antheraea mylitta*) pupae represent an underexplored source of lipid-rich natural products. This study investigates a temperature-based drying optimization strategy to enhance the extraction efficiency and pharmacological potential of tasar pupal oil (TPO). **Materials and methods:** Tasar pupae were dried at 50 °C and 60 °C (TPO-50 and TPO-60), and oil was extracted using the Soxhlet method. The chemical composition and functional groups were characterized by GC-MS and FTIR, respectively. Antibacterial activity against *Salmonella typhi* and *Staphylococcus aureus* was assessed using the agar well-diffusion method by measuring the zone of inhibition (ZOI). **Results:** GC-MS analysis revealed α-linolenic acid (ALA) as the major fatty acid, followed by methyl 9-octadecenoate and methyl hexadecanoate, with the highest ALA content in TPO-50 (27.03%) and slightly lower in TPO-60 (26.15%). FTIR confirmed key functional groups, while both oils showed notable antibacterial activity against *S. typhi* and *S. aureus*, with ZOI values ranging from 14.5 to 16 mm. **Conclusion:** The study highlights the innovative use of drying temperature optimization to enhance the bioactive potential of TPO. Oils obtained at 50 °C and 60 °C demonstrated higher ALA content and notable antibacterial activity, indicating their promise as natural bioactive resources for future pharmacological and therapeutic applications. **Keywords:** *GC-MS, Natural product, Tasar pupal oil, Therapeutic activity, Sustainable resources*

OFOPIPTR24

Digital Innovation in AYUSH: Strengthening Research and Clinical Practice through Integrated Platforms

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Background: The AYUSH system of medicine is gaining global recognition, but challenges remain in terms of scientific validation, data management, and integration of research with clinical practice. Digital innovation has emerged as an important tool to improve the efficiency, transparency, and evidence base of AYUSH healthcare systems. **Materials and Methods:** This study is based on a review of major digital initiatives developed by the Ministry of AYUSH, including platforms such as AYUSH Research Portal, ACCR, NAMASTE Portal, and A-HMIS. These platforms were analysed to understand their role in research data collection, clinical documentation, and system integration. **Results:** The integration of these digital platforms facilitates systematic data

collection, standardization of disease terminology, and documentation of clinical outcomes. This helps in bridging the gap between research and clinical practice. It also promotes evidence-based practice, improves accessibility of information, and supports better healthcare decision-making in AYUSH. **Conclusion:** Digital innovation through integrated platforms plays a significant role in strengthening research and clinical practice in AYUSH. These systems enhance data-driven approaches and contribute to the development of a more reliable and scientifically validated AYUSH healthcare system. Further awareness and effective implementation are required to maximize their potential.
Keywords: AYUSH, Digital Innovation, Research, Clinical Practice, Integration, Evidence-Based Medicine

OFPPIPTR1

Synergistic Potential of Plant-Derived Prebiotics and Probiotics Against Multidrug-Resistant Pathogens

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Background: The alarming rise of multidrug-resistant (MDR) infections has intensified the need for alternative therapeutic strategies beyond conventional antibiotics. Synbiotic approaches combining prebiotics and probiotics offer a promising avenue for managing antimicrobial resistance. This study focuses on exploring how plant-derived prebiotics can enhance the efficacy of probiotics in suppressing MDR pathogens. **Materials and Methods:** Selected plant extracts were evaluated for their prebiotic potential in supporting probiotic growth and activity. Laboratory experiments involved testing prebiotic–probiotic combinations against key MDR bacterial strains, including *Listeria monocytogenes* (MTCC 839), *Shigella flexnerii* (MTCC 1457), *Escherichia coli* (MTCC 1687), and *Streptococcus* spp. (MTCC 389). The antimicrobial effects will be analysed through growth inhibition assays, short-chain fatty acid (SCFA) estimation, and biofilm disruption studies. **Results:** Certain plant-derived prebiotic and probiotic combinations may show significant inhibitory effects against MDR strains. The observed antimicrobial activity will attribute to enhance probiotic metabolism, increased SCFA production, and interference with biofilm formation, leading to reduced pathogen proliferation. **Conclusion:** The findings highlight the potential of synbiotic formulations as natural and sustainable tools to mitigate antibiotic resistance. Ongoing investigations aim to evaluate the contribution of non-carbohydrate bioactive components in strengthening probiotic activity and antimicrobial efficacy.
Keywords: Synbiotics; Multidrug-resistant pathogens; Plant-derived prebiotics; Probiotic synergy; Antimicrobial resistance

OFPPIPTR2

Integrating Traditional Knowledge and Pharmacology: An evaluation of medicinal plants used in Sowa Rigpa from the Sacred Sapi lake, Ladakh, Trans-Himalaya

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Renowned worldwide for its traditional wisdom and floristic abundance, India holds a prominent place in global biodiversity. Among its regions, Ladakh is particularly blessed with unique and rare plant diversity and a colourful tapestry of cultural traditions. The study includes documentation of medicinal plants used in Sowa-Rigpa system of traditional medicine from the veiled, remote and sacred Sapi lake region of Kargil district, Ladakh. This plant diversity and traditional knowledge is of utmost importance to the Amchis (traditional healers) in this rough and inaccessible terrain. The current study for the first time records 54 plants from 22 families in addition to the traditional knowledge on ethnomedicinal plants associated with them. Plant parts such as roots, flowers and leaves were predominantly used by the local people primarily for medicinal purpose like

treating skin disorders, gastrointestinal ailments, pulmonary diseases, etc. Herbarium samples have also been preserved at Leh as records for future reference. Asteraceae was documented to be the most dominant family and majority of flora was herbaceous in nature. Multiple reconnaissance surveys were carried out in the region and a questionnaire was framed to document the traditional knowledge from the region. Cataloguing such indigenous knowledge on medicinal plants and traditional practices of the native communities is crucial for primary healthcare, sustainable management of resources, biodiversity conservation and formulation of novel drugs in the field of pharmacology before it is consumed by the vagaries of environmental degradation and reduced interest of the younger generation.

Keywords: Biodiversity, Sowa-Rigpa, Traditional knowledge, Trans-Himalaya, Sustainability, Conservation, Pharmacology

OFPPIPTR3

Digital *Ayurveda* in Maternal Care:*Garbhsanskar* Applications and Artificial Intelligence in Promoting Healthy Progeny

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Background: Digital *Ayurveda* represents the integration of classical *Ayurvedic* knowledge with modern digital technologies to enhance healthcare delivery and accessibility. The digital tools and artificial intelligence (AI) has opened new avenues for preventive and promotive healthcare. *Garbhsanskar*, a traditional *Ayurvedic* concept aimed at promoting the physical, mental, and emotional well-being of the fetus, is increasingly being delivered through digital platforms.Emerging studies suggest that components of *Garbhsanskar* antenatal yoga, meditation, mantra chanting, and positive lifestyle practices are associated with improved maternal mental health, reduced stress, and favorable fetal outcomes. **Materials and Methods:** A narrative and conceptual analysis were conducted using *Ayurvedic* texts related to *Garbhsanskar* and *Garbhini Paricharya*, along with contemporary literature on Digital *Ayurveda* and AI-based health applications. Existing digital *Ayurveda* platforms and mobile applications related to maternal care, *Prakriti* assessment, lifestyle management, and tele-*Ayurveda* were reviewed to understand their scope and utility. **Results:** Digital *Ayurveda* applications provide structured *Garbhsanskar* guidance including month-wise *Garbhini Paricharya*, dietary and lifestyle recommendations, *yoga*, meditation, *mantra* chanting, and psychological support. Additional applications support *Prakriti* analysis, personalized diet planning, *Dinacharya* and *Ritucharya* guidance, disease-specific lifestyle advice, and remote *Ayurvedic* consultations. Integration of AI enables personalized recommendations, compliance monitoring and enhancing continuity of care and accessibility, especially in rural and underserved populations. **Conclusion:** Digital *Ayurveda*, supported by AI and *Garbhsanskar*-based applications, has significant potential to strengthen preventive maternal healthcare and preserve classical *Ayurvedic* wisdom. Standardization, validation, and ethical regulation are essential for its effective implementation and wider acceptance.

Keywords: Digital *Ayurveda*, *Garbhsanskar*, *Garbhini Paricharya*, Maternal Health

OFPPIPTR4

Dincharya

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Dinacharya (दिनचर्या) means **"daily routine"** or **"daily practice"** in English, a concept from Ayurvedic medicine that outlines a structured, health-2 promoting daily schedule, aligning activities like waking, hygiene, meals, exercise, and sleep with natural bodily and cosmic rhythms to balance the body's energies (doshas) for overall well-being. It's about creating harmonious daily rituals to maintain physical, mental, and spiritual health, working with nature's cycles rather than against them. **Key aspects of Dinacharya: Origin:** A Sanskrit word where 'Dina' means 'day' and 'Charya' means 'routine' or 'practice'. **Purpose:** To balance the three doshas (Vata, Pitta, Kapha) and prevent disease. **Practices:** Includes rising with the sun, tongue scraping, oil pulling, yoga, meditation, mindful eating, and consistent sleep patterns. **Benefits:** Improves digestion, immunity, mental clarity, emotional stability, and supports longevity

OFPPIPTR5

Medicinal Plant Resources of Jammu District and Their Clinical Translation Potential

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Medicinal plant resources used by tribal and local communities represent an important but largely untapped component of healthcare and biodiversity. In the Jammu district of the north-western Himalayan region, traditional plant-based remedies are still actively used for the management of common ailments such as gastrointestinal disorders, respiratory problems, skin conditions, fever, and musculoskeletal complaints. However, the lack of systematic documentation and quantitative validation has limited the scientific acceptance and clinical relevance of this traditional knowledge. The present study was designed to bridge this gap by identifying medicinal plant resources with potential relevance for clinical translation. Field-based surveys were conducted in selected tribal and rural areas of Jammu district. Information was collected from traditional healers and experienced community members through structured questionnaires, personal interviews, and focused group discussions. Data on plant species, parts used, preparation methods, and therapeutic indications were recorded. Plant specimens were collected, taxonomically identified using standard floras, and preserved as herbarium vouchers. The collected data were analyzed using SPSS software. Descriptive statistics along with quantitative indices such as Use Value (UV), Informant Consensus Factor (ICF), and Fidelity Level (FL) were applied to evaluate consistency of use, agreement among informants, and therapeutic reliability. The study documented a diverse range of medicinal plant species with repeated and consistent use across communities. Leaves were the most commonly utilized plant part, and decoction was the predominant mode of preparation. Several plant species showed high use values and strong informant consensus, indicating reliable therapeutic application and highlighting their suitability for further pharmacological screening and clinical research. The study demonstrates that statistically validated traditional medicinal plant knowledge can provide a credible foundation for evidence-based and integrative healthcare.

Identifying high-consensus medicinal plant resources can support clinical research while simultaneously promoting sustainable biodiversity management. **Keywords:** Medicinal plant resources; clinical translation; traditional knowledge; statistical analysis; SPSS; biodiversity management; Jammu district

OFPPIPTR6

Comprehensive Antioxidant Assessment of *Lemna minor* Extracts Through Multiple Radical Scavenging Assays

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Background: *Lemna minor* (duckweed) is a small hydrophyte that has gained scientific attention for its strong antioxidant potential, attributed to diverse bioactive constituents such as flavonoids, polyphenols, tannins, fatty acids, alkaloids, and phenolic acids, which confer antimicrobial, anti-inflammatory, hepatoprotective, anti-ulcer, antiproliferative, neuroprotective and anti-osteoporotic activities. In this study, its extracts exhibited significant free radical scavenging activity, evaluated through DPPH, ABTS, TAC, and hydrogen peroxide scavenging assays. **Materials and methods: DPPH Assay:** Extracts (1 mg/mL) were mixed with DPPH, incubated 30 min, absorbance read at 517 nm, using ascorbic acid as control. **ABTS assay:** Trolox served as standard; samples reacted with ABTS•+, incubated 30 min in dark, and inhibition was measured at 734 nm. **TAC:** Plant extracts or standards (1 mg/mL) were mixed with reagent, incubated at 95 °C for 90 min, and absorbance measured at 695 nm. **H_2O_2 Scavenging Assay**: A 43 mM H_2O_2 solution in 0.1 M phosphate buffer (pH 7.4) was prepared, mixed with buffer and extracts, and absorbance measured at 230 nm. **Results:** The DPPH, TAC, H_2O_2, and ABTS assays revealed strong antioxidant activity, with methanolic extract showing the highest radical scavenging (up to 87.5%) and a clear concentration-dependent response (R^2 = 0.9783), confirming *L. minor* as a promising natural antioxidant for nutraceutical and functional food applications. **Keywords:** *Lemna minor,* Antioxidant, Bioactive constituents, Radical, Neuroprotective

OFPPIPTR7

In Vitro Antioxidant and Anti-Inflammatory Evaluation of *Zingiber chrysanthum* Roscoe Fractionations

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Background: *Zingiber chrysanthum* Roscoe is an underexplored wild ginger species with promising therapeutic potential. Traditionally used in indigenous medicine, it is believed to possess strong antioxidant and anti-inflammatory properties, which are critical in the prevention and management of oxidative stress mediated disorders, including cardiovascular diseases. However, limited scientific data are available on the bioactive

fractions of this plant. Therefore, the present study aimed to fractionate the crude extract of *Z. chrysanthum* Roscoe and evaluate the antioxidant and anti-inflammatory potential of its different fractions using in-vitro assays. **Materials and Methods:** The crude extract of *Zingiber chrysanthum* Roscoe was subjected to solvent solvent fractionation to obtain four distinct fractionations based on polarity differences. Each fractionation was concentrated and evaluated for its bioactivity. Antioxidant potential was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay and 2,2′-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical cation decolorization assay. Anti-inflammatory activity was evaluated through nitric oxide scavenging activity (NOSA) and bovine serum albumin (BSA) denaturation inhibition assay. All experiments were performed in triplicate, and the activity of each fractionation was compared to standard reference compounds to determine relative efficacy. **Results:** Among the four fractions, ethyl acetate fractionation exhibited significantly higher antioxidant activity in both DPPH and ABTS assays. The same fractionation also demonstrated superior nitric oxide scavenging and protein denaturation inhibition, indicating strong anti-inflammatory potential compared to the other fractionations. **Keywords:** *Zingiber chrysanthum* Roscoe, DPPH, ABTS, Cardiovascular diseases, Fractionation

OFPPIPTR8

AI and Nanotechnology: Future Strategies Against Antimicrobial Resistance

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One of the most prevalent urological conditions is nephrolithiasis, namely calcium oxalate (CaOx) stone production, which is frequently linked to oxidative stress, inflammation, and renal failure. The search for safer and more effective alternatives is necessary because current medicines only partially relieve the condition and are linked to recurrence. The goal of the current study was to examine sitagliptin's nephroprotective effects in rats with ethylene glycol (EG)-induced CaOx nephrolithiasis. Sitagliptin's authenticity and purity were verified by physicochemical characterization; its excellent absorption profile was supported by its moderate lipophilicity (logP 1.7) and melting point of 206 °C. Structural integrity and excipient compatibility were confirmed by FTIR analysis. In vivo testing was done on rats with EG-induced nephrolithiasis, treated with sitagliptin (10 and 20 mg/kg), and contrasted with the common medication cystone (750 mg/kg). The findings showed that sitagliptin considerably decreased the risk of supersaturation by improving urine volume, pH, salt, and potassium excretion. It restored magnesium and decreased levels of calcium,oxalate, protein, and phosphorus in the urine. Serum tests showed that the levels of urea, creatinine, and uric acid were returned to normal, suggesting that renal function had been retained. Strong antioxidant and anti-inflammatory benefits were confirmed by sitagliptin

administration, which also decreased renal TNF-α and IL-1β levels, reduced malondialdehyde (MDA) and nitrite levels, and restored glutathione (GSH). Further histopathological analysis revealed reduced inflammation, low crystal formation, and preservation of renal architecture, especially at the 20 mg/kg dose. In conclusion, sitagliptin's diuretic, antioxidant, and anti-inflammatory properties demonstrated strong nephroprotective effect against EG-induced CaOx nephrolithiasis. According to the results, sitagliptin may be used as a treatment agent for kidney stone disease management and prevention in addition to its well-established antidiabetic function. **Keywords:** Sitagliptin, nephrolithiasis, calcium oxalate, oxidative stress, TNF-α, IL-1β, nephroprotective

OFPPIPTR9

Green synthesis and characterization of $Mg(OH)_2$ nanoparticles prepared using *Tinospora cordifolia* stem extract

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Green synthesis of nanoparticles offers an eco-friendly and sustainable alternative to traditional chemical methods. In this study, *Tinospora cordifolia* stem extract was used as a natural stabilizing and reducing agent to prepare magnesium hydroxide ($Mg(OH)_2$) nanoparticles. This formation of nanoparticles facilitates through phytochemicals present in the *T. cordifolia* stem without using any harmful chemical by plant mediated green co-precipitation method. X-ray diffraction (XRD), scanning electron microscopy (SEM), and energy-dispersive X-ray spectroscopy (EDS) were used to characterize the prepared ($Mg(OH)_2$) nanoparticles. While SEM showed that the synthesized nanoparticles are predominantly hexagonal plate like in shape, XRD analysis confirmed their crystalline nature and phase purity. The elemental composition confirmed the presence of oxygen and magnesium by EDS analysis. The green synthesized nanoparticles showed good stability demonstrating the effectiveness of *T. cordifolia* extract in nanoparticle synthesis. This green approach highlights the potential of ($Mg(OH)_2$) nanoparticles for applications in pharmaceutical, and environmental fields. **Keywords:** Green synthesis, Magnesium hydroxide, Nanoparticles, *Tinospora cordifolia.*

OFPPIPTR10

The Future of Climate-Smart Farming *Biochemically Mediated Precision Crop Nutrition under Climate Stress*

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Background: Soils depleted of organic carbon, marked by weakened rhizospheric microbial dynamics and reduced cation-exchange capacity, suffer from poor nutrient retention, limited moisture-holding capacity, and gradual structural degradation—processes that hasten the onset of desertification. In such stressed agroecosystems, Modified- Release Fertiliser Delivery Systems (MRFDS) provide a sustainable solution by aligning nutrient release with plant uptake while simultaneously supporting the restoration of soil health. **Materials and Methods:** The study integrated bio-wastes, vermicomposting using *Perionyx excavatus*, SMARAN-based aqueous

mustard cake extract, foliar micronutrients, and a neem- derived bio-pesticide. Trials were conducted on degraded soils (pH 6.8–8.2) under both in situ and ex situ conditions, employing basal, side-dressing, and foliar application methods. Mustard cake extract was prepared via continuous 24-hour aqueous extraction using the SMARAN system and applied at a rate of 750 mL to 1 L per plant. The integrated system was evaluated across multiple growth stages of crops, including rose, dahlia, gladiolus, brinjal, ginger, tomato, and other species under controlled irrigation schedules. **Results:** MRFDS significantly improved plant height, leaf area, biomass accumulation, yield quality and quantity, and overall disease resistance. *Perionyx excavatus* enhanced rapid mineralisation of bio-waste, while the viscous SMARAN-derived extract strengthened nutrient–soil adhesion, improved moisture retention, and enabled a slow yet sustained release of nutrients. Foliar micronutrient application effectively corrected trace-element deficiencies. Together, these synergistic interactions revitalised soil microbial communities, enhanced bioavailability of nutrients, reduced reliance on conventional fertilisers, and mitigated progressive soil degradation. **Conclusion:** Modified-Release Fertiliser Delivery Systems align nutrient release with crop demand, thereby enhancing soil fertility, boosting productivity, and strengthening ecological resilience in nutrient-depleted soils. **Keywords:** SMARAN, MRFDS, *Perionyx excavatus*, nutrient cycling, soil fertility restoration.

OFPPIPTR11

In-silico Identification of microRNAs and Their Targets Involved in Iron and Zinc Homeostasis in Wheat

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Iron (Fe) and zinc (Zn) are essential micronutrients required for plant growth and human nutrition and their deficiency in staple crops such as wheat contributes significantly to global malnutrition. MicroRNAs (miRNAs) are small non-coding RNAs that regulate gene expression at the post-transcriptional level and play an important role in nutrient homeostasis. The present study aimed to identify miRNAs and their target genes involved in Fe and Zn homeostasis in **wheat** using a bioinformatics approach. Wheat miRNA sequences were retrieved from **Ensembl Plants** and potential target genes were predicted using the **psRNATarget** server.The **metal transporter genes** were identified as miRNA targets including **ZIP (ZRT/IRT-like proteins)** involved in iron and zinc uptake, **NRAMP** genes responsible for divalent metal transport and **YSL (Yellow Stripe-Like)** genes associated with iron–nicotianamine transport.This in-silico study provides insights into the potential role of miRNAs in regulating Fe and Zn accumulation in wheat. The identified miRNA–target interactions may serve as valuable candidates for future experimental validation and could contribute to the development of **miRNA-based biofortification strategies** aimed at enhancing iron and zinc content in wheat grains. Publicly available genomic and miRNA databases were utilized to predict conserved and novel miRNAs, followed by target gene identification and functional annotation. The findings highlight the potential of digital biology and computational genomics in understanding

micronutrient regulation and offer insights for crop biofortification strategies. **Keywords:** miRNA, biofortification, metal transporter genes, Iron and Zinc, psRNA Target

OFPPIPTR12

Exploring the efficacy of *Asparagus racemosus* (Shatavari) in ameliorating the ethanol induced reproductive toxicity in *Drosophila melanogaster*

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The ingestion of ethanol adversely influences reproductive outcomes through disruption of homeostatic processes. The fruit fly, *Drosophila melanogaster*, is widely used to investigate reproductive toxicity because of its quick development and extensively studied reproductive biology The plant *Asparagus racemosus*, commonly known as Shatavari, has long been used in traditional medicine for supporting reproductive health by regulating mating hormones, gonadal functions and viability. In the present study, adults of *D. melanogaster* were exposed to ethanol 40% to induce reproductive toxicity and subsequently maintained on a diet supplemented with different concentrations of *Asparagus racemosus* (0.1%, 0.25% and 0.5%). Reproductive parameters, including fecundity, fertility and developmental time, were assessed and compared with control groups. Ethanol- exposed flies exhibited a significant reduction in egg- laying capacity and reproductive performance. In contrast, flies fed on diet supplemented with *A. racemosus* showed a marked improvement in mating efficiency, oviposition and fertility parameters at 0.25% concentration, demonstrating the protective efficacy of the herb by restoring the reproductive performance following ethanol exposure. The findings suggest that *A. racemosus* effectively ameliorates ethanol-induced reproductive toxicity in *Drosophila melanogaster*, possibly through its antioxidant and adaptogenic properties. This study provides experimental evidence supporting the therapeutic potential of *Asparagus racemosus* in managing ethanol-associated reproductive dysfunction and highlights its relevance to human reproductive health research. **Keywords:** Shatavari, *Asparagus racemosus*, ethanol toxicity, *Drosophila melanogaster*, Reproduction, Fecundity, Fertility, Viability

OFPPIPTR13

Selection and Propagation of elite germplasm in *Malaxis acuminata*- an important ingredient of Ashtavarga drug

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Crepidium acuminatum (D. Don) Szlach (syn.*Malaxis acuminata* D. Don, *Microstyliswallichii*(Lindl.)Deb traditionally known as Jeevak, is a terrestrial, perennial, medicinal orchid, distributed in temperate to subtropical Himalayas at an altitude of 1200-2100m.It is an important ingredient of Ashtavarga drug, used in various Ayurvedic formulations and has potent aphrodisiac activity. Due to unscientific harvesting, overexploitation and habitat destruction, the existence of the species is under threat and is listed in CITES Appendix-II for ensuring its conservation. Genetic diversity assessment studies conducted at Dr Y S Parmar Universityof Horticulture & Forestry, Solan, Himachal Pradesh resulted in isolation of one unique & stablemorphotype having distinct colour of floral buds, flowers, sheath on base of shoot (rhizome) and pseudobulbs, which was got

registered with NBPGR with National Identity no. INGR-18043. The developed germplasm INGR-18043 along with other promising germplasms were evaluated for their growth and yield potential consecutively for three growing seasons. The germplasm INGR-18043 performed much better in terms of all the growth and yield parameters with maximum rhizome length (5.10 cm), rhizome diameter(18.65 mm), Pseudobulb length (2.29 cm), Pseudobulb diameter (11.81 mm),rhizome fresh weight (10.59 g/plant)&average weight of pseudobulb (1.68 g/plant). Beside evaluation, study was also conducted to propagate the species through rhizome, pseudobulbs and nodal segments of rhizomes. The sprouting percentage was very high (>93%) in all type of propagules used *i.e.* basal, middle and top part of rhizomes, whole rhizome and whole pseudobulbs. The size of propagule greatly influenced the growth and yield parameters and maximum value for almost all the parameters was obtained in both large size rhizomes (4-6g) and large size pseudobulbs (2-3g). The results of present study resulted in identification of elite germplasm with high economic yield. **Keywords:** Ashtavarga drug, *Crepidium acuminatum, Malaxis acuminata,* medicinal orchid, rhizome, elite germplasm.

OFPPIPTR14

Flavonoids as Potential Inhibitors of Tau Aggregation in Alzheimer's Disease: An Integrated In Silico and *In Vitro* Study

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Background: Alzheimer's disease (AD) is a progressive neurodegenerative disorder marked by cognitive decline and abnormal aggregation of tau protein into neurofibrillary tangles. Current therapies provide only symptomatic relief. Flavonoids, known for neuroprotective and anti-aggregative properties, may offer novel therapeutic potential. **Materials and Methods:** Flavonoids were screened using SwissADME for drug-likeness and blood–brain barrier permeability. Sixteen compounds were selected and docked against AD-related targets, focusing on tau (PDB ID: 4NFN). The top candidates, Primuletin and Chrysin, were further evaluated by molecular dynamics simulations. In vitro validation included DPPH antioxidant assay, protein denaturation anti-inflammatory assay, and tau aggregation assay. Tau fibrils were induced using heparin and treated with compounds (25–100 µM). Aggregation and disaggregation were assessed using Thioflavin S fluorescence, inverted microscopy, and atomic force microscopy (AFM). **Results:** Primuletin and Chrysin demonstrated strong binding affinity and stable tau interactions in silico. In vitro, both compounds significantly reduced tau aggregation in a dose-dependent manner, showing decreased ThS fluorescence up to 96 h. AFM analysis confirmed reduced fibril formation compared to control. **Conclusion:** Primuletin and Chrysin exhibit promising anti-tau aggregation activity and may serve as potential therapeutic candidates for Alzheimer's disease. **Keywords:** Alzheimer's disease, Tau protein, Flavonoids, Primuletin, Chrysin, Molecular docking, MD simulation, Tau aggregation.

OFPPIPTR15

Quality control studies of castor seeds and cold-press castor oil

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Background: India is the largest producer of castor (*Ricinus communis L*). According to reports from 2023-2024, India's total castor seed production was estimated at 18.79 lakh tonnes. Ricinoleic acid (RA, $C_{18}H_{34}O_3$) is extracted from castor oil and has diverse industrial applications spanning pharmaceuticals, cosmetics, lubricants, food, paints and fuel sectors. Approximately 80% of castor oil and ricinoleic acid produced in India is exported. Although, a steady decline in castor oil exports has been reported. A few factors that affect quality of castor oil include seed variety, growing conditions, and post-harvest handling. To compare quality of different regional castor seeds using moisture studies, ash studies and extractive studies. To compare quality of different brands of cold-press castor oil using acid value and saponification value.To establish reliable HPTLC and GC-based fingerprinting methods for qualitative assessment of castor oil and castor seeds. **Materials and Methods:** Quality control studies involving proximate analysis were performed on castor seeds and oil referring to Ayurvedic Pharmacopeia (API) and the Indian Pharmacopeia (IP) respectively. Castor seeds were collected from different location in Maharashtra and Madhya Pradesh. Cold-press castor oil was collected from different brands. HPTLC and GC-based analytical methods were used to develop qualitative fingerprints of castor oil. **Results:** Market available castor seeds contain 1.973% total ash content, 6.1% water soluble extractives, 42.587% alcohol extractive. Yugandhar and Sips & Bites castor oil contains 1.3 and 1.7 acid value along with 177 and 180 saponification value respectively. Two bands for TLC were observed with R_f value of 0.4 and 0.6. **Conclusion:** Market-available seeds and Madhya Pradesh indicated better quality than other regional seeds. Yugandhar and Sips & Bites indicated good quality oil. Label claims and adulteration in castor seeds and oil could be checked using these parameters and the developed fingerprints. **Keywords:** Castor seeds, cold-press castor oil, quality control.

OFPPIPTR16

Innovation, Patents, and Translational Research in Natural products and ASU drugs.

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Background: Growing global interest in traditional medicine has created a strong need to modernize Ayurvedic, Siddha, and Unani (ASU) drugs. While these systems are rich in therapeutic knowledge, many formulations lack standardized processing, scientific validation, and user-friendly dosage forms. **Materials and Methods:** This study is based on a conceptual review of classical Ayurvedic texts along with recent scientific literature from databases such as PubMed and Google Scholar. Focus was given to identifying limitations in traditional formulations and exploring innovative approaches like novel drug delivery systems, analytical standardization techniques. **Results:** Translational efforts have led to the transformation of classical formulations into more acceptable dosage forms such as capsules, gels, and nano-based preparations. These advancements have improved drug stability, bioavailability, and patient compliance. Additionally, increased patent activity

reflects growing interest in protecting innovations related to herbal formulations, extraction processes, and therapeutic applications. **Conclusion:** Integrating innovation with traditional knowledge through translational research is essential for the wider acceptance of ASU drugs. Strengthening standardization, validation, and intellectual property strategies can help develop safe, effective, and globally competitive herbal medicines while preserving their traditional essence. **Keywords:** ASU drugs, Innovation, Translational research, Natural products, Standardization, Herbal formulations.

OFPPIPTR17

Innovation and Translational Research in ASU Drugs

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Background: The escalating global interest in traditional medicine has highlighted the need for innovation and translational research in ASU (Ayurveda, Siddha, Unani) drugs to overcome challenges such as some classical formulations lack modern validation, standardized processing, and convenient dosage forms. **Materials and Methods:** Classical formulations from authoritative texts were critically evaluated for their limitations in dosage form, stability, and palatability. Key areas explored including reformulation strategies, advanced analytical techniques, and development of novel dosage forms such as capsules, gels, and transdermal preparations. Emphasis was given to standardization protocols and safety evaluation. **Results:** Translational adaptation of ASU drugs resulted in improved dosage accuracy, enhanced stability, and better patient palatability. Scientific validation through analytical and experimental methods supported the safety and efficacy claims. Innovative approaches such as encapsulation and semi-solid conversions improved therapeutic efficiency. **Conclusion:** Translational research and innovation is essential for integrating ASU drugs into modern healthcare. By aligning traditional formulations with scientific methodologies, it is possible to develop reliable, effective and globally acceptable formulations while preserving their classical essence. **Keywords:** ASU drugs, Translational medicine, Innovation, Standardization, Dosage form conversion, Evidence-based Ayurveda

OFPPIPTR18

Innovation and Translational Research in ASU Drugs

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Background: Natural products and ASU (Ayurveda, Siddha, Unani) drugs constitute a rich source of structurally diverse bioactive compounds with multi-target therapeutic potential. Despite extensive traditional usage, their global integration is hindered by inadequate standardization, limited mechanistic insights, poor pharmacokinetic–pharmacodynamic (PK–

PD) correlation, and weak intellectual property (IP) protection. Recent advances in phytochemistry, systems biology, and regulatory science have accelerated innovation and translational potential. **Materials and Methods** An integrative review was performed using classical Ayurvedic compendia, indexed scientific databases (PubMed, Scopus), and patent repositories (WIPO, IPO India). Data on phytochemical standardization, bioanalytical techniques (HPLC, LC-MS/MS), and novel drug delivery systems were analyzed. Translational frameworks encompassing preclinical evaluation, toxicity studies, and clinical validation were critically appraised alongside patenting trends. **Results**: A significant transition toward standardized phytopharmaceuticals and evidence-based ASU formulations was observed. Innovations in nanoformulations, bioenhancers, and targeted delivery systems have improved drug solubility, stability, and bioavailability. Patent activity has increased in areas of extraction processes, polyherbal synergy, and marker-based standardization. Integration of network pharmacology and omics approaches has elucidated multi-target mechanisms. However, gaps remain in high-quality clinical trials, regulatory harmonization, and protection against biopiracy. **Conclusion:** Strategic convergence of innovation, patenting, and translational research is crucial for transforming ASU drugs into globally accepted therapeutics. Strengthening PK–PD studies, clinical evidence generation, and IP frameworks will enhance credibility, commercialization, and sustainable utilization of natural products. **Keywords**: ASU Drugs, Natural Products, Translational Research, Phytopharmaceuticals, PK–PD, Patent Strategy, Standardization, Network Pharmacology.

OFPPIPTR19

NANO-CORDYCEPIN from Cordyceps militaries: Innovations and Solutions by New Faces and Growing Awareness

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Background: Cordycepin millitaris is a common Himalayan fungus in North India. The awareness on Nano-cordycepin biological is proposed as pure new nano-pharmaceutical to disrupt adenosine metabolisms in inflammation, fibrosis, gliosis and cancer cells. Objective: An anticancer mechanistic model of slow-released activated cordycepin from coated stable 10- 100 nm sized PGLA carriers to define the adenosne deaminase enzyme catalyzed inhibition of cordycepin conversion to 3'-deoxyinosine that might interfere in nucleoside metabolism. **Model of Mechanism:** An anticancer-antifibrosis-anti-inflammatory action of cordycepin proposed model in support is based on the possible following mechanism in cancer cells: 3'-deoxydenosine enters in cancer cells by ENT1 and ENT2 nucleoside transporters to convert the cordycepin to cordycepin mono-, di-, triphosphates, Cordycepin phosphates activates the Adenosine monophosphate kinase enzyme, The Cordycepin monophosphate replaces the ATP to interfere and inhibit the RNA polymerase I,II,III enzyme subtypes in RNA synthesis, Interference in new RNA synthesis enhances the upregulated catabolite pathway to inhibit the anaerobic natural RNA required in energy homoeostasis, Upregulated catabolite pathway induces apoptosis through: i. modified mitochondrial pathways in releasing cytochrome-C to activate caspase cascade; ii. Cell cycle arrest via A3

adnosine receptor binding; iii. Cordycepin Mono Phosphate induced cAMP downregulation and GSK-3β /β-catenin signaling trigger. **Results:** Nano-cardiocepin amounts showed correlation with apoptosis indices (r2 = 1.246; P value 0.0001). Nano-cordycepin assembly size showed correlation with apoptosis indices (r2 = 1.362; P value 0.0001). Above mechanism model further suggests a possible solution to more-efficient inflammation and fibrosis suppression in microglial cells in dreaded glioblastoma disease. Possible awareness is needed if nano-cordycepin effectively may suppress proliferation, migration, epithelial-mesenchymal transition in cancer cells. **Conclusion:** Nano-Cordycepin from cordycep fungus may be a new solution of anticancer-antifibrosis- anti-inflammatory action in cancers.

OFPPIPTR20

Hypothesis-driven Ancient Pattern-recognition Fingerprints in Predictive Analytics (APFP) by Molecular Imaging

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Innovation: As an IASI initiative, Hypothesis-driven Ancient Pattern-recognition Fingerprints in Predictive Analytics (APFP) redefines the three doshas—Vata, Pitta, and Kapha. **Materials and Methods**: Three biological energies determine an individual's physical observations (vata) , mental symptoms and signs (pitta), and metabolic regulatory (pitta dominance) or lab investigation (kapha) to evaluate the kapha aggravation as disease prognosis or tendencies (lakchhan) and therapy response (nidan) using Trimodal CT-PET/MRSI imaging chemical biosignals (Pitta-Kapha patterns). In steps, AI predicts risks or outcomes (patterns) after using the above DOSHA (vikriti) with TRIVIDHA PARIKSHA: (Darshan) skin, eye, tongue, nail, posture examination; (Spardhan) nadi or pulse, skin texture, temperature, tenderness; (Prasana) appetite, sleep, emotion, and PRAKRITI borne tendencies. APFP is based on hypothesis-driven Clinical Molecular Imaging Evaluation Fingerprints (CMIEF), emerging as a powerful tool to bridge ancient Ayurvedic knowledge with modern, evidence-based medicine. **Results:** Artificial Intelligence (AI)-based APFP performs vata-pitta-kapha classification 70-90% well in brain, liver, heart, and muscle disease (vicar) by facial image, pulse signal, and molecular imagics.. Kapaha dominance (obesity), Pitta elevation (inflammation), and Vata aggravation (neurostress) were visible patterns on molecular images. APFP diagnostics offered pattern-based machine learning (pattern-based behavior, physiology, lifestyle) as 'diagnostic philosophy' and traits (measurable anthropometry, blood flow, pulse waveforms, sleep patterns, diet, lifestyle). The AI use of Random Forest (trait-based classification), Support Vector Machines (3D-features), Logistic Regression (Prakriti prediction), CNN (facial or pulse waveforms), and Deep Learning networks enhanced the clinical outcomes (patterns-constitution risk) from 62% to 94% as precise personalized treatment, improved predictive disease risk, and safer Ayurvedic herbal formulation selections and dosage. By simulating and collecting on hypothesis-driven testing, Ayurvedic principles—such as pathophysiology or *Prakriti* (constitution) and metabolic regulation or *Dosha* (humor) imbalances—against available large evidence datasets, AI predicted personalized healing plans (nidan) with a 25% improvement in treatment (upchaar) or efficacy. **Prospective:** Possibilities are real-time monitoring imagics, personalized treatment plans, advanced diagnostic platforms, etc. **Conclusion:** Innovative molecular image-based APFP diagnostics is predictive analytics. AI offers holistic, preventive, and personalized healthcare solutions, transforming Ayurvedic

philosophy to digital molecular imaging, quantifiable evidence of vata-pitta-kapha patterns to redefine how present healthcare systems can utilize patterns in holistic, personalized healthcare, and provide patient-specific predictions with enhanced patient and clinical outcomes. **Key Words:** AI, Holistic AI tools, Ayurveda philosophy, Molecular Imaging patterns, APFP.

OFPPIPTR21

Bridging Bench to Bedside in ASU Medicine: A Translational Approach to Natural Product Research

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Background: Translational research is the process of converting scientific knowledge or traditional findings into practical treatments or healthcare solutions. Its integration into modern healthcare systems remains limited due to inadequate scientific validation. **Materials and Methods:** A multidisciplinary translational research approach should be adopted to bridge classical Ayurvedic knowledge with modern scientific validation key points being Selection of Drug/Formulation, Pharmacognostical Evaluation (Authentication of raw drugs through macroscopic and microscopic examination), Pharmaceutical Preparation, Standardization & Quality Control and Phytochemical Screening. **Results:** Translational research in ASU successfully validates traditional medicines scientifically and improves their safe and effective use in modern healthcare. ASU drugs generally exhibit significant therapeutic effects such as anti-inflammatory, antioxidant and antimicrobial activities. Scientific validation confirmed that traditional formulations are effective and reliable. Standardized ASU formulations showed consistent quality and presence of bioactive compounds. **Conclusion:** Translational research bridges traditional ASU knowledge with biomedical science to develop safe, effective, and evidence-based treatments.

OFPPIPTR22

Innovation, Patents, and Translational Research in Natural Products and ASU

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Background: Natural products and ASU (Ayurveda, Siddha, and Unani) systems have long served as a foundation for healthcare. With growing global interest, there is a need to integrate innovation, patent protection, and translational research to scientifically validate and promote these traditional medicines. To highlight the significance of innovation, intellectual property rights, and translational research in strengthening the scientific basis and global acceptance of natural products and ASU drugs. **Methods:** A comprehensive review of classical ASU literature, modern scientific studies, and patent databases was conducted. **Results:** Innovative approaches in ASU have led to the development of new formulations and advanced drug delivery systems. Patenting safeguards traditional knowledge while encouraging research and commercialization. **Conclusion:** The integration of innovation, patents, and

translational research plays a crucial role in bridging traditional knowledge with modern science. **Keywords:** Innovation, Patents, Translational Research, Natural Products.

OFPPIPTR23

Medicinal Plant Resources and Biodiversity Management in Type 2 Diabetes Mellitus (Madhumeha)

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Background: Type 2 Diabetes Mellitus (T2DM) is a major non-communicable disease characterized by insulin resistance and chronic hyperglycemia. Its rising prevalence, particularly in India, necessitates safer and sustainable therapeutic approaches. In Ayurveda, T2DM is correlated with Madhumeha, involving Kapha dosha imbalance and derangement of Meda dhatu. Medicinal plants play a significant role in its management. **Methods:** A narrative review was conducted using classical Ayurvedic texts and modern scientific literature from PubMed and Scopus databases. Key medicinal plants with reported antidiabetic activity and biodiversity-related aspects were analyzed. **Results:** Medicinal plants such as Tinospora cordifolia (Guduchi), Gymnema sylvestre (Gurmar), and Momordica charantia (Bitter gourd) exhibit hypoglycemic, antioxidant, and insulin-sensitizing properties. Studies demonstrate inhibition of α-amylase and α-glucosidase enzymes, reduction in oxidative stress, and improved glycemic control. However, increasing demand has led to overexploitation, habitat loss, and reduced availability of these species. **Discussion:** Biodiversity management strategies, including in-situ and ex-situ conservation, sustainable harvesting, and cultivation practices, are essential for preserving medicinal plant resources. Integration of Ayurvedic knowledge with modern pharmacology enhances evidence-based application in diabetes care. **Conclusion:** Medicinal plants offer a promising, cost-effective approach for T2DM management. Sustainable biodiversity management is crucial to ensure their long-term availability and therapeutic efficacy.

ONOPIPTR1

Antidiabetic potential of arjunetin via inhibiting dipeptidyl peptidase-4, inflammatory cytokines, and apoptosis pathway: *in vitro* and molecular docking analysis

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Background: *Terminalia arjuna (Combretaceae) is widely used in traditional Indian medicine and is reported to have antidiabetic effects; however, the hypoglycemic mechanism of its phytoconstituent arjunetin via DPP-4 inhibition remains unclear. This study evaluates the antidiabetic activity of arjunetin using an in vitro DPP-4 enzyme assay, ADMET prediction, and molecular docking with the DPP-4 receptor, along with its interactions with inflammatory cytokines and targets in the apoptotic pathway to clarify its potential mechanisms of action.* **Materials & Methods:** The DPP-4 inhibitory activity of arjunetin was evaluated by *invitro* assay. Arjunetin was evaluated for its binding affinities using Autodock Vina software against DPP-4 receptor-related targets [PDB IDs: 1ITB (IL-1β), 14ZS7 (IL-6), 2AZ5 (TNF-α), and 3GJQ (Caspase-3)]. Subsequent in silico ADMET analysis was assessed using pkCSM. **Results:** Arjunetin demonstrated significant *in vitro* DPP-4 inhibitory activity (85.39 ± 7.50%), comparable to the synthetic inhibitors vildagliptin (90.42 ± 7.84%) and sitagliptin (84.67 ± 8.21%), highlighting its potential as an indigenous DPP-4 inhibitor. Molecular docking showed arjunetin's strong interactions, especially with TNF-α (score -8.780 kcal/mol), forming hydrogen bonds with several residues. In silico ADME–toxicity analysis indicated good intestinal absorption, Caco-2 permeability, limited brain distribution, a low risk of drug interactions, and clearance. Additionally, it revealed no mutagenic, cardiotoxic, or hepatotoxic effects. **Conclusion:** These results suggest that arjunetin may effectively modulate DPP-4 inhibition, inflammatory cytokines and apoptotic pathways, supporting its potential role in antidiabetic mechanisms. **Keywords:** Arjunetin, invitro assay, DPP-4 inhibition, docking analysis

ONOPIPTR2

A Preliminary Pharmaceutico – Analytical Study and Nutritional Study of Sorghum Samp (Yavanala Yusha) and Poly Herbal Tea

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Background: Diabetes Mellitus Type 2 (DMT2) is a chronic metabolic disorder characterized by elevated blood glucose levels due to insulin resistance and inadequate insulin secretion. It possesses a significant global health challenge. The main cause for the Diabetes is improper life style, this revert back normal by following proper diet patterns. **Materials and Methods:** To care and cure the diabetes, Sorghum samp (YavanalaYusha) and Poly Herbal Tea were taken to analyze the phyto chemical and Nutritional Properties. The organoleptic characteristics and other analytical tests like pH, total ash, Water Soluble ash, Alcohol soluble extractives, Water soluble extractives, loss on drying and Nutritional Content were carried out as per the standard protocol. **Results:** The obtained results were discussed in the present paper. The Sorghum Samp (YavanalaYusha) and Poly Herbal Tea is a

simple preparation and can be prepared by easily available drugs. Both the samples were contains Carbohydrates, saponins and resin which work on reducing cholesterol levels, anti-inflammatory, antiviral, cardioprotective, anti –inflammatory and anti microbial and will helpful to regulate blood sugar levels as well as improves the digestive health. **Conclusion:** The analytical study findings can be taken as a preliminary standard for analysis of standardization. **Keywords:** Sorghum, Glucose, Insulin, Carbohydrates, Organoleptic.

ONOPIPTR3

Quantitative Assessment of Altitude-Dependent Variation in Secondary Metabolites and Antioxidant Activity of *Tinospora cordifolia*

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Tinospora cordifolia (Willd.) Miers ex Hook. f. & Thomson (Menispermaceae), revered in Ayurvedic tradition as Guduchi and Giloy, is a therapeutically celebrated medicinal climber with well-documented immunomodulatory, anti-inflammatory, and antioxidant properties. Despite its centuries-long medicinal significance, whether geographical elevation meaningfully influences its phytochemical composition remains poorly understood. This study investigates how altitudinal gradients across Himachal Pradesh, India, shape secondary metabolite accumulation and antioxidant potency in stem extracts of *T. cordifolia*. Stem samples were collected from three ecologically distinct altitudinal zones above mean sea level, dried, and extracted using methanol. Quantitative estimation of alkaloids, glycosides, and flavonoids was performed using standard protocols. Antioxidant activity was assessed through DPPH and ABTS radical scavenging assays, and LC–MS profiling was employed for comprehensive metabolite characterization. A striking positive correlation emerged between altitude and phytochemical richness. Alkaloid content rose nearly threefold from 4.12 ± 0.21 mg/g DW at 250 m to 11.87 ± 0.44 mg/g DW at 1450 m, with glycosides and steroids following similar trends. DPPH IC_{50} values declined progressively from 148.3 µg/mL to 38.7 µg/mL, reflecting enhanced antioxidant potency with elevation. LC–MS identified 10 key bioactive constituents, including berberine, palmatine, tinosporaside, cordifolioside A, β-sitosterol, and stigmasterol. These findings confirm that high-altitude stressors actively stimulate secondary metabolite biosynthesis, with significant implications for phytochemical standardization and sustainable harvesting of *T. cordifolia* across Himalayan ecosystems. **Keywords:** Alkaloids; Antioxidant Activity; Secondary Metabolites; *Tinospora cordifolia*

ONOPIPTR4

Evaluation of *Valeriana wallichii* and *Ocimum sanctum* plant extracts in vitro antioxidant properties and their synergistic antioxidant potency

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Background: Bioactive phytochemicals with neuroprotective and antioxidant properties are abundant in natural plant products. While *Ocimum sanctum* is rich in eugenol, rosmarinic acid, and flavonoids with great antioxidant potential, *Valeriana wallichii* includes phenolics, flavonoids, and sesquiterpenes that scavenge free radicals and diminish oxidative stress. The combined usage of these herbs may have a synergistic antioxidant effect that improves

protection against illnesses caused by oxidative stress. Although each of these plants has been extensively explored separately, their combined potential has not been examined. The current study intends to investigate the synergistic antioxidant capability. **Materials and methods:** *O. sanctum* leaves and *V. wallichii* roots were purchased from the local market, and the plants was subsequently identified and authenticated. This work uses only analytical-grade chemicals and solvents. Ferric reducing antioxidant power (FRAP), total phenolic content (TPC), total flavonoid content (TFC), and 2-diphenyl-2-picryl hydrazyl radical scavenging (DPPH) assays were used to evaluate the antioxidant qualities. **Results:** *O. sanctum* had the highest flavonoid concentration (89.26 ± 0.59 mg QE/g extract), whereas *V. wallichii* methanolic extract had the highest phenolic content (76.77 ± 1.11 mg GAE/g extract). The study shows that *V. wallichii* and *O. sanctum* have synergistic antioxidant capacity, as evidenced by the highest DPPH assay reading (91.14%). The antioxidant activity of these plants methanolic extracts varied and was strongly correlated with their total phenolic content. **Conclusion:** These findings indicate that these plant extracts are promising natural antioxidant agents that may be used in pharmaceuticals to treat a variety of illnesses. **Keywords:** DPPH radical scavenging study, *Ocimum sanctum, Valeriana wallichii*, natural plant extract, and synergistic antioxidant activity.

ONOPIPTR5

Exploring the Role of *Himasagara Taila* in psychological disorders and *Dosha* Imbalance

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Background: *Taila Kalpana* is an *Ayurvedic* pharmaceutical process for the preparation of lipid and water-soluble extract of phytoconstituents into a lipid medium and is one of the four main *Chatur Snehas*. In this, the medicinal properties of oil depend on the levels of processing of *Mrdu, Madhyama,* or *Khara Paka*, as it helps in the medicinal application as per the related health conditions. Main constituents being *Tila Taila* and *Narikela Kṣīra* as base media. **Materials and methods:** The data for this was collected through classical *Ayurvedic* literature and modern electronic databases. The *ayurvedic* components were extracted from the *Bhaishajya Ratnavali,* while scientific validation was sought via PubMed, Google Scholar, and the AYUSH Research Portal. **Results:** Recent scientific data and clinical experiences demonstrate its efficacy as an external application for managing different diseases with significant therapeutic potential in treating psychological conditions in children, insomnia and anxiety. **Conclusion:** Pharmacological interventions for insomnia and behavioral disorders often carry risks of dependency and adverse side effects, *Himasagara Taila* offers a safer, lipid-based alternative. Its external application provides a non-invasive route for drug delivery that minimizes systemic toxicity while effectively managing symptoms of anxiety and sleep disturbances. **Keywords:** *Himasagara Taila, Taila Kalpana, Sneha Paka,* Lipid-based Drug Delivery, Insomnia.

ONOPIPTR6

Bhunagadi Taila: Pharmaceutical Composition and Therapeutic Application

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Background: *Bhunagadi Taila* is a classical Taila Kalpana described in the Kerala Ayurvedic text *Vaidyatharakam* authored by Narayanan Vaidyan and mentioned in the *Muyalikarappan Adhyaya*. It is indicated in *Apasmara* (epilepsy), locally known as *Muyalikarappan*, and traditionally prescribed for external application over *Sandhis.* The formulation reflects the region-specific pharmaceutico-therapeutic wisdom of Kerala Ayurveda, characterized by unique ingredients and indigenous application techniques. **Materials and Methods:** The major *Kalka Dravyas* of *Bhunagadi Thaila* are *Bhunaga* (earthworm) and ant egg, highlighting the therapeutic application of *Jangama Dravyas* (animal-origin substances). The formulation also includes herbal drugs such as *Jathi, Katu Rohini,* and *Rasna*, along with Kandivenna (meconium of elephant), a rare ingredient cited in traditional Kerala texts. The Drava dravya used is the Swarasa of Karlakam, a regionally utilized medicinal plant. Avanakkenna (castor oil) and Nallenna (gingelly oil) are employed as Sneha Dravyas. Although classical references advise application over joints, this study explores its administration as Thodutailam, a localized oil application over specific body parts, especially Marma points, practiced predominantly in Northern Kerala. **Results:** The formulation demonstrates a distinctive integration of Jangama and herbal components, and the Thodutailam method offers a modified external application with potential localized therapeutic benefits in neurological conditions. **Conclusion:** Bhunagadi Taila administered as Thodutailam represents an important regional therapeutic adaptation in Kerala Ayurveda. Documentation and scientific evaluation of such practices are essential to preserve traditional knowledge and explore their clinical relevance in Apasmara and related neurological disorders. **Keywords:** Bhunagadi taila,Epilepsy,Thodutaila,Animal origin substance

ONOPIPTR7

Gula Sunti and Asthi Dhathu Poṣaṇa: An Ayurvedic Neutraceutical Approach to Calcium Deficiency

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Background: Calcium deficiency is a common nutritional problem leading to bone and musculoskeletal disorders. Ayurveda describes several dietary formulations that act both as therapeutic and nutritional supplements. *Arogyakalpadruma* mentions **Gula Sunti**, a formulation indicated in *kasacikitsa* for conditions such as *kasa*, *aruci*, *chardi*, *gulma*, and *urakṣata*. The ingredients—*tila* (Sesamum indicum), *guda* (jaggery), and *shunṭhi* (Zingiber officinale)—possess significant nutritional value, suggesting a potential role in correcting calcium deficiency. **Materials and Methods:** A literary review of *Arogyakalpadruma* was conducted to analyze the formulation Gula Sunti, prepared using 1 part *shunṭhi*, 2 parts *guda*, and 4 parts *tila*, stirred using an iron rod. The calcium content and supportive nutritional properties of the ingredients were assessed based on classical Ayurvedic texts and contemporary nutritional understanding. **Results:** *Tila* is a well-recognized calcium-rich food, contributing significantly to bone nourishment (*asthi*

dhatu poṣaṇa). *Guda* supports mineral absorption and provides energy, while *shuṇṭhi* enhances digestion and improves bioavailability of nutrients. The combined formulation exhibits *brhhaṇa* and *rasayana* properties, making it beneficial in nutritional deficiencies. Iron rod processing may also add trace minerals, further enhancing its nutraceutical value. **Conclusion:** Gula Sunti, though primarily indicated in *kasacikitsa*, has strong potential as a nutraceutical formulation for calcium deficiency due to the high calcium content of *tila* and the bioavailability-enhancing action of *suṇṭhi* and *guda*. **Keywords:** Gula Sunti, Calcium Deficiency, Tila, Neutraceutical, Asthi Dhātu

ONOPIPTR8

Synergistic Therapeutic Effects of Panchgavya and Mesenchymal Stem Cells: A Novel Approach to Enhancing Beta-Cell Function and Lipid Metabolism in Diabetes

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Diabetes mellitus, a chronic metabolic disorder characterized by impaired insulin secretion and action, remains a critical global health challenge. This study evaluates the therapeutic potential of metformin, panchgavya, mesenchymal stem cells (MSCs), and a combination of panchgavya with MSCs in a diabetic mouse model. To mimic the metabolic and cellular damage associated with human diabetes, the condition was induced in C57BL/6 mice using a High-Fat Diet (HFD) followed by streptozotocin (STZ) injections. The experimental subjects were organized into seven groups: control, HFD, diabetic, metformin-treated, panchgavya-treated, panchgavya with MSCs combination, and MSCs alone. The efficacy of these interventions was monitored through blood glucose levels, insulin sensitivity, pancreatic beta-cell function, and lipid profiles. Results demonstrated that both panchgavya and MSCs significantly reduced hyperglycemia and improved beta-cell health. Interestingly, while MSCs alone showed the most profound effect on insulin secretion and beta-cell protection, Panchgavya-treated groups exhibited a superior lipid-regulating effect; specifically, Panchgavya treatment resulted in higher levels of High-Density Lipoprotein (HDL) and lower levels of Low-Density Lipoprotein (LDL) and Very-Low-Density Lipoprotein (VLDL) compared to the MSCs-alone group. Histological examination further confirmed that the combination therapy reduced pancreatic tissue damage, significantly increased the population of viable beta cells, and restored islet morphology. These findings suggest that the integration of MSCs and panchgavya works through complementary mechanisms—where MSCs provide potent regenerative support and panchgavya offers superior metabolic and lipid control—offering a more holistic approach for diabetes management. This study highlights the synergistic potential of combining cellular therapy with traditional formulations to achieve better glycemic and lipidemic stability. **Keywords:** Panchgavya, Mesenchymal Stem Cells, HDL, LDL, VLDL, Streptozotocin, High-Fat Diet and C57BL/6 Mice.

ONOPIPTR9

Toxicological Assessment of Cardiac Glycoside Extracted from *Calotropis procera* leaves: Integrating Ayurvedic Principles and Modern Experimental Toxicological Science

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Calotropis procera (Arka) is a well-known medicinal plant characterized in Ayurvedic classics for its therapeutic use in Kapha-Vata dominant disorders. It exhibits Tikta-Katu Rasa, Ushna Virya, and Laghu-Ruksha Guna, indicating strong pharmacological activity. However, rigorous safety evaluations are essential to support evidence based AYUSH practices. The study correlates classical Ayurvedic concepts with modern *in vivo* toxicological evaluation. Cardiac glycoside was extracted from *Calotropis procera* leaves using a liquid-liquid extraction method. The qualitative confirmation was performed using Baljet's reagent, and quantification was carried out by UV-Visible spectrophotometry at 495 nm. Acute oral toxicity was assessed to determine the LD_{50} cut-off value, followed by 28-day repeated dose oral toxicity study with recovery was conducted in *Sprague Dawley* rats across control, treatment, and recovery groups. The typical experimental toxicological parameters were observed including mortality and clinical signs. The LD_{50} cut-off value was found to be between 2000 and 5000 mg/kg body weight. No mortality, treatment-related clinical signs, or organ toxicity were observed during repeated dose exposure. Body weight gain, feed consumption, functional observational parameters, ophthalmoscope examination, organs weight and histopathological findings remained comparable to controls. The troponin I test showed negative results in both control and treatment groups. Based on the above results and experimental condition used in the study, the high dose (1000 mg/kg) is found to be no observed adverse effect level when cardiac glycoside dosed orally in rats. The findings validate the Ayurvedic principle of Yukti Yukta Prayoga, when administered in controlled doses is safe and non-toxic. **Keywords:** *Calotropis procera*, Cardiac glycoside, Ayurvedic correlation, Toxicological evaluation, AYUSH

ONOPIPTR10

Dutch Bucket Hydroponics: A Modern Alternative for the Cultivation of Ayurvedic Root Herbs

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Background: Traditional Ayurvedic medicine relies heavily on the therapeutic properties of plant roots. However, conventional soil cultivation faces challenges such as soil-borne pathogens, scarcity of arable land, excessive water consumption, and inconsistent nutrient uptake. Additionally, soil-based harvesting is labor-intensive and often damages delicate root structures. Hydroponics, a soil-less cultivation technique, offers a controlled environment using nutrient-enriched solutions as the growth medium. The Dutch Bucket system is uniquely suited to the demands of medicinal shrubs with roots as useful part. By offering a high-volume growth environment, it allows unrestricted radial and vertical root expansion. This maximizes root biomass and ensures a damage-free harvest of the roots. **Materials and Methods:** A review of the Dutch Bucket system's operational mechanics and nutrient delivery efficiency was first conducted through books, horticultural websites, and online research articles. This study evolved to focus specifically on the system's application for Ayurvedic plants where the root is the primary medicinal part. **Results:** Preliminary analysis indicates that the system produces significantly higher root biomass within shorter growth cycles compared to soil. The controlled environment ensures the preservation of key bioactive compounds and reduces the risk of contamination. **Conclusion:** The Dutch Bucket system is a viable,

sustainable alternative to traditional cultivation for Ayurvedic plants where the root is the primary medicinal component. This method provides a reliable framework for producing standardized, high-purity medicinal roots for the global herbal industry.

ONOPIPTR11

Nephroprotective Effect of *Nyagrodhadi Churna* in High Fat Diet-Low Dose Streptozotocin induced Diabetic Rats

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Nyagrodhadi churna (NC) is a compound Ayurvedic formulations used in the treatment of *prameha* which correlates with diabetes and kidney problems. The present study demonstrates effect of NC on nephropathy in high-fat diet and low dose streptozotocin induced type II diabetes in rats. NC (250 and 500 mg/kg) were administered orally for 8 weeks after confirmation of diabetes. Metformin (200 mg/kg) was used as reference standard. The weekly body weight and intermittent fasting plasma glucose levels, lipid profile (total cholesterol, triglycerides, HDL-c), kidney function tests (urea, and creatinine), and albumin were estimated in plasma including sodium and potassium. Urine output, microprotein and creatinine clearance was measured. At the end, kidney weight, kidney hypertrophy was measured in addition to oxidative parameters. NC treatment for 8 weeks showed significant reduction in hyperglycemia and improved lipid profile along with reduction in urea and creatinine and albumin. It also improved creatinine clearance compared to diabetic rats including decrease in kidney weight and hypertrophy. The effects were comparable to standard drug, metformin. In conclusion, NC showed moderate degree of amelioration of type II diabetes induced nephropathy indicating nephroprotective effect which may be attributed to various antioxidant and renoprotective plant ingredients and phytochemicals present in them. **Keywords:** Nyagrodhadi churna, Diabetic nephropathy, Streptozotocin, Kidney Dysfunction, Metformin

ONOPIPTR12

Nutritional Characterization and Safety Evaluation of an Ayurveda Functional Spice Blend - Detox Curry Blend

Innovation, Patents and Translational Research in Natural Products & ASU Drugs

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Traditional South Asian spice blends are highly valued for supporting digestive balance and systemic wellness; however, rigorous scientific validation of their nutritional density and safety remains relatively limited. This study presents a comprehensive characterization of Detox Curry blend (also known as Healthy Curry Blend), a proprietary Ayurvedic-inspired functional spice formulation meticulously composed of Coriander Seeds (*Coriandrum sativum*), Cumin Seeds (*Cuminum cyminum*), dried fruits of Black Pepper (*Piper nigrum*), dried rhizome of Turmeric (*Curcuma longa*), and Flax Seeds (*Linum usitatissimum*). The formulation was developed in powdered form following a

standardized Ayurveda drug preparation method. Authenticated raw materials were cleaned and shade-dried for 5 days to preserve phytochemical integrity, followed by fine pulverization, sieving, and uniform blending to obtain a stable curry powder suitable for regular dietary consumption. Comprehensive biochemical and microbiological analyses were conducted at a NABL-accredited laboratory (MATS India Pvt. Ltd., Chennai) utilizing internationally recognized AOAC and ISO methodologies. Proximate analysis demonstrated a superior nutritional profile, featuring high crude fiber content (15.70 g/100 g), balanced total fat (15.23 g/100 g), total carbohydrates (55.21 g/100 g), and a significant energy value of 420.71 kcal/100 g. Food safety evaluation confirmed that aflatoxins (B1, B2, G1, and G2) and heavy metals including lead, cadmium, arsenic and mercury were all below the limit of quantification, while total sugar content was non-quantifiable. Microbiological analysis further verified the absence of *Salmonella* spp., demonstrating compliance with international food safety standards. This study integrates Ayurvedic culinary principles with modern analytical validation and demonstrates the Detox Curry blend as a safe, nutrient-dense functional food supporting systemic lipid homeostasis, healthy hepatic function, and overall metabolic wellness. **Keywords:** Functional Foods, Ayurvedic Nutrition, Detox Curry blend, Food Safety, Proximate Analysis.

ONOPIPTR13

Development, Optimization and Translational Evaluation of Licorice (Glycyrrhiza glabra)–Gomutra Phytosomal Nanocarrier for Enhanced Anticancer Activity

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Background: Natural products and ASU drugs possess significant therapeutic potential but suffer from poor solubility, low bioavailability, and limited clinical translation. Phytosomal nanocarriers offer an innovative strategy to enhance delivery and improve pharmacological efficacy of herbal actives such as glycyrrhizin from Glycyrrhiza glabra. **Materials and Methods:** Phytosomes containing licorice extract and lyophilized Gomutra were prepared by thin-film hydration and optimized using a 2^3 full factorial Design of Experiments. Formulations were evaluated for particle size, PDI, zeta potential, entrapment efficiency, drug release, and stability. Glycyrrhizin was standardized by HPTLC. In-vitro anticancer activity was assessed on MCF-7 breast cancer cells using the MTT assay. **Results:** The optimized batch (LP-F07) showed nano-size 98.7 nm, PDI 0.18, entrapment efficiency 94.8%, and zeta potential −42.6 mV. Sustained drug release of 88% over 24 h followed Higuchi diffusion kinetics. The formulation exhibited dose-dependent cytotoxicity with IC_{50} of 56.74 µg/mL, indicating significant antiproliferative activity compared to extract alone. **Conclusion:** The developed phytosomal system demonstrates an innovative and translational nano-herbal platform that enhances stability, controlled release, and anticancer efficacy of ASU drugs,

supporting its potential for patentable and clinical development. **Keywords:** Phytosome, Licorice, Gomutra, Natural products, ASU drugs, Nanocarrier, Anticancer, Translational research

ONOPIPTR14

Vrkshayurveda based *Kunapajala* as a liquid fertilizer for medicinal plant cultivation: A review

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With the current global trend for herbal products, there is a need for higher production of medicinal plants. However, rather than the use of inorganic fertilizers and pesticides which ultimately negatively affect soil fertility and secondary metabolites, eco-friendly methods are preferred for increasing productivity of medicinal plants. *Kunapajala*, described in ancient *Vrkshayurveda* is a type of organic liquid manure formed from fermented animal and fish remains. It is mainly composed from the combination of fermented animal waste, fat and marrow with the addition of clarified butter and milk. The objective of this research was to gather information regarding *Kunapajala* as a liquid fertilizer for medicinal plant cultivation. The data was gathered from published journal articles across the databases of Google Scholar, PubMed and Science Direct. Articles published within the last 10-year period (2015-2025) containing information regarding *Kunapajala* and its uses in production of medicinal plants were included. While articles that were not available in full form and duplicates were excluded. Accordingly, use of *Kunapajala* leads to increased soil fertility and secondary metabolites of medicinal plants. Additionally, research on medicinal plants such as *Withania somnifera* and *Uraria picta*, revealed higher root yield, higher leaf area, higher nutrient products and higher levels of photosynthetic pigments such as Chlorophyll a, b and carotenoids on the plants treated with *Kunapajala*. Therefore, it can be concluded that *Kunapajala* is a sustainable and eco-friendly organic liquid fertilizer that can be used to increase seed germination, crop productivity, soil fertility in the cultivation and propagation of medicinal plants. **Keywords:** Cultivation, *Kunapajala*, Medicinal plants

ONOPIPTR15

Development of An Herbal Toothpaste for enhancing Oral Hygiene and Gum Protection

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Oral hygiene plays a key part in preserving general health, and rising worries surrounding the detrimental effects of synthetic dentifrices have pushed the development of safer herbal alternatives. The present study aims to develop and standardize and quality control a Herbo-mineral toothpaste formulation for effective oral health and hygiene. The toothpaste was formed using 10 ml of herbal decoction blended with natural herbal treatments including *Pongamia pinnata, Elettaria cardamomum* into a chemical base The formulation was evaluated with physical, chemical, and phytochemical parameters and chromatographic analysis. Physical properties were a light grayish hue, good fragrance, beautiful creamy texture, and sweet taste. The pH was 7.59 at 28.4 °C, indicating near-neutral compatibility with the oral cavity. Foamability revealed a foaming power of 7. Moisture content was 4.819%, and relative density was 0.5161. Spreadability was 6.67×10^{-5} Nm (6.67 g cm^{-1}). Phytochemical study indicated the presence of considerable secondary metabolites, including alkaloids (26.5%),

tannins (7.365% as tannic acid equivalent), phenols (1.76% as gallic acid equivalent), and flavonoids (9.825% as catechin equivalent). Thin Layer Chromatography utilizing ethyl acetate, toluene, hexane, and formic acid (4.5:3.5:1:1) found nine different peaks. The findings show that the prepared herbal toothpaste satisfies acceptable physicochemical parameters and includes bioactive ingredients helpful for oral care. Further clinical studies and advanced assessments are recommended to confirm its therapeutic effectiveness and safety. **Keywords:** Herbal toothpaste, Oral hygiene, Gum protection, Plaque control, antimicrobial activity

ONOPIPTR16

Development and Standardization of Herbal Gummy Supplement for *Pandu Roga*

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Background: *Pandu roga*, correlated with iron deficiency anemia, poses a major global health challenge; Traditional remedies often face adherence issues due to poor palatability and metallic taste. This research developed a standardized herbal gummy product to provide a palatable, patient friendly alternative to traditional treatments. **Materials and methods:** The formula is mentioned in *Pandu Roga Chikitsa* in Ashtanga Hridaya. And the main raw ingredients are *Draksha (Vitis vinifera), Pippali (Piper longum), Amalaka (Phyllanthus emblica), Vamsha lochana (Bambusa arundinacia), Nagara (Zingiber officinale)* and *Madhuka (Glycyrrhiza glabra)*. To prepare the herbal gummies, a hot aqueous extraction was first obtained from the raw materials. This decoction was combined with sweeteners like honey and sugar, along with gelatin as the gelling agent. Through repeated trials, the gelatin concentration was optimized to ensure an ideal chewy texture. The final mixture was molded, cooled and coated with sugar to prevent sticking, resulting in a standardized 5.0g supplement. **Results:** Comprehensive standardization was performed on both the raw materials and the final product. Key findings from the final product analysis showed high consistency with an average weight of 5.0g and pH of 4. 99. Notably the gummy demonstrated an efficient dissolution time of 23 minutes in simulated gastric conditions. Furthermore, qualitative phytochemical screening confirmed the presence of bio active compounds including alkaloids, flavonoids and tannins. Organoleptic evaluation shows the gummy has mitigated the palatability issues of traditional remedies. According to nutritional assessment each 100g of this gummy contained 4.55g of sugar, 0.06g of salt, 0.51g of fat, 0.04g of crude fiber and 31.55mg of Vitamin C. **Conclusion:** This study concludes that the developed herbal gummy is a successful and standardized novel dosage form beneficial in *Pandu Roga*. **Key words:** *Ayurveda,* Herbal gummy, Iron deficiency anemia, Palatability, *Pandu roga,* Standardization

ONOPIPTR17

Standardization of "Wal Ananda Rasa Guliya"; A Herbal Expectorant in Katudampe Tradition

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Sri Lanka's traditional medicine blends Ayurveda & indigenous practices, preserved through generations. Originating in South Sri Lanka, *Katudampe* tradition was also a prominent indigenous medical

tradition in the 19th century. The formula is selected based on ola leaf manuscripts of *Katudampe* tradition. In this study is designed to prepare and develop a standardization profile for "*Wal Ananda rasa guliya*" which is made with *Nigella sativa, Trachyspermum roxburghianum, Piper longum, Zingiber officinale, Terminalia chebula*, *Syzygium aromaticum*, *Allium sativum*, *Acalypha indica*, along with qualitative analysis of different phytochemical compositions in these. Here's an abstract of research findings on phytochemical and physicochemical properties of the formulation. Under organoleptic parameters the pill was found to have brown colour, astringent aroma and bitter and astringent taste. Under physical parameters, total ash 1.7%, acid-insoluble ash 0.6%, water-soluble ash 1%, size 5.804mm, weight 2.023mg, hardness 1.8N, water- soluble extractive value 54.16% were determined for the raw material and pH 5.05 value was determined for the aqueous extract of the pill. Both aqueous extract and methanol extract of the pill were positive for alkaloids, tannins, terpenoids and Saponins. Only the aqueous extract was positive for flavonoids, only the methanol extract was positive for glycosides, Tests for Simple sugar and Carbohydrates were positive. TLC of methanol extract for Hexane: Toluene: Dichloromethane: Chloroform (2:1:2:5) (v/v). **Keywords:** Herbal Expectorant, Katudampe tradition, Wal Ananda Rasa Guliya, Standardization of herbal pills

ONOPIPTR18

Formulation, Development and Standardization of a Rectal Suppository for the Management of *Arshas* with Special Reference to *Shurandhi* Lepa.

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Arshas (hemorrhoids or piles) is a common and distressing anorectal disorder characterized by pain, swelling, inflammation, bleeding, and prolapse, leading to impaired quality of life. Modern management relies on drugs and surgery; however, recurrence, complications, and low compliance demand safer, minimally invasive alternatives. Ayurveda attributes *Arshas* to vitiation of *Vata, Pitta,* and *Kapha doshas*, causing derangement of anorectal tissues. Classical Ayurvedic preparations like *Shuranadhi Lepa*, described in *Bhaisajya Ratnavali* under *Arsho Roga Adhikara*, are recognized for their anti-inflammatory, analgesic, and wound-healing actions. Nevertheless, direct application has limitations including poor retention and inconvenience. The present study aimed to formulate and standardize a rectal suppository based on this classical formulation to improve local drug delivery and patient acceptability. *Surana, Haridra, Citraka, Pushkara, Purana Guda*, and *Kanji* were incorporated into appropriate bases using standard pharmaceutical techniques. Four formulations were developed and evaluated. The optimized batch showed a brownish, moderately smooth appearance with uniform weight of 2.5 g, hardness of 13.1 N, melting point of 55 °C, and pH of 8.37. Stability testing revealed no observable changes at 25 °C and −4 °C. Preliminary phytochemical analysis confirmed the presence of alkaloids,

tannins, flavonoids, saponins, and terpenoids. This study is expected to produce a stable, patient-friendly, and scientifically validated rectal dosage form, thereby providing an effective Ayurvedic treatment option and demonstrating the integration of traditional knowledge with contemporary drug-delivery approaches for the management of *Arshas.* **Keywords:** *Arshas, Shuranadhi Lepa,* Rectal Suppository, Bhaisajya Ratnavali, Standardization

ONOPIPTR19

Formulation an Antiurolithiatic (Ashmaribhedana) Herbal Product Using *Aerva Lanata*

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In ayurveda view urinary calculi is under ashmari and antiurolithic action is explained as *ashmaribhedana* property. *Aerva lanata* is one of the best plants for urinary calculi. This was designed to develop a standardization profile for *Aerva lanata* with qualitative analysis of different phytochemical composition in it. This focused on to prepare an herbal powder then develop it as an herbal tea for antiurolithiatic with standardized it. The resulting decoction had a light brown color, a mild earthy aroma, for physical parameters total ash 10.03%, acid-insoluble ash 6.45%, water-soluble ash 11.5 %, water- soluble extractive value 22 % were determined for raw material and pH 6.48 was determined for the decoction. Qualitative phytochemical was analyzed obtain the crude extract from powdered sample of plant using ethanol and distilled water and performed the TLC and HPTLC mobile phase used as the toluene: ethyl acetate: hexane (6:3:1) (v/v). Both freeze-dried aqueous extract and ethanol extract of the *Aerva lanata* were positive for alkaloids, tannins, terpenoids, glycosides. Only the aqueous extract was positive for saponins, simple sugar and iodine. Freeze dried decoction was in-vitro evaluated for ability to dissolve urine stones in a lab setting. Calcium Oxalate crystals were prepared artificially by homogenous precipitation method. This model was prepared using semipermeable egg membranes. Dissolution models containing Calcium Oxalate and different concentrations of aqueous extract suspended in conical flasks containing tris-buffer solution. Dissolution percentage of Calcium Oxalate in each instance was evaluated by titrimetric with KMnO4. When the concentration of the extract increased the dissolution percentage was increased. Freeze-dried extract of the decoction at 50 mg concentration produced the highest dissolution percentage than other concentrations. Therefore, Polpala decoction is effective in the management of urolithiasis. **Keywords:** Urine calculi, *Aerva lanata,* Freeze dried aqueous, ethanol extract

ONOPIPTR20

Comparative evaluation of powder microscopic studies on *Sitopaladi Churna* using raw materials from various geographical areas in Sri Lanka.

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Background: *Sitopaladi churna* (SC) is a widely used Ayurveda formulation that consists of a powder of cardamon, cinnamon, long pepper, siliceous concretion and sugar cubes, mainly used for respiratory illnesses like asthma, cough. This study aimed to conduct a

comparative microscopic evaluation of SC samples obtained from different geographical regions of Sri Lanka to establish its pharmacognostic profile. **Materials and Methodology**: the constituents of the formulation included fine powder of seeds of *Elettaria cardamomum,* bark of *Cinnamomum zeylanicum*, fruits of *Piper longum*, siliceous concretion as the substitute for *Bambusa arundinacea* and sugar cubes. Cardamom seeds were collected and labelled respectively (C1-C8) from eight regions of Sri Lanka. (Badulla, Kandy, Kegalle, Kurunegala, Matale, Matara, Nuwara Eliya and Ratnapura). Using these samples, 16 different SC samples were prepared with two varieties of Cinnamon (*Sri Gemunu*-SC1 and *Sri Vijaya*-SC2) along with other ingredients. The 16 SC powder samples were examined through Zeiss Axio microscope equipped with a digital camera for morphological evaluation. **Results:** Parenchymatous cells with abundant simple and compound starch grains, stone cells, spiral vessels, pitted vessels, lignified fibers, cork cells, starch grains, oil globules, and amorphous sugary mass were commonly observed in all samples. Their similar diagnostic characters, indicated uniformity in formulation. **Conclusion:** Powder microscopy of 16 SC samples revealed consistent diagnostic features, confirming the identity, purity, and uniformity of the formulation while ruling out adulteration or substitution. Minor variations were attributed to their quality and quantities of phytochemical constituents. This study revealed that establishing powder microscopy as a reliable method to authenticate genuine raw materials of *Sitopaladi Churna* as a quality assessment.

Keywords: *Sitopaladi Churna*, Powder microscope, quality assessment

ONOPIPTR21

Phytochemical Retention vs. Functional Potency: Influence of formulation processing methods on polyherbal formulation.

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Inflammation and dyslipidemia are closely linked, as inflammatory mediators can disrupt lipid metabolism. Therefore, agents that modulate both pathways have significant clinical value. Balabilvashunti Decoction (BD) is a classical Ayurvedic formulation used for inflammatory and metabolic disorders. However, its efficacy can be influenced by processing methods, which affects compound stability and solubility. BD was prepared as a traditional decoction (TDF) and processed into spray-dried (SDF) and freeze-dried (FDF) powder forms. Phytochemical similarity was evaluated by High Performance Thin Layer Chromatography (HPTLC) using a Toluene:Hexane:Ethyl Acetate:Formic Acid:Methanol (4:3:9.6:0.5:1.4) solvent system. Anti-inflammatory activity was assessed via egg albumin denaturation assay, and hypolipidemic activity via the Liebermann-Burchard method. Diclofenac and atorvastatin served as respective standards. HPTLC analysis showed variation in the overall number of peaks among the three extracts, with the SDF and

FDF exhibiting several closely matching peaks. But all formulations shared three common peaks (Rf 0.69, 0.75, and 0.98), indicating the retention of similar phytoconstituents across all processing methods. However, pharmacological activities differed significantly. SDF demonstrated superior anti-inflammatory efficacy (IC_{50} = 5.11±0.08 mg/mL) relative to FDF (IC_{50} = 11.88±0.03 mg/mL) and TDF (IC_{50} = 8.57±0.15 mg/mL). Conversely, TDF exhibited the highest hypolipidemic potency (IC_{50} = 38.73±0.03 µg/mL), compared to FDF (IC_{50} = 182.20±2.98 µg/mL) and SDF (IC_{50} = 276.65±0.46 µg/mL). These findings indicate that although similar compounds are present, processing can alter pharmacological properties. Drying temperature and heat or air exposure may affect stability and cause degradation, emphasizing the need for formulation-specific optimization in novel multi-component phyto-therapeutics. **Keywords:** Spray dry, Freeze dry, Hypolipidemic, Anti-inflammatory

ONOPIPTR22

Evaluation of *in-vitro* glycemic regulatory and cholesterol-lowering activity of Trijatha formulation: an Ayurveda polyherbal formulation

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Background: Trijatha is a poly herbal formulation used mainly as a sub-ingredient of anti-diabetic medications in Ayurveda medicine. The three components in conventional Trijatha are Twak (bark of *Cinnamomum zeylanicum*), Ela (seeds of *Elettaria cardamomum*), and Pathra (leaves of *Cinnamomum tamala*). In the present study Trijatha formulation (TF) was prepared by substituting *C. zeylanicum* leaves, due to the unavailability of *C. tamala* in Sri Lanka. Present study aimed to evaluate *in-vitro* glycemic regulatory and cholesterol-lowering activity in TF prepared with different ratios of its components. **Materials and methods:** Bark of Sri Wijaya type of *C. zeylanicum* (SWB), leaves of Sri Wijaya type of *C. zeylanicum* (SWL), seeds of *E. cardamomum* from a cultivation field (CF) were used in 1:1:1 (R1), 2:1:1 (R2) and 2:2:1 (R3) ratios for glycemic regulatory (alpha-amylase inhibition (AA), alpha-glucosidase inhibition (AG), anti-glycation (AY)) and cholesterol-lowering (Lieberman-Burchard method) assays. **Results:** R3 showed the highest activities among the selected ratios (p<0.05). Ratios of TF (except R1) showed significantly higher AG and AY activity than the respective standards (p<0.05). IC_{50} (µg/mL) of R2: 121 ±4.3, R3: 83.2 ±1.9, standard (acarbose): 186.7 ±4.4 were in AG assay while R2: 151.8 ±6.6, R3: 107.6 ±4.5, standard (rutin): 250.4 ±4.4 were in AY assay. R3 showed the highest AA activity (IC_{50}: 209.7 ±8.2 µg/mL) and cholesterol-lowering activity (IC_{50}: 99.6 ±3.5 µg/mL) among the ratios (p<0.05). **Conclusion:** With exhibited *in-vitro* glycemic regulatory and cholesterol-lowering activities, it is worth investigating further to develop TF as a main polyherbal formulation. **Keywords:** *Cholesterol-lowering, glycemic regulatory, Trijatha, ratios*

ONOPIPTR23

Effectiveness of a traditional powder and a traditional oil in the Management of *Kitibha Kushta* with special references to Psoriasis – An Observational Case Study

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Kitibha Kushta, described in Ayurvedic classics as a type of *Kushta Roga* (skin disorder), closely resembles psoriasis in modern dermatology. Psoriasis is a chronic autoimmune condition characterized by erythematous, scaly plaques and recurrent flare-ups, affecting approximately 2–3% of the global population. Conventional therapies often provide only temporary relief and are associated with adverse effects, highlighting the need for safe, long-term alternatives. In Ayurveda, *Kitibha Kushta* is understood to arise from aggravated *Vata* and *Kapha* doshas, leading to dryness, scaling, and inflammation. Although traditional formulations have been used for centuries in Sri Lanka, systematic clinical observation of their effectiveness remains limited. This observational case study investigated the clinical effectiveness of a traditional powder and a traditional oil formulation in the management of *Kitibha Kushta* (psoriasis). A clinically diagnosed patient aged 35 years was treated according to Ayurvedic principles, administration of a traditional powder (5g twice daily with *anupana*) and external application of a traditional oil (*Abhyanga*, 90 ml) for four weeks. Outcomes were measured weekly using a gradation criteria and patient-reported self-assessment. Patient showed significant clinical improvement, with reduction in erythema (mean reduction 50%), scaling (66%), pruritus (66%), and lesion thickness (50%) by week 4. No severe adverse effects were observed. Follow-up at 4 weeks demonstrated sustained remission in patient. These findings suggest that traditional formulations provide safe and effective therapeutic options for psoriasis and warrant larger-scale clinical trials.
Keywords: *Kitibha Kushta*, Psoriasis, Ayurveda, Traditional Medicine, *Bahya Pratikara*

ONOPIPTR24

Pharmaceutical Transformation of a Traditional Remedy indicated for *Kapha -Vata jvara* in to Modern Dosage forms.

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Ayurveda, an ancient holistic medical system practiced for over 3000 years, emphasizes maintaining balance among the three *Doshas—Vata, Pitta,* and *Kapha*—to preserve health and manage disease. Although widely practiced, many Ayurvedic remedies lack rigorous scientific evaluation in modern pharmaceutical contexts. This study aimed to pharmaceutically transform a classical *Kashaya* indicated for *Kapha-Vata Jvara* into a medicated carbonated beverage to enhance palatability and consumer compliance while preserving therapeutic value. A simple and well-known formulation was selected from the Sri Lankan text *Sarasankshepaya* (*Jvara-chikitsa* section) containing ginger *(Zingiber officinale)*, coriander *(Coriandrum sativum)* and long pepper *(Piper longum)* with rock salt (q.s.). Authenticated and dried raw materials were used for the decoction. The decoction was supplemented with white sugar. Carbonated water and sodium benzoate were added to obtain a final fizzy beverage. The

formulation was evaluated for organoleptic, physicochemical, phytochemical parameters and chromatographic profiles. The pH was 4.17 and colour intensity value of 21–23. Qualitative phytochemical screening confirmed the presence of tannins, flavonoids, glycosides, simple sugars, and iodine. Carbonation, sweetening, and salt addition improved organoleptic properties with pungent and sweet taste, brown colour and fizzy liquid. Chromatographic studies of each ingredients showed four, three, five peaks with highest Rf values of 0.42, 0.50, 0.65 for ginger, coriander and long pepper respectively. The added preservative extended the shelf life. This novel carbonated *Kashaya* beverage would retain its proposed *Ama-pacana, Agni-dipana,* and *Jvaraghna* activities while offering a palatable and convenient alternative dosage form. Further preclinical and clinical studies are required to substantiate its safety and efficacy. **Keywords:** Carbonated beverage, Ginger, Coriander, *Jvara Chikithsa*, *Sarasankshepaya*

ONOPIPTR25

Pharmacognostical and chromatographic characteristics of *Abutilon indicum* plant used for wound healing action in the Sri Lankan traditional medical system

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Background- '*Beheth Anoda',* botanically identified as *Abutilon indicum,* is an important medicinal plant documented in classical texts of both Ayurveda and the Sri Lankan traditional medical system. The plant is being used in various forms for different disease conditions, such as decoction, powder, paste, etc. This research focuses on identifying the pharmacognostical and chromatographic features of the traditional *Beheth Anodha* leaves paste, mentioned in *Ayurveda Aushadha Sangrahaya* under *Lepa Kalpana,* which is practiced by the 'Morawaka' traditional lineage. The formulation mainly consists of leaves *of Beheth Anodha*, *Curcuma longa* (turmeric), red rice (*Kekulu haal*), and coconut milk (*Cocos nucifera*). **Materials and methods:** The paste was subjected to hot continuous extraction under reflux using methanol and dichloromethane (DCM), and the phytochemistry and chromatographic profiles. **Results:** In Ayurveda, wound healing effect (*Vrana Ropaṇa Karma)* refers to the systematic process of wound healing and restoration of normal tissue integrity. Ayurveda pharmacodynamic properties such as sweet (*Madhura), bitter (Tikta) ,pungent (Katu) and astringent (Kashaya) tasted (rasa);* light (*Laghu)* and unctuous (*Snigdha) qualities (guna)*; and Cold potency (*Sheetha veerya.*) collectively support cleansing, reduce inflammation, promote tissue regeneration, and stabilize wounds. The chromatographic characters were evaluated using Thin-Layer Chromatography (TLC) and high-performance thin-layer chromatography (HPTLC). The dichloromethane extract exhibited a greater number of peaks with higher peak values compared to the methanol extract. **Conclusion**: These results suggest the presence of semi-polar to non polar compound in the paste compared to polar compounds, which may contribute significantly to the wound-

healing potential of the traditional *Beheth Anodha* paste. However, further studies need to be done to evaluate the chemical profiles and their scientific evidence on wound healing action. **Keywords:** Ayurveda, Wound Healing, *Beheth Anodha*, *Vrana Ropaṇa*, Traditional Herbal Paste

ONOPIPTR26

Development of the Protocol for *In-Vitro* Propagation Of *Atalantia Ceylanica (Arn.) Oliv*

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Atalantia ceylanica (Family *Rutaceae*) is an endemic medicinal plant of Sri Lanka whose populations are declining due to habitat loss and overharvesting. *In-vitro* propagation offers a viable strategy for its conservation and suitable utilization. This study aims to develop an optimized *in-vitro* propagation protocol for *Atalantia ceylanica* by evaluating suitable explants, sterilization methods, culture media and plant growth regulators to enhance shoot induction, multiplication rooting etc. Seeds from field grown plants were surface sterilized using 70% alcohol for 1 minutes, followed by 1.8% Sodium Hypo chlorite for 20 minutes and then rinsed three times with sterile distilled water and kept the seeds on soaked filter papers from distilled water for 10 days. After cultured on Murashige and Skoog medium supplemented with two different plant growth regulators. The highest shoot induction (approximately 5-5.5cm) was obtained on MS medium with 2.0mg/L- Benzylaminopurrine (BAP) and 0.1 mg/L – Naphthaleneacetic acid (NAA). All the cultured plants were kept under 20^0C and sterile environment. The optimized protocol provides a reliable method for large-scale propagation and ex situ conservation of *Atalantia ceylanica* and may facilitate future phytochemical and pharmacological studies of this valuable species. **Keywords:** *Atalantia ceylanica,* micropropagation, *in-vitro* culture, Murashige and Skoog medium, shoot induction, rooting

ONOPIPTR27

Pharmacognostical, Phytochemical and Biological Evaluation of Selected Indian Medicinal Plants from Himachal Pradesh

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This study aimed to assess the pharmacognostic, phytochemical, and biological aspects of *Echinops niveus* Wall. ex Roxb., a medicinal plant prevalent in the mountainous areas of Himachal Pradesh, India. The pharmacognostical assessment comprised comprehensive macroscopic and microscopic analysis of the plant material, as well as the determination of physicochemical constants including ash levels, extractive values, moisture loss, and fluorescence properties. Diagnostic microscopic characteristics such as lignified vessels, fibers, trichomes, and calcium oxalate crystals were found, serving as dependable markers for verification. Initial phytochemical analysis of successive solvent extracts indicated the existence of significant secondary metabolites, including alkaloids, flavonoids, phenolic compounds, tannins, saponins, glycosides, and terpenoids. Quantitative analysis revealed substantial concentrations of total phenolics and

flavonoids, indicating noteworthy anti-inflammatory potential. The biological assessment was conducted utilizing established in vitro models. The extracts demonstrated significant nucleation assay in anti-urolithiasis experiments and revealed dose-dependent anti-inflammatory effects via protein denaturation and membrane stabilization techniques. The findings furnish scientific proof affirming the therapeutic significance of *Echinops niveus* and establish foundational data for its quality control, pharmacological validation, and subsequent isolation of bioactive elements. **Keywords:** *Echinops niveus,* Pharmacognostical evaluation, Phytochemical screening, Antioxidant activity, Anti-inflammatory activity, Anti-urolithiasis activity.

ONOPIPTR28

GC-MS Based Chemical Profiling of Rhizome Extracts of *Calanthe tricarinata* Lindl.

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Background: *Calanthe tricarinata* Lindl. (Orchidaceae), known as *Monkey Orchid*, is an erect terrestrial Himalayan orchid traditionally used for arthritis, cuts, wound swelling and digestive ailments. Despite its widespread ethnomedicinal relevance, systematic chemical characterization of its rhizome remains limited. Establishing its metabolite profile is essential for validating traditional uses and identifying candidates for pharmacological development. **Materials and Methods:** Rhizomes sample were collected from Deiya village (2,156-2,252 m) of Nerwa tehsil, Shimla district. Methanol and acetone extracts were prepared and analysed through Gas Chromatography-Mass Spectrometry (GC-MS) at the Central Instrumentation Laboratory, Central University of Punjab. **Results:** The methanol extract showed several major constituents including 9,12-octadecadienoic acid (30.03%), 5-hydroxymethylfurfural (15.08% and 11.76%), n-hexadecanoic acid (5.93%), γ-sitosterol (5.15%), 7,10,13-hexadecatrienoic acid (3.20%), genkwanin (1.62%) and trans-indigo (0.33%), along with multiple furanone, pyranone and phenolic derivatives. The acetone extract was enriched in lipophilic metabolites, with 9,12-octadecadienoic acid (45.00%), n-hexadecanoic acid (8.49%), β-sitosterol (7.74%), ergosta-5,22-dien-3-ol (6.04%), isatin (4.01%) and tryptanthrine (0.32%) as dominant constituents, reflecting a broad chemical spectrum of fatty acids, sterols, phenolics and alkaloids. **Conclusion:** The present chemical profiling of *C. tricarinata* establishes a clear baseline of diverse secondary metabolites, including fatty acids, sterols, phenolics and alkaloids. The presence of compounds with reported antioxidant, antimicrobial, anti-inflammatory and wound-healing activities provides scientific support for the plant's long-standing ethnomedicinal applications and the study opens avenues for targeted pharmacological screening and potential phytopharmaceutical development. **Keywords:** *Calanthe tricarinata*, GC-MS, Rhizome extract, Bioactive compounds, Shimla, Nerwa tehsil.

ONOPIPTR29

From Traditional Diet to Translational Innovation: Standardization and Nutraceutical Potential of Pancha Mutti Kanji for Tuberculosis-Associated Malnutrition

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Background: Tuberculosis (TB) remains a major public health challenge in India, with malnutrition significantly impairing

immune recovery and treatment outcomes. Translating traditional dietary knowledge into evidence-based, standardized innovations offers a sustainable approach to address TB-associated malnutrition within the AYUSH framework. **Materials and Methods:** Pancha Mutti Kanji (PMK), a traditional Siddha formulation, was prepared using equal proportions of green gram, black gram, Bengal gram, Toor dhal, and raw rice. The formulation was standardized and evaluated for nutritional composition, antioxidant activity (DPPH assay), anti-nutritional factors, and phytochemical fingerprinting using HPTLC to support quality control and translational readiness. **Results:** PMK exhibited high protein content (20.2 g/100 g) and exceptionally high folic acid levels (930 µg/serving), along with essential minerals such as iron and zinc. The formulation demonstrated strong antioxidant activity with 60% DPPH radical inhibition at 1000 mg/ml. Anti-nutritional factors were negligible, confirming high nutrient bioavailability. HPTLC fingerprinting established a reproducible phytochemical profile, supporting standardization and future product development. **Conclusion:** This study demonstrates the successful translation of a traditional dietary formulation into a standardized, scientifically validated, and potentially patentable AYUSH-based nutraceutical. Pancha Mutti Kanji represents a scalable, affordable innovation with strong public health relevance for TB nutritional support programs. **Keywords:** Pancha Mutti Kanji; Translational Research; AYUSH Innovation; Tuberculosis Malnutrition; Nutraceutical Development.

ONOPIPTR30

Comparative Evaluation of Drying-Induced Variations in Phytochemical Composition, Antioxidant Capacity, and Antimicrobial Activity of *Gymnema sylvestre* Leaves

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Gymnema Sylvestre (GS) is a medicinally important plant widely used in traditional medicine for the management of diabetes, obesity, and metabolic disorders, owing to its rich phytochemical composition, which includes gymnemic acids, triterpenoid saponins, flavonoids, tannins, and polyphenols. Post-harvest processing, particularly drying, plays a critical role in determining the stability, composition, and biological efficacy of these bioactive compounds. This study comparatively evaluates the effect of conventional sun drying (SD) and freeze-drying (FD) on the phytochemical profile, antioxidant capacity, and antimicrobial activity of GS leaves. Fresh leaves were subjected to SD and FD, followed by comprehensive physicochemical and biological analysis, including moisture determination, NIR and FTIR spectroscopy, TLC and HPTLC profiling, fluorescence analysis, DPPH and free radical scavenging assay, total phenolic content estimation, and agar diffusion-based antimicrobial testing against selected Gram-positive and Gram-negative bacteria. Both drying methods yielded powders within acceptable moisture limits, with FD

(1.2%) having a lower moisture content than FD (2%). However, FD samples exhibited superior preservation of functional groups and molecular integrity, as evidenced by sharper spectroscopic signals and a significantly greater phytochemical diversity on HPTLC. FD extracts exhibited markedly higher antioxidant activity and total phenolic content than their SD counterparts. Furthermore, FD extracts demonstrated enhanced antimicrobial efficacy, producing larger zones of inhibition against all tested bacterial strains. Overall, the findings indicate that FD is significantly more effective than SD in preserving phytochemical complexity and enhancing biological activity in GS leaves. These results underscore the importance of optimised drying techniques for ensuring quality, efficacy, and consistency in herbal and naturaceutical health products.
Keywords: Gymnema Sylvestre, Sun-drying, Freeze drying, Phytochemical preservation

ONOPIPTR31

Thymol-Embedded Biodegradable Starch Films from *Artocarpus lakoocha*: A Green Strategy for Shelf-Life Improvement in Food Packaging

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Background: The aim of this study is to develop a biodegradable film for the preservation of fruits by using nonconventional starch sources. Our objectives was to addition of thymol oil to enhance the fatty acid modified *Artocarpus lakoocha* starch films. To determine how fatty acid modified film influences the film properties and its protective effect on oxidation on the thymol- unloaded film was primary objective of this research. **Materials and Methods:** The fabrication of film was done using solvent-casting method. Then, its physicochemical, mechanical, microstructural, thermal stability, analytical profile and antioxidant activity were determined. **Results:** The findings revealed that modification by fatty acid decreases the water content (10.30 ± 1.02) and enhances transparency (29.66 ± 0.42) as relative to native starch films (42.64 ± 1.18). A smooth and homogenous surface was observed by SEM analysis, while A- type crystallinity in native starch was found in X-ray diffraction. FTIR revealed the hydrogen bond interaction between fatty acid, thymol, starch, and glycerol. It confirms the stability of the film. The excellent stability was observed by thermal analysis. The film strength, flexibility, and overall functionality were significantly improved. Antioxidant properties was observed in thymol incorporated film, the modified starch with stearic acid showed a best DPPH radical scavenging activity (90.01 %). **Conclusion:** The overall findings of the study highlight the underutilize starch source can be used for fabricating biodegradable antioxidant films for the preservation of fruits. That could be serve as ecofriendly sustainable film for biobased fruit preservation as packaging materials.
Keywords: Biodegradable film, *Artocarpus lakoocha,* Thymol, Ecofriendly, Fruit preservation

ONOPIPTR32

Scientific Assessment of Siddha Purification (Suddhi) Process of Muthu (Pearl) Using Modern Instrumental Methods

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Background: Muthu (Pearl) is an important marine drug widely used in Siddha medicine for the management of eye disorders, kapha diseases, toxins, and nervous system ailments. Classical Siddha texts emphasize purification (*Suddhi*) as an essential step to ensure safety and therapeutic efficacy of mineral drugs. However, scientific validation and standardization of the purification process of Muthu remain limited. **Materials and Methods:** Raw Muthu was procured from an indigenous drug source and purified according to Siddha literature using curd and sunlight exposure in repeated cycles. Both unpurified and purified samples were subjected to comprehensive instrumental analyses including Inductively Coupled Plasma–Optical Emission Spectrometry (ICP-OES), Atomic Absorption Spectrometry (AAS), Fourier Transform Infrared Spectroscopy (FTIR), X-Ray Powder Diffraction (XRD), Scanning Electron Microscopy (SEM), and Energy-Dispersive X-Ray Spectroscopy (EDX) to evaluate elemental composition, heavy metal content, functional groups, crystalline structure, and surface morphology. **Results:** Instrumental analysis confirmed calcium as the major constituent in both samples, consistent with the calcium carbonate nature of pearl. FTIR and XRD analyses demonstrated preservation of functional groups and crystalline structure after purification, with improved crystallinity in purified Muthu. SEM revealed smoother surface morphology and reduced agglomeration in purified samples. ICP-OES, AAS, and EDX analyses showed absence of toxic heavy metals such as lead, arsenic, cadmium, and mercury, confirming the safety of purified Muthu. **Conclusion:** The study scientifically validates the traditional Siddha purification process of Muthu, demonstrating improved physicochemical characteristics and confirmed toxicological safety. These findings support standardization and quality control of Muthu, reinforcing its safe therapeutic use in Siddha medicine. **Keywords:** Siddha Medicine, Muthu (Pearl), Purification, Instrumental Analysis, Standardization

ONOPIPTR33

In-Vitro and *In-Silico* Antibacterial Potential of Oleanen-3-Acetate (Beta Amyrin Acetate) Isolated from the Ethyl Acetate Ex[1]tract of Stem Bark of *Senna siamea* against Clinical Isolates.

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Background: The escalating global burden of antimicrobial resistance (AMR) continues to undermine the effectiveness of conventional antibiotics, gradually eroding the foundation on which the cornerstone of modern medicine was built upon thereby contributing to rising treatment failures, healthcare expenditures, and mortality. This study integrates *in vitro* and *in silico* methodologies to assess the antimicrobial potential of Oleanen-3-acetate (β-amyrin acetate) isolated from the Stem bark of *Senna siamea* against clinical bacterial pathogens. **Methods:** The separation and isolation of the compounds were carried out using standard chromatographic techniques. Their structures were elucidated through Gas Chromatographic -

Mass Spectrometry analyses, and further confirmed by comparison with previously reported literature values. Antimicrobial evaluation was performed using agar disc diffusion and broth dilution assays. **Results:** The compound exhibited pronounced, concentration-dependent antibacterial activity, with the highest inhibition observed at 5 mg/ml. *Staphylococcus aureus* (30 mm) and *Pseudomonas aeruginosa* (29 mm) demonstrated the greatest susceptibility, whereas *Klebsiella pneumoniae* was least sensitive (18 mm). *Pseudomonas, E.coli and Klebsiella* showed MIC at 1.25mg/ml while *S. aureus* showed MIC at 1.75mg/ml. *Pseudomonas, E.coli and K. pneumoniae* showed MBC at 1.50mg/ml while *Staphylococcus aureus* showed MBC at 1.75mg/ml. Activity at 5 mg/mL was comparable to ciprofloxacin, underscoring its broad-spectrum potential. A molecular docking study was carried out against four bacteria protein targets (UDP-galactopyranose mutase (an isomerase), from *Escherichia coli* (1I8T), carbapenemase KPC-2 β-lactamase (serine β-lactamase) Class (hydrolase) from *Klebsiella pneumoniae* (6J8Q), Surface adhesion protein (SasG) from *Staphylococcus aureus* (8TB2), Outer-membrane porin (OprD) a membrane transport protein from *Pseudomonas aeruginosa* (2ODJ) yielding favourable binding energies (–8.6 to –10.3 kcal/mol), dominated by hydrophobic interactions, with a notable hydrogen bond observed in the 2ODJ complex. The most susceptible protein target was the Outer-membrane porin (OprD) a membrane transport protein. **Conclusion** These findings collectively indicate that Oleanen-3-acetate is a promising natural scaffold for further antimicrobial development, particularly against multidrug-resistant pathogens.

Keywords: Oleanen-3-acetate, *Senna siamae,* In-silico Antimcrobial potential, Clinical isolates

ONOPIPTR34

In Vivo Anticancer Activity of Pancha Pasaana Chendhuram (PPC), in Dalton's Lymphoma Ascites Tumour Bearing Mice

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Background: Cancer is a major global health problem and there is increasing interest in traditional medicinal systems for the discovery of novel anticancer agents. Siddha medicine includes several herbo metallic formulations used for chronic diseases including cancer. *Pancha Pasaana Chendhuram* (PPC) is a classical Siddha preparation and the present study aimed to evaluate its in vivo anticancer activity. **Materials and Methods:** The anticancer activity of PPC was evaluated in female Swiss albino mice (25–30 g) after Institutional Animal Ethics Committee approval (IAEC No: 267/2017). Animals were divided into six groups (n=6). Dalton's Lymphoma Ascites (DLA) tumour cells (1×10^6) were inoculated subcutaneously. After 24 hours, treatment was initiated and continued for 30 days. The groups included normal control, DLA control, reference control (Cisplatin 3.5 mg/kg, i.p., once weekly), and PPC-treated groups at doses of 1, 3, and 6 mg/kg (p.o.). Tumour volume was measured every 5 days using a Vernier calliper and tumour weight was recorded at the end of the study. **Results:** PPC treatment significantly reduced tumour volume and tumour weight

compared to the DLA control group. Cisplatin produced 70.22% tumour growth inhibition. PPC also showed notable inhibition of tumour growth, with reductions of 36.80%, 54.74%, and 59.23% at doses of 1, 3, and 6 mg/kg respectively. **Conclusion:** The findings indicate that *Pancha Pasaana Chendhuram* possesses significant in vivo antitumor activity in DLA tumour-bearing mice, supporting its potential as a Siddha-based therapeutic candidate for cancer management. **Keywords:** Pancha *Pasaana Chendhuram,* Siddha medicine, Anticancer activity, Dalton's lymphoma ascites, In vivo study.

ONOPIPTR35

A Novel Siddha Inspired Functional Chocolate *"Happiy Dates"* - Intended For Menstrual Wellness

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Background: Dysmenorrhea is one of the most common menstrual complaints among young women, leading to pain, absenteeism, and reduced productivity. While traditional Siddha medicines are effective in relieving menstrual discomfort, their conventional dosage form leads to low acceptance and poor compliance. Frequent use of analgesics may be associated with dependency and adverse effects. This creates a need for a safe, and user-friendly menstrual wellness solution that is both effective and acceptable. To develop a Siddha-inspired functional chocolate to support menstrual comfort, while improving compliance and ease of use. **Methodology**: The formulation concept is based on Siddha principles focusing on pain reduction, muscle relaxation properties. These principles are integrated with food science by selecting chocolate as a palatable and familiar delivery medium. Chocolate is known to support mood enhancement and stress reduction, which positively influence menstrual comfort. Traditional menstrual wellness concepts are thus adapted into a contemporary, lifestyle-friendly format. **Results**: The proposed product, HAPPIY DATES, is standardized which offers a modern delivery system that, It supports relaxation, ease of menstrual cramps, and regular consumption, thereby enhancing user compliance and daily functionality during menstruation. **Conclusion**: HAPPIY DATES successfully bridges traditional Siddha wisdom through modern delivery system, providing an acceptable and innovative approach to menstrual wellness. **Keywords**: Menstrual wellness, Dark chocolate, Mood swings.

ONOPIPTR36

Management of Psoriasis (*Mandal Kustha*) through *Sanshaman Chikitsa*

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Background-The *Ayurvedic* concept of Psoriasis highlights the inter-relationship between *Dosha*, *Dushya* and *Agni*, making its management both challenging and holistic. *Mandal Kustha* is a *Kapha Pradhan Vyadhi* with *Pitta Anubandha*. It involves *Tridosha and Dushya Twak, Rasa, Mamsa and Lasika.* **Case-** A 38-years-old female, complaining of erythematous lesions associated with itching and scaling on nape of the neck and scalp. **Methodology-** Psoriasis was assessed by Psoriasis area severity index (PASI) score. *Rasmanikya, Chandramrit rasa, Pittantak yoga, Shuddh gandhaka, pravala Bhasma, shankha Bhasma, Triphala churna, vidanga churna, Amalaki churna, Mahamanjisthadi kwath, Triphala guggulu, Kaishor guggulu, Vindhyaderm* powder for oral medication and *Nisorea* oil and *Bhritmarichyadi* oil for local application. **Result-** Erythematous

scaly lesion diminished totally after taking 6 months treatment and before treatment PASI score was 1.8 and after treatment it reduces to 0. **Conclusion-** *Mandal kustha* is a *Kapha Pradhan Vyadhi* and treatment provided was *Ushna, Tikshana, Tridosha shamaka.* **Keywords-** Psoriasis, *Mandal Kustha, Tridosha*

ONOPIPTR37

Synthesis and Characterization of CeO_2 Nanoparticles for the Photocatalytic Breakdown of Persistent Organic Pollutants

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Photocatalytic degradation utilizing nanomaterials offers a superior pathway for neutralizing non-biodegradable cationic dyes in industrial wastewater. This study details the chemical synthesis of cerium oxide (CeO_2) nanoparticles through a simple, cost-efficient precipitation method designed for industrial scalability. The synthesized CeO_2 exhibited exceptional photocatalytic performance under UV-Visible irradiation, attributed to its characteristic fluorite structure and the Ce^{3+}/Ce^{4+} redox couple which facilitates electron transfer. To validate the structural and optical properties of the catalyst, analytical techniques including XRD, FT-IR, UV-DRS, and FE-SEM were employed, with zeta potential analysis ensuring high surface activity and stability. Our findings confirm that these CeO_2 nanoparticles serve as an effective, high-performance photocatalyst for the mineralization of organic contaminants. The study highlights the potential of CeO_2 based systems as a scalable solution for modern environmental challenges. **Keywords:** CeO_2, Cationic dye, Degradation, Photocatalyst

ONOPIPTR38

Isolation and Characterization of Ferulic Acid from Plant Sources and its Treatment in Depression

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Background: Changes in neurotransmitter levels, oxidative stress, and inflammation are linked to depression, a major mental health condition worldwide. Due to their therapeutic and safety potential, natural plant compounds are gaining attention. Ferulic acid, a phenolic compound found in plants such as rice bran, wheat, oats, and medicinal herbs, exhibits antioxidant, anti-inflammatory, and neuroprotective properties that may be beneficial in managing depression. **Methods:** Alkaline hydrolysis, solvent extraction, and chromatographic purification (e.g., HPLC) are among the more recent and conventional methods of extracting ferulic acid from plant sources that are the subject of this study. Additionally, the mechanisms of action and therapeutic efficacy of ferulic acid's antidepressant potential were examined in both preclinical and clinical studies. **Results:** Utilizing optimized extraction and purification techniques, ferulic acid can be isolated from plant materials with high purity and efficiency. Experimental studies indicate that ferulic acid exerts antidepressant-like effects by modulating neurotransmitters (serotonin, dopamine), reducing oxidative stress, and inhibiting inflammatory pathways. Additionally, it protects neuronal cells and increases neurogenesis. In experimental models, it has better safety profiles and fewer side effects than conventional antidepressants. **Conclusion:** Ferulic acid is a promising bioactive compound derived from plants that has a lot of potential for depression treatment. Its use as a complementary therapeutic agent is

supported by the combination of its antioxidant and neuroprotective properties. However, further large-scale clinical trials are required to establish its efficacy and safety in humans. **Keywords:** Ferulic Acid, Depression, Plant Extraction, Antioxidant, Neuroprotection, Phytochemicals.

ONOPIPTR39

Technological Advances in Natural Product Drug Discovery

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Drug regulation is an integral part of the public health policy of a country and India's journey of drug regulation started in the third decade of the nineteenth century. Recognizing the growing need to create regulatory mechanisms or frameworks to prevent non-compliant drugs, the government passed the Drugs and Cosmetics Act, 1940 (DCA) after the recommendation of the Chopra Committee to have drug regulations in the country. To address increasing commercialization in the preparation and marketing of Ayurveda, Siddha, and Unani (ASU) drugs and to ensure the interests of the profession and public, the DCA was amended to include provisions of ASU drugs in 1964 wherein DCA comprises a dedicated chapter for regulatory provisions of ASU drugs. The recent expansion in the size of the Ayush market has reflected a strong need for strengthening of central and state drug regulatory framework, pharmacopeial standards,revision and updating Schedule I, Schedule E-1, and provisions related to good manufacturing practices (GMP), export of Ayush products so as to bring a paradigm shift in Ayush drug regulations and its global market Ayurveda, the ancient Indian system of medicine, offers a rich treasure of time-tested herbal, herbo-mineral and mineral formulations and contains holistic therapeutic principles. With the growing global demand on health care products, there is a persistent need to reassess and reinterpret Ayurvedic formulations through the lens of modern science. This paper explores the development of innovative Ayurvedic formulations that integrate traditional knowledge with modern pharmacological insights, standardization techniques, and clinical validations. It highlights the role of phytochemical profiling, nanotechnology, and synergistic compound optimization in enhancing therapeutic efficacy and bioavailability. By bridging ancient Ayurvedic wisdom with cutting-edge biomedical research, this approach not only reinforces the credibility of Ayurvedic practices but also facilitates their integration into mainstream healthcare systems. The study underscores the potential of such innovations in addressing contemporary health challenges while preserving the philosophical and ecological ethos of Ayurveda. **Keywords**: Innovative Ayurvedic formulations, traditional medicine, pharmacological validation, phytochemical profiling, nanotechnology, bioavailability, integrative healthcare

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