INTERNATIONAL CONFERENCE
on

LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY

15th, 16th, 17th January 2025

Souvenir

Organized by :

ST.WILFRED'S P.G. COLLEGE

Sector-10, Meera Marg, Madhyam Marg,
Mansarovar, Jaipur, Rajasthan, INDIA
in association with

BSM (Bhartiya Shikshan Mandal Jaipur Prant)

www.stwilfredscollege.com

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Shri Vasudev Devnani
Honorable Speaker
Rajasthan Legislative Assembly

Message

वासुदेव देवनानी

सत्यमेव जयते
अध्यक्ष
राजस्थान विधान सभा

क्रमांक R-225 दिनांक 10.01.2025

Message

I am very happy to know that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

The theme of the conference is extremely important as it touches every living organism on this planet. This conference will provide a platform for deliberations on very important topics to discuss. The findings of this conference will be a great benefit to the research scholars, educationists, environmentalists and the scientists. I wish good luck to the organizing committee and the management.

(वासुदेव देवनानी)

Dr. Fareeda Hasani
Principal & Convener
St. Wilfred's P.G. College
Jaipur.

Shri Madan Dilawar

Honorable Minister for School Education of Rajasthan

Government of Rajasthan

Message

I am glad to know that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

This conference is of great relevance as the theme of this conference is very pertinent to every living being. I hope it will open new aspects and new dimensions for the academicians, researchers, scientists and the students as well. We need to spread awareness regarding sustainability of Life Science and Environment.

I wish all success to the organizing team and the management of the conference.

Madan Dilawar

Prof. Ashok Kumar

Former Vice-Chancellor
Deen Dayal Upadhyay University, Gorakhpur
CSJM University, Kanpur

Message

It is a matter of great pleasure to know that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

The conference is multidisciplinary and the topic is very pertinent to each and every living being. It will open new aspects and new dimensions for the academicians, researchers, scientists and students as well.

I hope the discussion and conclusion during this conference will be beneficial for everyone.

I convey my best wishes for the conference

Prof. Ashok Kumar

Dr. Keshav Badaya
Secretary
St. Wilfred's Education Society

Message

It's a matter of immense pleasure for us that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

I felicitate all the delegates from Abroad and India on behalf of St. Wilfred's society. We are committed for providing quality education imbibed with Indian values to our students. In the span of 24 years we have broadened our horizons and our students are excelling in academics & in other co-curricular activities. For the holistic development of the students International Conferences & National Seminars are organized in college time to time.

The conference is multidisciplinary and highly relevant to the current context. It will pave the way for new perspectives and opportunities for academicians, researchers, scientists, and students alike.

I am sure that all the delegates will enhance their knowledge from the scientific deliberations, will have a comfortable stay and a memorable time in the Capital of Rajasthan.

Warm Wishes

Dr. Keshav Badaya

Prof. Tribhuwan Singh
Co-Chairman
Former Head, Department of Botany,
UOR, Jaipur

Message

I am happy to know that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

The theme of the conference is very significant as sustainability of Life Science and Environment and its impact on living beings is of great importance in present time. It will be a beneficial expense for the students and other participants as they will get an exposure to this very sensitive issue.

I convey my best wishes to the organizers and the management of the society for bringing together intellectuals, academicians and delegates from all over the world on a common platform.
I convey my best wishes to the organizing team.

Tribhuwan Singh

Prof. Tribhuwan Singh

Prof. M.K. Pandit
Co-Chairman
Former Head, Department of Geology,
UOR, Jaipur

Message

I am very happy to know that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

The theme is contemporary and the Conference will provide a platform for academicians and students to deliberate upon the Sustainability of Life Science & Environment for all living beings on this planet, especially the mankind. The topic is of immense significance and touches each one of us in some way or the other.

I congratulate the organizers of this conference and wish them success.

Prof. M.K. Pandit

Prof. G.P. Singh
Convener & Principal,
University Maharaja College,
University of Rajasthan, Jaipur

Message

It's a matter of immense pleasure for us that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize an International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

Conferences provide an opportunity to all the participants to share their views. This conference is on a topic of great relevance. Sustainability of Life Science and Environment is something which concerns everyone. The outcomes of the deliberations will be beneficial for the students, research scholars, academicians and the society in general.

I wish great success to this conference.

Prof. G.P. Singh

Prof. Hemant Pareek
Convener & Principal
A.P.J Abdul Kalam Government Girls College
Gangapole, Jaipur

Message

It's a matter of immense pleasure for us that St. Wilfred's P.G. College in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) is going to organize International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

Conferences offer participants a platform to exchange their perspectives. This conference addresses a highly relevant topic. The shifting climate is a matter of universal concern. The discussions and insights from this event will prove valuable to students, researchers, academician, and society as a whole.

I wish great success to this conference.

Dr. Hemant Pareek

Prof. Fareeda Hasani
Convener & Principal
St. Wilfred's PG College, Jaipur

Message

It gives me immense pleasure that we are organizing a conference in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES) on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025.

This conference will cover a wide range of very relevant themes relating to environmental issues and its impact on our planet. As educators, researchers, and society, we stand at the forefront of a crucial global movement. This conference serves as a platform to exchange ideas, share best practices and develop actionable solutions to the environmental challenges that affect us all. I hope this conference will prove to be a great success and open new dimensions and novel aspects regarding the issue of great concern.

I convey my best wishes for the success of the conference.

Fareeda

Prof. Fareeda Hasani

Prof. Dileep Gupta
Organizing Secretary
Head Department of Botany
St. Wilfred's PG College, Jaipur

Message

On behalf of the organizing committee I feel happy to welcome all the Eminent Educationists, Renowned Academicians, Scientists, Research Scholars, Students and the Environmentalists who have come from different parts of India & abroad to participate in this International Conference. I am delighted that St. Wilfred's P.G. College has provided such a huge platform to all the intellectuals to discuss and interact on relevant issues. It is my privilege that we are organizing International Conference on the topic "LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY" on 15th, 16th & 17th January, 2025 in association with Bhartiya Shikhan Mandal, Jaipur Prant under the auspices of Society for Plant Research (India) and ISLS (INTERNATIONAL SOCIETY FOR LIFE SCIENCES).

I hope the deliberation in conference will help us to understand the Impact of life Science on Environmental Sustainability. It is a topic of great relevance today as the consequences of Environmental Changes on living beings cannot be ignored at any level. The outcome of the conference will be beneficial for everyone. Once again I extend my gracious welcome to all the delegates and assure them for their soothing and pleasant stay.

Prof. Dileep Gupta

International Conference on Life Science & Environment Sustainability 2025

Scientific Program sheet (15-17 Jan 2025)		
Day-1, Wednesday, January 15, 2025		
10:00 - 10:30	**Registration**	
10:30--11:40	**Inaugural Functions**	
11:40-12:10	**High Tea**	
Session-I	Chairpersons: Prof. Ashwani Kumar & Prof. M. B. Siddique	
12:10-12:40	Keynote Address by **Prof. Lal Marvin Dharmasiri, Sri Lanka**	
12:40-13:10	Plenary Talk by **Prof. Ashok Kumar,India**	Cancer:-A Preventable Epidemic? The Role of life style and Environment
13:10-13:40	Plenary Talk by **Prof. S.B. Babbar, India**	DNA Barcoding: What, Why, When and How?
13:40-14:30	**Lunch**	
Session-II	Chairpersons: Prof.T. Singh & Prof. Sadhana Babbar	
14:30 - 15:00	Plenary Talk by **Prof. M.K Pandit, India**	Minding and environmental sustainability transforming problem into solution
15:00-15:30	Plenary Talk by **Prof. Narendra Singh, India**	
15:30-16:00	Invited Talk by **Prof. P.K. Kasera,India**	“Indigenous Medicinal Plants of the Indian Arid Zone”
16:00-16:30	Invited Talk by **Prof. Monika Kanan**	
16:30-17:00	**Tea**	

Day-2, Thursday, January 16, 2025		
9:00-9:30	**Poster Presentation(P-1 to 50)**	
session-III	Chairpersons: Prof. M. K. Pandit & Prof.R.A. Sharma	
09:30 - 10:00	Keynote Address by **Prof. N. K. Dubey**	
10:00 - 10:30	Plenary Talk by **Prof. S.K. Bhatnagar,India**	ENVIRONMENTAL GLORY: ARE WE ABLE TO SUSTAIN ?
10:30 - 11:00	Plenary Talk by **Prof. Ramphal Sharma**	Today need of Nanotechnology for Medical Applications
11:00 - 11:30	Plenary Talk by **Prof. T. I. Khan**	Climate Change, Biodiversity and Sustainability
11:30 - 11:45	**Tea Break**	
Session-IV	Chairpersons: Prof.Madhu Kumar & Prof. Alok Chaturvedi	
11:45: 12:15	**Invited Talk by** **Prof. Sapna Jadon, USA**	Solar recovery of copper and other metals using functionslized materials
12:15: 12:45	Plenary Talk by **Dr. Sikha Tiwari**	
12:45: 13:15	Invited Talk by **Prof. Mukesh Kumar,India**	GTW:A POSSIBLE HERBAL MALE BIRTH CONTROL PILL?
13:15: 13:45	Plenary Talk by **Prof. R. S. Gajraj, India**	
13:45: 14:30	**Lunch**	
Session-V	Chairpersons: Prof. Anita Sharma & Dr. Trapti Gupta	
14:30-15:00	Invited Talk by **Prof. Hemant Pareek,India**	Bioassay-Guided Anti-Diabetic Activity by Isolation and Identification of Active Compounds from Tridax procumbens
15:00-15:30	Invited Talk by **Prof. Shilpi Rijhwani, India**	

15:30-16:00	**Plenary Talk by** **Prof. N. P. Singh, India**	Xenobiotic- challenge to environment
16:00-16:30	Inivited Talk by **Prof.Girraj Singh Meena**	
16:30-17:00	**Tea**	
Day-3, Friday, January 17, 2025		
Session-VI	Chairpersons: Prof. Rekha vijyavargia & Prof. Sunita Kachwaha	
09:30-10:00	Plenary Talk by **Prof. Vinod Bhardwaj, India**	Educating Youth for Environmental Management : Roles and Responsibilities
10:00-10:30	Inivited Talk by **Prof. Deep Jyoti Chakraborty**	Sustainable utilization of Medicinal plants: from traditional approaches to innovative tools and techniques
11:30-12:00	Inivited Talk by **Dr. Bharat Singh**	Plant cell culture engineering used in increasing the secondary metabolites production in medical plants
12:00-01:00	Velidictory Ceremony	
01:00-02:00	**Lunch**	

St. Wilfred's Group of Colleges
Wilfred's: A Journey towards perfection

With this mission and aim St. Wilfred's Group of Institutions began its Voyage in 2001 with a handful of courses and a few students. A small effort makes a big difference and the group has gradually established several academic institutions in and outside Rajasthan. We have 19 sister branches in Jaipur, Pink City, in Ajmer, the Religious hub and even in the city of Bollywood, Mumbai. When the phenomenon of Co-education was obsolete, Shri Suresh Kumar Gupta and Dr. Keshav Badaya, the founders of this institution took it as a challenge and initiated first private English medium Co-educational institute.

Since its inception in the year 2001 under the ages of St. Wilfred's Education Society, the group has widened its horizon and is running various professional, post graduate, law, and architecture and engineering colleges. Over a time span of 24 years, St. Wilfred's Universe boasts of student population of more than 10,000. It offers nearly 50 UG and PG academic and professional programs.

The group is also felicitated with the Education Excellence Award-Best Private Educational Institute of 2013 for providing best services in the field of academics and education. St. Wilfred's College is awarded third position in the Top ten lists of the best co-educational private institutional of 2014 by India Today Magazine in a Survey conducted by 'Nielsen'. In 2015 our group has been ranked 21th & 24th in the best colleges of India by Nielsen survey (India Today). In 2017, a new feather added in a cap, the group has been awarded 16th Rank in top 40 colleges of India. For providing quality education our group has recently been awarded Overall Excellence Award 2017 by shri vasudev devnani.

Our Strength

- Campus at Mumbai, Jaipur, Ajmer
- Awarded Best Private Education Institute of 2013 & 2014 and 21st Rank in Top 40 colleges of India, Awarded 16th Rank in the best colleges of INDIA, overall excellence award 2017 by Nielsen Survey. 12000+ Students, 500000+ Sqft. Modem Constructions, 600+ Faculties, 5000+Scholarships
- The most hi tech campus designed to meet global standards. State-of-the-Art Infrastructure include spacious and airy learning rooms, Well equipped Science Laboratories, Modem Computer labs, Well stocked library, large play grounds and full facilities for Games and Sports
- Personality development program and emphasis on English and Business etiquettes. Academic sound, gleaned and experienced faculty
- Teaching on value based life style.
- Practical and Industry Oriented curriculum based on the value of 4 Ps, Purpose, Perspective, Patience and Pride.
- Innovative Programmes such as National level Seminars, Conferences, Workshops, Presentations, Symposia and Interaction with renowned professors.
- Experts of Various Universities, Industry and Corporate world. A team of experienced and expert counselors to help students

INTERNATIONAL SOCIETY FOR LIFE SCIENCES (ISLS)

The International Society for Life Sciences (ISLS) is a premier scientific society established in 2012 and offcially get registered in 2016. The move for the formation of International Society for Life Sciences (ISLS) was initiated in the Department of Zoology, University of Rajasthan in academic leadership of Prof. Ashok Kumar, presently Vice Chancellor, DDU University, Gorakhpur, UP, wherein the research scholars, faculty and senior faculty members of various universities, institutions and adjacent government colleges unanimously agreed to start this society to foster the progress and recent developments in the field of life sciences. The International Society for Life Sciences was instituted with following objectives:-

a) To provide a forum for the discussion of Scientific, Clinical, Social, Legal and Veterinary knowledge on all aspects of Life Sciences.
b) To facilitate exchange of knowledge and ideas in the emerging area of life sciences through Seminars, Workshops, Conferences and Meetings held form time to time.
c) To approve/promote establishments of forums, hospitals, units, chapter in different geographical locations.
d) To maintain fellow and fraternity amongst the members of the society by promoting social and cultural association amongst themselves and also institute the awards/fellowships as incentive /support.
e) To foster the collaborations among the members and the institutions of Government and public for Scientific and academic purposes.
f) To promote the growth of the all discipline of Life Sciences.
g) To maintain benevolent fund to help individual member of the society and students in case of distress.
h) To prepare, print and publish papers, periodicals, monographs and books, to organize libraries, references and information system, processing centers, laboratory analysis, demonstration and common services relevant and necessary for further enhance the objectives of society.
i) To revive, strengthen, sponsor and open education institution and take step for imparting Education, Computer Education, Illiteracy eradicatin, Research & Training in information technology and alternative energy sources and spread consciousness for Literacy and Anti-Intoxication.
j) To conduct programs for skill development, health awareness for malnutrition, child and women welfare, rural & tribal development & population control.
k) To Catalyse Agro Industrial growth, conservation of Environmental & Natural Resources.
l) To do all such things as may be deemed incidental or conductive to the attainment of the foregoint objects. The Society may accept any contribution, donation, fees, grants from Government, funding agencies, private industry or public for carrying our projects and functions in consonance with the objectives and spirit of the society.

m) The Society may acquire any property either by gift, purchase, loan or lease or hire, movable or immovable property required for the purpose of the smooth functioning of the Society. The property or money so acquired by the Society will be dealt in by the authorized Execute e Committee member of the Society in manner benefiting with holding the dignity of the Society.

Actively participate in the programs/schemes launched by the government agencies.

ISLS Executive Committee

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Prof. Ashok Kumar
Former Vice-Chancellor,
Deen Dayal Upadhaya Gorakhpur University,
Gorakhpur (UP)

Vice-Presidents

Prof. G. C. Jain
UGC-Emeritus Professor
Department of Zoology
University of Rajasthan, Jaipur

Dr. Atul Gupta
Director
HCMS
Jaipur

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Lecturer
Department of Zoology
S. K. Govt. P G. College, SIKAR

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Lecturer
Department of Zoology
Govt. P. G. College. Sawai Madhopur

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UGC-Emeritus Professor
Department of Zoology
University of Rajasthan, Jaipur

Prof. P. N. Saxena
Professor,
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Dr. B.R Ambedkar University, Agra

Dr. Gajendra Pal Singh
Associate Professor Department of Botany,
University of Rajasthan, Jaipur

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SPC Govt. College Ajmer, Ajmer

Dr. Madan M Mahawar
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Dr. Baiju Mathur
Asst. Director,
Forensic Science Department Udaipur

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HoD
Department of Biotechnology,
University of Mumbai,
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Lecturer
Department of Chemistry Govt. P. G. College
Rajgarh, Alwar

Dr. Mukesh Kr. Sharma
Lecturer
Department of Zoology,
SPC Govt. College Ajmer, Ajmer

Dr. Rashmi Pareek
Lecturer
Department of Botany.
Govt. College Behror. Alwar

Co-opted Members (2017-18)

Dr. Praveen Katiyar
Coordinator
University Institute of Health Sciences,
CSJM University,
Kanpur

Prof. Sant Prakash
Professor & Head
Department of Zoology
Dayalbagh Educational Institute (Deemed University)
Dayalbagh. Agra

KEYNOTE ADDRESS & ORATION

INTERNATIONAL CONFERENCE
On
LIFE SCIENCE & ENVIRONMENT SUSTAINABILITY
16th, 17th, 18th January 2025
Available at stwilfredscollege.com/conference

Human - Monkey Conflict in South Asia: Challenges and Strategies for Coexistence and Environmental Sustainability with a Focus on Sri Lanka and India.

Lal Mervin Dharmasiri[1]

Senior Professor, Cadre Chair,
Head of the Department of Geography,
University of Kelaniya, Sri Lanka.
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Abstract

The human-monkey conflict in South Asia, particularly in Sri Lanka and India, has emerged as a significant challenge, intertwining biodiversity conservation, human welfare, and environmental sustainability. In Sri Lanka, the macaques, purple-faced langurs, and gray langurs cause substantial crop damage, especially to coconuts, while also disrupting infrastructure and posing health risks through disease transmission. With an estimated 3 million monkeys in Sri Lanka and over 50 million in India, the conflict intensifies due to urbanization, deforestation, and habitat fragmentation. The economic losses, including an estimated 55.3 billion Sri Lankan rupees in 2024, reflect the severity of the issue. Despite the cultural reverence for monkeys, their adaptation to human settlements exacerbates the problem. Addressing this challenge requires a multi-faceted approach, including habitat restoration, community-based conflict mitigation, sustainable urban planning, and scientific research. Strategies like translocation, sterilization, and the installation of repellents are being adopted in Sri Lanka, alongside regional cooperation for more effective management. This discussion is about the key challenges of habitat loss, changing monkey behavior, and cultural perceptions, while offering strategies to mitigate conflict and foster coexistence. The goal is to ensure the long-term environmental sustainability of both human and wildlife populations in South Asia through collaborative efforts and informed policy frameworks. However, experiences of India of human-monkey coexistence will provide valuable lessons for neighboring countries like Sri Lanka.

Keywords: Human-Monkey Conflict, Biodiversity Conservation, Economic Losses, Urbanization and Habitat Fragmentation, Coexistence Strategies.

Invited Lectures

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Environmental Management and Implication of the Human Development

ADITI BHARAGAVA
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ABSTRACT

Environmental management plays a critical role in addressing the implications of human development on natural ecosystems. With rapid urbanization, industrial growth, and technological advancements, the balance between human progress and environmental sustainability has become increasingly fragile. This paper ***Environmental Management and Implication of the Human Development*** explores the multidisciplinary scope of environmental management, integrating insights from environmental science, literature, sociology, economics, and policy studies to highlight the pressing need for sustainable development.

The article examines the interdependence between human activities and ecological systems, focusing on how unchecked development exacerbates climate change, biodiversity loss, and resource depletion. It highlights the importance of adopting sustainable practices to mitigate these impacts while ensuring equitable human development. Drawing from global examples and frameworks, the study emphasizes the need for a paradigm shift—one that prioritizes renewable energy, circular economies, and community-based conservation efforts.

In managing Mother Earth, sustainable development emerges as both a goal and a strategy. By harmonizing economic growth with environmental stewardship, societies can create resilient eco-systems capable of supporting future generations. The findings of this research aim to inform policymakers, educators, and stakeholders about innovative solutions and collaborative approaches essential for preserving our planet while fostering human well-being.

Keywords: Environmental Management, Sustainable Development, Human Development, Climate Change, Biodiversity Conservation, Circular Economy, Ecological Balance, and Urbanization Impacts

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Nanophononics and Light-Matter Interaction at the Nanoscale: Applications in Modern Optoelectronics"

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Abstract

Nanophononics, the study of phonon behavior at the nanoscale, and light-matter interactions within nanostructures are pivotal in shaping the future of modern optoelectronics. At this scale, the manipulation of vibrational energy (phonons) and electromagnetic waves leads to unprecedented control over thermal, electronic, and optical properties. This interplay enables the development of advanced devices with enhanced efficiency, speed, and functionality.This study delves into the fundamentals of nanophononics and nanoscale light-matter interaction, focusing on phenomena such as surface-enhanced Raman scattering, phonon-polariton coupling, and plasmonic effects. Applications in optoelectronics, including high-efficiency light-emitting diodes (LEDs), photodetectors, nanoscale lasers, and energy-harvesting systems, are examined. The integration of nanophononic principles into thermal management solutions for optoelectronic devices is also discussed, offering insights into overcoming heat dissipation challenges.Advancements in material design, such as the use of low-dimensional materials, metasurfaces, and hybrid structures, are explored to highlight their role in optimizing phonon and photon interactions. Emerging fabrication techniques and computational models are presented to address scalability and predict material behavior under diverse operating conditions.

This research underscores the transformative potential of nanophononics and light-matter interaction in revolutionizing optoelectronic technologies, enabling faster, smaller, and more efficient devices for applications in communication, sensing, and energy systems.

Keywords: - the future of modern optoelectronics, nanophononics and nanoscale light-matter interaction

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COW DUNG WOOD

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Abstract

It is high time people should understand and adopt sustainable ways like this. Not just milk, cattle can actually be much more useful for its waste, especially in rural areas. We all in our big or small ways need to make a responsible contribution towards a zero-waste circular economy.

Many Indians live in rural areas and still rely heavily on firewood; this is something that people in urban areas frequently don't realize. Their primary energy source is diminishing, and it is becoming scarcer.

Firewood is necessary even for crematoriums to perform last rites. Therefore, by turning a readily available waste material into something so valuable and useful, we are contributing to the creation of a great wood substitute in addition to helping with waste management. Besides, this cow dung log is extremely combustible because it is somewhat hollow to allow for the passage of oxygen, unlike firewood, which frequently needs other materials to burn longer.

The production of wood from cow dung is a stable, lucrative industry with a promising future. Over the next few years, there will probably be a significant increase in public awareness of the value and applications of cow dung wood. For cremation, people in India prefer to use dried logs made from cow dung or cow dung wood. The cremation procedure that uses cow dung wood is less expensive when compared to firewood and other options. It is in high demand, but it is difficult to meet each customer's specific needs because there aren't many producers of cow dung wood. We can therefore conclude that it's a thriving company with a strong chance of changing a household's future.

Keywords: – zero waste circular economy, combustible, sustainable

Impacts of Climate Change on Plant Life: Physiological, Phonological, and Distributional Shifts

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Climate change, characterised by rising global temperatures, altered precipitation patterns, and increased atmospheric CO_2 concentrations, profoundly impacts plant life and ecosystems. Over the past century, global surface temperatures have risen by approximately 1.1°C, with projections estimating an increase of 1.5–2°C by 2050. These shifts influence plant physiology, distribution, and phenology, disrupting ecosystems worldwide. For example, elevated CO_2 levels, currently exceeding 420 ppm, enhance photosynthesis in some species, leading to increased growth—a phenomenon termed the "CO_2 fertilisation effect." However, this benefit is often offset by water scarcity and nutrient limitations.

Rising temperatures have triggered changes in plant phenology, such as earlier flowering and leaf- out, which affect plant-pollinator interactions. A study across Europe revealed that flowering onset advanced by 2.5 days per decade from 1971 to 2000. Additionally, extreme weather events, such as droughts and heatwaves, have reduced crop yields, with global wheat production decreasing by 6% for every 1°C rise in temperature.

Plant distribution is also shifting as species migrate to cooler climates. Alpine plants, for instance, are moving to higher altitudes, threatening biodiversity as competition intensifies. Furthermore, invasive species often benefit from warmer climates, outcompeting native flora.

While some plants adapt through plasticity or evolution, the pace of change may exceed their capacity to cope, leading to population declines or extinction. Understanding these dynamics is crucial for developing mitigation strategies, such as sustainable land management and ecosystem restoration, to preserve plant biodiversity and ensure global food security.

Keywords: – Climate change, water scarcity and nutrient limitations

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Environmental Management and Implication of the Human Development

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Abstract

Environmental management plays a critical role in addressing the implications of human development on natural ecosystems. With rapid urbanization, industrial growth, and technological advancements, the balance between human progress and environmental sustainability has become increasingly fragile. This paper "*Environmental Management and Implication of the Human Development"* explores the multidisciplinary scope of environmental management, integrating insights from environmental science, literature, sociology, economics, and policy studies to highlight the pressing need for sustainable development.

The article examines the interdependence between human activities and ecological systems, focusing on how unchecked development exacerbates climate change, biodiversity loss, and resource depletion. It highlights the importance of adopting sustainable practices to mitigate these impacts while ensuring equitable human development. Drawing from global examples and frameworks, the study emphasizes the need for a paradigm shift—one that prioritizes renewable energy, circular economies, and community- based conservation efforts.

In managing Mother Earth, sustainable development emerges as both a goal and a strategy. By harmonizing economic growth with environmental stewardship, societies can create resilient eco-systems capable of supporting future generations. The findings of this research aim to inform policymakers, educators, and stakeholders about innovative solutions and collaborative approaches essential for preserving our planet while fostering human well-being.

Keywords: human progress and environmental sustainability

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Georesources and Environmental Concerns

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Abstract

Georesources, such as minerals, fossil fuels, and water, are essential for modern society. However, their extraction and utilization often have significant environmental impacts, including pollution, habitat destruction, and climate change. Georesources play a crucial role in our daily lives, providing the raw materials for everything from smartphones to automobiles.We rely on a vast array of georesources, from the minerals that power our technology to the fossil fuels that fuel our transportation and industries. However, the increasing demand for these resources has led to a range of environmental problems.

Types of Georesources and their Environmental Impacts:

Fossil Fuels: Greenhouse gas emissions,Air and water pollution, Habitat destruction Minerals:Mining waste,Water contamination,Deforestation Water Resources: Overexploitation,Pollution,Water scarcity Sustainable Resource Management Strategies: Resource conservation ,Recycling and reuse,Renewable energy sources,Technological advancement.

Addressing these challenges requires a multi-pronged approach:-

By implementing sustainable practices, promoting responsible consumption, and investing in clean technologies, Public awareness and engagement in environmental issues Transition to Renewable Energy: Shifting away from fossil fuels towards renewable sources like solar, wind, and geothermal energy is crucial. This transition not only mitigates climate change but also reduces air and water pollution, Sustainable Mining Practices, Resource.

Conservation and Efficiency: Reducing our reliance on certain resources through conservation efforts, such as water-efficient technologies and recycling programs, is vital. Technological Innovation: Investing in research and development of cleaner technologies, such as carbon capture and storage, and more efficient resource extraction methods, we can mitigate the environmental impacts of resource extraction and utilization

Keywords: - pollution, overexploitation, habitat destruction, 3R's, Renewable energy sources, technological innovation, sustainable, public awareness.

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Microalgae Biotechnology for Carbon Capture and Biofuel Production

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Abstract

Microalgae biotechnology is emerging as a promising solution for addressing two of the most pressing challenges of our time: climate change and sustainable energy production. Microalgae, due to their fast growth rates, high photosynthetic efficiency, and ability to utilize atmospheric CO2, offer a unique platform for both carbon capture and biofuel production. This dual-purpose application positions microalgae as a vital tool in mitigating global carbon emissions while supporting the transition to renewable energy sources.

Microalgae can efficiently capture carbon dioxide through photosynthesis, converting it into biomass. When cultivated in open ponds or photo bioreactors, microalgae can absorb CO2 from industrial emissions or the atmosphere, reducing greenhouse gas concentrations. Studies show that microalgae can sequester CO2 at rates far higher than terrestrial plants, making them a key technology for carbon capture (Zhu et al., 2018). Moreover, this process not only helps reduce CO2 emissions but also produces valuable biomass that can be further processed into biofuels, such as biodiesel, bioethanol, and biogas. Algal lipids, in particular, are rich in oil content, which can be converted into biodiesel through transesterification processes (Rajesh et al., 2020).

The integration of carbon capture and biofuel production creates a sustainable, closed-loop system. By utilizing waste CO2 from industries such as power plants, cement factories, or refineries, microalgae bioreactors can effectively mitigate carbon emissions while producing biofuels that can replace fossil fuels. Furthermore, the use of wastewater and nutrient-rich effluents to cultivate microalgae enhances the sustainability of the process by providing a cost-effective nutrient source for algal growth.

Key words: - Microalgae, photo bioreactors, sustainability

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SIGNIFICANCE OF INDIGENOUS MEDICINAL PLANTS TOWARDS A SUSTAINABLE FUTURE

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Abstract

Indigenous or native plants have their origins in a specific region or country. They are exclusively found in their rightful place, thriving within their natural habitat and under prevailing environmental conditions. Owing to its diverse geography and climate, India is renowned for its unique variety of flora, which sets it apart from other regions. India has a wide range of ecosystems that support a rich tapestry of plant species. These ecosystems include dense forests, arid regions, expansive grasslands, wetlands and coastal areas.

Indigenous Indian medicinal plants are native flora used in traditional medicine for their curative properties. They show relevance in treatment of health conditions through ancient medication. Phytochemicals obtained from medicinal plants encompass scope for drug discovery. The World Health Organization defines traditional medicine as "sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness."

In conclusion**,** indigenous plants of India are part of a rich and diverse ecosystem, serving as vital habitats for flora and fauna along with ecological benefits such as carbon sequestration and soil conservation. These plants are culturally significant integrated in spiritual practices and traditional medicine. However, deforestation, urbanization and climate change pose threats to their survival. Community involvement, conservation efforts and sustainable practices are crucial to protect these valuable resources for a greener and more sustainable future.

Keywords: environment, indigenous, medicinal, native, plants.

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Climate Change and Life

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Abstract

Climate change presents a profound and multifaceted threat to life on Earth. Rising global temperatures, driven primarily by human activities, are causing significant disruptions to natural systems. These include: Increased frequency and intensity of extreme weather events: Heatwaves, droughts, floods, and severe storms are becoming more common and severe, impacting human societies and natural ecosystems.Disruption of ecosystems: Shifts in temperature and precipitation patterns alter habitats, disrupt food chains, and threaten biodiversity. Coral reefs are bleaching, polar ice caps are melting, and species are facing extinction.Human health impacts: Climate change exacerbates air pollution, increases the spread of infectious diseases, and poses risks to food and water security.
Social and economic consequences: Climate change can displace populations, exacerbate inequalities, and strain global resources.

Addressing climate change requires urgent and coordinated global action, including transitioning to renewable energy sources, reducing greenhouse gas emissions, and implementing adaptation strategies to minimize the impacts on human societies and the natural world.

Keywords: - Climate Change, Global Warming, Extreme Weather Events, Ecosystems, Biodiversity, Human Health, Social Impacts, Mitigation, Adaptation, Renewable Energy, Greenhouse Gas Emissions

Shifting Sands: Climate Change and the Evolving Landscape of Madhubani, Warli and Pattachitra Forms of Indian Folk Art.

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Abstract

Indian folk art, a rich tapestry of cultural and historical narratives, faces a unique challenge in the wake of climate change. The intricate connection between these traditional art forms and the natural environment is being reshaped as shifting ecological patterns impact their themes, mediums, and survival. The study investigates how environmental changes are altering artistic practices, themes, and the socio-economic lives of folk artists.

Indian folk art, deeply rooted in local traditions and natural environments, reflects the socio-economic and ecological contexts of its practitioners. However, climate change has disrupted these foundations. Rising temperatures, erratic monsoons, and depleting natural resources have altered the availability of materials like clay, pigments, and textiles traditionally used in folk art forms like Madhubani, Warli, and Pattachitra. Artists are forced to innovate with synthetic alternatives or adapt their techniques, compromising the authenticity of their craft.

The research draws insights from surveys involving many folk artists across regions known for Madhubani (Bihar), Pattachitra (Odisha and West Bengal), and Warli (Maharashtra) art forms. Respondents overwhelmingly (82%) noted the decline in availability of natural materials like organic dyes, plant-based colors, and clay due to deforestation, water scarcity, and soil erosion. For instance, Madhubani artists reported difficulty in sourcing traditional cow dung for canvas preparation due to a reduction in livestock farming caused by droughts. Warli art form, which uses rice paste on mud backgrounds, has been affected by water scarcity and soil degradation. Droughts and erratic monsoons have made rice cultivation less viable, reducing the availability of rice paste.

Surveyed artists noted an evolution in themes, with climate change becoming a dominant narrative. Economic challenges emerged as a critical concern. Over 80% of respondents indicated reduced income stability, exacerbated by climate-related disruptions to agriculture, a primary supplementary occupation for many artisans. However, the rise in global demand for sustainable and eco-conscious art has provided some relief, with 55% of artists reporting opportunities to market their work internationally.

The study underscores the resilience and adaptability of Indian folk artists. It emphasizes the need for institutional support, such as workshops on eco-friendly materials, access to financial aid, and platforms to promote climate-resilient art forms. This research, grounded in empirical data, underscores the dynamic interplay between culture and climate, advocating for stronger cultural preservation and

climate mitigation strategies to safeguard India's folk art heritage.

Keywords: climate change, Indian folk art, environmental impact, cultural adaptation, sustainable art

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Relationship between Green Spaces in Urban Areas and Mental Health

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Abstract

The rapid pace of urbanization has often resulted in the depletion of green spaces, significantly impacting human well-being. This paper investigates the profound relationship between green spaces in urban areas and mental health, focusing on the psychological, emotional, and social benefits these spaces offer. To serve this purpose various researches and articles were taken into consideration. Based on the work research indicates that exposure to green environments reduces stress, anxiety, and depression, enhances cognitive functioning, and fosters emotional resilience. Green spaces also promote physical activity and social interaction, strengthening community bonds and overall psychological well-being. By mitigating urban stressors such as noise, pollution, and overcrowding, these natural havens provide a therapeutic escape in the concrete jungle. However, inequitable access to green spaces highlights a pressing need for inclusive urban planning. Addressing this gap can ensure the mental health benefits of green spaces reach all demographic groups. This paper underscores the critical role of green spaces in fostering mental health and calls for their integration into urban planning as a fundamental element of sustainable development. Policymakers and urban designers must prioritize equitable access to these spaces to promote collective well-being and resilience in rapidly urbanizing societies. Investing in green infrastructure is not merely an aesthetic choice but a strategic imperative for healthier, happier communities.

Keywords:
Green spaces, mental health, urbanization, psychological well-being, & cognitive function.

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Environmental Pollution Laws and Practices in India

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Abstract

Environmental pollution has become a critical concern in India due to rapid industrialization, urbanization, and population growth. To address this, the Indian government has implemented a robust legal framework and numerous practices to regulate and mitigate pollution. Key legislations include the Environment Protection Act (1986), the Air (Prevention and Control of Pollution) Act (1981), and the Water (Prevention and Control of Pollution) Act (1974). These laws empower regulatory bodies like the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) to enforce standards, monitor compliance, and address violations.

India has also adopted international commitments, such as the Paris Agreement, and introduced policies like the National Action Plan on Climate Change (NAPCC) to combat pollution. In addition to legislative measures, technological innovations like real-time air quality monitoring systems and practices like Extended Producer Responsibility (EPR) for waste management have been promoted.

Despite these efforts, enforcement challenges persist due to gaps in implementation, resource constraints, and lack of public awareness. Judicial interventions, such as those by the National Green Tribunal (NGT), play a pivotal role in bridging these gaps. Public participation, corporate social responsibility (CSR) initiatives, and grassroots movements further augment the government's efforts.

This abstract underscores the need for integrated approaches, stricter enforcement, and global cooperation to ensure sustainable development and mitigate the adverse impacts of environmental pollution in India.

Keywords: industrialization, urbanization, and population growth

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Sacred Plants in Indigenous Healing Rituals: Historical and Cultural Perspective

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Abstract

Throughout history, indigenous healing practices have relied heavily on sacred plants as both spiritual and physical mediators in the quest for balance and health. Through an analysis of their functions in mythology, ethno medicine, and ceremonial rituals, this study investigates the historical and cultural relevance of sacred plants in indigenous healing traditions. The research emphasizes the symbolic meanings and therapeutic uses of these plants, ranging from hallucinogenic species utilized in shamanic rituals to herbs valued for their spiritual and medicinal qualities, by drawing on historical writings, oral histories, and ethnobotanical investigations. The study also looks into how globalization and imperialism have affected indigenous knowledge systems and sparked a renewed interest in traditional plant-based medicine. The study highlights the continued significance of sacred plants in contemporary contexts, such as integrative health and cultural preservation, by charting their use over time and across geographical areas.

Keywords: plants, ranging from hallucinogenic

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Environmental Management and Implication of Human Development

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Abstract

Environmental management is the process of managing interactively with the environment. Through urbanization, industrialization, deforestation, and resource depletion, human actions continue to transform natural ecosystems, thus, effective environmental management attempts to lessen the negative effects of this transformation. Solutions and principles that sustain ecological systems, enhance biodiversity for a sustainable supply of resources encompass this multidisciplinary field.

The living standards of human development and economic growth often come with the cost of the environment. Unsustainable actions, like overuse of natural resources, pollution, and habitat destruction, have brought about urgent environmental problems, such as climate change, biodiversity loss, and water scarcity. Thus, the integration of environmental considerations into development strategies has been the needs which never had a community more urgent. Sustainable development — development that meets our needs without compromising the abilities of future generations to meet their own — is critical for our long-term well-being.

The effect of human development on environmental management is widespread. Urbanization needs ways to handle waste and energy, while industrialization needs new clean technologies and resource-efficient processes. As one of the pillars of human development, agriculture needs significant changes in order to mitigate land degradation. The complex interrelationship between human development and environmental management it that addressing these environmental challenges will necessitate a coordinated global effort based on integrating sustainability principles into economic and social frameworks to deliver a planet viable for future generations.

Key words: Sustainable development, environmental management, ecosystem, biodiversity,

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Environmental Protection in India: Prospects and Challenges

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Abstract

Conserving and protecting the environment is essentially a desire to see that the development goals coincide with pertinent environmental concerns. There is no deficiency of available legislations on environmental protection in India but enforcement of these legislations has been far from satisfactory. There is an urgent need for effective enforcement of the constitutional mandate and other environmental legislations in India. The role of India Judiciary and National Green Tribunal [NGT] has been significant in this. Pursuant to the provisions contained in Articles 48–A and 51–A[h] of the Indian Constitution, various Public Interest Litigations have been instituted in the Supreme Court against several industries for failing to provide sufficient pollution control and against Pollution Control Boards to direct them to take proper measures to ensure pollution control.

Protecting the environment and maintaining ecological balance is a gargantuan task which requires not only the input of the government but also active participation of every individual, association, society, industry and corporation. It is a social compulsion and fundamental duty enshrined in Article 51–A[g] of the Indian Constitution.

Keywords:

Environmental Protection, Air Pollution, Water Pollution, Public Interest Litigation, Constitution of India, National Green Tribunal and Judiciary.

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thnobotanical Studies of Traditional Medicinal Plants of Fatehpur Beer of Sikar District, Rajasthan (India) and their used in Folk and Herbal Remedy.

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Abstract

Plants are main parts of living - beings. Beer Fatehpur is located in tehsil Fatehpur of district Sikar (Raj.). The total geographical area of beer Fatehpur is 3971 km^2. The climate is arid to semi arid. The present study was carried out by interviews, group - discussions and cash- study with rural people, priests, bhopas, bhagats, kalbellia, banjaras, pansaries, aayurvedic doctors etc. In the present study, field surveys and visits were conducted regularly during 2022-24. Field surveys was carried out to observe the 81 medicinal plant species belonging to 42 families and 78 genera. The plants species used in folk and herbal remedies by tribal people to cure different ailments.

Key words: - Fatehpur beer, Tribal, Folk, Herbal, Remedies, Aliments.

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Environmental Pollution Law

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Abstract

The legal frameworks and regulations intended to prevent, control, and lessen the negative impacts of human activity on the environment are collectively referred to as environmental pollution laws. In order to safeguard biodiversity, human health, and natural ecosystems, these rules address a variety of pollution types, including as air, water, soil, and noise pollution. Regional policies, national laws, and international treaties are used to enforce them.

Setting pollution regulations, controlling emissions, putting waste management procedures into place, and guaranteeing environmental impact assessments for industrial and development projects are all essential elements of environmental pollution law. The "polluter pays" theory, which holds criminals responsible for the harm they cause to the environment, is frequently incorporated into the law.

Environmental law enforcement is essential, but it is frequently hampered by a lack of funding, political will, and public awareness. These regulations are advanced in large part by innovations like green technology and harsher sanctions for non-compliance. In order to promote sustainable growth and ecological balance, environmental pollution laws are constantly changing to address global issues including urbanization, industrialization, and climate change.

In addition to protecting the environment, this paradigm encourages ethical stewardship and prudent resource management for coming generations.

Keyword: pollution law, human activities, green technology.

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"Nanozymes as Eco-Friendly Catalysts for Bioremediation of Emerging Contaminants in Water Systems"

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Abstract

Emerging contaminants (ECs), including pharmaceuticals, synthetic dyes, and microplastics, have become a pressing concern in aquatic ecosystems due to their persistence and potential harm to human and environmental health. Conventional treatment methods often fail to address these pollutants effectively, creating a need for innovative and sustainable solutions. Nanozymes, nanomaterials with enzyme-like catalytic activity, represent a groundbreaking approach to tackling these contaminants.

This study focuses on the use of iron oxide- and cerium-based nanozymes for the eco-friendly degradation of ECs in water systems. By mimicking peroxidase and oxidase activities, these nanozymes demonstrate the ability to break down complex organic pollutants under mild conditions. Key advantages of nanozymes, such as their stability, reusability, and tunable catalytic properties, make them suitable for long-term environmental applications.

Experimental results reveal that functionalized nanozymes can efficiently degrade pharmaceutical residues and dyes at low concentrations while maintaining non-toxic interactions with aquatic organisms. Their incorporation into wastewater treatment systems, such as advanced filtration units, offers a scalable and cost-effective pathway for improving water quality.

This research highlights the dual potential of nanozymes as effective catalysts for bioremediation and as a sustainable alternative to conventional water treatment technologies. By integrating nanotechnology and environmental chemistry, this study contributes to the development of greener solutions for addressing water pollution in the Anthropocene era.

Keywords: Emerging contaminants, iron oxide- and cerium-based nanozymes

Indigenous Knowledge and Practices: Key Drivers of Sustainable Environmental Management and Conservation

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Abstract

This study explores the vital role Indigenous communities play in managing natural resources in a sustainable manner. It emphasizes how their traditional knowledge, land rights, and cultural practices contribute to environmental preservation. Indigenous groups, such as the Maasai in East Africa and the Inuit in the Arctic, have historically used practices like rotational grazing and seasonal hunting to protect biodiversity and maintain ecosystem health. However, these communities face increasing threats from land displacement, resource extraction, and climate change.

For instance, the Maasai are impacted by agricultural expansion, while the Inuit are affected by melting sea ice and rising temperatures. The research highlights how Indigenous management strategies, such as community-led forestry in the Amazon and controlled fire practices by Aboriginal Australians, provide effective solutions to modern environmental problems. Additionally, it examines how acknowledging Indigenous land rights and incorporating their knowledge into policy can promote environmental sustainability and economic stability.

The study also explores the challenges Indigenous peoples face in securing their rights, referencing successful legal victories in Canada and Australia. Finally, it looks at the potential of collaborative conservation models, such as co-management of national parks, exemplified by the partnership in Denali National Park, Alaska. These approaches promote ecological health, cultural preservation, and economic development, benefiting both the environment and local communities.

Keywords: Indigenous communities, land rights, and cultural practices contribute

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Evaluation of Heavy Metal Toxicity in Soil and Vegetable Sewage Irrigation Water: A Case Study of Sikar District, Rajasthan

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Abstract

Agricultural wastewater for crop irrigation poses serious environmental and health risks due to the precipitation of heavy metals. This study investigated the extent of heavy metal toxicity in soil and vegetables irrigated with wastewater in Sikar district of Rajasthan By analyzing the concentrations of copper, cadmium, mercury and arsenic in soil and vegetable samples collected mouth from the target areas, the study examines the relationship between pollutant levels in soil and materials a they are in it. The study measures potential health risks to consumers and shows the spatial distribution of irrigation contaminants in the region. Advanced analytical techniques including atomic absorption spectroscopy and inductive coupled plasma mass spectrometry are used to ensure accurate measurements Health risk assessment and statistical analysis provide important insights into the implications of contaminant ingestion in. This study addresses important gaps in the literature, providing evidence-based recommendations on mitigation strategies to protect public health and promote sustainable agricultural practices in Sikar district.

Keywords: Agricultural wastewater for crop irrigation

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Nanophotonic Devices for High-Speed Data Transmission: Applications in Next-Generation Computing Networks

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Abstract

The exponential growth of data generation and processing demands a paradigm shift in computing networks to overcome the limitations of traditional electronic-based systems. Nanophotonic devices, leveraging the unique properties of nanoscale materials and light, offer transformative solutions for high-speed data transmission in next-generation computing networks. These devices integrate optical components such as waveguides, resonators, and modulators into compact nanoscale architectures, enabling unprecedented data transfer rates, low power consumption, and enhanced bandwidth efficiency. This study explores the potential of nanophotonics in revolutionizing computing infrastructures, focusing on key technologies like plasmonics, photonic crystals, and quantum dots. It examines how these innovations address critical challenges, including signal latency, thermal management, and miniaturization, while maintaining compatibility with existing electronic circuits. The integration of nanophotonic devices into data centers, 5G networks, and emerging quantum computing systems promises to redefine communication speed and efficiency. Furthermore, advancements in fabrication techniques, such as nanoscale lithography and self-assembly, are paving the way for scalable production of these devices. By bridging the gap between electronics and photonics, nanophotonic technology is poised to drive the evolution of computing networks toward a faster, more energy-efficient, and interconnected future.

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Global thermal effect on bird migration in and around Beawar region

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Abstract

The Beawar region, located in the semi-arid landscape of Rajasthan, India, is experiencing the impacts of global climate change, particularly through rising temperatures and altered precipitation patterns. These changes have significant implications for migratory bird species that pass through or inhabit the region. This study investigates the global thermal effects on bird migration patterns in and around Beawar, focusing on the timing, routes, and success of migratory movements. Warmer temperatures have been shown to alter the timing of bird migration, often leading to earlier spring arrivals and delayed autumn departures, as well as shifts in migration routes. Additionally, changes in local habitat conditions, such as the availability of food and water resources, influence the birds' choice of stopover sites and breeding grounds. In Beawar, wetlands and agricultural landscapes provide critical resources for migratory birds, but the region's thermal effects are causing alterations in these ecosystems. Furthermore, extreme weather events and temperature extremes further disrupt migration, potentially increasing bird mortality or delaying migration. The study also examines the potential for new species to arrive in the region as they adapt to changing conditions, and the conservation challenges these shifts present. Understanding the thermal impacts on bird migration is crucial for developing strategies to mitigate the effects of climate change on migratory species and their habitats in the Beawar region.

Keywords: Global warming, bird migration, Beawar region, climate change, habitat alteration, migratory patterns, thermal effects, conservation.

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Antioxidant Activities of Holoptelea integrifolia Seed Extract: In-vivo Study Using Caenorhabditis elegans as an Animal Model

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Abstract

Holoptelea integrifolia commonly known as Elm tree, belonging to the family Ulmaceae, has been traditionally used to treat various human ailments. This study aims to report the phytoconstituents through GC-MS, toxicity, and antioxidant activity of H. integrifolia seeds using Caenorhabditis elegans as a model organism, and to explore their potential applications. Fruits were collected from the vicinity of Ajmer district in April, and the seeds were separated after 30 days of shade drying. The powdered seeds were extracted using the Soxhlet apparatus with solvents. The methanol extract yielded 10.35% of the extract, while the distilled water extract yielded 8.655%. GC-MS analysis identified 30 phytoconstituents in the methanol extract and 15 in the distilled water extract. Both extracts were found to be nontoxic to C. elegans upto 1 mg/ml concentration. The maximum In-vitro antioxidant activity (DPPH assay) was found at 1 mg/ml concentration. Further, the in-vivo Oxidative Stress Assay (Juglone) showed the highest survival rate of C. elegans at 60 µg/ml. Oxidative stress and antioxidants are crucial factors for sports persons. So, H. integrifolia seed extracts could be a good supplement for athletes.

Keywords - Antioxidant activity, C. elegans, Holoptelea integrifolia seeds, GC-MS profiling, Oxidative stress, Toxicity.

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Usage and Challenges of Technological Implementation in Traditional Agricultural Practices- A Review

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Abstract

After the inception of green revolution in Indian agricultural practices, nation has now witnessed a significant transformation in the traditional agriculture methods with the implementation of technology and scientific approach towards them. With the introduction of practices like drone irrigation, mulching, advanced threshers, farm automation, SHC card, RFID technology, vertical farming, etc, agriculture has gone leap forward not only in terms of production and yield but also in terms of modernization of agriculture practices. The increased usage of technology has also given a boost to the job opportunities in agriculture field. It has also proved helpful in keeping the trust of younger generation in farming and agriculture. May be on a smaller side, but it has also pushed the farmers and peasants to upskill their awareness and methods. However, this aid of technology is mainly limited to the big farmer groups due to affordability, increasing the ever-existing gap between big farmers and marginal farmers. Expensive prices of modern technology also hamper the moral of prospective users. Uneducated class of farmers are left behind in this advancement. Apart from these, many other challenges prevail, but looking forward to them, government and farmer groups are making proactive efforts to overcome them in order to lead a sustainable and advanced agricultural future.

Keywords: opportunities in agriculture

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Societal role in enforcement of environmental law

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Abstract

The role of society in environmental law is multifaceted, as it involves the active participation of individuals, communities, organizations, and governmental bodies in shaping, enforcing, and complying with environmental regulations.

Societal awareness and advocacy are critical in driving environmental protection. Citizens and environmental groups can influence legislation and policies through campaigns, lobbying, and activism. Public concern over issues like climate change, pollution, and habitat destruction often prompts governments and industries to adopt stronger environmental laws.

Members of society, especially through grassroots movements, scientific communities, and civil society organizations, can advocate for new or improved environmental laws. For instance, public input is often sought during environmental impact assessments or consultations on new policies or regulations, ensuring the community's needs and concerns are represented.

Society plays a crucial role in ensuring compliance with environmental laws. This can involve reporting environmental violations, participating in environmental monitoring, and adhering to sustainable practices. In some cases, communities might take legal action against polluters or non-compliant entities.

Environmental education empowers individuals to make informed decisions regarding resource use, waste management, and conservation. A society that values environmental education is more likely to support sustainable practices and hold corporations and governments accountable for their environmental impact.

Society, through consumer behavior and public pressure, can influence corporations to adopt sustainable practices. Companies that prioritize environmental sustainability are often responding to societal demands for eco-friendly products, ethical production methods, and climate-conscious policies.

Courts sometimes play a role in enforcing environmental laws by accepting cases brought forward by society. Citizens and NGOs can file lawsuits to hold governments or corporations accountable for environmental damage, contributing to the interpretation and enforcement of environmental laws.

In summary, society not only creates demand for environmental protection but also helps shape laws, enforce regulations, and ensure that sustainable practices are integrated into both public and private sectors.

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A perceptive study on Feeding Pattern of nilgaii (*Boselaphus tragocamelus)* in Jodhpur region, rajasthan, India.

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Abstract

Nilgaii antelope *(Boselaphus tragocamelus)* are an exotic ungulate species in India.Food pattern and seasonal variation of nilgaii *(Boselaphus tragocamelus)* was studied during My Ph.D. work in adjoining areas of Jodhpur region. A Two year food habit study of nilgaii and its forage selection was conducted. The results have shown that nilgaii preferred to feed on large open areas interspersed, with cover and ponded, water. They were grazers, their average diet consisting of 60% grasses, 25% forbs and 15% browse. They augmented the nutritive level of their basic diet by selecting nutritious plant parts and changing their selections as the parts appeared, waned and fluctuated in quality with the seasons. When food was scarce, nilgaii ate more browse, dead vegetation, and dry dung of large herbivores. The food pattern of the nilgaii varied from season to season.

Keywords: Food habits, Nilgaii, mixed feeder, wild ungulate, preference rating.

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ROLE OF BIOTECHNOLOGY IN ACHIEVING SUSTAINABLE DEVELOPMENT

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ABSTRACT

The "Modern biotechnologies" of molecular biology and gene technology have grown significantly in importance in the sustainable development in recent years. Sustainability development has become a priority for the world's police makers. Among the broad range of technologies with the potential to reach the goal of sustainability, Biotechnology could take an important place, especially in the field of sustainable development. Biotechnology provides possibilities for creating clean energy and ensuring more effective power use, as well as for recycling forestry and urban waste and bioproducts from specific industries, lowering their environmental impact. For the production of clean, renewable energy, alternative biomass sources from forestry and agriculture are increasingly exploited. Sustainable development has been prioritized by top governments around the world. Biotechnology has taken a prominent place among the different strategies used to attain the objective of sustainability, particularly in the fields of bioremediation and food production, renewable raw materials, energy production, prevention of environmental pollution, biofuels, Biopesticides, genetically modified plants and animals, Biofertilizers and Bioplastics. However, there are still certain technical and financial concern to be resolved the convergence of applied science, technology and biology makes biotechnology a crucial tool for accomplishing sustainable development objectives. In order to achieve sustainable development Biotechnology is essential since it stimulates favorable changes in the social economic, and environmental spheres.

Keywords: Biotechnology Sustainability, Food Production, Bioremediation, Renewable Raw Materials.

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Comparison of Cadmium (Cd) Stress Tolerance Capacity in *Trigonella foenum– graecum* (Fenugreek) and *Cyamopsis tetragonoloba* (Guar).

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Abstract

This study investigates the comparative cadmium (Cd) stress tolerance of two leguminous plants, *Trigonella* (fenugreek) and *Cyamopsis tetragonoloba* (guar), both of which are important for their agricultural and ecological roles. Cadmium contamination in soils has become a significant environmental concern due to its toxic effects on plant growth and development. The aim of this research was to evaluate the physiological responses of these plants under Cd stress, focusing on growth performance (seed germination , root and shoot length ,fresh, dry weight), photosynthetic efficiency, antioxidant enzyme activity, biochemical analysis (determination of protein, total soluble sugar , starch, phenol, lipid, chlorophyll, carotenoid content) and Cd accumulation in plant tissues. The results show that *Cyamopsis tetragonoloba* demonstrated higher resistance to Cd stress, as evidenced by better growth retention, enhanced antioxidant activity, and more efficient Cd sequestration in roots and shoots. In contrast, *Trigonella* exhibited reduced biomass, increased oxidative damage, and a higher accumulation of Cd in root tissues, indicating lower tolerance. These findings highlight *Cyamopsis tetragonoloba* as a potentially superior candidate for phytoremediation of Cd-contaminated soils, while *Trigonella* may be more suitable for environments with moderate heavy metal exposure. Further molecular studies are needed to uncover the genetic and biochemical mechanisms underlying these differential stress tolerance strategies.

Keywords: *Trigonella*, *Cyamopsis tetragonoloba*, cadmium stress, heavy metal tolerance, oxidative stress, phytoremediation, antioxidant enzymes, metal sequestration.

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Quantum Confinement Effects in Low-Dimensional Nanostructures: Implications for Advanced Material Design"

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Abstract

Quantum confinement effects, a hallmark of low-dimensional nanostructures, have revolutionized the understanding of material behavior at the nanoscale. When the dimensions of a material are reduced to the scale of its excitonic Bohr radius, it's electronic, optical, and magnetic properties deviate significantly from their bulk counterparts, offering unique opportunities for material innovation. This phenomenon is prominently observed in quantum dots, nanowires, and 2D materials, where discrete energy levels emerge due to spatial confinement of charge carriers. This study explores the fundamental principles of quantum confinement and their implications for the design of advanced materials with tailored properties. By examining size-dependent tunability of band gaps, charge transport mechanisms, and enhanced light-matter interactions, we uncover how these effects drive breakthroughs in optoelectronics, photonics, and energy conversion technologies. Applications in solar cells, light-emitting diodes, and quantum computing are highlighted, showcasing the potential of low-dimensional nanostructures to reshape technological paradigms. Furthermore, the paper delves into experimental techniques for synthesizing and characterizing these nanostructures, alongside theoretical models that predict their behavior. Challenges in scaling up production and integrating these materials into commercial devices are also discussed, with a focus on sustainable and cost-effective approaches. Quantum confinement thus emerges as a cornerstone of nanoscience, unlocking pathways for the development of next-generation materials and devices that bridge the gap between classical and quantum regimes.

Key Words: Quantum confinement, electronic, optical

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Nanotechnology in Wastewater Treatment: Current Trends and Future Prospects

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Abstract

Nanotechnology has emerged as a revolutionary approach to enhancing wastewater treatment processes, offering significant improvements in efficiency, cost-effectiveness, and sustainability. The unique properties of nanomaterials, such as their large surface area, high reactivity, and ability to target specific contaminants, have made them ideal candidates for addressing complex water purification challenges. This paper explores the current trends in the application of nanotechnology for wastewater treatment, focusing on the use of nanomaterials like carbon nanotubes, metal oxide nanoparticles, and magnetic nanoparticles for the removal of heavy metals, organic pollutants, and pathogens from wastewater. Recent advancements in the development of nanocomposites, nanofiltration membranes, and photocatalytic nanomaterials have demonstrated promising results in improving pollutant removal rates, reducing energy consumption, and enhancing the overall efficiency of wastewater treatment systems.Furthermore, the paper discusses the integration of nanotechnology with conventional treatment methods such as activated sludge and membrane filtration, leading to hybrid systems that offer superior performance and flexibility. Despite the progress, challenges such as the potential toxicity of nanoparticles, high costs, and the need for large-scale application remain. The paper concludes with an outlook on the future prospects of nanotechnology in wastewater treatment, emphasizing the need for more research into the long-term environmental impact of nanoparticles and the development of cost-effective, scalable solutions. The continued advancement of nanotechnology holds the potential to revolutionize wastewater management, contributing to sustainable water resources and improved environmental health.

Keywords: Nanotechnology, Wastewater Treatment, Environmental Remediation, Nanomaterials.Water Purification.Contaminant Removal

Environmental Pollution Laws and Practices in India and Outside India

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Abstract

Environmental pollution significantly affects ecosystems, human health, and global quality of life. To address these challenges, governments and organizations worldwide have implemented laws and practices aimed at reducing pollution and promoting sustainable development.

Key Elements of Environmental Laws

Laws to combat pollution focus on protecting ecosystems, ensuring human health, reducing healthcare costs, and fostering global cooperation. International frameworks like the **Paris Agreement (2015)** and the **Kyoto Protocol (1997)** emphasize reducing greenhouse gas emissions. The **Basel Convention (1989)** aims to regulate hazardous waste disposal.

National legislations, such as India's Environment Protection Act (1986), the U.S. Clean Air Act (1970), and the EU's Emissions Trading System, address region-specific environmental challenges.

Role of International Organizations

Global agencies play a pivotal role in fostering collaboration:

- **UNEP** promotes global environmental initiatives like the "Clean Seas" campaign.
- **WHO** develops guidelines on air and water pollution's health impacts.
- **ILO** advocates for sustainable work environments and green jobs.
- **IPCC** provides scientific data on climate change mitigation.
- Financial institutions like the **World Bank** and **GEF** fund renewable energy and waste management projects.

Landmark Indian Cases

Indian judiciary has significantly influenced environmental protection:

- **M.C. Mehta v. Union of India (1987)** established absolute liability for hazardous activities.
- **Vellore Citizens Welfare Forum v. Union of India (1996)** introduced the "polluter pays" and "precautionary" principles.
- **Subhash Kumar v. State of Bihar (1991)** recognized the right to pollution-free air and water as fundamental rights.

Effective Practices and Challenges

Best practices include waste segregation, adoption of renewable energy, sustainable agriculture, public awareness campaigns, and corporate adherence to green standards. However, challenges like poor enforcement, economic pressures, technological gaps, and public apathy hinder progress.

Keywords: Environmental pollution, ensuring human health, reducing healthcare costs

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"The Sociology of Climate Change: Human Behavior and the Global Environmental Crisis"

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The sociology of climate change examines how human behavior, societal structures, and cultural norms intersect with environmental issues, shedding light on the root causes and potential solutions to the global climate crisis. Climate change is not only an ecological concern but also a profound social issue, shaped by patterns of consumption, economic systems, and political decision-making. Human behavior, driven by industrialization, resource extraction, and overconsumption, has contributed significantly to the environmental degradation we face today. At the same time, social inequalities such as class, race, and gender shape both the vulnerability to and responsibility for environmental risks. While wealthier nations and individuals are the primary contributors to climate change, the impacts disproportionately affect marginalized populations, particularly those in the Global South, who have contributed least to global emissions. Sociological research highlights that the climate crisis is not only about technological fixes but also about changing social practices and values. Emphasizes the importance of collective action and social movements in addressing the climate crisis, arguing that climate change solutions must involve shifts in societal behaviors, norms, and policies, rather than relying solely on technological innovation. Activist movements, both at the local and global levels, are essential in pushing for systemic change, advocating for more sustainable consumption patterns, and demanding equity in climate policy.

Further, the political economy of climate change is crucial in understanding the barriers to effective action. Powerful economic interests, including fossil fuel industries, often obstruct meaningful policy changes, while international inequalities complicate the implementation of global solutions. As such, sociological insights into power structures, social justice, and collective action are vital for addressing the climate crisis comprehensively.

Keywords: - climate change, Ecological, Sociological research

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Urgent Challenges Facing Wildlife Conservation

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Abstract

Ecological equilibrium and biodiversity can be maintained by preserving wildlife and their habitats. Effective wildlife conservation is hampered by a number of issues, such as habitat loss and fragmentation, poaching, conflict between humans and wildlife, climate change, and a lack of financing. Climate change is rapidly altering ecosystems and habitats, affecting the survival of many species. Food availability, breeding seasons, and migration patterns are all being disrupted by rising temperatures, shifting rainfall patterns, and extreme weather events. Additionally, the issue is made worse by weakened government, corruption, and a lack of community involvement. The illegal wildlife trade targets iconic species like pangolins, elephants, rhinos, and tigers, intensifying the decline of already endangered species. Hunting methods that are not sustainable, particularly in developing nations, can drive animals to the verge of extinction. Pollution is poisoning animals and destroying their habitats, including plastic waste, oil spills, and chemical runoff. Wildlife is suffering greatly from diseases like Ebola, chytridiomycosis (a fungal disease), and other viral infections, particularly animals that are already under stress from other factors like habitat loss and climate change.

The preservation of wildlife is frequently subordinated to land development, agricultural growth, and resource extraction, especially in developing countries. Raising local communities' support for animal protection can also be facilitated by education and awareness campaigns. In order to ensure the long-term survival of species and ecosystems, custodians must be able to strike a balance between conservation efforts and human demands. Addressing these challenges requires a global, multifaceted approach and urgent action to ensure that future generations inherit a planet rich in biodiversity.

Keywords:-Wildlife Conservation, Habitat Loss, Human-Wildlife Conflict, Climate Change, Sustainable Land-Use Planning

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Biotechnology: A Solution for Sustainable Development

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Abstract

We are all aware of the threat to our environment and the urgent need to take action to protect it. Since the climate is changing and our future is in jeopardy, biotechnology holds out promise for solutions that will create a sustainable environment. Better biological and sustainable substitutes for the materials and processes that cause pollution can be found through biotechnology. Biotechnology is the efficient utilization of living organisms to break down garbage and other items that contribute to pollution from the environment. Remediation methods can assist reduce the amount of trash released by industrial processes. With the help of microbes, biotechnology also plays a critical role in turning hazardous waste products and contaminants into beneficial byproducts. Therefore, biotechnology can reduce pollution of many kinds in a wide range of ways such as bioprospecting, bioplastics, biopesticides, biofertilzers, biofuels, cultivated meat and using enzyme detergents.

Key words: Biotechnology, bioprospecting, bioplastics, biofuels, enzyme detergents etc

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Micropropagation –an important tool for conservation of economically important endangered plants

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Abstract

Micropropagation offers a rapid means of propagation, multiplying woody biomass, conservation of elite and rare germplasm, regeneration of plantlets from both callus cultures and organ cultures, shortening germination period and developing single cells into callus. The applications of micropropagation techniques as an alternative mean of asexual propagation of important plants have increased the interest of workers in various fields. The technique of cell, tissue and organ culture under controlled and defined conditions, have contributed in raising new plants, manipulation of plants without conventional breeding mechanism and methods, shortening germination and developmental phase of plants. It thus holds a place of unique importance in today's world among plant biologists. It is also employed in haploid production, production of disease free and resistant plants, elimination of breeding barriers, biosynthesis of secondary metabolites, generation of variability, germplasm conservation and selection of desirable traits. There is also a conservation use for those species that are at risk, rare, endangered or of special cultural, economic or ecological value.

The demand for the plant based raw materials is growing at the fast rate. The genetic diversity of medicinal and economically important plants in the world is getting endangered because of over-harvesting for production of medicines, habitat degradation, industrialization, illegal trade practices, loss of regeneration potential of degraded forests. All these factors pose a serious threat to the genetic stock and the biodiversity of medicinal and economically important plants. The rich resource is disappearing at an alarming rate as a result of over- exploitation. Rapid agricultural development, population growth, urbanization and the indiscriminate collection of medicinal plants from the wild resulted in the over-exploitation of natural resources. The conventional means of propagation takes a long time for multiplication. Micropropagation offers a tremendous potential solution for the propagation of endangered and superior genotypes of these plants which could be released to their natural habitat or cultivated on a large scale for the pharmaceutical product of interest. It offers advantages over conventional methods of propagation for a rapid and largescale multiplication of important plants under *in vitro* conditions irrespective of season with conservation of space and time.

These techniques are being used globally for the conservation and utilization of genetic resources.

Molecular markers have been used for testing the genetic fidelity during micropropagation/*ex situ* conservation on the one hand and for characterization of plant genetic resources on the other. This aspect of the use of molecular markers has received attention in recent years due to the significance that is being attached to micropropagation of elite genotypes and to the *in situ* and *ex situ* conservation of plant genetic resources. Molecular markers have particularly been suggested to be useful for confirmation of genetic fidelity in micropropagated plant species.

Creation of seed gene banks and cryobanks for long-term storage of genetic material are required to preserve endemic and endangered plant species. Such an integrated approach allows to save genetic material for a long time and reproduce identical clones to restore natural populations in nature. New opportunities have been created for producers, farmers and nursery owners for high quality planting materials. With more innovative work and intensive exploitation of our flora, the micropropagation technique will help us in consolidating our leadership at the global level.

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Optimization Algorithms for Nanostructure Fabrication and Performance Enhancement"

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Abstract

Optimization algorithms play a crucial role in advancing the fabrication and performance of nanostructures, enabling precise control over their design, synthesis, and functional properties. These computational techniques leverage mathematical models to solve complex, multi- dimensional problems, addressing challenges such as minimizing defects, enhancing structural stability, and achieving desired electronic, optical, and mechanical characteristics.This study explores the application of optimization algorithms, including gradient-based methods, genetic algorithms, particle swarm optimization, and machine learning-based approaches, in nanostructure fabrication. It focuses on their use in refining parameters for processes like chemical vapor deposition, lithography, and self-assembly to achieve high precision and scalability. Additionally, the role of optimization in tailoring nanostructures for specific applications, such as quantum dots for optoelectronics, nanowires for sensors, and nanocomposites for energy storage, is examined.Key advancements in combining optimization techniques with high-fidelity simulations, such as density functional theory (DFT) and molecular dynamics, are highlighted to showcase their potential for predicting material behavior and guiding experimental efforts. The study also addresses computational challenges, such as high-dimensionality and nonlinearity, and proposes strategies to overcome them for efficient and reliable optimization.By bridging the gap between theory and experiment, optimization algorithms offer transformative opportunities in nanoscience, paving the way for the development of innovative, high-performance nanomaterials and devices.

Keywords: Optimization algorithms, genetic algorithms, particle swarm optimization

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Socioeconomic Aspects of Environmental Issues

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Abstract

Environmental issues are intricately linked to socioeconomic dynamics, creating a complex interplay that shapes both global ecosystems and human societies. This abstract explores the socioeconomic dimensions of environmental challenges, including climate change, resource depletion, pollution, and biodiversity loss. Environmental degradation disproportionately affects vulnerable communities, exacerbating existing inequalities and poverty. Marginalized populations often lack the resources to adapt to changing environmental conditions, leading to a cycle of environmental injustice.

Economic activities, driven by industrialization and urbanization, contribute significantly to environmental degradation. However, these same activities are essential for economic growth and development, highlighting the need for sustainable practices. The transition to a green economy offers opportunities for job creation, innovation, and improved public health, but it also poses challenges such as displacement of traditional industries and unequal access to green technologies.

Policy responses, such as carbon pricing, renewable energy incentives, and sustainable development goals, aim to address these issues. However, their success depends on inclusive decision-making processes that consider the diverse needs of stakeholders. Global cooperation is crucial, as environmental challenges often transcend national borders.

In conclusion, understanding the socioeconomic aspects of environmental issues is critical for developing equitable and effective solutions. By integrating social, economic, and environmental priorities, societies can create a pathway toward a sustainable and resilient future.

Keywords: Economic activities, socioeconomic dynamics

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Water Pollution and its effects on health

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Abstract

Water is the important constituent of life support system. No one can live and even dream to live without water. Most of our water bodies have become polluted due to industrial growth; urbanization and man-made problems mainly the result of population growth. Poor sanitation and contaminated drinking water arising from human activity and natural phenomena create serious problems in human health. The chief sources of water pollution are sewage and other waste, industrial effluents, agricultural discharges and industrial wastes from chemical industries, fossils fuel plants and nuclear power plants. They create a larger problem of water pollution rendering water no longer fit for drinking, agriculture and, as well as for aquatic life. More than 2.6 billion people--40% of the world's population--lack basic sanitation facilities and over one billion people still use unsafe drinking water sources. As a result thousands of children die everyday from diarrhoea and other water, sanitation and hygiene-related diseases and many suffer and are weakened by illness.

Keywords: - Pollution, Sanitisation, Agriculture, Industrial Waste.

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Most Advanced Nano Material Carbon Quantum Dots (CQD) Viable for Technologies

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Abstract

Carbon Quantum Dots are using Semi Conductor particles, a few nano meters in size having optical and electronic properties that after from lager LED particles. They are a centre theme in nano technology when the CQD are illu1ninated by UV light. Some of CQD are fluorescent have the property of high solubility, good conductivity, low toxicity, environmental friendliness. Simple synthetic route are well comparable optical properties to CQD. Because of their highly tunable properties CQD of wide interest applications included. Due to high photostability and low toxicity these CQD are demonstrated as excellent probe in cellular imaging. Nitrogen doped CQD used as biological probe for investigation of cells. CQD can be used for bioimaging due to their fluorescent emission and biocompatibility.

CQD are also applied in biosensing as biosensor carriers for their flexibility in modification and high solubility in water. The biosensor based on CQD and CQD based material could be used for visual monitoring of cells. CQD used as drug carrier ,tracers as well as controlling drug release ,used as photo catalyst because they absorb light of different wavelength. CQD possess the potential in serving as material for dye sensitizer, solar cells, organic solar cells and super capacitor and light emitting devices. CQD are also used for the enhancement of latent finger prints.

Keywords: Carbon Quantum, good conductivity

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The Essence of Slow Living: A Qualitative Exploration of Goa's Rural Economic Landscape

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Abstract

The relentless pursuit of fast-paced lifestyles, driven by consumerism and rapid economic growth, has significantly strained the environment. This approach has led to environmental degradation, climate change, and resource depletion, prioritizing short-term gain s over ecological sustainability. The need to reconsider our relationship with nature has never been more urgent to mitigate these consequences and secure long-term well-being.

Slow living presents a sustainable alternative by promoting deliberate, mindful actions that prioritize quality of life and environmental preservation. Rooted in practices such as slow food, slow fashion, and slow industry, it aligns with circular economy principles, emphasizing resource efficiency, ecological preservation, and social cohesion. By challenging fast-paced consumerism, slow living fosters a balanced and enriched human experience while supporting sustainable development.

This study explores eight variables like slow pace, slow wear, slow food, slow industry, and slow education to evaluate slow living's role in reducing environmental harm and fostering a green economy. These variables highlight the interplay between individual behaviors, societal norms, and ecological outcomes.

Poinguinim, a rural village in South Goa, serves as the study site. Its agrarian economy and community-oriented lifestyle provide a unique context to examine how local practices align with slow living principles and contribute to sustainability.

By connecting theoretical models with real-world evidence, this study advances the understanding of slow living as a means to address socioeconomic and environmental issues, offering practical insights into integrating sustainability into daily life.

Keywords: Slow Living, Slow Pace, Slow Wear, Slow Food, Slow Education, Slow Fashion, Slow Industry, Socioeconomic, Sustainability

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Toxicological Impact and Ld50 Analysis of Ginger, Garlic, Peppali, and Onion Peels Against Larvae of Tribolium Castaneum

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Abstract

Insects including the Angoumois grain moth, the Rice moth, the Red rust flour beetle, the lesser grain borer, the maize weevil, and the granary weevil pose a serious threat to cereal grain storage in India. Without management, the losses caused by these pests might reach 50%. Although synthetic pesticides were created to safeguard food grains, their widespread use has resulted in problems such as environmental pollution and pesticide residues. The safer, more biodegradable, and easier-to-apply pesticides derived from plants are attracting more and more attention. The antifeedant properties of Tribolium castaneum, a red flour beetle, have been investigated using peppali peel, ginger, and garlic, onion, and onion peelings. Insects avoid these plant-based goods because of the bioactive compounds they contain. Research into biopesticides made from onion, garlic, ginger, and pepper peels is part of a larger effort to promote biodiversity and reduce chemical residues in food as part of sustainable agriculture. A controlled laboratory setting was established for the examination at the research centre in Jaipur, India. We used the Soxhlet extraction method to make plant extracts, and we bought fresh herbs from nearby markets. Using the method proposed by Sun and Johnson (1960), the combined toxicity of several plant extracts against Tribolium castaneum was assessed. The results showed that when tested against Tribolium castaneum, the onion extract was the most effective plant extract, whilst ginger and peppali were shown to be somewhat toxic. It would be beneficial for future research to look at more plant extracts, various insect species, field testing, long-term stability, and cost-effectiveness.

Keywords: Tribolium castaneum, Ginger, Garlic, Onion, Peppali, Toxicity

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The Application of Nanotechnology in Human Health

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Abstract

Nanotechnology is a transformative tool in the field of healthcare, enabling earlier diagnosis, more effective treatments, and better patient outcomes. The potential applications of nanotechnology in human health will expand, offering even more opportunities to address medical challenges across the globe.

Drugs can be delivered to particular cells or tissues in the body using nanoparticle engineering, increasing therapy efficacy and minimizing adverse effects, by delivering chemotherapy medications straight to cancer cells. The ability of nanoparticles to attach to particular proteins linked to tumours can improve the visibility of tumours in medical imaging tests such as PET, CT, or MRI scans. In regenerative medicine, nanotechnology is crucial, especially for tissue engineering and wound healing. Scaffolds that resemble the extracellular matrix seen in nature can be made from nanomaterials to assist the growth and regeneration of organs, tissues, and cells.

Nanoparticles can serve as adjuvants, which are substances that enhance the body's immune response to an antigen. Lipid nanoparticles are being used to deliver mRNA in COVID-19 vaccines (like those by Pfizer and Moderna), facilitating a more efficient immune response. Nanomaterials, such as silver nanoparticles, have antimicrobial properties and are being used in healthcare settings to prevent infections. These nanoparticles can disrupt bacterial cell membranes, inhibit microbial growth, and reduce the risk of hospital-acquired infections.

Nanoscale contrast agents, such as iron oxide nanoparticles or quantum dots, can provide enhanced resolution and contrast in imaging systems like MRI, ultrasound, and fluorescence microscopy. This leads to better visualization of tissues, tumors, and biological processes, helping doctors to diagnose and monitor diseases more effectively. Nanoparticles are being developed as vehicles for gene delivery in gene therapy. For diseases caused by genetic mutations (e.g., cystic fibrosis, muscular dystrophy), nanoparticles can deliver therapeutic genes directly into the cells, correcting the underlying genetic issues.

Keyword: Nanotechnology, diagnosis, cancer cells, microbial growth.

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Waste Management: Challenges, Strategies, Solutions

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Abstract

Waste management is a critical environmental issue that affects human health, natural resources, and the economy. The rapid increase in population, urbanization, and consumption patterns has led to a significant rise in waste generation. This paper discusses the challenges, strategies, and solutions for effective waste management. It highlights the importance of integrated waste management, waste reduction, reuse, and recycling, and emphasizes the need for a multi-stakeholder approach to address the waste management crisis. Effective waste management requires a multi- stakeholder approach that combines integrated waste management strategies, public awareness and education, and community participation.

Keywords: Waste management, natural resources, and the economy

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Tulsi – Ocimum sanctum: a herb for all rason's

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Abstract

The predominant cause of global morbidity and mortality is lifestyle-related chronic diseases, many of which can be addressed through Ayurveda with its focus on healthy lifestyle practices and regular consumption of adaptogenic herbs. Of all the herbs used within Ayurveda, tulsi (Ocimum sanctum Linn) is preeminent, and scientific research is now confirming its beneficial effects. There is mounting evidence that tulsi can address physical, chemical, metabolic and psychological stress through a unique combination of pharmacological actions. Tulsi has been found to protect organs and tissues against chemical stress from industrial pollutants and heavy metals, and physical stress from prolonged physical exertion, ischemia, physical restraint and exposure to cold and excessive noise. Tulsi has also been shown to counter metabolic stress through normalization of blood glucose, blood pressure and lipid levels, and psychological stress through positive effects on memory and cognitive function and through its anxiolytic and anti-depressant properties. Tulsi's broad-spectrum antimicrobial activity, which includes activity against a range of human and animal pathogens, suggests it can be used as a hand sanitizer, mouthwash and water purifier as well as in animal rearing, wound healing, the preservation of food stuffs and herbal raw materials and traveler's health. Cultivation of tulsi plants has both spiritual and practical significance that connects the grower to the creative powers of nature, and organic cultivation offers solutions for food security, rural poverty, hunger, environmental degradation and climate change. The use of tulsi in daily rituals is a testament to Ayurvedic wisdom and provides an example of ancient knowledge offering solutions to modern problems.

Keywords: Ayurveda, tulsi (Ocimum sanctum Linn) is preeminent, and scientific research

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Potential Toxic Elements in the Yamuna's Canal System of Haryana: Sources, Impacts, and Mitigation Strategies

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Abstract

The River Yamuna's associated canal systems in Haryana, India, are vital for agricultural, industrial, and domestic activities. However, the rapid industrialization and urbanization in the region have led to persistent potentially toxic element contamination, posing significant risks to ecosystems and public health. This paper provides a comprehensive analysis of the primary pollution sources, including industrial effluents, agricultural runoff, and untreated sewage, and their contribution to the degradation of water quality. It highlights commonly detected potentially toxic elements such as lead (Pb), cadmium (Cd), chromium (Cr), and mercury (Hg), examining their toxicological impacts on aquatic ecosystems and human health through bioaccumulation and food chain transfer. The findings emphasize the urgent need for integrated solutions aligned with Sustainable Development Goal 6 (Clean Water and Sanitation) to improve water quality and promote sustainable water management practices. Furthermore, the study underscores the relevance of Sustainable Development Goal 12 (Responsible Consumption and Production) by addressing the role of unsustainable production methods and consumption patterns in exacerbating pollution. Regulatory measures and remediation strategies, including physical, chemical, and biological approaches, are discussed as essential tools to mitigate contamination and achieve long-term sustainability. This study aims to inform policymakers, researchers, and stakeholders about the critical steps needed to protect the Yamuna River and its canal systems while advancing global sustainability targets.

Keywords: Bioaccumulation, Ecotoxicology, Haryana Canals, Potential Toxic Elements, Remediation Strategies. Sustainable Development.

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Isolation, Identification and Quatitative analysis of Phytosterols from *Basella alba* L.

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Abstract

Medicinal plants contain some organic compounds which provide definite physiological action on the human body. The present study describes the phytosterols from *Basella alba L*. It is belong to basellaceae. Seed and stem of *Basella alba* L. were shaded, dried, powdered and were extracted using solvent benzene. Preliminary phytochemical screening of the extract was carried out and it revealed the presence of carbohydrates, proteins, phenols, lipids, flavonoids, alkaloids and phytosterols. Phytosterols are naturally occurring compounds that resemble cholesterols both in structure and biological function. The phytosterols in *Basella alba* L. were identified by using IR and GC-MS. β-sitosterol, Stigmasterol, Campestrol and Lanosterol were reported by TLC. Total amount of phytosetrol were found in *Basella alba L*. (0.45 mg/gdw in stem and 3.75 mg/gdw in seed). In *Basella alba* L. 50 compounds were identified in GC-MS analysis. From which one compound 1H- 1,2,4-Triazole-1-carboxamide,5-acetylamino-3-amino (area of % 5.52) was found in highest amount. Many phytochemical are available in the *Basella alba L*. which can be used for treatment of various diseases.

Keywords : *Basella alba*, Phytosterols, IR, TLC, GC-MS.

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Exploring Graphene and 2D Materials for Nanoscale Electronic and Photonic Applications"

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Abstract

Graphene and other two-dimensional (2D) materials have emerged as transformative platforms in nanoscience, offering extraordinary electronic, mechanical, and optical properties. These atomically thin materials exhibit unique phenomena, such as high carrier mobility, tunable band gaps, exceptional thermal conductivity, and strong light-matter interactions, making them ideal candidates for nanoscale electronic and photonic applications.This study investigates the potential of graphene and 2D materials, including transition metal dichalcogenides (TMDs), hexagonal boron nitride (h-BN), and black phosphorus, in advancing next-generation technologies. Key applications discussed include field-effect transistors, flexible and transparent electronics, photodetectors, and energy-efficient optoelectronic devices. The integration of 2D heterostructures, combining different materials to achieve tailored functionalities, is also explored as a pathway to multifunctional devices.Furthermore, the paper examines recent progress in fabrication techniques, such as chemical vapor deposition (CVD) and mechanical exfoliation, alongside challenges related to scalability, stability, and interface engineering. Emerging trends, such as the use of 2D materials in quantum computing and plasmonics, are highlighted to showcase their versatility in addressing future technological demands.

The study underscores the transformative potential of graphene and 2D materials in bridging the gap between fundamental physics and real-world applications, paving the way for ultra-compact, efficient, and sustainable electronic and photonic devices

Keywords: 2D materials in quantum computing and plasmonics

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The Role of Indigenous Medicinal Plants of India in Traditional Medical System: A Review

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Abstract

Indigenous medicinal plants are those plants that are native to a specific region and have been traditionally used by local communities for their medicinal properties. These plants are often an integral part of traditional healing practices, such as Ayurveda in India, Traditional Chinese Medicine (TCM), or Native American herbalism. They have been used for centuries to treat various ailments and maintain overall health. India is a treasure trove of indigenous medicinal plants, many of which have been used in traditional healing practices like Ayurveda for centuries. Here's a brief introduction to some notable ones: **Tulsi**(*Ocimum sanctum*) known to boost immunity, **Neem**(*Azadirachta indica*) known for its antibacterial, antiviral, and antifungal properties, **Ashwagandh**a(*Withania somnifera*) is renowned for its apoptogenic properties.**Turmeric** (*Curcuma longa*)has powerful anti-inflammatory and antioxidant properties, **Amla** (*Phyllanthus emblica*) is rich in Vitamin C and antioxidants to boost immunity, **Brahmi** (*Bacopa monnieri*) used to enhance cognitive function, improve memory, and **Shatavari** (*Asparagus racemosus*) is known for its rejuvenating and nourishing properties. **Arjuna** (*Terminalia arjuna*) used to support heart health. **Gotu Kola** (*Centella asiatica*) is known for its ability to enhance cognitive function and improve circulation. **Guduchi (***Tinospora cordifolia*) is considered a powerful immunity booster.

These plants are just a glimpse into the rich heritage of indigenous medicinal plants in India. Their uses are deeply rooted in traditional knowledge, yet many are gaining recognition in modern medicine for their remarkable benefits.

Keywords: Ayurveda in India, Traditional Chinese Medicine (TCM)

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Use of carbon nanotubes and graphene-based filters for desalination and water treatment

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Abstract

The increasing demand for clean water, coupled with growing environmental challenges, necessitates innovative approaches to desalination and water treatment. Carbon nanotubes (CNTs) and graphene-based filters have emerged as promising nanotechnology solutions due to their unique physicochemical properties, such as high surface area, excellent mechanical strength, and superior thermal and chemical stability. This study explores the application of CNTs and graphene-based materials in desalination and water treatment processes. CNTs, with their hydrophobic interiors and tunable surface functionalities, enable efficient removal of contaminants, including heavy metals, organic pollutants, and microbial pathogens. Similarly, graphene and its derivatives, such as graphene oxide, demonstrate exceptional performance in membrane technologies, allowing selective ion rejection and enhanced water flux in reverse osmosis and forward osmosis systems.The incorporation of these nanomaterials into filtration systems offers significant advantages, including improved energy efficiency, reduced fouling, and scalability for large-scale applications. Additionally, functionalized graphene and CNT composites are investigated for their ability to degrade persistent pollutants through photocatalytic and adsorption mechanisms. However, challenges such as high production costs, environmental impact, and long-term stability need to be addressed to ensure sustainable deployment. Advances in material synthesis, membrane design, and system integration are essential for realizing the full potential of CNTs and graphene-based technologies in providing affordable and sustainable solutions for global water scarcity. This study highlights the transformative role of nanotechnology in revolutionizing water treatment and underscores the need for continued research to overcome existing limitations.

Keywords: Carbon Nanotubes (CNTs), Graphene-based Filters, Desalination, Water Treatment, Nanotechnology, Membrane Technology

Sustainable Development Goals in Higher Education

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Abstract

Higher education institutions play a pivotal role in addressing the multifaceted challenges of sustainable development. By integrating the United Nations' Sustainable Development Goals (SDGs) into their curricula, research, and community outreach, universities can foster a holistic approach to sustainability that balances social, economic, and environmental dimensions.

Exploration: The journey begins with exploration, wherein institutions assess their current practices and identify opportunities for incorporating SDGs. This involves auditing campus operations, academic programs, and research initiatives to understand their impact on sustainability. Engaging students, faculty, and staff in this exploration phase can yield diverse perspectives and innovative ideas for embedding SDGs into the academic fabric.

Integration: Once opportunities are identified, the next step is integration. This entails embedding SDG principles into existing courses and developing new interdisciplinary programs that address global challenges. Universities can promote collaborative research projects that span multiple disciplines, fostering a comprehensive understanding of sustainability issues. Additionally, campuses can adopt sustainable practices in their operations, such as reducing carbon footprints, conserving resources, and supporting local communities.

Implementation: The final phase is implementation, where the focus shifts to tangible actions and measurable outcomes. Institutions can establish sustainability committees, set specific targets, and monitor progress through transparent reporting mechanisms. Collaborating with external stakeholders, including governments, NGOs, and industry, can enhance the impact of these efforts. Furthermore, fostering a culture of sustainability through student-led initiatives and community engagement can create lasting change.

By exploring, integrating, and implementing the SDGs, higher education institutions can become catalysts for sustainable development, equipping future leaders with the knowledge and skills to create a balanced and resilient world.

Keywords: social, economic, and environmental dimensions

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Fundamental Concepts in Graph Theory

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Abstract

Graph theory is a branch of mathematics that studies the properties and applications of graphs, which are structures used to model pairwise relationships between objects. Graph theory is a field of mathematics focused on the study of graphs, which are mathematical structures representing relationships between objects. A graph is composed of vertices (nodes) and edges (connections), which can be directed or undirected, weighted or unweighted. The study encompasses various types of graphs, including trees, bipartite graphs, and planar graphs, each with distinct properties and applications. Graph theory provides a foundation for solving complex problems in areas such as computer science, physics, biology, social sciences, and engineering. Its applications include network analysis, optimization, algorithm design, and modeling real-world systems such as transportation networks, social interactions, and biological processes. This abstract provides an overview of fundamental concepts in graph theory, its classifications, and its evolving role in addressing complex real-world problems, emphasizing its interdisciplinary importance and future potential in computational research.

Key words: Vertices, Edges, Directed graphs, weighted graphs, Trees, Bipartite graphs, and Planar graphs.

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Effect of environment radiation pollution on human health.

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Abstract

A clean environment is essential for human health because this interaction between the environment and human health so the complexity air pollution less water quality noise etc directly effect the human health climate changes depletion of ozone laws of biodiversity can also effect of human health most of modern technology produce radiation in the environment both beneficial and harmful effect through radiation material. Natural radioactive source including cosmic radiation come from the Sun and outer space small amount reach the earth surface to which we are exposed the exposure. of this type radiation is hire for people living above sea level radon is the produced through the decay of Uranium and thorium that are found natural in the earth crust. Artificial radioactive source including fall out radiation which result from the past atmospheric bomb test Mani test exclusion is environment changes weather occurring as the natural phenomena changes the ecological balance and context within which disease host or vector and parasite and transmitted today radiation is a common used in medicine to diagnose illness research to treat disease and industry to generate electricity in nuclear power reactor. Radiation in energy that move through space or matter at high speed .the energy can we the from particles such as Alpha or beta particles. They are two types of health effect from radiation threshold and non threshold effect.

Keywords: human health climate, ozone law, Natural radioactive

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Computational fluid dynamics for air quality modelling and control

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Abstract

Computational Fluid Dynamics (CFD) has emerged as a powerful tool for air quality modeling and control, enabling detailed analysis of pollutant dispersion, emission sources, and the effectiveness of mitigation strategies. By solving the Navier-Stokes equations and integrating chemical reaction models, CFD provides insights into the behavior of gaseous and particulate pollutants in diverse environments, ranging from urban areas to industrial settings. Advanced turbulence models, coupled with high-resolution numerical methods, allow for accurate simulation of airflow and pollutant transport under varying meteorological conditions.

Applications of CFD in air quality management include optimizing ventilation systems, assessing indoor air quality, evaluating the impact of urban planning decisions on pollution hotspots, and developing emission control technologies. The flexibility of CFD to simulate complex geometries and multi-scale phenomena makes it a crucial tool for policymakers and engineers striving for sustainable air quality improvements. This paper reviews the advancements in CFD techniques for air quality modeling, highlights case studies of successful applications, and discusses future challenges in integrating CFD with real-time monitoring and machine learning for dynamic air quality management.

Keywords: Chemical reaction models, advanced turbulence models

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"Isolation and Identification of Endophytic Bacteria From *Salvadora* Sp."

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Abstract:
Endophytic microbes reside in plant tissues without inducing any symptoms. They provide advantages to their host through several means. *Salvadora* is a plant that flourishes in tropical and subtropical regions of Africa and Asia. It has the ability to effortlessly adjust to saline environments. Our experimental study shows results pertaining to morphological biochemical and molecular characterization of different endophytic bacterial strains associated with *Salvadora sp.* For this study, nearly 100 unknown bacterial strains were collected from root, stem, leaf and rhizosphere soil of *Salvadora* from Jaipur and Jhunjhunu.Endophytic bacteria were isolated and molecular and biochemical tests were carried out for identification, further identification was done by molecular sequencing and sequence were submitted at NCBI to obtain accession number of each. Name of the some identified endophytic bacteria- *Bacillus cereus, B. pumilus, B. thurinegiensis, B.safensis, B.nitratireducens,B.tenebrionis B. australimaris, B.toyonensis B. Zhangzhouensis, B. wiedmannii, B. anthracis, Bacillus sp. (in:fermicutes), B. Paramycoides, Staphylococcus sp., Proteus mirabilis, P. penneri, Proteus sp BUR10, Microbacterium testaceum, Microbacterium hydrothermale.*

Key words: Endophytic Bacteria,*Salvadora*,Morphological, Biochemical, Molecular, Accession Number.

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TitlImpact of Climate Change on human health, Case study of Bhayandar East, Thane

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Abstract

Climate alter postures significant dangers to human wellbeing, especially in urban ranges like Bhayandar East, India, where quick urbanization, natural debasement, and statistic changes compound the impacts. This case think about explores the complex connections between climate alter and human wellbeing in Bhayandar East, recognizing vulnerabilities, and suggesting evidence-based relief techniques. The inquire about destinations of this think about are fourfold. To begin with, to examine the impacts of climate alter on human wellbeing in Bhayandar (East) moment, to distinguish powerless populaces and communities. Third,to analyze the adequacy of existing healthcare foundation and crisis readiness. At long last, to create climate-resilient healthcare procedures and suggestions. A mixed-methods approach was utilized, combining statistic, natural, and wellbeing information examination with partner interviews and overviews. The think about checked on existing writing and arrangements related to climate alter and wellbeing, and counseled with healthcare experts, community pioneers, and inhabitants.

The key discoveries of this ponder uncover expanded rate of heat-related ailments, water-borne infections, and vector-borne infections. Powerless populaces, counting children, the elderly, and those with pre-existing restorative conditions, are excessively influenced. Besides, lacking healthcare foundation, destitute natural administration, and constrained open mindfulness worsen wellbeing dangers. To moderate these impacts, this think about suggests creating climate- resilient healthcare frameworks and crisis readiness plans. Progressing natural administration, squander transfer, and water quality is significant. Improving open mindfulness and instruction on climate alter and wellbeing, as well as actualizing early caution frameworks for warm waves and malady episodes, are moreover basic.

This case ponder contributes to the understanding of climate change's wellbeing suggestions in urban India and educates evidence-based procedures for moderating these impacts. The discoveries have critical suggestions for policymakers, healthcare experts, and community pioneers looking for to ensure the wellbeing and well-being of urban populaces. The suggestions of this consider are far-reaching. The investigate illuminates climate alter and wellbeing approach improvement, upgrades healthcare foundation and crisis readiness, and bolsters community-led activities and climate strength programs. In spite of the study's commitments, confinements exist. Information accessibility and openness impediments and the study's scope and geographic center require encourage investigate. Future investigate bearings incorporate examining climate change's mental wellbeing impacts, creating climate-resilient healthcare models for urban India, and investigating the part of community-led activities in climate alter adjustment.

Keywords: human wellbeing

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Biodiversity and Ethnomedicinal Value of Native Flora in Banswara: A Sustainable Approach

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Abstract

An essential component of the traditional healthcare practices of the local inhabitants, namely the Bhil and Meena tribes, the varied flora of Banswara, a tribal area in southern Rajasthan, has great ethnomedicinal significance. This study employs field surveys and interviews with traditional healers to document a variety of native medicinal plants and their uses. A total of 120 plant species from 55 families were discovered, together with information about the conditions they treat, how they are prepared, and their therapeutic uses. The herbs that have been reported are frequently used to treat skin ailments, respiratory disorders, digestive disorders, and fever.

The study emphasizes how critical it is to use and conserve these native plants sustainably in order to preserve the area's unique biodiversity and traditional knowledge.Threats to the survival of medicinal plant species include habitat loss and unsustainable harvesting methods. The report makes recommendations for medicinal plant cultivation, community-based conservation initiatives, and the promotion of traditional medicine in addition to contemporary healthcare. Through the preservation of both biodiversity and indigenous knowledge, this strategy seeks to promote sustainable livelihoods and local healthcare.

Keywords: local healthcare, traditional knowledge, bhil and meena tribes, ethnomedicine

Geo-resource and environmental concerns

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Abstract

Minerals, fossil fuels, soil, and water are examples of geo-resources that are essential to maintaining human civilization and economic development. However, there are frequently serious environmental issues with the mining of these resources. In order to guarantee sustainable development, a balanced approach to resource management is required due to the interaction between environmental impact and geo-resource extraction.

Soil erosion, biodiversity loss, and habitat degradation are the results of intensive mining and drilling operations. Climate change is further exacerbated by resource processing and use, such as burning fossil fuels, which releases greenhouse gases into the atmosphere. Mining runoff, industrial discharges, and over-extraction frequently result in the depletion or contamination of water resources, both surface and groundwater. Furthermore, inappropriate resource extraction waste disposal puts the ecosystem at long-term danger for pollution and land degradation.

Incorporating sustainable practices—such as switching to renewable energy sources, increasing material recycling and reuse, and enforcing strict environmental regulations—is necessary to mitigate these issues. Cutting-edge tools like machine learning, GIS, and remote sensing help reduce environmental impact and maximize resource exploration. Furthermore, attaining fair resource distribution while protecting the environment depends on promoting international cooperation and community involvement.

This abstract emphasizes how important it is to handle environmental issues when using geo-resources. Prioritizing sustainable practices and cutting-edge technologies will help to maintain ecosystem resilience and the welfare of future generations by striking a balance between resource needs and environmental conservation.

Keywords: Minerals, fossil fuels, soil, and water

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Prosopis cineraria: An Indigenous, medicinal, life sustaining tree of Indian Thar Desert

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Abstract

Prosopis cineraria is an indigenous tree species to India. It is less popular as medicinal plant but very well known for its medicinal uses from ancient time. The leaves of Prosopis cineraria have antioxidative, antibacterial, analgesic, anti-hypercholesterolemic, antitumor, antihyperglycemic and antihyperlipidemic activities. Leaf paste of P. cineraria provides relief in boils, blisters and mouth ulcers. The inflorescence of Prosopis cineraria is given to the pregnant women as a pregnancy safeguard. Bark of Prosopis is used in making medicines related to stomach, skin and eye problems. It is also useful in some other diseases like asthma, dysentery, leukoderma, leprosy, dyspepsia, and earache the genus Prosopis L. belongs to the family Fabaceae which is well known for its economic importance. Prosopis is considered a blessing for people living in the arid and semi-arid regions. It grows in all the adverse environmental conditions of the desert. It provides food for human beings as well as animals. The plant is well known for its usefulness and hence being known as 'Kalpvriksha of the desert'. The present study involves the economical as well as traditional and potential mediational uses of P. cineraria. This plant fulfills all basic needs of life such fuel, food, fodder and medicine hence it is a life sustaining tree for the people living in arid and semi-arid region of India.

Key words: Prosopis cineraria, Kalpvriksha, arid and semi-arid, life sustaining tree

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Enviromental Managment and Implication of Human Development

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Abstract

The production and use of all energy sources results in undesirable environmental effects, which vary based on the health of the existing ecosystem, the size and health of the human population, energy production and consumption technology, and chemical properties of the energy source or conversion device. Environmental impacts are changes in the natural or built environment, resulting directly from an activity that can have adverse effects on the air, land, water, fish, and wildlife or the inhabitants of the ecosystem. Pollution, contamination, or destruction that occurs as a consequence of an action that can have short-term or long-term ramifications is considered an environmental impact. Most adverse environmental impacts also have a direct link to public health and quality of life issues. Several successful reductions in pollution levels have been attributed to stricter regulations, including levels of carbon monoxide and more recent reduction in fine particulate matter. Sustainable Development is a dynamic process which enables all people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the Earth's life support systems". This contributed to understand that sustainable development encompasses a number of areas and highlights sustainability as the idea of environmental, economic and social progress and equity, all within the limits of the world‟s natural resources. Environmental management and sustainable development are two intertwined concepts related to methods of meeting human needs without damaging the environment. Environmental management focuses on maintaining natural resources such as timber, water and open land without diminishing or destroying them. Sustainable development seeks to meet human needs without depleting resources. Many people also believe that environmental problems can wait until developing countries are richer.

Keywords: Industry, Work, Change, Women, Society.

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Ethyl Acetate extract from fruits of *Martynia annua* L. enhances resistance against Oxidative Stress in *Caenorhabditis elegans*

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Abstract

The ethyl acetate fruit extract of *M. annua L.* was analyzed using GC-MS, revealing a diverse array of bioactive compounds, with Cyclohexasiloxane, dodecamethyl- (20.88%) as the predominant constituent, followed by Cycloheptasiloxane, tetradecamethyl- (17.24%). These compounds are known for their antibacterial, antifungal, and antitumor properties, highlighting the therapeutic potential of the extract. Biological assays corroborated these findings, with the DPPH assay demonstrating strong antioxidant activity and survival assays in *C. elegans* showcasing significant protection against juglone-induced oxidative stress, particularly at moderate concentrations (40–60 µg/mL). Toxicity evaluations revealed the extract to be safe at concentrations ≤1 mg/mL. The combination of its chemical profile and biological activities positions *M. annua L.* as a promising candidate for natural antioxidant, antimicrobial, and anticancer therapies. These findings pave the way for further exploration into isolating active compounds, validating their bioactivities, and exploring their clinical applications. This study underscores the potential of *M. annua L.* as a valuable resource in sustainable healthcare solutions.

Keywords: Antioxidant activity, GC-MS analysis, *Martynia annua* L., Toxicity.

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Advancing Environmental Sustainability: Applications and Challenges of Solar Cells in India

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Abstract

This review article explores the role of solar cells in advancing environmental sustainability, focusing on their applications and the challenges in India. As the country faces increasing energy demands and environmental degradation, solar energy has emerged as a promising solution to India's growing energy demands and environmental concerns, offering a renewable, clean alternative to conventional energy sources. The article examines the widespread adoption of solar cells in various sectors, including residential, commercial, and industrial applications, highlighting their potential in reducing carbon emissions and promoting energy independence. Despite significant progress, India faces several challenges in scaling up solar energy, such as infrastructure limitations, technological barriers and financing issues. The paper also, explores the integration of artificial intelligence (AI) technologies to enhance solar energy conversion efficiency and promote environmental sustainability in India. By leveraging AI-driven predictive analytics, machine learning algorithms, and smart grid solutions, the study identifies methods to optimize photovoltaic system performance, forecast energy demand, and streamline maintenance operations. Additionally, the paper examines case studies and real-world applications that highlight AI's transformative impact on solar energy projects across India. The findings emphasize that the fusion of AI with solar energy systems not only improves energy efficiency but also supports India's transition towards a greener, more sustainable future.

Keywords: Clean Energy Applications, Climate Change Mitigation, Solar Technology Advancements, Solar Power Infrastructure, Artificial Intelligence

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Global warming impact on Agriculture in India

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Abstract

India's total area is 3,287,263 square kilometers (1,269,219 square miles). This makes it the seventh largest country in the world by area, and it accounts for 2.42% of the world's total area.

India lies in the Northern Hemisphere. With respect to the latitudinal and longitudinal extent, India lies between latitudes 8° 4'N and 37° 6'N, and the longitudes 68° 7'E and 97° 25'E. India's climate is tropical monsoon. The Indian Meteorological Department (IMD) designates four official seasons:

- Winter, from December to early April.
- Summer or pre-monsoon, from April to June (April to July in north-western India)
- Monsoon or rainy, from June to September.
- Post-monsoon, from October to December

According to the Department of Agriculture & Farmers Welfare, the total agricultural area in India was 54.8% of the country's geographical area in 2021-22. The total cropped area was 219.158 million hectares, and the net sown area was 141.00 million hectares. About 55–65% of the workforce in India is engaged in agriculture and related activities.

Global warming is the unusually rapid increase in Earth's average surface temperature over the past century primarily due to the greenhouse gases released by people burning fossil fuels. The greenhouse gases that are the biggest contributors to global warming are carbon dioxide, methane and nitrous oxide, with a significant amount coming from the transportation, manufacturing, construction, agriculture, and oil and gas industries.

Every 1oC increase in temperature reduces wheat production by 4-5 million tons. Loss only 1-2 million tons if farmers could plant in time. Increasing sea and river water temperatures are likely to affect fish breeding, migration, and harvests. Coral reefs will start declining from 2030.
The shift in climate patterns is a global phenomenon that has badly affected the crop yield in India. It has also influenced the types of crops that can be cultivated in certain regions by affecting the soil, water and pest prevalence in those regions. Due to global warming, crops' sowing and ripening time period have changed. Crop-related diseases have increased. The quality of grains and fruits has decreased, the time for crop rotation has changed and the yield of crops has decreased due to continuous attack by insects and other pests on the cultivated area, which has thus reduced overall food production.

Due to the rise in temperature and changes in water availability, climate change can affect irrigated agricultural production throughout agro-ecological zones.
Farmers should also follow climate-smart agriculture (CSA) technologies to properly manage their farmland and livestock along with landscapes—forests, groves, and regional biodiversity.

To minimize the effect of climate change on agriculture, afforestation, urbanization and industrialization with planning, pest management, soil management, crop management, organic farming and awareness are a must.

Keywords: Crop rotation, CSA, Yield, Coral-reef.

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Reimagining Plant Pathology in an Age of Environmental Uncertainty

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Abstract

The ongoing environmental uncertainties, driven by climate change, habitat degradation, and global trade, are reshaping the landscape of plant pathology. Traditionally focused on pathogen biology and host susceptibility under stable conditions, plant pathology now faces an era of rapid ecological changes, which demand innovative approaches to disease prediction and management. This paper examines how the escalating impacts of climate variability are influencing plant diseases, shifting pathogen distribution, and altering host-pathogen interactions. Research suggests that warmer temperatures and altered precipitation patterns are extending the range of many pathogens while simultaneously increasing the frequency and severity of plant disease outbreaks (Smith et al., 2024). Furthermore, changes in agricultural practices and biodiversity loss are facilitating the emergence of new, often more virulent, pathogens (Jones et al., 2024). To address these challenges, we advocate for a holistic, systems-based approach to plant disease management that integrates ecological and genetic data, leveraging advanced technologies such as climate modeling, pathogen genomics, and big data analytics. This paper highlights the need for adaptive disease management strategies that prioritize ecosystem resilience, incorporating both proactive and reactive measures. By fostering interdisciplinary collaboration and leveraging cutting-edge scientific advancements, plant pathologists can better prepare for the uncertainties of an increasingly unpredictable environment. A more resilient agricultural future will depend on the integration of environmental, ecological, and genomic insights into plant health management.

Keywords: - Pathogens, Resilience, climate modeling, pathogen genomics,

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Nano Science: A major role in environmental protection

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Abstract

The primary challenge facing the entire planet is the degradation of water, land, and atmosphere caused by the discharge of harmful chemicals from continuous human activity. The unique characteristics of materials at the Nano-scale enables nanotechnology to detect, mitigate, and remediate environmental pollution in a variety of creative ways, like in Air Pollution Control, Water Pollution Treatment, Soil Remediation, Energy-Related Pollution Mitigation and Detection and Monitoring.

Photo-catalytic coatings, including surface coatings for building exteriors, employ metal nanoparticles. They decompose pollutants including nitrogen oxides and volatile organic compounds (VOCs) when exposed to sunshine. Catalytic converters use nano-structured catalysts to change toxic gases including carbon monoxide (CO), nitrogen oxides, and hydrocarbons into less toxic forms in order to lower vehicle emissions.

Particulate Matter (PM) 2.5 and PM10 particles are more successfully removed from water than by conventional filters. The application of nanocatalysts in degradation through photo-catalytic processes, organic pollutants such as dyes and pesticides are broken down by zinc oxide or titanium dioxide nanoparticles.

Water contaminants are removed by nano-filtration membranes. Using adsorption Lead, arsenic, and other heavy metals can be effectively removed by iron oxide nanoparticles and other materials. Because of their large surface area and adsorption capacity, carbon nanotubes and graphene oxide can remove oil, toxins, and organic contaminants.

Nanostructured bioremediation products employ nano-carriers to provide nutrients or oxygen to the soil. Contaminant Neutralization Zero-valent iron (nZVI) nanoparticles are used to treat soil contaminated with heavy metals, pesticides, and chlorinated hydrocarbons by dissolving or immobilizing them.

Nanomaterials enhance solar panels, batteries, and fuel cells, lowering pollutants and reducing reliance on fossil fuels. Hazardous materials, such as heavy metals, volatile organic compounds, and greenhouse gases, can be detected in small levels in soil, water, and air using very sensitive sensors based on carbon nanotubes, gold nanoparticles, or quantum dots.

Key word: nanotechnology, environmental pollution, graphene oxide, greenhouse gases.

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Safeguarding the Future of Wildlife: Addressing Emerging Challenges and Opportunities in Conservation

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Abstract

The world's wildlife is facing unprecedented threats, from habitat destruction and climate change to poaching and human-wildlife conflict. As the global community strives to protect and conserve biodiversity, new challenges and opportunities are emerging. This presentation will highlight the current state of wildlife protection worldwide, with a focus on the most pressing challenges and opportunities. The present article include the impact of climate change on wildlife populations and ecosystems, the role of human-wildlife conflict in driving species decline, and the effectiveness of existing conservation strategies and policies. The potential of innovative technologies, such as camera traps and drones, and community-based approaches in enhancing wildlife protection will also be explored. Drawing on case studies and examples from around the world, explore the complexities and nuances of wildlife conservation in the 21st century. It will identify key areas for future research, policy, and practice, with the goal of informing and inspiring more effective conservation efforts globally.

Keywords: Biodiversity, Climate change, Conservation policy, Human-wildlife conflict, Innovative technologies, Wildlife conservation.

Ethno-veterinary Study of Medicinal Plants of Shekhawati region of Rajasthan

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Abstract

The goals of this article were to (i) describe ethno-veterinary plants and their formulation procedures in an undiscovered Shekhawati region, and (ii) choose prospective medicinal plants with higher fidelity value for subsequent in vitro examination. A semi-structured questionnaire was used to interview a group of 40 people. In the study region, 28 plants from 23 families were utilized to heal livestock problems. Whole plants (39%) were usually employed in the form of paste and powder in the formulations. The bulk of the plants were used to treat cow and buffalo problems, while gastrointestinal and skin infections were found to be more prevalent. *Allium cepa Linn.* Rated first with a FL value of 93%, followed by *Curcuma longa Linn.* Ranked second (91%), *Punica granatum Linn*. ranked third (90%), and *Cassia tora Linn*. ranked fourth (85%). Plants with significant FL scores might be studied in vitro for the discovery of new bioactive chemicals, and young people should be taught about ethno-veterinary practices.

Keywords- Ethno-veterinary, Shekhawati region Herbal plants, Medicinal, Traditional, ailments, fidelity level.

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Bioremediation Potential of *Sesamum indicum*: A Sustainable Approach to Environmental Cleanup

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Abstract

The increasing burden of environmental pollution, particularly from heavy metals and toxic organic compounds, has intensified the need for sustainable remediation strategies. Bioremediation, an eco-friendly and cost-effective method, leverages biological agents to mitigate pollutants. This study explores the potential of *Sesamum indicum* (Sesame), a widely cultivated oilseed crop, for phytoremediation of contaminated soils.

A detailed investigation was conducted to assess Sesame's ability to uptake, accumulate, and metabolize heavy metals, including lead (Pb), cadmium (Cd), and arsenic (As), under controlled and field conditions. The plant's robust root system, high biomass production, and ability to tolerate stress in polluted environments make it an ideal candidate for bioremediation applications. Key findings include: Heavy Metal Accumulation: Sesame exhibited significant bioaccumulation factors (BAF > 1) for Pb and Cd in its root and shoot tissues, Phytotransformation: Enzymatic analysis revealed the activation of antioxidant systems, including superoxide dismutase (SOD) and catalase (CAT), aiding in detoxification, Growth Performance: Despite exposure to contaminants, Sesame maintained a stable germination rate and growth profile, indicating resilience and adaptability, Soil Restoration: Post-harvest analysis of treated soils showed a 40-60% reduction in heavy metal concentrations, alongside improvements in soil microbial diversity.

The study highlights the dual benefits of Sesame cultivation: environmental cleanup and economic returns through oilseed production. Further research into genetic modification and microbial symbiosis could enhance its efficacy for site-specific remediation.

Keywords: Bioremediation, *Sesamum indicum*, Phytoremediation, Heavy Metals, Environmental Sustainability.

Environmental Glory: Are We Able To Sustain?

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Abstract

Nature has enriched the planet earth with plant and animal biodiversity to provide surplus natural resources for human survival. Initially, human race was grateful to the creator for his blessings but with the passage of time, greed to earn more and more initiated steep downfall of the values resulting into the rapid loss of biodiversity. Excessive use of chemical fertilizers, biocides against pests, herbs, weeds for enhancing agriculture production is leading to severe health hazards to animal and human race. In order to combat these problems, the process of using Cyanobacteria as bio-fertilizer and bio-inoculant for organic food production was explored.

Receding fossil fuel reserves can also be compensated to some extent by using algae biofuel. The need of environment friendly biodiesel extracted from high fatty acid algal strains will be used as green energy and will sequester carbon emission. Due to our dreadful acts, we are now finding ways to create artificial rain to help the drought affected areas but these technologies in no way can compensate the natural climatic boons. But an act against nature has recently shown a big disaster in Dubai which virtually submerged due to artificial rain.

We have recently witnessed the biggest global catastrophe in the form of Covid-19 caused by Corona virus which is a threat to mankind all over the world. Persistent destruction and exploitation of natural resources, deforestation, increased pollutant, dangerously reduced air and water quality, deteriorated soil health and absolute negligence towards our the health of our planet has led to this alarming global health emergency. Nature has decided to reclaim itself and the invisible virus has done it successfully by shutting down almost everything. Health of nature is directly associated with our health and we remain ignorant, similar will be the result.

Biotechnological intervention may be a useful tool to sustain environment but its misuse will again be the toughest problem to solve. Through micro-propagation, tissue culture, hydroponics,

medicinal plant multiplication and by exploring immune-protective measures, we may be able to restore the environmental damage to a little extent. Manmade technological implements, space program, malpractices to distort nature, progress via destruction are few big concerns which need immediate attention of the policy makers.

Keywords: plant and animal biodiversity, Covid-19 caused by Corona virus

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Antifertility analysis of Moringa oleifera leaf-mediated silver nanoparticles in male albino rats

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Abstract

Expanding population growth presents significant challenges, leading to negative social, economic, personal, and health outcomes and environmental damage. *Moringa oleifera* extract has been utilized in ayurvedic medicine since ancient times to address various health conditions. This study aimed to evaluate the effectiveness of silver nanoparticles (AgNPs) derived from *M. oleifera* leaves as an effective antifertility agent in male albino rats. A total of 40 rats were divided into five dosage groups and monitored over a 60-day period. Sperm motility, sperm density, and various biochemical parameters, including protein, glycogen, sialic acid, and fructose were evaluated. The results revealed that increasing doses of AgNPs significantly reduced fertility rates and reproductive organ weights. Notably, both sperm motility and density showed marked declines. Changes in critical biochemical parameters, such as protein levels and sialic acid, strongly indicated adverse effects on reproductive health; however, recovery was observed in a designated recovery group. Additionally, serum testosterone levels significantly decreased with higher doses. These findings suggest that AgNPs derived from *M. oleifera* may function as a potential antiandrogenic agent for the development of herbal male contraceptives. Nevertheless, further research is necessary to confirm their efficacy and safety.

Keywords: Herbal, Nanoparticle, Testes, Antifertility, Histopathology

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Studies on Medicinal Plants of Ayurvedic Significance in Sikar District, Rajasthan

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Abstract

Medicinal plants surveys were carried out in Sikar area during 2022 to 2024. During the survey some very interesting cultivated plants were found, which having therapeutic properties, used in ayurvedic remedies such as *Aloe vera* (L.) Burm.f. (Asphodelaceae), *Bombax ceiba* L. (Bombacaceae), *Emblica officinalis* Gaertn. (Euphorbiaceae), *Mantha arvensis* L. & *Ocimum sanctum* L. (Lamiaceae), *Syzygium cumini* (L.) Skeels (Myrtaceae) and *Trigonella foenum- graecum* L. (Papilionaceae) etc. The people of study area mostly rely on ethnomedicinal practices; particularly in treating common medical problems like gastric troubles, constipation, blood purifier, loss hair fall and dandruff, coolant, cough and cold, skin diseases and abdominal disorders. The information on medicinal uses of plants is based on the exhaustive interviews with local Vaidya's (practicing indigenous system of medicines) and self-observations. Among different plant parts used for the preparation of medicine, leaves were found most frequently used for the treatment of diseases followed by fruits, bark and seeds. Study deals with the documentation and observation of ethnomedicinal uses of selected cultivated plants that can be very easily grow up in our living place like balconies, roof top, and our small gardens which are very connected to us in our home; used by the local people. Plants are described alphabetically with updated botanical names followed by local names, family, plant part used and Ayurvedic purposes.

Key Words: Medicinal plants, Ayurvedic remedies, Sikar, Rajasthan

Wild life protection and challenges

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Abstract

The sustainability of life on Earth, ecological equilibrium, and biodiversity all depend on the conservation of wildlife. But because of habitat loss, poaching, and pollution brought on by urbanisation, industrialisation, and population increase, many species are in danger of going extinct. Protecting natural habitats, upholding anti-poaching legislation, and raising public awareness of the need of human-wildlife cooperation are the main goals of conservation initiatives.

Many issues still exist in spite of continuous international efforts. Deforestation, urbanisation, and agricultural growth continue to be the primary threats to habitat, while climate change is making ecosystems even more unstable. Many species are forced to move, adapt, or face extinction as a result of rising temperatures and changing weather patterns. Furthermore, the desire for exotic animals and their derivatives fuels the illicit wildlife trade, which is still very much alive and well, especially in areas with lax enforcement and little money for conservation.

Other risks include invasive species and conflicts between humans and wildlife. Tensions between local residents and animals are heightened when encroachments into natural ecosystems frequently cause agricultural damage, livestock loss, and even mortality. Because invasive species outcompete native ones, ecosystems become unstable and biodiversity drastically falls.

Resolving these issues requires a multifaceted approach. Strengthening legislative frameworks, promoting community engagement, and utilising modern technologies for monitoring and enforcement are all crucial strategies. International collaboration and educational programs are crucial to promoting a global culture of conservation. Other long-term solutions include restoring ecosystems and putting sustainable development plans into action.

Keywords: Deforestation, urbanisation, and agricultural growth

Super Absorbent Polymer

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Abstract

Super Absorbent Polymers (SAPs) also called hydrogels are synthetic materials with a remarkable ability to absorb water, up to 100,000% of their weight. They are mainly made of polyacrylates, they are nontoxic, biodegradable, and can release absorbed water under pressure, which makes them suitable for agriculture. The application of SAP to soils is regarded as an effective practical method to increase yield and water conversation because the polymer has special water absorption and water retention properties.

SAPs improve water holding capacity, reduce evaporation, and prevent leaching, which enhances soil structure and aeration. They induce seed germination, seedling growth, and drought tolerance. This improves crop yields and minimizes seedling mortality. SAPs also reduce irrigation frequency and consumption of fertilizers and pesticides, hence promoting agricultural sustainability. They are non-polluting.

Some examples of SAPs are pusa hydrogel, and cassava starch-based SAP. Pusa hydrogel is developed by the Indian Agricultural Research Institute. It absorbs 400 times its weight in water and can be effective for at least one year in soil. Cassava Starch-Based SAP is a semi- synthetic with high absorbency and improved soil properties. It is suitable for various plants.

The high net return in the majority of crops indicates that SAP is an economically feasible system. It is a sustainable agricultural technology that can help mitigate droughts and water shortages. It has significant economic advantages as well as enormous potential for yield optimization, and water conservation. However, future research should look into the potential risks SAP brings to human health and the environment.

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Differential expression of miRNAs regulating structural genes of the carotenoid pathway in *Dunaliella salina* under salinity stress

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Abstract

Green microalga *Dunaliella salina* is widely recognised for its ability to accumulate high levels of beta-carotene under varied environmental conditions. However, the regulatory mechanisms governing the expression of carotenoid pathway genes (*Crt* genes) are not fully understood. MicroRNAs (miRNAs), which function as key post-transcriptional regulators of gene expression, remain largely unexplored in the context of carotenogenesis in *D. salina*. This study aimed to identify and characterise miRNAs potentially involved in regulating *Crt* genes in *D. salina*. Homology-based approaches were employed using publicly available miRNA sequences from *Chlamydomonas reinhardtii* and *Arabidopsis thaliana*. A total of 30 candidate miRNAs were identified, and their target genes were predicted using psRNATarget. Validation of miRNA-target hybridization sites was performed using RNAHybrid, revealing potential regulatory interactions between these miRNAs and *Crt* genes. From the identified miRNAs, five candidates—Ds- miR1163.2, Ds-miR917, Ds-miR1145.1, Ds-miR166a-3p, and Ds-miR414—were selected for further validation. Expression analysis under control conditions (2M NaCl) confirmed their presence in *D. salina*. Differential expression patterns of these miRNAs were examined under hypersaline stress (4M NaCl) using stem-loop qRT-PCR, demonstrating their regulatory role under stress conditions. Only Ds- miR1145.1 and Ds-miR414 were found to be upregulated, while all other miRNAs were downregulated under increased salt stress. This is the first report of differential expression analysis of miRNAs in a *D. salina* strain isolated from Sambhar Lake, India. These findings highlight the regulatory potential of miRNAs in carotenogenesis and will promote studies for post-transcriptional regulation mechanisms in *D. salina* strains for augmenting carotenoid production.

Keywords: study aimed to identify and characterise miRNAs potentially

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Bonding Relationship between Silicon and Germanium with Group 13 and Heavier Elements of Groups 14–16

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Abstract

The topic of heavier main group compounds possessing multiple bonds is the subject of momentous interest in modern organometallic chemistry. Importantly, there is an excitement involving the discovery of unprecedented compounds with unique bonding modes. The research in this area is still expanding, particularly the reactivity aspects of these compounds. This article aims to describe the overall developments reported on the stable derivatives of silicon and germanium involved in multiple bond formation with other group 13, and heavier groups 14, 15, and 16 elements. The synthetic strategies, structural features, and their reactivity towards different nucleophiles, unsaturated organic substrates, and in small molecule activation are discussed. Further, their physical and chemical properties are described based on their spectroscopic and theoretical studies.

Keywords: unprecedented compounds, physical and chemical properties

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Significance of Indigenous Medicinal Plants towards a Sustainable Future

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Indigenous or native plants have their origins in a specific region or country. They are exclusively found in their rightful place, thriving within their natural habitat and under prevailing environmental conditions. Owing to its diverse geography and climate, India is renowned for its unique variety of flora, which sets it apart from other regions. India has a wide range of ecosystems that support a rich tapestry of plant species. These ecosystems include dense forests, arid regions, expansive grasslands, wetlands and coastal areas.

Indigenous Indian medicinal plants are native flora used in traditional medicine for their curative properties. They show relevance in treatment of health conditions through ancient medication. Phytochemicals obtained from medicinal plants encompass scope for drug discovery. The World Health Organization defines traditional medicine as "sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness."

In conclusion**,** indigenous plants of India are part of a rich and diverse ecosystem, serving as vital habitats for flora and fauna along with ecological benefits such as carbon sequestration and soil conservation., These plants are culturally significant integrated in spiritual practices and traditional medicine. However, deforestation, urbanization and climate change pose threats to their survival. Community involvement, conservation efforts and sustainable practices are crucial to protect these valuable resources for a greener and more sustainable future.

Keywords: environment, indigenous, medicinal, native, plants.

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Contribution of Biotechnology in Achieving Sustainable Development Goals (SDGs)

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Abstract

Biotechnology plays a pivotal role in advancing the United Nations Sustainable Development Goals (SDGs) by providing innovative solutions to global challenges. This review presents an overview of the contributions of biotechnology towards achieving these goals. Biotechnology enhances agricultural productivity (SDG 2) through the development of genetically modified crops that are resistant to pests, diseases and environmental stresses, thereby ensuring food security. It also contributes to good health and well-being (SDG 3) by enabling the production of vaccines, antibiotics, therapeutics and by advancing personalized or precision medicine.

In the realm of clean water and sanitation (SDG 6), biotechnological applications such as biofiltration and bioremediation improve water quality and waste management. Biotechnology also supports affordable and clean energy (SDG 7) through the development of biofuels and other renewable energy resources. Furthermore, it aids in mitigating climate change (SDG 13) by reducing greenhouse gas emissions (GHGs) and enhancing carbon sequestration through biotechnological innovations.

The integration of biotechnology in industry, innovation and infrastructure (SDG 9) fosters sustainable industrial practices leading to development of biodegradable materials and thereby reducing environmental impact. Additionally, biotechnology contributes to life below water (SDG 14) and life on land (SDG 15) by promoting biodiversity conservation and ecosystem restoration.

Biotechnology is a crucial tool in the global effort to achieve sustainable development, addressing multiple SDGs through its diverse applications and innovations. Innovations in biotechnology drive global progress toward a healthier and sustainable future.

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Environmental Pollution Law

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Abstract

The legal frameworks and regulations intended to prevent, control, and lessen the negative impacts of human activity on the environment are collectively referred to as environmental pollution laws. In order to safeguard biodiversity, human health, and natural ecosystems, these rules address a variety of pollution types, including as air, water, soil, and noise pollution. Regional policies, national laws, and international treaties are used to enforce them.

Setting pollution regulations, controlling emissions, putting waste management procedures into place, and guaranteeing environmental impact assessments for industrial and development projects are all essential elements of environmental pollution law. The "polluter pays" theory, which holds criminals responsible for the harm they cause to the environment, is frequently incorporated into the law.

Environmental law enforcement is essential, but it is frequently hampered by a lack of funding, political will, and public awareness. These regulations are advanced in large part by innovations like green technology and harsher sanctions for non-compliance. In order to promote sustainable growth and ecological balance, environmental pollution laws are constantly changing to address global issues including urbanization, industrialization, and climate change.

In addition to protecting the environment, this paradigm encourages ethical stewardship and prudent resource management for coming generations.

Keyword: pollution law, human activities, green technology.

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Effect of Climate Change on Bird Migration in Ana Sagar Lake, Ajmer (Rajasthan)

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Abstract

The migration patterns of birds are profoundly influenced by various environmental factors, with climate change emerging as a significant determinant in recent years. This study investigates the impact of climate change on the migratory behavior of birds at Ana Sagar Lake in Ajmer, an important ecological site for avian species. Data was collected over multiple seasons, analyzing temperature trends, rainfall patterns, and migratory timings of bird species. Results suggest that climate change has led to altered migration routes, delayed arrival times, and shorter stay durations for several migratory bird species. Additionally, changes in water levels, temperature, and quality are altering the composition of aquatic plants and animals, which are essential food sources for many bird species. The findings highlight the need for adaptive conservation strategies to mitigate the effects of climate change on migratory bird populations in the region. This study emphasizes the interconnectedness of climate variables and ecological stability, underscoring the importance of monitoring and protecting avian migration patterns in the face of global climate change.

Keywords: environmental factors, with climate change

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Green Synthesis: Microwave Synthesis of Nobel Phenothiazine Metal Complexes

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Abstract

Phenothiazine is a member of thiazine class of heterocyclic compounds and is extensively used for preparation of various dyes such as methylene green, thionine etc. Phenothiazines are used to treat neurosis including schizophrenia; violent, agitated, disturbed actions and obsession secondary to bipolar disorder. So, it is very useful schiff base with various uses and are synthesised by various methods. Most of these methods encompasses several hazard chemicals.

Microwave-assisted organic synthesis is chemical reactions under the effect of microwave radiation. Microwave-assisted synthesis is green chemical method, the application of microwave-assisted is beneficial technology in organic synthesis since it is simple, sensitive, reducing the hazard and also possible to reduce reaction time. The synthesis in Microwave irradiation is solvent free or lower solvent conditions are decent method for decrease the pollution, dropping the cost and increase the product together with simplicity in processing and handling.

Keywords: Phenothiazine, Schiff Base, Microwave, Green Chemistry.

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The Effect of Mining Operation on Barmer District Waste Production and Disposal

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Abstract

The mining operations in the Barmer district have boosted the local economy, but at a high environmental cost. To lessen these effects, efficient waste management and disposal procedures backed by strong regulatory frameworks are essential. Barmer can strike a sustainable balance between resource exploitation and environmental preservation by tackling the gaps and difficulties that have been highlighted. Numerous aspects of the mining industry should be investigated by the government. Even though the government has many obstacles in combating illicit mining, it must be handled as a top priority, and mining operations should be outlawed in environmentally sensitive and fragile areas. Mining operations must be forbidden in areas that are ecologically sensitive, and these areas should be mapped. Former mining areas should be rehabilitated by the government. Standards that control pollution levels and aim to reduce environmental effect must be followed by mining operations. The mining industry must therefore insist on actions from mining firms to guarantee sustainable development, as well as accountability from the government and the bureaucracy.

Keywords: efficient waste management and disposal procedures

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Wildlife Protection and Challenges

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Abstract

Wildlife traditionally refers to undomesticated animal species but has come to include all plants, fungi, and other organisms that grow or live wild in an area without being introduced by humans.

The importance of wildlife includes maintaining balance in the ecosystem, natural habitats, food chains, promoting pollination and continuity of native plant species, medicinal value, aesthetic benefits, preserving heritage and culture, promoting tourism attraction, and protecting ecological stability and balance for future generations.

However, wildlife faces numerous challenges, with approximately 23% of mammals and 12% of birds considered threatened by the International Union for Conservation of Nature (IUCN). Additional challenges include species loss, human population growth, unsustainable consumer lifestyles, waste, pollutants, urban development, and international conflict.

To address these challenges, strategies for wildlife protection include habitat conservation, sustainable land use, creating protected areas, banning hunting, prohibiting deforestation, and raising awareness.

Keywords: aesthetic benefits, preserving heritage and culture

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Acacia Nilotica Nano Particles: A Strong Antimicrobial Agent

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Abstract

Acacia Nilotica, the "Tree of Life" belongs to the Mimosaceae and Leguminosae family. Its anti-oxidative, anti- inflammatory, anti-microbial, anti-depressive, anti-diabetic, memory enhancer, analgesic, antiepileptic, anti inflammatory, anticonvulsant, sedative and anti-cancer properties are reported. But Antimicrobial activities of nano particles of Acacial Nilotica is not reported yet. In present research antimicrobial activities of copper nanoparticles is analyzed on Staphylococcus aureus , E-Coli , Klebsilla and Salmonella receptor. The result shows that the interaction between CuO NP and the Staphylococcus aureus, E-Coli, Klebsilla and Salmonella receptor was strong and may be used as an antimicrobial agent.

Keywords: Acacia `Nilotica, Antimicrobial activity, copper nanoparticles

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Phytopathogenic Fungi Control Using Botanical Extracts From Medicinal Plants

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ABSTRACT

Chemical fungicides pollute the environment, make plant pathogenic fungi resistant to drug, and endanger both humans and animals. Therefore, creating biological control solutions that are low in toxicity, highly effective, and environmentally friendly is essential for managing plant fungal diseases, and preserving ecological balance. Importantly, natural compounds derived from medicinal plants provide a useful resource for preventing fungal infections in plants. Advances in the study and application of natural products derived from medicinal plants to inhibit plant pathogenic fungi are crucial because they serve as a reference for the development of botanical fungicides and their practical use in preventing and controlling plant fungal diseases. Because of the presence of phytochemicals such as phenols, tannins, alkaloids, flavonoids, sterols, glycosides and terpenoids, medicinally significant plants are utilized in traditional medicine for a variety of therapeutic effects. There are numerous instances of plant extracts being widely employed as commercial deterrents in horticultural and agricultural settings. This provides promising prospect to use indigenous medicinal plants as a significant and natural strategy for managing phytopathogenic fungi over the long run.

Keywords: Phytopathogenic fungi, Botanical extracts, Medicinal plants, Phytochemicals.

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Insect effector proteins: Emerging tools for pest management.

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Abstract

Effector proteins (EPs) are small, secreted molecules that alter the structure and function of host cells to facilitate infection. These proteins help insects and pests invade plants by suppressing the plant's immune system. Notable EPs, such as HARP1 Helicoverpa armigera, GOX in Helicoverpa zea, Me10 in Macrosiphum euphorbiae, HAS1 in Helicoverpa armigera have been identified. These EPs are introduced into plants when insects feed on them, usually through wounds. EPs affect key processes like the jasmonic acid (JA) and salicylic acid (SA) pathways, which are involved in plant defense. EPs are known for their ability to suppress immune responses in plants, and enhances insect survival and promotes successful infection. So insect-derived EPs could potentially be utilized to proactively prime plants, in that way enhancing their resistance to pest attacks. This approach can be useful for implications of the sustainable pest management, synthesis of chemical analogues of these effector proteins (synthetic effectors) could serve as a novel method for priming plant defenses. Because plants can recognize these synthetic effectors based on past exposure to similar attacks, this would trigger an immune response, providing a protective advantage against future infestations. The homologues of these identified EPs, once their modes of action are revealed, could offer valuable tools in the development of targeted strategies to eliminate harmful pests. This method could provide a new, eco-friendly alternative to traditional pest control, and contributing to more sustainable farming practices.

Keywords: Macrosiphum euphorbiae, HAS1 in Helicoverpa armigera

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Impact of Azoxystrobin Exposure on Sperm Quality and Oxidative Balance in Testis of Mice

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Abstract

Azoxystrobin fungicides belongs to Strobilurin family, is widely used in agriculture to protect a variety of crops such as soybeans, rice, cereals, vegetables and fruit trees from fungal infections like powdery mildew, fruit rot, early and late blight of tomato and potato. The goal of this study was to assess effects of Azoxystrobin on sperm parameters and antioxidant markers in Swiss albino male mice. Doses of azoxystrobin were given at 3 different levels- low (125 mg/kg body weight), medium (250 mg/kg body weight) and high (500 mg/kg body weight) orally for 30 and 60 days. Sperm viability, sperm count and motility showed a non- significant change at low and medium dose level while a significant decline was noted at high dose level at 30 days. In the case of 60 days, a significant decline was observed in sperm parameters at all doses. Morphological abnormalities in sperm like globular head, bent and coiled tail, headless, tailless, amorphous head etc. were also increased after exposure of azoxystrobin at 500 mg/kg body weight. Antioxidant parameters showed a non-significant change at low and medium dose level while a significant decline was noted after high dose treatment for 30 and 60 days. Sperm parameters and Antioxidant parameters showed a recoverable effect after treatment withdrawal. Based on results it can be concluded that azoxystrobin might cause adverse impact on sperm parameters and cause a deleterious effect on testicular function by altering antioxidants parameters in the testis of Swiss albino male mice.

Keywords: Azoxystrobin, Strobilurin, Antioxidants, Fungicides, Mice.

Endangered Ecosystems and Human Struggles: A Study of Climate Ethics in Amitav Ghosh's The Hungry Tide

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Abstract

The Hungry Tide by Amitav Ghosh explores the relationship between humans and nature in the Sundarbans, a labyrinth of islands in the Bay of Bengal and intricately weaves themes of ecology, human survival, and climate ethics against the backdrop of the Sundarbans' fragile mangrove ecosystem. This paper examines how the novel addresses environmental conservation challenges and the ethical dilemmas posed by climate change. By highlighting the vulnerability of endangered species like the Royal Bengal tiger and the precarious lives of marginalized communities, Ghosh portrays the Sundarbans as a contested space between human aspirations and ecological sustainability.

The narrative explores the ethical and cultural complexities of climate resilience and environmental justice through its central characters. Piya, a marine biologist, represents scientific inquiry and advocacy, while Fokir, a local fisherman, embodies indigenous knowledge and a profound connection to nature. Their interplay underscores the tension between global environmental concerns and local realities, particularly the displacement and livelihood struggles of Sundarbans' inhabitants due to rising sea levels, natural calamities, and state-imposed conservation policies.

By situating the story in a region shaped by the ebb and flow of tides, Ghosh emphasizes the impermanence of ecosystems under climate change. The novel critiques anthropocentrism, advocating for a harmonious balance between human needs and ecological sustainability. This paper argues that *The Hungry Tide* transcends fiction to serve as an ecological treatise, urging collective action for climate resilience and the protection of endangered ecosystems. A significant contribution to eco-criticism, the novel invites reflection on humanity's role in fostering a sustainable future.

Keywords: Climate ethics, environmental justice, endangered ecosystems, Sundarbans, climate resilience, eco-criticism, sustainability.

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Biomass Conversion for Sustainable Production

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Abstract

Biomass conversion has emerged as a pivotal solution for sustainable production, offering an alternative to fossil fuel dependence and contributing to the circular economy. Biomass, derived from organic materials such as agricultural residues, forestry waste, and algae, can be converted into biofuels, biochemicals, and bioplastics through innovative biotechnological processes. These products serve as eco-friendly substitutes for conventional petrochemical-based counterparts, reducing greenhouse gas emissions and minimizing environmental degradation.

This abstract explores the technologies involved in biomass conversion, including thermochemical (pyrolysis, gasification) and biochemical (fermentation, enzymatic hydrolysis) processes. It also highlights advancements in microbial engineering and synthetic biology that enhance the efficiency and scalability of biomass utilization. Case studies showcasing successful biomass-to-product transitions in various industries are presented, emphasizing their environmental and economic benefits.

The discussion underscores the potential of biomass conversion to meet global energy and material demands sustainably. It calls for interdisciplinary research, supportive policy frameworks, and industrial collaborations to overcome existing challenges and unlock the full potential of biomass as a renewable resource for sustainable development.

Keywords: biomass conversion biochemical thermochemical,

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A review on *Anogeissus pendula* (Edgew.) extract mediated synthesis of silver nanoparticles for antimicrobial applications: A green expertise

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ABSTRACT

Anogeissus pendula (Edgew) of family Combretaceae a deciduous, small, legume social forestry tree distributed in warmer parts of the world. It is mostly dominant tree of Rajasthan Aravali mountains range, Sabarkanta and Banaskantha division of Gujarat, and some part to be found in Madhya Pradesh and Haryana. Silver nanoparticles synthesized by green technology have received special focus by scientists due to their appliance in several areas. Like as catalysis, sensors, drug delivery system and antimicrobial efficacy against viral particles. *A. pendula* was done using UV-Visible Spectroscopy, Transmission electron microscope (TEM), Scanning electron microscope (SEM), Fourier transformed infrared spectroscopy (FTIR), and X-ray diffraction (X-RD). The biological activity of synthesized silver nanoparticles using *A. pendula* was tested by microbial bioassay on some bacteria and fungi species. The impact of green synthesised AgNPs on bacteria. All concentration of synthesised AgNPs had no impact on two bacteria namely *S. aureus* and *S.griseus*.

KEY WORD - *Anogeissus pendula* (Edgew), SEM, TEM, X-RD, FT-IR.

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Evaluation of Phytochemical Antioxidant of Medicinal Plant

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Abstract

Herbal medicine is the oldest form of medicine known to mankind. Medicinal plants generally produce many secondary metabolites which are bio-synthetically derived from primary metabolites and constitute an important source of many pharmaceutical drugs. Research plant Ficus religiosa (Indian Medicinal Plant) is a huge tropical, deciduous, evergreen tree belong to moraceace family used in ayurvedic treatment for various diseases. The report on chemical analysis revealed that Ficus species had a broad variety of phytoconstituents that included flavonoids, phenols, alkaloids and saponins. They also contain tannins, glycosides, terpenoids proteins volatile and essential oils, and steroids. The current research on effects of the pharmacological properties have revealed that the Ficus species had a wide variety of biological properties which included anti-oxidants, Antidiabetic an anti-inflammatory, anti-cancer, and anti-tumor and anti-proliferative properties, as well as anti-mutagenic an anti-helminthic, liver protective anticoagulant, wound healing immune modulatory properties, anti-stress toxicological studies, and mosquitocidal effects. Ficus species are rich source of naturally occurring antioxidants and polyphenolic compounds, flavonoids which are responsible for strong antioxidant properties that help in prevention and therapy of various oxidative stress related diseases such as neurodegenerative and hepatic diseases.

Keywords: flavonoids, phenols, alkaloids and saponins

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Clonal Propagation of *Atriplex*: A Sustainable Approach for Desertification Management

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Abstract

Plant tissue culture, combined with clonal propagation, offers a robust method for the large-scale multiplication and genetic improvement of halophytic species like *Atriplex*, known for their exceptional resilience in arid and saline environments. This study aimed to develop an optimized protocol for the in vitro propagation of *Atriplex* to support ecological restoration and sustainable agriculture in degraded regions.

Nodal segments and leaf explants were cultured on Murashige and Skoog (MS) medium supplemented with growth regulators, including 6-Benzylaminopurine (BAP) and Indole-3-acetic acid (IAA). Shoot induction, a critical step for clonal propagation, was optimized at 2.0 mg/L BAP, resulting in a high regeneration rate of 85%. Rooting was successfully achieved on half-strength MS medium enriched with 1.0 mg/L Indole-3-butyric acid (IBA), producing vigorous root systems. Acclimatization of rooted plantlets under greenhouse conditions resulted in a survival rate of 75%, showcasing the viability of the propagation process.

The integration of clonal propagation ensures genetic uniformity and scalability, making it suitable for large-scale applications. This approach demonstrates significant potential in restoring saline soils, mitigating desertification, and providing high-quality livestock fodder. Moreover, the ability to produce stress-tolerant plants efficiently through tissue culture highlights its role in addressing climate change challenges and promoting sustainable agriculture in arid regions.

Keywords: *Atriplex*, plant tissue culture, clonal propagation, halophytes, desertification, saline soils, sustainable agriculture, growth regulators.

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Role of Climate Change in Path of Evolution

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Abstract

The link between biodiversity and climate has been obvious to biologists since the work of von Humboldt in the early 1800s, but establishing the relationship of climate to ecological and evolutionary patterns is more difficult. On evolutionary timescales, climate can affect supply of energy by biotic and abiotic effects. Some of the best evidence for a link between biodiversity and climate comes from latitudinal gradients in diversity, which provide an avenue to explore the more general relationship between climate and evolution. Among the wide range of biotic hypotheses, those with the greatest empirical support indicate that warmer climates have provided the energetic foundation for increased biodiversity by fostering greater population size and thus increased extinction resistance; have increased metabolic scope; have allowed more species to exploit specialized niches as a result of greater available energy; and generated faster speciation and/or lower extinction rates. In combination with geological evidences for carbon dioxide levels and changing areas of tropical seas, these observations provide the basis for a simple, first-order model of the relationship between climate through the Phanerozoic and evolutionary patterns and diversity. Such a model suggests that we should expect greatest marine diversity during globally warm intervals with dispersed continents, broad shelves and moderately extensive continental seas. Demonstrating a significant evolutionary response to either climate or climatic change is challenging, however, because of continuing uncertainties over patterns of Phanerozoic marine diversity and the variety of factors beyond climate that influence evolution.

Keywords: biodiversity and climate comes from latitudinal gradients in diversity

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Effect of TiO2 Nanoparticles on pigment profile and lipid content of *Dunaliella salina*

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Abstract:

Titanium nanoparticles (TiO2NPs) are becoming prevalent in numerous industrial applications, raising concerns about their environmental impact, particularly in aquatic systems. This study examines how TiO2NPs affect the pigment production and lipid content in *Dunaliella salina Teod*., a microalga well-suited to saline environments.

Cultures of *D. salina* were treated with different concentrations of TiO2NPs (Control, 100, 200, and 5000 mg/L) over a 5 week period. The study measured changes in chlorophyll content, lipid content and carotenoid accumulation. Higher TiO2NPs concentrations led to notable reductions in chlorophyll content and photosynthetic performance, indicating increased oxidative stress within the cells. Carotenoid levels were also studied since they play significant protective role against oxidative damage. Altered lipid amounts were also observed during the experiment. The findings point to potential harmful effects of TiO2NPs pollution on microalgal species, underlining the need for further research into nanoparticle impacts on aquatic ecosystems.

Keywords: pigment production and lipid content

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A Brief Introduction of Climate Change and Its Impact on Biodiversity of Plant

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Abstract

Climate change represents a major global threat with significant implications for plant life. Rising temperatures, shifting precipitation patterns, and an increase in extreme weather events are altering the conditions under which plants grow, affecting biodiversity and ecosystem health. Higher temperatures can disrupt key processes in plant life cycles, such as flowering, fruiting, and seed dispersal, potentially leading to mismatches with pollinators or other critical organisms. Additionally, elevated levels of carbon dioxide (CO2) may influence photosynthesis, with effects that vary by species and environmental factors, sometimes boosting plant growth and other times hindering it. Climate change also facilitates the spread of invasive plant species that are better suited to altered conditions, threatening native plants and destabilizing ecosystems. Water availability is another key concern, as droughts stress water-dependent plants, while excessive rainfall can cause flooding, root damage, and increase the spread of plant diseases. In forests, climate change is driving shifts in species distribution, with some plants thriving in new areas while others decline, affecting ecosystem functions such as carbon storage. Agriculture is similarly impacted, as extreme weather, pest outbreaks, and diseases make crop yields more unpredictable, challenging food security. To address these challenges, it is essential to adopt adaptive management strategies, including conservation efforts, sustainable agricultural practices, and policies aimed at mitigating climate change. These measures are crucial to safeguarding plant diversity, supporting ecosystem resilience, and ensuring that plant species can continue to thrive in an increasingly unstable climate.

Keywords: precipitation, biodiversity, pollinators, ecosystem, food security, sustainable agriculture

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"Growing Trouble: Climate Change and Its Effects on Plant Life"

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Abstract

Climate change has a profound impact on plant life, influencing growth, distribution, and survival. Rising temperatures are causing shifts in growing seasons, with some plants experiencing longer growing periods, while others face heat stress, which stunts growth and leads to plant mortality. Extreme temperatures can damage plant tissues and disrupt reproductive cycles, threatening biodiversity.

Changes in precipitation patterns are another significant effect. Some regions are facing more intense droughts, stressing plants by limiting water availability, which is crucial for their survival. Conversely, increased rainfall and flooding can damage plant roots, promote soil erosion, and lead to the spread of plant diseases.

Elevated levels of CO2 in the atmosphere may initially boost photosynthesis and plant growth, especially in certain crops. However, the benefits are tempered by other factors such as heat stress and nutrient deficiencies. In fact, higher CO2 levels can reduce the nutritional quality of some crops, affecting food security.

Additionally, climate change is altering plant distributions. Invasive species, better suited to new environments, are also expanding, threatening native plants and ecosystems.

Overall, climate change disrupts plant life by affecting their environment, reproduction, and health. These changes are already evident in agriculture and natural ecosystems, highlighting the urgent need for adaptive strategies to preserve plant biodiversity and food security.

Keywords: Climate change, Biodiversity, Precipitation patterns, CO2, Crop growth, Ecosystem, Invasive species, Plant diseases, Reproductive cycles, Heat stress.

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Impact of climate change on Forests

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Abstract

There is a close inter-relationship between climate change and forests. Air temperature, solar radiation, rainfall and concentrations of carbon dioxide in the atmosphere are major factors in forest productivity and forest dynamics. Forests, in turn, affect climate by removing and releasing large amounts of atmospheric carbon, absorbing or reflecting solar radiation, cooling through evapotranspiration and producing cloud-forming aerosols.

Some tree species are migrating uphill and northward as temperatures increase, while other species are migrating downhill and westward as changing precipitation patterns create drier conditions. Since 2000, an annual average of 72,600 wildfires have occurred across the U.S., scorching an average of 7 million acres of land, including forests, each year. Some landscapes are getting so dry that they can't support forests at all. It's pushing forests out of their physiological limits. This doesn't mean that every tree is going to die. Some forests will be replaced by shrub lands."

When trees are exposed to a drought or wildfire, they can become less resilient to pests and pathogens. The warmer temperatures and drier conditions associated with drought, in particular, could increase the reproductive rate of certain insect species. The price of paper, lumber and other forest products will likely increase in the coming decades as a result of carbon offset projects,

Adaptive management is a dynamic approach to forest management in which changing conditions are monitored and practices modified accordingly. To cope with climate change, species will need to adapt to the changed conditions or migrate to areas with suitable conditions for survival. The ability of species to migrate will depend on their capacity to disperse and the existence of physical connections to suitable habitats.

Keywords: solar radiation, rainfall and concentrations

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Indigenous Medicinal Plants

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Abstract

Indigenous medicinal plants are plants that have been used for healing by indigenous communities for generations. In India, several historic and deeply developed healing traditions are practiced alongside or in place of allopathy; such as Ayurveda, Yoga, Naturopathy, Unani and Homeopathy. Ayurvedic therapies are based on complex herbal compounds, minerals and metal substances. Certain plants are believed to have multi-chemical properties in healing and curing. In common diseases like Diarrhea, Malaria, Piles, Fever, Snakebite and Mumps, leaves and fruits are widely used. Some common medicinal plants in India include Emblica officinalis, Saraca asoka, Withania somnefera, Aegle marmelos, Bacopa monnieri, Tinospora cordifolia, Azadirachta indica, Ocimum sanctum, etc. In addition to using these plants in traditional medicines, Indians also use them in cooking, some traditional formulation such as, Chyawanprash, Triphala and Roof Afza are commonly used as nutritional supplements. Other medicinal plants like Punarnava used for Anemia, Liver diseases and Tulsi used for Heart and respiration diseases etc. Some major exports from India are Plantago ovata, Cassia angulifolia, Rheum austral, Rauwalfia serpentine, Hedyehium spicatum, Zingiber officinal, Adhatoda vasica, Juglans regia, Juniperus communis, Picorhiza kurrea and Saussurea lappa. Herbal medicines are one of the oldest forms of medicinal treatments in human history and could be considered as one of the modern pharmaceutical trade. So, medicinal herbs can be a good alternative for human diseases. They are of low cost and have fewer side effects.

Keywords: Indigenous, Medicinal plants, Ayurveda, Diseases and Herbal

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Carulluma edulis: An Important Rare Medicinal Plants of Thar Desert

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Abstract

Carulluma edulis (Apocynaceae) is an important food-cum-medicinal plant of the extreme arid regions of the Thar Desert. It is a drought resistant succulent herb, locally known as “Pimpa”. It occurs in the dry sandy areas of arid regions in association with *Panicum turgidum* (Murath grass). However, its existence was also found under the canopy of arid shrubs and trees such as *Capparis deciduas*, *Leptadenia pyrotechnica*, *Ziziphus nummularia*, *Aerva persica*, *Acacia senegal*. This species is categorized under the list of rare and threatened species because of high grazing pressure and changes in land use pattern. This plant has an outstanding therapeutic background in the traditional system of treatment and recommended for hypertension, Alzheimer's disease, rheumatism, gastric problems and leprosy. This species has been kept on high conservation priorities and should be conserved using *in situ* and *ex situ* methods. For this survey was conducted during the month of September to November (2024) in Jaiselmer district of Rajasthan and identified patches of *C. edulis* from Bandha village. Rooted-stems of *C. edulis* was collected from the above site and planted in nursery of ICFRE- Arid Forest Research Institute, Jodhpur for further characterization and evaluation of germplasm for its sustainable utilization in future.

Keywords: Conservation, Germplasm, Medicinal plants, Succulent herbs, Threatened

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Suppression of Fertility in Male Albino Rats by Extract of *Corchorus depresses*

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Abstract

To evaluate the effect on suppression of fertility in male albino rats, methanolic extract of whole plant of *Corchorus depresses* at the dose level of 100mg/kg body weight/day was orally administrated to rats for 60 days. After administration a significant decrease in weight of testes, epididymis, seminal vesicle and ventral prostate was noted whereas body weight did not show any significant change when compared to control. Sperm motility as well as sperm density were also reduced along with complete inhibition of fertility.

A significant fall in the testicular protein, glycogen, sialic acid and seminal vesicular fructose was also observed whereas no significant alteration was noted in the blood and serum parameters throughout the course of investigation.

A marked depletion in the testicular germ cell population was noticed, the seminiferous tubule diameter, cross sectional surface area and counts of Sertoli cells also show notable reduction. In conclusion *Corchorus depresses* methanolic extract causes impairment of testicular function and suppression of fertility in male albino rats.

Keywords: Corchorus depresses, Sperm motility, Sertoli cells, Testicular cell population

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Exploration of Potential Biocontrol Agent ENT against Plant Parasitic Nematodes

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Abstract

Root-knot nematodes (RKN) are major agricultural pests, causing significant crop losses and threatening food security. Traditional chemical nematicides, while effective, pose environmental & health risks and contribute to resistance development. This study investigates plant-based extracts as sustainable, eco-friendly alternatives for nematode management, emphasizing their potential within integrated pest management systems.

Objective

The research aims to analyse the phytochemical composition of plant extracts and evaluate their nematicidal efficacy against *Meloidogyne* spp.

Methodology

Aqueous extracts of various plants were prepared and analysed for bioactive compounds using qualitative tests, GC-MS, and HPLC. Nematicidal activity was assessed by testing extract concentrations on *Meloidogyne incognita* juveniles (J2s) and evaluating mortality via immobility.

Key Findings

- *Mentha piperita* (10%) caused 100% mortality in *Meloidogyne chitwoodi*.
- *Acalypha indica* (1000 ppm) showed 62% mortality in *M. incognita*.
- *Cinnamomum cassia* reduced root galling and egg masses in soybean.
- *Allamanda cathartica* demonstrated significant nematicidal activity with alkaloids, flavonoids, saponins, and tannins (1.43–103.44 µg/ml).

Conclusion

The findings underscore the high toxicity of plant extracts against nematodes and their effectiveness in controlling infestations. These extracts also act as biostimulants, promoting plant growth while ensuring soil biotic safety. Future nematode management strategies should consider cost-effectiveness and prioritize high-value crops due to the high market price of these extracts.

Keywords: *Mentha piperita, Meloidogyne chitwoodi, Meloidogyne incognita, mortality, secondary metabolites*.

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Socioeconomic Aspects of Environmental Issues of Textile Industry in India: Challenges and Opportunities

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Abstract

The textile industry, a vital pillar of India's economy, contributes significantly to employment, GDP and exports. However, its environmental footprint is substantial, posing severe challenges to ecosystems and communities. The paper explores the socioeconomic aspects of environmental issues in the textile industry, emphasizing the associated challenges and opportunities.

Environmental concerns such as water pollution, chemical waste, high carbon emissions and unsustainable resource consumption have profound socioeconomic repercussions. These include health risks to workers and surrounding communities due to exposure to hazardous chemicals, depletion of water resources affecting agrarian livelihoods and the economic burden of addressing environmental damage. Small and medium enterprises (SMEs), which dominate the textile sector, often lack the financial and technical capacity to adopt sustainable practices, further exacerbating these issues.

On the other hand, significant opportunities arise from addressing these environmental challenges. Transitioning to sustainable practices, such as adopting eco-friendly dyes, efficient water treatment technologies and renewable energy sources, can reduce ecological harm and enhance long-term profitability. Government policies, such as the National Textile Policy and incentives for green manufacturing, along with international demand for sustainably produced textiles, present avenues for industry transformation.

The paper advocates for a multi-stakeholder approach involving government, industry players and local communities to mitigate environmental impacts while fostering inclusive growth. By embracing sustainable practices, the Indian textile industry can achieve a balance between economic development, social equity and environmental stewardship, ensuring its global competitiveness in the future.

Key words: Socioeconomic, Ecosystem, Economic, Textile, Environment

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Biodiversity and Ethnomedicinal Value of Native Flora in Banswara: A Sustainable Approach

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Abstract

An essential component of the traditional healthcare practices of the local inhabitants, namely the Bhil and Meena tribes, the varied flora of Banswara, a tribal area in southern Rajasthan, has great ethnomedicinal significance. This study employs field surveys and interviews with traditional healers to document a variety of native medicinal plants and their uses. A total of 120 plant species from 55 families were discovered, together with information about the conditions they treat, how they are prepared, and their therapeutic uses. The herbs that have been reported are frequently used to treat skin ailments, respiratory disorders, digestive disorders, and fever.

The study emphasizes how critical it is to use and conserve these native plants sustainably in order to preserve the area's unique biodiversity and traditional knowledge.Threats to the survival of medicinal plant species include habitat loss and unsustainable harvesting methods. The report makes recommendations for medicinal plant cultivation, community-based conservation initiatives, and the promotion of traditional medicine in addition to contemporary healthcare. Through the preservation of both biodiversity and indigenous knowledge, this strategy seeks to promote sustainable livelihoods and local healthcare.

Keywords: local healthcare,traditional knowledge,bhil and meena tribes,ethnomedicine

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Physicochemical Study of Sagra Talab in Gonda District, U.P. With Special Reference to Perspective of Ecotourism

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Abstract

Water is the most important natural resource on Earth and is vital to all the living organisms. There are two types of fresh water bodies *viz.* lotic (rivers) and lentic (ponds and lakes). Lentic water bodies usually prefer the growth of phytoplanktons (algae) such as Cyanophycean algae (BGA), which constitute the base of aquatic ecosystem. Ponds and lakes serve many purposes such as drinking water source, cleaning and bathing, fishery, irrigation, maintaining natural ground water level, aesthetic value and many other livelihood. Hence, ponds and lakes provide a healthy environment to its location. But, nowadays the dynamic equilibrium of these water bodies is being disturbed due to several anthropogenic activities. Therefore, these water bodies are under threat.

Sagra Talab, located in Gonda District of Uttar Pradesh is one of the famous ponds of the district. Being located in the middle of the city, the pond is called “Heart of the City”. Owing to its central location, the pond is connected to many drains. So, huge quantity of silt has accumulated there, which has reduced its water holding capacity and oxygen availability for the pond’s organisms.

Hence, physicochemical study of the pond water was carried out. Also, efforts to improve the aesthetics of the area will ultimately improve the tourist footfall of the pond.

Keywords- Physicochemical, Sagra Talab, Lentic, Ecotourism.

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Ethno botanical studies on use and mode of administration of medicinal plants in tribal districts of Rajasthan with special reference to Respiratory, Rheumatism, Diabetes and Cardio vascular diseases

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Rajasthan, the largest state of India covers an area of 3, 42, 239 km^2, approximately 10.41% of the geographical area of the country. The state has a total of 41 districts out of which 8 districts have either full or partial area declared as scheduled V area (tribal area). A large number of wild and cultivated plants are being used by tribals for treatment of various ailments. Therefore, a lot of information on medicinal plants is available with these tribal communities. Based on the above fact, reconsiaance survey was conducted through semi structured questionnaire in Jaipur, Sirohi, Udaipur, Alwar, Churu, Sawai Madhopur, Tonk, Banswada, Bundi, Pratapgarh, Dungarpur, Karauli, Bharatpur, Nagaur, and Rajsamand districts to document the use and mode of administration of medicinal plants in their traditional health care system. Findings reveals that 227 medicinal plant species belonging to 94 families and 44 genus are being used by ethnic groups to cure respiratory disorders, diabetes, rheumatism and other ailments.

District wise analysis on use of plants indicates the order as: Banswada and Sawai Madhopur > Jaipur > Udaipur and Pratapgarh > Churu and Alwar > Bundi > Tonk Rajsamand > Sirohi > Dungarpur > Karauli > Nagaur > Bharatpur. Among respiratory, rheumatism, diabetes, cardiovascular and other diseases maximum medicinal plant species used by ethnic groups are in the order as: Other diseases (mostly gastric and skin diseases) > respiratory > diabetes > cardiovascular diseases > rheumatism. Utilization of *Cassia angustifolia* was found maximum where as *solanum nigrum* , *S.surattenase* , *Momordica balsamina*, *Cocculus hirsutus* and *Ziziphus mauritiana* was used in minimum quantity by respondents in their traditional health care system. Efforts should be made for active involvement of ethnic groups in evaluation, planning and monitoring processes for sustainable and long term conservation of these natural resources.

Keywords: tribal communities, wild and cultivated plants

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Microbial Biofertilizers

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In the era of sustainable development various practices were done to replace chemical fertilizers with eco friendly alternatives. Sustainable agriculture practices like use of microbial bio fertilizer is one of them. Biofertilizers consists of soil microorganism as bacteria, fungi which in turn increase fertility of soil. Chemical fertilizers reduces soil fertility by continuous and prolong use. Use of biofertilizers are nontoxic to soil ecosystem. It also reduced risk of environmental damage, improves soil fertility by fixing nitrogen, phosphorus mineralization and production of antibiotics. Besides providing nutrient enrichment to the soil, microbial bio fertilizers promote plant growth by increasing efficient uptake or availability of nutrients for the plants and by suppressing soil borne diseases. Researches reveals that Phosphorus- solubilizing bacteria like *Azotobacter a*nd *Azospirillum* that fix atmospheric nitrogen can increase the solubility and availability of phosphorus to plants and crop yield. Bio fertilizers are excellent alternatives to chemical fertilizers which are damaging human health and ecosystem. These are preferred over chemical fertilizers due to their increasing efficiency and minimum fertilizers consumption. With the knowledge and use of biofertilizers farming and agriculture can be done in a sustainable and pollution free manner.

Key Words: Sustainable, Biofertilizers, Ecosystem, Microorganism.

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Physical Control by Oil Thermotherapy of Seed-Borne Infection of *Fusarium Oxysporum* In Okra Seeds

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Abstract

Seed samples carrying 40-50% natural infection of *Fusarium oxysporum* were selected for physical control by oil thermotherapy treatment .For the control of pathogen heated oil of seven plants viz., coconut, groundnut, castor, mustard, neem, sesame and sunflower were used as seed treatments. Randomly taken seeds were tied in cheesecloth and placed separately in different oils heated to 60^0,80^0 and 95 ± 3^0 for period of 2, 5 and 10 min. The oils were heated in a temperature controlled hot water bath. After treatment, cooled down seeds were washed in 95% ethanol to remove the excess oil, surface sterilized with 1% NaOCl for 3-4 min, rinsed in distilled water, air-dried and incubated on moistened blotters. Untreated seeds were used as control. The seed germination was significantly high at 60^0C (2 min) in neem (86.44%) followed by sunflower (81.66%) mustard and coconut (76.66%) in comparison to control (58.33%). Oil thermotherapy at 80^0C showed maximum inhibition in pathogen incidence and seedling infection in castor oil [100% (2 min), 75% (5min) and 87.5% in 10 min seed treatments) and neem oil (100%) in 5 and 10 min seed treatments. The significant seed germination was not observed in all 2, 5 &10 min oil treatments at 95^0C as compared to control. An increase in temperature and duration of treatment resulted in better control of the pathogen but reduced radical emergence and percent seed germination. Oil thermotherapy may not be practical for large scale use because of the problem of heating seeds uniformly in large quantity. It may be of practical use for small farmers, primarily in developing countries, who save seeds for growing season, for the control of seed -borne pathogens.

Keywords: Oil thermotherapy, *Fusarium oxysporum* Okra seeds.

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Histochemical Studies on the Insect Entomogenous Stem Gall and Normal Counterparts of *Salvadora persica L.*

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Abstract

Galls are unique examples of complex inter-specific interaction and mutual adaptation between *the plants and gall inducing agents. Salvadora persica L.* is a tree of great economic importance. Tender twigs are used for making toothpastes, commonly known as miswak. The present study deals with stem galls caused by *Thomasiniana salvadorae* Rao. On *Salvadora persica*. Stem galls of *Salvadora persica* are sub-globose, ovoid or fusiform sometimes cylindrical.Histo-chemical studies of normal and gall tissue have been done. Various metabolites localized were starch, cellulose and carbohydrate. The gall has brought about various structural and physiological changes in host tissue. The gall tissue showed higher amount of starch granules, cellulose and carbohydrates. Thus the normal and gall tissue showed histochemically differential behavior in terms of these metabolites. By using histochemical technique, an alternation in localization of metabolites due to insect attack was observed. These studies may be helpful to surpass the hurdle in understanding the tumor biology and in crop improvement.

Keywords: *Salvadora persica*, Starch, *Cellulose, Carbohydrates.*

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Socioeconomic Aspects of Environmental Issues

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Abstract

The importance of environmental challenges to the long-term viability of societies around the world is becoming more widely acknowledged. However, the ecological or technical aspects of environmental issues frequently garner more attention than the social ones. This study examines the intricate relationships that exist between socioeconomic variables such as poverty, inequality, resource availability, and economic development and environmental deterioration. The main goal is to evaluate how various socioeconomic groups are impacted by environmental problems, such as pollution, deforestation, climate change, and resource depletion, and how these problems impact public health, social stability, and economic systems.

The study looks at how vulnerable and marginalized populations are affected by environmental issues, as they frequently bear a disproportionate amount of the damage even though they have a smaller role in its causes. With an emphasis on how environmental policies can either lessen or worsen already-existing inequities, it also examines how governance and policy shape the socioeconomic results of environmental challenges. The study also looks into the possibilities of sustainable development plans that strike a balance between social justice, environmental preservation, and economic expansion.

Important conclusions show that poverty is made worse by environmental deterioration, which frequently exposes vulnerable groups to more environmental risks, causes them to lose their means of subsistence, and limits their access to clean air and water. On the other hand, particularly in developing countries, well-crafted environmental regulations and green technologies can present chances for employment growth, poverty alleviation, and enhanced quality of life. The research concludes with a call for integrating socioeconomic considerations into environmental policy frameworks, advocating for a more holistic approach to addressing environmental challenges that accounts for both ecological and social factors.

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Biochemical Carbon Sequestration: Harnessing the Catalytic Potential of Bacterial Enzymes for a Low-Carbon Future

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Abstract

Climate change mitigation strategies necessitate innovative solutions for carbon sequestration. Biochemical carbon sequestration, leveraging the catalytic potential of bacterial enzymes, offers a promising approach. This study explores the feasibility of utilizing bacterial enzymes to convert CO2 into valuable organic compounds, thereby sequestering carbon. Research Objectives were as follows Firstly Investigation of the catalytic properties of bacterial enzymes in CO2 conversion was performed. After which Evaluating the efficacy of various bacterial strains in carbon sequestration was done following Optimization of enzyme-assisted CO2 conversion processes for scalability and efficiency. comprehensive screening of bacterial strains identified enzymes with high CO2 conversion rates. Enzyme kinetics, substrate specificity, and optimal reaction conditions were characterized. A bioreactor system was designed to scale up enzyme-assisted CO2 conversion. Preliminary results demonstrate the potential of bacterial enzymes in sequestering carbon. The optimized bioreactor system achieved significant CO2 conversion rates, highlighting the feasibility of biochemical carbon sequestration. This innovative approach offers a low-carbon future solution, contributing to climate change mitigation efforts. Further research will focus on process optimization, scalability, and integration with existing carbon capture technologies.

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Isolation and identification of endophytic bacteria from rhizospheric soil of Capparis decidua collected from Alwar, Rajasthan

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Abstract

The use of plant-associated microbes to reduce plant diseases is becoming more common. Endophytic microbes are microorganisms isolated from surface-sterilized plant tissues that do not harm plant growth. In the present investigation, sampling of the rhizospheric soil of Capparis decidua was done from Alwar district of Rajasthan state and endophytic bacteria associated with the sample was isolated and cultured. Then those were identified by morphological (Gram's staininga and KOH test) and biochemical (Protease, Urease, Lipase, Gelatinase, Phosphate solublization, Siderophore, Catalase, H2S production, IAA production etc.) tests. Results of our investigations confirmed the presence of Proteus mirabilis and Bacillus species. These bacteria may help plants to survive in harsh climatic conditions.

Keywords: biochemical, morphological, microorganisms, endophytes, Capparis decidua etc.

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In vitro somatic embryogenesis of anthocephalus cadamba

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Abstract

Anthocephalus cadamba (Rebox) Miq. (Rubiaceae) is widely distributed throughout the greater part of India, especially at low levels in wet places. The genus Anthocephalus is one of the important members of the family Rubiaceae and comprises of only three species. Callus was induced from two types of explants on MS medium supplemented with Zeatin (ZT) and activated charcoal. It appeared that it was much easier to induce callus from internode than leaf explants. Embryogenic callus developed into somatic embryos at various stages after 25 days of subculture. The internode was the most responsive explant for production of somatic embryos, than leaf explants. Moreover, a low concentration of ZT was advantageous to the induction of embryogenic callus. Internode explants were cultured on Murashige and Skoog (MS) medium supplemented with 0.2 mg/L Zeatin and 2 g/L activated charcoal. Zeatin, a cytokinin, was employed to induce somatic embryos while activated charcoal was used to adsorb inhibitory substances and improve culture conditions. This optimized protocol offers an efficient method for mass propagation of Anthocephalus cadamba, with potential applications in reforestation and commercial forestry.

Keywords: Anthocephalus cadamba, somatic embryogenesis, Zeatin, activated charcoal, plant tissue culture, mass propagation

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Nanotechnology Meets Bioscience: Emerging Applications and Future Directions

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Abstract

Nanoscience and biotechnology are rapidly evolving fields that are revolutionizing various industries, including medicine, environmental science, and materials engineering. This presentation explores the intersection of nanoscience technologies and their applications in biosciences, highlighting the transformative potential of nanoscale innovations. The first section of the talk will provide an overview of key nanotechnology techniques, such as nanoparticle synthesis, nanofabrication, and molecular imaging, which are pushing the boundaries of biological research and diagnostics. In the second part, we will delve into the wide array of bioscience applications enabled by nanoscience, including drug delivery systems, cancer therapies, biosensors, and tissue engineering. The presentation will also address the challenges of integrating nanoscience with biology, such as safety concerns, ethical considerations, and regulatory frameworks. Finally, future directions and the promise of nanoscale technologies in revolutionizing personalized medicine, disease prevention, and sustainable solutions will be discussed, underscoring the interdisciplinary nature of this dynamic field.

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Polystyrene microplastic accumulation in brain with emphasis on morphometric and histopathological changes in brain areas of Swiss albino mice

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Abstract

The widespread problem of microplastic (MP) contamination is becoming a major threat to the globe. Although most of the research to date has concentrated on the physiological impacts of MPs exposure, a relatively new field of study is beginning to examine its effects on the behaviour and limbic regions of the brain. In this study, exposure to polystyrene MPs (PS-MPs) for acute and sub-chronic durations negatively affected cognition and induced anxiety-like behaviour in mice. PS-MPs were detected in vital organs of mice, including the brain, which induced neurobehavioural and pathological changes in the limbic system. Furthermore, morphometric analysis revealed a significant decrease in the total cell count in the Dentate Gyrus (DG) and Cornu Ammonis (CA) regions of the hippocampus. Signs of neuronal injury and dystrophic changes were observed in the cortex, amygdala, and hypothalamus, potentially affecting anxiety and fear responses. Our study thus provides insight into the effect of PS-MPs on the neurobiology of the brain's limbic system and related behavioural alterations.

Keywords: PS-MPs, brain areas, Neuronal architecture, Morphometric analysis, Histopathological alterations

Biotechnology application in sustainable development

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Abstract

Biotechnology plays a crucial role in advancing sustainable development by offering innovative solutions to global challenges in areas such as agriculture, energy, and environmental protection. Biotech Impacts Sustainable Development Goals (SDG). Biotech has been approved through various health and agriculture applications.

1. Role in Agriculture:
   (a) Genetic modification (GM) crops that are resistant to pests, diseases, and environmental stress.
   (b) Adds to food security and lessens low dependance on chemical pesticides
   (c) The increased crop yields lead to sustainable farming practices that are less harmful to the planet as well as your local water table.

2. Contribution to Energy:
   (a) Biotechnology can be used to produce renewable biofuels (e.g., bioethanol and biodiesel).
   Also, reduces dependency on fossil fuels and aids in the reduction of greenhouse gas emissions.

3. Environmental Protection:
   (a) Applications of biotechnology, like bioremediation with microorganisms, contribute to restoring polluted environments and minimizing pollution.

4. Advancements in Medicine:
   (a) A part of and supports development of vaccines, diagnostics and therapeutic treatments.

5. Biodiversity Conservation:
   (a) Plays a role in the preservation of endangered species and ecosystems.

Wildlife protection and challenges

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Abstract

Wildlife refers to those plant and animal species which live and grow in areas where human population is not present.it include all non - domesticated animals and plants.forest,plains, grassland ,deserts and all other areas have a specific and form of wildlife.india is home to 16 percent of the world's population.india is a land which is one of the richest biodiversity hotspots in the world.411 species of mammals,1232 birds,456 reptiles,219 amphibians,2546 fish and 83,436 kinds of invertebrates and over 50,000 plant species are there.india has three biodiversity hotspots among the 34 biodiversity hotspots of the world which are found in Western ghats,eastern Himalayas and the indo - burma region respectively.india has set up 104 national park ,18 bio reserve and more than 515 sanctuaries to protect and preserve wildlife.12.6% avian,7.6% mammals ,6.2% reptiles and 6.0% species of flowers are native to this country.the conservation of wildlife mainly aims at protecting the endangered species from becoming extinct due to various human and human induced activities.habitat destruction and fragmentation can take place by human activities such as felling of trees,drudging rivers,constructing dams,filling wetlands,use of lands for agriculture, construction of house and roads etc.illegal trading, hunting and poaching has posed a major threat to wildlife which is further increasing due to the lack of proper management.global warming and climate change has also played a major role in posing threat to the wildlife.which is done by the burning of fossil fuels etc.Exploitation and over exploitation of resources for food and other purposes has resulted in posing a threat to the wildlife, especially to the endangered species.the over use use of the wild animals and plants for food, medicines, clothing etc has badly affected the wildlife population has become a threat to their existence.the exploitation of wildlife for trade and other benefits of human have resulted in enacting and enforcing various legislation and Acts in almost all the countries of the world.the wildlife protection act ,custom Act , import - export policies in india has provisions in regulating the conservational measures and trade of wildlife species especially the endangered species.there is another problem identified that the forest department and the forest officers are not able to work effectively in implementing the laws and facilitate the conservation activities because they are not adequately trained or have adequate resources. Wildlife protection Act ,1972 is implemented to save wildlife.Awareness among public and officials.recogninzing and involving NGO'S,In- situation and ex -situation conservation, creation and management of biosphere reserves can protect and conserve the wildlife.

Keywords - Wildlife, Domestication, Exploitation, Conservation .

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Neurobehavioral effects of microplastic particles in Diabetic Swiss albino mice

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Abstract

Microplastics (MPs), particularly polystyrene microplastics (PS-MPs), have emerged as pervasive environmental pollutants with significant implications for human and animal health. Recent studies suggest that MPs can accumulate in tissues and induce oxidative stress, inflammation, and neurotoxic effects. However, the impact of MPs on cognitive and behavioral functions, especially in individuals with chronic conditions such as diabetes, remains poorly understood.

This study investigated the neurotoxicity of 2 μm PS-MPs in diabetic and non-diabetic mice, focusing on anxiety, behavior, and learning impairments. Diabetes was induced using streptozotocin (STZ), and both diabetic and non-diabetic mice received 1 mg/kg body weight of PS-MPs daily for 30 days. Behavioral assessments, including the open-field test, Morris water maze, elevated plus maze, novel object recognition, and pole test, were conducted to evaluate cognitive and behavioral outcomes.

The results demonstrated that exposure to PS-MPs induced significant behavioral and cognitive changes, with diabetic mice exhibiting more pronounced impairments compared to non-diabetic controls. Observed effects included increased anxiety-like behavior, reduced exploratory activity, memory deficits, and impaired motor coordination. These findings highlight the heightened vulnerability of diabetic individuals to MP-induced neurotoxicity and suggest that even short-term exposure to MPs can adversely affect cognitive functions.

This study underscores the urgent need for further research to elucidate the mechanisms underlying MP-induced neurobehavioral changes and to explore the broader implications of environmental MP exposure for public health, particularly in susceptible populations.

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Environmental and Safety Challenges in Oil and Gas: Comparative Risk Strategies for Offshore and Onshore Sites

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Abstract

The oil and gas sector plays a critical role in global energy supply but faces significant environmental and safety challenges, particularly at offshore and onshore drill sites. This study investigates the risk management strategies employed in India's oil and gas industry, highlighting the unique challenges, practices, and emerging trends at these sites.

Offshore drilling operations, while essential for tapping deepwater reserves, are exposed to extreme environmental conditions, equipment failures, and catastrophic events like oil spills, which threaten marine ecosystems. Conversely, onshore operations face challenges such as land degradation, groundwater contamination, and community health risks due to proximity to human settlements. Effective risk management is essential to mitigate these impacts while ensuring operational safety and environmental sustainability.

This comparative analysis identifies key practices in risk assessment, mitigation, and monitoring at offshore and onshore sites. Data-driven insights reveal the role of advanced technologies, such as real-time monitoring systems, predictive analytics, and automated shutdown mechanisms, in minimizing risks. Additionally, the study explores regulatory frameworks and industry standards that guide sustainable practices, emphasizing the importance of collaboration between stakeholders to address environmental and safety concerns.

The findings underline the need for integrated risk management approaches that align with environmental sustainability and operational efficiency. By bridging gaps in existing practices, this research contributes to the development of safer and more sustainable drilling operations in India’s oil and gas sector.

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Cryopreservation and Its Role in Life Science and Sustainability: Insights into Fertility Outcomes

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Abstract

Cryopreservation has revolutionized reproductive medicine by enabling the long-term storage of sperm and embryos, offering hope to individuals and couples facing fertility challenges. This research investigates the impact of different cryopreservation techniques on the viability, integrity, and overall fertility outcomes of stored gametes and embryos, while highlighting their alignment with sustainable practices in life sciences.

The study analyzes key cryopreservation methods, including slow freezing and vitrification, assessing their effects on post-thaw survival rates, DNA integrity, and implantation success. Comparative data from clinical studies provide insights into optimizing protocols for improved reproductive outcomes. Special focus is given to the role of cryoprotectants and their influence on cellular resilience during freezing and thawing processes.

Beyond clinical benefits, cryopreservation contributes to environmental sustainability by reducing the resource-intensive requirements of repeated in vitro fertilization (IVF) cycles. This aligns with the principles of sustainable healthcare, minimizing waste and energy consumption. Additionally, advances in cryopreservation facilitate biodiversity conservation by preserving genetic material in endangered species, thereby promoting ecological sustainability.

This research underscores the dual impact of cryopreservation in enhancing human fertility outcomes and supporting broader life science and environmental goals. By bridging reproductive medicine and sustainability, it paves the way for innovative, eco-friendly solutions in healthcare and beyond.

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Integrating AI in Road Safety for Sustainable Development and Environmental Health

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Abstract

Road accidents remain a significant global challenge, causing substantial loss of life, economic burden, and environmental impact. This research explores the transformative role of Artificial Intelligence (AI) in predicting and preventing road accidents, contributing to sustainable development and environmental health. Leveraging AI technologies such as machine learning, computer vision, and data analytics, this study investigates their potential to enhance traffic safety while minimizing ecological disruptions.

The integration of AI-driven systems in transportation enables the real-time analysis of vast datasets, including vehicle speed, road conditions, and driver behavior. Predictive algorithms can identify high-risk scenarios, providing actionable insights to prevent accidents before they occur. Advanced driver-assistance systems (ADAS) and smart traffic management solutions further reinforce road safety by dynamically adapting to environmental and traffic conditions. Moreover, accident prevention through AI reduces traffic congestion, a major source of greenhouse gas emissions, thereby promoting cleaner air and healthier ecosystems. This alignment with the principles of environmental sustainability highlights AI's dual role in protecting human lives and preserving ecological balance.

This paper presents a comprehensive analysis of case studies, challenges, and opportunities in deploying AI for road safety. By bridging the gap between technological innovation and sustainability goals, the research emphasizes the potential of AI to revolutionize transportation systems while fostering a safer and environmentally friendly future.

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Polyhydroxyalkanoates: As Potential Source of Bioplastic

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Abstract

Polyhydroxyalkanoates (PHAs) are a group of biodegradable polyesters produced by various microorganisms, primarily as intracellular carbon and energy storage compounds under nutrient- limiting conditions. PHAs are synthesized through the polymerization of hydroxyalkanoate monomers. These bioplastics have garnered considerable attention as sustainable alternatives to conventional petroleum-based plastics due to their biodegradability, biocompatibility, and the ability to be produced from renewable resources. Microorganisms, such as Pseudomonas, Ralstonia, Alcaligenes, and Bacillus, are well-known producers of PHAs, particularly polyhydroxybutyrate (PHB) and its copolymers. These microorganisms accumulate PHAs under conditions where an excess of carbon is available, but essential nutrients like nitrogen or phosphorus are limited. The composition of the polymer depends on factors like the microbial strain, the carbon source, and the fermentation conditions. PHAs are attractive for various applications due to their biodegradability and environmental compatibility, making them a promising alternative to conventional plastics that contribute to long-term environmental pollution. They are used in a wide range of products, including packaging materials, agricultural films, medical devices, and drug delivery systems. Additionally, PHAs can be produced from a variety of renewable feedstocks, including waste materials, plant oils, and even CO2, providing a more sustainable approach to plastic production. PHAs produced by microorganisms are expected to become a more competitive and widespread alternative to conventional plastic materials.

Keywords: Polyhydroxyalkanoate, Polyhydroxybutyrate, Biodegradability, Renewable, Biocompatibility.

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Climate change and plant life

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Abstract

Climate change poses a significant threat to plant life worldwide. Rising temperatures, altered precipitation patterns, and increased frequency of extreme weather events disrupt plant growth, reproduction, and distribution. One major impact is the shifting of plant ranges. As temperatures rise, many plant species are moving to higher altitudes or latitudes in search of cooler conditions. This can lead to habitat loss and fragmentation, putting pressure on already threatened species.

Changes in precipitation patterns also have a profound effect. Droughts can stress plants, leading to decreased growth, reduced yields, and increased mortality. Conversely, excessive rainfall can lead to flooding, which can uproot plants, damage root systems, and increase the risk of disease. Extreme weather events, such as heatwaves and wildfires, can have devastating consequences for plant populations. Heatwaves can cause heat stress and desiccation, while wildfires can destroy entire ecosystems, leaving behind barren landscapes.

The effects of climate change on plant life are far-reaching and complex. They not only threaten plant biodiversity but also have significant implications for human well-being, as plants provide us with food, fiber, and other essential resources.

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HAZARDOUS WASTE MANAGEMENT, TREATMENT AND DISPOSAL

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Abstract

The industrial activity that powers modern economies has, inevitably, led to an increase in waste generation, presenting both opportunities and challenges. Waste, particularly hazardous waste, is defined as material that is discarded with little or no expectation that its inherent value will be recovered. The accumulation of waste is an unavoidable consequence of industrial processes, and improper management of such waste can lead to significant risks to both human health and the environment.

In countries like India, which are undergoing rapid industrialization, the issue of waste management is particularly pressing. The generation of hazardous waste, emissions, and effluents is tightly regulated; however, solid waste disposal often lacks the same level of attention or infrastructure. This has led to alarming levels of improper waste handling, storage, transportation, and disposal, which are contributing to various environmental and public health risks, particularly in urban and industrial areas.

Keywords: Hazardous waste generation, Waste disposal techniques, Environmental and Public Health Risk.

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Environmental Cost of Fast Fashion

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Abstract

Fast Fashion's Environmental Toll: A Case Study of India The global apparel industry is increasingly dominated by the fast fashion phenomenon, characterized by rapid production cycles, low-cost manufacturing, and a culture of disposable consumerism. While offering trendy clothing at affordable prices, fast fashion carries significant environmental and social costs. This research investigates the environmental impact of fast fashion in India, a country experiencing rapid economic growth and facing unique environmental challenges.

India's water resources are already under stress, and the textile industry, a major water consumer, contributes significantly to pollution through the discharge of toxic chemicals used in dyeing and treatment processes. The industry also generates massive amounts of textile waste, much of which ends up in landfills, further contaminating land and water. Moreover, the demand for raw materials like cotton puts pressure on agricultural land and water resources, leading to soil degradation and water overuse.

To highlight the global nature of the problem. While India faces specific challenges, the environmental impact of fast fashion transcends borders, underscoring the need for international collaboration and sustainable solutions.

The study also explores emerging sustainable practices in India, including the revival of traditional textile techniques, the development of innovative materials, and the adoption of circular economy models. These initiatives offer hope for mitigating the environmental damage and creating a more responsible and ethical fashion industry.

Ultimately, this research calls for a collaborative effort between the government, businesses, and consumers to address the environmental challenges posed by fast fashion and promote a more sustainable future for the apparel industry in India and beyond.

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Advanced Control Strategies for Enhanced Efficiency in Wind Energy Conversion Systems (WECS)

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Abstract

This paper presents a comprehensive exploration of advanced control strategies aimed at enhancing the efficiency of Wind Energy Conversion Systems (WECS). As the demand for renewable energy sources escalates, optimizing the performance of wind turbines becomes critical. We investigate various control methodologies, including model predictive control, adaptive control, and fuzzy logic control, to improve energy capture and system stability under varying wind conditions. The integration of these advanced strategies not only maximizes power output but also minimizes mechanical stress on turbine components, thereby extending their operational lifespan. Furthermore, we analyze the impact of real-time data analytics and machine learning algorithms in optimizing control responses and predicting maintenance needs. Through simulation and experimental results, we demonstrate the effectiveness of these advanced control techniques in enhancing the overall efficiency and reliability of WECS. This research contributes to the ongoing efforts to make wind energy a more viable and sustainable alternative in the global energy landscape.

Keywords: Wind Energy Conversion Systems (WECS), renewable energy sources, Model predictive control, Sustainability, Sustainable energy

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Environmental Management and Implications of Human Development

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Abstract:

Environmental management and human development are inextricably intertwined, with each having a complex and frequently significant impact on the other. In order to maintain a balance between development and the preservation of natural ecosystems, efficient environmental management is becoming increasingly important as human populations rise and industrialization quickens. With an emphasis on the effects of unsustainable development on the environment and the function of management methods in reducing environmental degradation, this study investigates the connection between environmental management practices and human development.

The study looks into how many aspects of human development, including agriculture, urbanization, industrialization, and technology breakthroughs, affect the environment and cause problems like resource depletion, deforestation, biodiversity loss, and climate change. Additionally, it evaluates how green technologies, sustainable practices, and environmental legislation support more sustainable development paths. The focus is on the differences in development around the world and how environmental management initiatives can be modified to meet the unique needs of both developed and developing countries.

Important conclusions indicate that although human development might raise living standards and spur economic growth, it frequently comes at the expense of environmental deterioration. The study also shows that human development and environmental sustainability can coexist if appropriate environmental management techniques are used, such as integrated land use planning, the use of renewable energy, and waste reduction. The paper goes on to examine how human growth affects environmental management systems, emphasizing the value of a coordinated strategy that takes into account local, national, and international viewpoints.

The study comes to the conclusion that environmental factors must be incorporated into all phases of development planning and policy-making in order to achieve sustainable human development. Human civilizations can guarantee that progress continues to meet present demands without jeopardizing the ability of future generations to meet their own needs by implementing ecologically sustainable practices. The study advocates for a multidisciplinary approach to environmental management, emphasizing collaboration across sectors, greater public awareness, and the fostering of a global environmental ethic.

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A Comparative Study on Level of Problem Solving and Life Satisfaction Among Youth and Old Age Population

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Abstract

Life satisfaction and Problem solving skills plays a very important role to flourish one's life. Life satisfaction is an important aspect of subjective wellbeing. Lack of problem-solving, and satisfaction leads a person to stress, lack of motivation, and anxiety. These two aspects changes over the time so, the aim of the study is to compare the level of problem solving skills and life satisfaction among youth and old age population. Sample included 80 participants , 40 youth (13 to 20 years) population and 40 old (60 to 70 years) age population. Problem solving ability test (PSAT) by L.N Dubey and satisfaction with Life Scale (SWLS) by Diener, Emmons &Larsen (1985) was used for data collection.

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Wildlife Protection and Challenges

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Abstract

Protection of wildlife is the call of the hour as it means preserving biodiversity, maintaining the environmental balance, and ensuring the survival of countless species that are essential to life on earth. Protecting natural ecosystems, stopping illicit poaching and trafficking, and addressing the effects of pollution and climate change are the goals of conservation initiatives. National parks, wildlife sanctuaries, and biosphere reserves are examples of protected regions that are important to these initiatives.

However, there are several obstacles in the way of protecting animals. Deforestation, urbanization, and agricultural growth continue to pose a serious danger to habitat. Elephants, tigers, and rhinos are among the species that are still in danger due to poaching and the illicit wildlife trade. These issues are made worse by climate change, which modifies ecosystem and endangers species that cannot adapt. Furthermore, where civilization encroaches on natural ecosystems, human-wildlife confrontations frequently occur, resulting in the death of both people and animals. Stronger laws, community engagement, education, and sustainable development strategies are some of the coordinated efforts required to overcome these obstacles. To guarantee a future in which people and animals coexist peacefully, international collaboration and initiatives—including those spearheaded by groups like WWF and CITES— are crucial.

Keywords: Wildlife, Poaching, Wildlife trade, Ecosystem, Human-Wildlife confrontations

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Green Bioplastics: An Environmentally Sustainable Product for Circular Bioeconomy using algae

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Abstract

Green bioplastics, synthesized from renewable biomass feedstocks microalgae are emerging pivotal solution to mitigate the environmental impacts of conventional petroleum-derived plastics. These bio-based polymers exhibit reduced carbon footprint during production, lower reliance on fossil resources, and a significant potential for biodegradability and compostability, which positions them as an integral component of a circular bioeconomy. The integration of green bioplastics into a circular system promotes material recovery, waste minimization, and reduced environmental contamination in marine as well as terrestrial ecosystems. Key classes of green bioplastics, including polylactic acid (PLA), polyhydroxyalkanoates (PHA), and starch- based polymers, demonstrate variable degradation kinetics depending on the environmental conditions, offering tailored solutions for specific applications such as packaging, agriculture, and biomedical devices. Despite these advantages, challenges remain in terms of scalability of production processes, material performance (mechanical strength, thermal stability), and cost competitiveness relative to conventional plastics. Furthermore, advancements in biopolymer synthesis, functionalization, and waste-to-feedstock technologies are essential to optimize the lifecycle of bioplastics and enhance their incorporation into industrial applications. Continued interdisciplinary research into the molecular design of bioplastics, coupled with improvements in industrial fermentation, extraction, and processing methods, will be crucial for transitioning to a more sustainable and economically viable bio-based material economy.

Keywords: Green bioplastic, Circular Bioeconomy, polylactic acid (PLA), polyhydroxyalkanoates (PHA), biopolymer, environmentally sustainable.

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Digital Learning for Environmental and Wildlife Education

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Abstract

Digital learning technologies have emerged as powerful tools for environmental and wildlife education, fostering awareness and advocacy among diverse audiences. This study examines the role of virtual reality (VR), augmented reality (AR), and gamification in simulating wildlife habitats and environmental challenges. These immersive experiences enhance user engagement and understanding of conservation efforts, making complex ecological concepts accessible. Case studies reveal the positive impact of digital platforms in shaping eco-conscious behaviours and supporting sustainable practices. This research advocates for integrating digital learning into educational curricula to inspire proactive environmental stewardship.

Keywords: Digital learning, Wildlife Education, Environmental Awareness, Virtual Reality, Conservation.

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Indigenous Medicinal Plants of Shekhawati Region of Rajasthan with their Hypoglycemic Aspects

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Abstract

There are many allopathic medicines and intravenous insulin injection to control increased blood sugar level, having a number of side effects. The major side effect is hypoglycemia, means decreased blood sugar level. Sometime it causes much tiredness to the patients. Objective of this paper is to highlight traditional herbal medicinal treatment and give emphasis on the uses of indigenous medicinal plants to cure diseases. This gives much relax to common man in ease of availability of medicines and economic aspects also. Such research work helps to increases pharmaceutical approaches in this area.

The study deals with ethno-botanical and ecological data of selected medicinal plants and give emphasis on their therapeutic values. This information is helpful to increase tradition medicinal system, pharmaceutical approaches and such type researches in this area.

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Degradation of hazardous impacts of pesticides with the use of novel nanomaterials approach

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Abstract

Excessive consumption of pesticides to improve agricultural yields and ensure adequate food supply is causing a number of serious issues with the environment. In the past few decades, pesticides have been shown to negatively impact the biodiversity of invertebrates, mostly insects, in numerous nations. Managing the use of pesticides effectively and cleaning them up is one of the most difficult challenges to overcome. The effectiveness of the existing pesticide biodegradation approaches, involving various microorganisms and enzymes, is restricted. Therefore, a new approach is required to protect the ecosystem from the severe environmental threat.

Green chemistry-based approaches are now widely employed to synthesise nanomaterials for environmental applications, offering a zero-waste, sustainable substitute for chemical-free procedures. Due to their distinctive characteristics of being small and having a large surface area, nanomaterials have gained interest in a variety of fields in recent years. In a variety of bioremediation procedures, nanotechnology has been considered to be a promising and successful technology. It also offers several important advantages for enhancing environmental technologies through the application of nanomaterials with effective performance.

Keyword: pesticides, environmental issues, biodegradation, Nanotechnology.

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Community and Voluntary Efforts in Wildlife Conservation: Lessons from Western Rajasthan

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Abstract

Western Rajasthan, with its arid ecosystems and unique biodiversity, faces persistent challenges in wildlife conservation, including habitat loss, human-wildlife conflicts, and climate change impacts. This paper examines the critical role of rural communities and voluntary organizations in addressing these challenges through sustainable and culturally grounded conservation practices.

Rural communities in Western Rajasthan, such as the Bishnoi community, have long upheld traditions that prioritize the protection of wildlife, notably blackbucks and other native species. Their practices illustrate the profound impact of cultural values and indigenous knowledge on conservation. Complementing these efforts, voluntary organizations like the Rajasthan Wildlife Protection Society play a vital role in habitat restoration, public awareness campaigns, and policy advocacy. Together, these stakeholders contribute to a model of conservation that balances ecological preservation with community well-being.

Drawing on qualitative research, including field interviews and case studies, the study highlights successful initiatives such as community-managed sanctuaries in Guda Bishnoi and collaborative conservation projects involving local stakeholders. It also identifies challenges, including limited resources, policy gaps, and the need for enhanced capacity-building efforts. The findings emphasize that integrating traditional ecological knowledge with modern conservation strategies can yield significant benefits for wildlife protection.

The paper advocates for scaling such community-led initiatives and fostering partnerships with voluntary organizations to ensure sustainable biodiversity management. These efforts are not only essential for preserving Rajasthan's fragile ecosystems but also align with broader global conservation goals and sustainable development imperatives.

Keywords: Wildlife Conservation, Voluntary Organizations, Sustainable Development.

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Phytotoxicity studies of Direct Black 22 (DB22) and its metabolites formed after degradation by Achromobacter pulmonis BIBDS31

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Abstract

Phytotoxicity assessment is a simple way to monitor environmental pollution. When released into the soil, textile effluents containing synthetic dyes pose serious dangers to crops. Thus, it is crucial to assess the toxicity of such effluents before their release. In this study, seeds of Cicer arietinum (Bengal gram) were used to investigate the phytotoxicity of the tetra azo dye and its metabolites generated after biodegradation by Achromobacter pulmonis BIBDS31. The plant was cultivated in petridishes with 100 healthy seeds (four sets of 25 seeds), moistened daily with 20 ml of distilled water (control), untreated DB22 dye at 2500 mg/L concentration (test) and metabolites of degraded dye. With reductions of 46.6%, the DB22 dye significantly inhibited seed germination in Cicer arietinum. However, the metabolites of degraded DB22 dye only caused 9.25% decrease in germination. Concerning plant growth, untreated DB22 dye resulted in a notable inhibition of growth, reducing shoot length and root length by 75.14% and 66.48% for

C. arietinum, respectively. However, reductions in shoot and root were 3.34% and 17.84, respectively, which were significantly less pronounced when exposed to the metabolites of degraded DB22 dye. These results suggest that the metabolites of the degraded DB22 have significantly lower toxicity compared to the parent dye, leading to less severe impacts on seed germination and plant growth. Therefore, it can be concluded that A. pulmonis successfully degraded the dye into non-toxic metabolites, making it suitable for large-scale bioremediation of textile dyes.

Keywords: Synthetic dyes, environmental pollution, biodegradation, non-toxic metabolites and bioremediation.

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A study of some sacred plants used in Indian socio religious activities

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Abstract

Indian culture has a unique characteristic of conservation of nature by various religious beliefs and taboos. Plants have played vital role in the growth of human civilization and since the beginning of civilization human beings are worshipping plants and using them in many kinds of religious practices, rituals, festivals and ceremonies. They are strongly related to human culture, ethos, religious ceremonies, stories, myths, folk melodies, and culinary and medical activities. They have played an important role in the rituals or customs of human beings right from birth to death. Religious practices are an important aspect of a community's sociocultural and religious characteristics, which eventually flow vertically and horizontally from generation to generation and community to community respectively.

Still, rapid socio-economic development and the disinterest of the younger generation have become a major threat to preserving this indigenous knowledge. Therefore, it is necessary to preserve this indigenous knowledge on using plants in socio-religious activities by proper documentation and identification of plant species used to save these plants from further loss and sustainable utilisation. An account of some plants which are very important in socio- religious rituals and customs are discussed in the present study. A total number of 20 plant species were documented which are most commonly used in Hindu mythology and rituals. The study reveals that the tradition of human civilization to worship plants supports the aim of protecting the important plants and their conservation.

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Some Traditional Ethnomedicinal Plants of Jhunjhunu district of Rajashthan

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Abstract

Medicinal plants are important in providing health care to about 80% of the population in India. The vast land of Rajasthan has a variety of medicinal plants growing in different habitats. The present study aims to document a preliminary analysis of medicinal plants in the Jhunjhunu district of the Shekhawati region of Rajasthan. A detailed survey was conducted and information about medicinal plants was collected based on frequent interviews with elderly people, vaidyas, vendors, shepherds and tribal folks. During the present research work, different areas of Jhunjhunu district were repeatedly visited and specimens were collected and identified using standard monographs and flora. 120 plant species were recorded, which were exploited by the local people to cure various ailments. Each plant species is discussed with its scientific name, local name, family name and its uses. The most commonly used plant parts to cure disease are leaves followed by fruits, seeds, bark, stems and flowers. The present study aimed to create awareness about the ethnomedicinal value of the plants and their uses to draw the attention of pharmacologists, phytochemists and pharmaceuticals. There is an urgent need to document and monitor the area for ethnomedicinal plants.

Keywords: Folk, Traditional, Flora, Ethnomedicinal plants, Jhunjhunu

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Bioconversion of agro-wastes by cultivation of Pleurotus ostreatus : A strategy towards sustainability

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Abstract

Agro-waste is a byproduct of crop cultivation process. Today we are facing many environmental issues related to agro-waste disposal. Agro-waste is a nutrient-rich form of waste. Mushroom is a fleshy, macroscopic fungus belonging to the basidiomycetes. Edible mushrooms show significant diversity in their cultivation. The climate of temperate region is suitable for Agaricus mushroom whereas the southern subtropical region is fit for Pleurotus and Volvoriella cultivation. Pleurotus has many species like P. ostreatus, P. florida, P. sapidus, P. djamor, P. eous etc. Rajasthan produces several subtropical crops like Bajra, Jowar, Mustard, Wheat, Guar and Groundnut which resulting in generation of lignocellulose-rich waste. The impact of agro-wastes on the growth of Pleurotus ostreatus RU01 was investigated. Three combinations of agro-crop wastes were employed and examined. Maximum mushroom production (636 gm), biological efficiency (84.7%) and Moisture content (91.44%) were noted in the Mustard-Bajra substrate combination.

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Navigating Strategic Management in the Era of Globalization: Challenges and Opportunities

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Abstract

The era of globalization has significantly transformed the landscape of strategic management, presenting both unprecedented opportunities and formidable challenges for organizations across the globe. This paper explores the evolving nature of strategic management in a globalized context, emphasizing the need for adaptive and innovative strategies to sustain competitive advantage. The study examines key challenges such as cultural diversity, market unpredictability, regulatory complexities, and technological disruption, which require businesses to rethink traditional management practices. Additionally, it highlights the opportunities arising from global market access, technological advancements, and cross-border collaborations.

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Scope of Life Science and Environmental Sustainability

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Abstract

Life Science and Environmental Sustainability are closely interconnected fields that focus on understanding living systems and finding solutions to preserve the environment for future generations. Here Life Science includes Biology, Ecology, Biotechnology etc which studies about the growth and development of various species interconnection with environment on other hand Environment Sustainability includes Conservation, Sustainable development, Waste Management and Issues dealing with Climate Change and Global Warming. While with tend to make Relation with both the Titles gave the new emerging concept in various field of Disciplines Such as Ecology, Geography, Biology etc. The recent emerged concept such as Biodiversity Conservation built in the Environment to conserve the Biodiversity on Earth by locating, Delimiting the zone of Restricted exploitation of Resource in Such regions. Here the Sustainability means to preserve the Natural Resources for future generation which should include Both Human and Non Human Species on Earth. It shows enormous concepts, procedure, processes which formulate the scenario to be worked upon.

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Pollution and Bioremediations

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Abstract

Environmental pollution has been rising in the past few decades due to increased anthropogenic activities. Bioremediation is an attractive and successful cleaning technique to remove toxic waste from polluted environment. Bioremediation is highly involved in degradation, eradication, immobilization, or detoxification diverse chemical wastes and physical hazardous materials from the surrounding through the all-inclusive and action of microorganisms. The main principle is degrading and converting pollutants to less toxic forms. Bioremediation can be carried out ex- situ and in-situ, depending on several factors, which include but not limited to cost, site characteristics, type, and concentration of pollutants. Hence, appropriate bioremediation technique is selected. Additionally, the major methodologies to develop bioremediation are biostimulation, bioaugmentation, bioventing, biopiles, and bioattenuation provided the environmental factors that decide the completion of bioremediation. Bioremediation is the most effective, economical, eco-friendly management tool to manage the polluted environment. All bioremediation techniques have its own advantage and disadvantage because it has its own specific applications.

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The Impact of Environmental Pollution on Life: Investigating Remedies and Strategies

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Abstract

This paper provides a thorough and insightful examination of the extensive consequences of environmental pollution on human, animal, and plant life. The findings indicate that air pollution, water contamination, and land/soil waste all exert a profoundly detrimental impact, not only on human health and well-being, but also on broader ecological systems. Importantly, the author suggests that global institutions, governments, and local authorities possess the resources and capacity to implement robust strategies aimed at restoring environmental balance and cultivating environmentally conscious citizenry. Crucially, the author emphasizes that an effective and enduring response to environmental contamination hinges on fostering comprehensive public understanding across all age groups, and on the development of nationwide, cost-sharing contamination control initiatives predicated on voluntary participation and collective responsibility. The author underscores the critical importance of global cooperation and coordinated efforts at all levels of society to address the pressing environmental challenges that threaten the delicate balance of our planet's ecosystems. Comprehensive education, targeted policies, and collective action are essential to reversing the damaging effects of pollution and safeguarding the long-term sustainability of our environment for future generations.

Keywords: Environment Pollution; Air Pollution; Water Pollution; Soil Pollution; Waste Management; Sustainability; Ecosystem Preservation; Environmental Remedies.

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Financial sustainability in the 21 st. century: trends and best practices

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Abstract

As we progress further into the 21st century, financial sustainability has become a critical concern for organizations, governments, and businesses alike. This research paper explores the evolving trends and best practices essential for achieving financial sustainability in an era marked by technological advancement, climate change, and global economic shifts. The study examines how financial sustainability is being redefined by emerging practices such as responsible investment, sustainable business models, and the integration of environmental, social, and governance (ESG) factors into financial decision-making.

One of the key trends identified is the growing emphasis on long-term value creation over short-term profits, driven by the recognition that sustainable practices lead to more resilient financial outcomes. This paper also highlights the role of technology in enhancing financial transparency, improving resource allocation, and enabling innovative financial solutions. Additionally, it delves into the challenges faced by organizations in maintaining financial sustainability, including regulatory pressures, market volatility, and the need for effective risk management.

Best practices discussed include the adoption of circular economy principles, strategic resource planning, stakeholder engagement, and the integration of sustainability metrics into financial reporting. The paper concludes by proposing a framework for organizations to achieve financial sustainability, emphasizing the importance of a holistic approach that aligns financial goals with broader societal and environmental objectives.

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Intelligent Waste Management System with CNN for Predictive Waste Sorting and Real-Time Segregation

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Abstract

The increasing volume of waste generated globally has made waste management a critical concern for both urban and rural areas. Traditional waste management systems often rely on manual sorting and inefficient processes, leading to environmental hazards and operational challenges. This paper presents an Intelligent Waste Management System (IWMS) that leverages Convolutional Neural Networks (CNNs) for predictive waste sorting and real-time segregation, enhancing efficiency, accuracy, and sustainability. The proposed system utilizes CNNs to automatically classify various types of waste based on visual recognition, enabling precise categorization (e.g., plastic, paper, metal, organic waste) through images captured by cameras integrated with waste bins or conveyor belts. Additionally, real-time data processing is incorporated, allowing the system to continuously adapt to varying waste types and environmental conditions. The system provides actionable insights through predictive analytics to optimize waste collection routes, reduce contamination rates in recycling streams, and improve overall operational efficiency. The integration of AI-driven decision-making enhances waste management capabilities, contributing to a cleaner environment and more sustainable urban living.

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Guar Gum based Superabsorbent Biodegradable Hydrogel for controlled nutrient release and enhanced water retention in soil

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Abstract

This study reports the development and characterization of a novel zinc-incorporated biopolymer hydrogel for controlled nutrient release and enhanced plant growth. The hydrogel was synthesized using a bio-based polymer matrix incorporating guar gum and cellulose, with zinc ions incorporated during the cross-linking process. Characterization techniques, including TGA, SEM, and swelling studies, were employed to investigate the physicochemical properties of the hydrogel. The release kinetics of zinc from the hydrogel was evaluated in both water and soil media, demonstrating a sustained and controlled release profile. The hydrogel exhibited a significantly longer release duration compared to a conventional zinc fertilizer, indicating its potential for enhanced nutrient utilization by plants. This innovative approach leverages waste-derived zinc and utilizes a bio-based polymer matrix, offering a sustainable and eco-friendly solution for improving plant nutrition and enhancing crop productivity.

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Green Chemistry

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Abstract

A novel method of organic synthesis called "green chemistry" is gaining popularity on a national and worldwide scale. The main advantages of the use of green chemistry is minimum waste, reduced harmful by-products and reagents and maximum production efficiency with environmental friendly.

Green chemistry involves 12 principles which can be achieved by the use of environmental friendly, harmless, reproducible solvents and catalysts during production of chemicals and in researches.

A substance called a photocatalyst transforms energy by absorbing photons and accelerating chemical reactions. TiO2, SnO2, ZnO, ZrO2, and so forth. was widely employed for many years as a photocatalyst. Photocatalysts soak up light, which excites electrons and creates reactive species able to beginning chemical reactions.Sustainable Energy Source: The use of sunlight as a catalyst supply offers a renewable and abundant strength input, making photocatalysis an appealing option for sustainable synthesis.

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The Interplay of Society, Economy, and Environmental Challenges

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Abstract

The complex interconnection between society, economy, and environmental challenges forms the cornerstone of sustainable development discourse. Environmental issues, ranging from climate change and biodiversity loss to resource depletion and pollution, are deeply influenced by socioeconomic activities and policies. This paper explores the intricate relationships among these dimensions, highlighting how societal behaviors and economic systems contribute to environmental degradation while simultaneously being impacted by ecological changes. It delves into key drivers such as industrialization, urbanization, and globalization, which have fueled economic growth at the expense of environmental stability.

Conversely, the study examines the socioeconomic repercussions of environmental crises, including impacts on livelihoods, public health, and social inequalities, particularly in vulnerable communities. The paper emphasizes the need for integrative approaches that align economic development with ecological conservation, advocating for sustainable practices, equitable policies, and technological innovations. By addressing the interplay of social, economic, and environmental factors, this study underscores the importance of collective responsibility and interdisciplinary solutions in achieving a balanced and resilient future. Ultimately, it calls for a paradigm shift towards sustainability to mitigate the dual crises of environmental degradation and socioeconomic disparities.

E waste management

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Abstract

Electronic waste or e-waste, is a growing global concern due to the rapid advancement of technology and the short lifespan of electronic devices. This abstract explores the critical issues surrounding e-waste management, its environmental and health impacts, and the importance of sustainable solutions.

E-waste is a complex mixture of valuable materials and hazardous substances. Improper disposal, such as landfilling or incineration, can lead to the release of toxic chemicals into the environment, contaminating soil and water sources. These chemicals, including heavy metals like lead and mercury, pose significant risks to human health, potentially causing respiratory problems, neurological disorders, and reproductive issues.

Effective e-waste management requires a multi-pronged approach. This includes reducing e-waste generation through initiatives like extended producer responsibility, promoting the repair and reuse of electronic devices, and establishing efficient collection and recycling systems. Responsible recycling processes can recover valuable materials like metals and plastics, minimizing environmental impact and conserving natural resources.

Raising public awareness about the dangers of improper e-waste disposal and the importance of responsible recycling is crucial. By encouraging consumers to participate in e-waste collection programs and make informed choices about electronic purchases, we can collectively mitigate the environmental and health consequences of this growing waste stream.

Key words: E-Waste, management of electronic waste, e-waste disposal.

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Eco-friendly Agriculture - Harnessing Biofertilizers and Bio-pesticides for Sustainable Environmental Management

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Abstract

In the face of escalating environmental challenges, eco-friendly agriculture has become a cornerstone for achieving sustainable development. The extensive use of chemical fertilizers and pesticides in conventional farming has led to soil degradation, water pollution, and biodiversity loss, necessitating a shift toward sustainable alternatives. Biofertilizers and biopesticides offer promising solutions by utilizing naturally occurring microorganisms and biological agents to enhance soil fertility and control pests without compromising environmental health.

Biofertilizers, composed of beneficial bacteria, fungi, and algae, improve nutrient availability in the soil by fixing atmospheric nitrogen, solubilizing phosphorus, and stimulating root growth through plant growth- promoting substances. This reduces the dependency on synthetic fertilizers, thus minimizing greenhouse gas emissions and preserving soil health. Biopesticides, derived from microbial, plant-based, or biochemical sources, provide targeted pest and disease management, ensuring reduced toxicity to non- target organisms, including pollinators and natural predators.

This abstract delves into the mechanisms by which biofertilizers and biopesticides contribute to sustainable agriculture, including enhanced nutrient cycling, increased crop yields, and improved soil microbial diversity. It also explores their role in mitigating climate change by reducing agricultural carbon footprints and promoting ecosystem resilience. Real-world examples and success stories of their adoption in diverse agroecosystems are discussed, highlighting their economic and ecological advantages.

To realize the full potential of these eco-friendly solutions, the presentation emphasizes the need for robust research, farmer education, and supportive policy frameworks. By integrating biofertilizers and biopesticides into mainstream agricultural practices, we can transition towards a sustainable agricultural paradigm that conserves natural resources, protects biodiversity, and ensures food security for future generations.

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Isolation and Identification of Phytosterols from *Basella alba* L.

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Abstract

Medicinal plants contain some organic compounds which provide definite physiological action on the human body. The present study describes the phytosterols from *Basella alba* L. This plant belongs to family basellaceae. Seed and stem of *Basella alba* L. were shaded, dried, powdered and were extracted using solvent benzene. Preliminary phytochemical screening of the extract was carried out and it revealed the presence of carbohydrates, proteins, phenols, lipids, flavonoids, alkaloids and phytosterols. The phytosterols in *Basella alba* L. were identified by using IR and GC-MS. β-sitosterol, Stigmasterol, Campestrol and Lanosterol were reported by TLC. Total amount of phytosetrol were found in *Basella alba* L. 0.45 mg/gdw in stem and 3.75 mg/gdw in seed. Fifty compounds were identified in GC-MS analysis.1H-1,2,4-Triazole-1- carboxamide,5-acetylamino-3-amino (area of % 5.52) was found in highest amount.

Keywords : *Basella alba*, Phytosterols, IR, TLC, GC-MS.

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Environmental Pollution Laws and AI Practices

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Abstract

Environmental pollution poses a global challenge, necessitating stringent laws and innovative practices for mitigation. This paper investigates the application of Artificial Intelligence (AI) in enforcing pollution control regulations. By employing predictive analytics, AI models can assess compliance risks and optimize industrial emissions monitoring. Case studies highlight successful integrations of AI in policy implementation, underscoring its potential to enhance regulatory frameworks. The study concludes by outlining AI-driven strategies for a cleaner and more sustainable future.

Keywords: AI, Environmental Laws, Pollution Control, Sustainability, Policy Innovation.

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Addressing Acrylamide Formation in Fried Potatoes: An Analysis of Contributing Factors and Mitigation Strategies

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Abstract

Acrylamide, a potentially harmful compound classified as a probable human carcinogen, forms during high-temperature cooking processes such as frying, baking, or roasting, particularly in carbohydrate-rich foods like potatoes. This study investigates the key factors influencing acrylamide formation in fried potatoes and explores effective mitigation strategies. Factors such as potato variety, sugar content, cooking temperature, and time significantly impact acrylamide levels. Moreover, pre-treatment methods, including soaking, blanching, and the use of additives, play a crucial role in reducing its formation. The analysis highlights the biochemical mechanisms underlying acrylamide formation, primarily the Maillard reaction between free asparagine and reducing sugars. The influence of environmental conditions during potato cultivation, storage practices, and the impact of frying oils are also evaluated. Particular emphasis is placed on how genetic and agronomic improvements in potato varieties can contribute to lower acrylamide precursors. Mitigation strategies discussed include optimizing cooking parameters, employing pre-frying treatments, and the use of novel techniques such as enzyme applications and natural inhibitors. Consumer-level practices, such as using air fryers or adjusting home-cooking methods, are also considered as practical approaches to reduce acrylamide exposure. The findings underscore the need for a multi-pronged approach involving industry stakeholders, researchers, and policymakers to address the health risks associated with acrylamide in fried potatoes. While advancements in mitigation strategies show promise, further research is essential to refine these methods, ensuring food safety without compromising sensory qualities. This comprehensive analysis aims to contribute to the ongoing efforts to minimize acrylamide levels in food products, promoting public health and consumer awareness.

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Unraveling microRNA-Mediated Control of Flowering in Sorghum bicolor

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Abstract

Sorghum (Sorghum bicolor L.) is a critical cereal crop valued for its exceptional tolerance to drought and heat stress, supporting its use in food, fodder, and industrial applications, including biofuel production. The rising demand for biofuels has underscored the need to enhance sorghum productivity, with flowering time serving as a key determinant of yield. Flowering regulation in sorghum involves complex interactions between transcriptional and post-transcriptional mechanisms, with microRNAs (miRNAs), small non-coding RNAs emerging as crucial regulators of gene expression in plant development and stress responses. This study explores the role of miRNAs in sorghum flowering by identifying key flowering-related genes and their miRNA regulators. We focused on SbFT-10, SbSPL-2, SbSPL-14, and SbEHD-1, targeted by miR821, miR156, miR5565, and miR5568e, respectively. These genes are integral to the vegetative-to-reproductive phase transition. Using reverse transcription PCR (RT-PCR) and quantitative RT-PCR (RT-qPCR), we analyzed gene and miRNA expression during vegetative and flowering stages. The results revealed significant upregulation of SbFT-10, SbSPL-2, SbSPL-14, and SbEHD-1 during flowering, while their respective miRNAs exhibited higher expression during the vegetative stage. This inverse expression pattern indicates that miRNAs act as repressors, delaying flowering by suppressing key regulatory genes. Our findings highlight the importance of miRNA-mediated networks in controlling flowering time in sorghum. These insights provide a foundation for breeding sorghum varieties optimized for specific uses, enhancing productivity and adaptability to varying environmental conditions.

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The Mind-Body Connection: Harnessing the Power of Brahmi for Mental Well- being

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Abstract

Brahmi (Bacopa monnieri), a perennial herb, holds a prominent place in traditional medicine systems, particularly Ayurveda, for its profound therapeutic benefits. Native to wet and marshy regions in India, Brahmi is renowned for its nootropic properties, often referred to as the "memory herb." Its bioactive compounds, including bacosides and alkaloids, contribute to its diverse medicinal effects.

The herb is widely used for enhancing cognitive functions, improving memory, and alleviating anxiety and stress. Studies suggest that Brahmi exhibits neuroprotective properties, supporting brain health by reducing oxidative stress and enhancing synaptic transmission. Additionally, it has been employed as a remedy for neurological disorders such as epilepsy, Alzheimer's disease, and attention deficit hyperactivity disorder (ADHD).

Brahmi also demonstrates anti-inflammatory, antioxidant, and adaptogenic properties, making it a versatile herb in managing conditions like arthritis, respiratory ailments, and digestive issues. Its hepatoprotective and cardioprotective effects further enhance its medicinal significance.

Traditionally consumed as decoctions, powders, or in oil form, Brahmi is a key ingredient in several Ayurvedic formulations. Modern research continues to validate its traditional uses, contributing to its inclusion in pharmaceutical and nutraceutical products worldwide.

The growing interest in Brahmi highlights its potential for addressing modern health challenges naturally. However, sustainable cultivation and conservation practices are essential to preserve this valuable indigenous plant for future generations

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Life Science for a Sustainable Future

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Abstract

Environmental sustainability has become a critical focus in life sciences, shaping innovative approaches to address global ecological challenges. This field explores the intersection of biological systems, environmental conservation, and sustainable practices to mitigate the impact of human activities on the planet. This abstract highlights the urgent need for interdisciplinary collaboration to foster a sustainable future through advancements in life sciences, balancing ecological preservation with societal progress.

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Novel approaches to combat multidrug resistance caused by microbial biofilm: a process in healthcare treatment regime

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Abstract

Antimicrobial resistance (AMR) has become a critical global health and economic issue, impacting humans, animals, and the environment. AMR complicates treatment, increasing morbidity and mortality, especially during the COVID-19 pandemic. Reports highlight growing resistance to existing antibiotics, particularly against respiratory infections, due to misuse and insufficient development of new treatments. The World Health Organization (WHO) identified AMR as one of the top ten global threats in 2019, attributing it to 700,000 deaths annually—a figure projected to reach 10 million by 2050.

Recent studies have isolated molecules from various organisms capable of disrupting biofilms, structures formed by bacteria to protect themselves. However, the mechanisms underlying these molecules' actions remain largely unexplored. Currently, no regulatory agency, including the U.S. FDA or India's Central Drug Control Organization, has approved drugs specifically targeting biofilms. Understanding the mode of action of previously identified biofilm disruptors is vital to advancing this field. The development of antibiofilm therapeutics represents a major scientific challenge of the 21st century.

This review focuses on microbial biofilm formation in ESCAPE pathogens and explores innovative approaches to combat biofilm-associated infections. These efforts are essential for addressing the growing threat of AMR and ensuring effective treatment options for future generations.

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Antibacterial and Antioxidant efficacy of Lepidagathis cristata Leaves Extracts

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Abstract

Traditional medicine has long utilized medicinal plants for the treatment of various diseases, with different plant parts, including leaves, flowers, and roots, being employed for therapeutic purposes. In India alone, approximately 3000 plant species with medicinal properties have been identified. Lepidagathis cristata is one such plant, whose various parts have shown therapeutic potential against microorganisms and a range of pathologies, including fever, pneumonia, mouth infections, eczema, psoriasis, and other skin conditions. Specifically, the leaves are known for their antimicrobial and, to a lesser extent, antioxidant properties. The objective of this study is to evaluate the antimicrobial and antioxidant activity of Lepidagathis cristata leaf extracts.

Different extracts of the leaves were prepared using six solvents, and antimicrobial activity was assessed using the agar diffusion method against Escherichia coli, Pseudomonas aeruginosa, Bacillus subtilis, Klebsiella pneumoniae, and Staphylococcus aureus. The zone of inhibition and activity index were measured, with Streptomycin used as a positive control. In addition, the antioxidant activity was evaluated using the DPPH (2,2-diphenyl-1-picrylhydrazyl) assay. Various concentrations of the leaf extracts (20, 40, 60, 80, 100 µg) were mixed with the DPPH reagent, and the absorbance was measured at 517 nm, with ascorbic acid serving as the positive control.

The antimicrobial results showed inhibition zones of 13 mm for E. coli using petroleum benzene extract and 12 mm for Klebsiella pneumoniae using ethyl acetate extract, compared to Streptomycin's inhibition zones of 32 mm and 31 mm, respectively. The antioxidant activity of Lepidagathis cristata leaves was found to be lower than the standard, but it holds promise for enhancement through bioactivity-guided fractionation, particularly by isolating flavonoid-rich fractions, which could potentially increase efficacy. These findings suggest that Lepidagathis cristata leaves possess notable antimicrobial activity and modest antioxidant potential, both of which can be further explored for therapeutic applications.

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Biotechnology Application in Sustainable Development

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Abstract

In the modern world, sustainable development is a big concern and worldwide challenge. It's challenging to use resources to meet current needs while also protecting them for coming generations. With the least amount of resources, biotechnology can improve our lives and contribute to sustainable development. Biotechnology is a broader field that covers and solves other issues rather than restricting its usage in pharmaceuticals. It provides a wide range of applications for academics to work on, from environmental challenges to the food and agriculture industries. Biological systems are manipulated by biotechnology to accomplish particular objectives. This poster will demonstrate how biotechnology can transform environmental management, energy production, and agriculture, paving the way for a more sustainable future We'll talk about things like raising meat, biofuels, waste management, bioremediation, and biofertilizer. In order to accomplish the Sustainable Development Goals (SDGs) of the UN, such as 2 (zero hunger), 13 (climate action), and 6 (clean water and sanitation), all of the applications are examined and evaluated.

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DNA Barcoding: What, Why, When and How?

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Abstract

DNA barcoding, a molecular diagnostic tool, makes use of inherent DNA sequence variations in standardized and globally accepted small regions of genome to provide unique recognition tags (molecular IDs) to species. As the variations in the four letters (bases) can be converted into a barcode, these have been called as DNA barcodes. Identification of species using DNA barcoding does not require the whole organism or even sometimes its tissues for identification. The concept of DNA barcoding was proposed by Paul Hebert and co-workers of Guelph University in 2003 based on their comparison of a small region (658 bp), known as Folmer region present at 5' end of the mitochondrial gene Cytochrome oxidase (Cox 1 or Co 1), among 200 lepidopteran species. As this region successfully discriminated species of birds and fishes investigated by the same group, they proposed it to be the universal barcode for all eukaryotes. However, soon it was realized that because of low substitution rate in mitochondrial genome, Cox 1 would not be suitable for DNA barcoding of plants. Thereafter, many research laboratories including ours focussed efforts to identify loci from the chloroplast genome of the plants, which could become effective barcodes for plants. By 2005, it had become clear that plant DNA barcode would comprise more than one locus. Research during the next six years led to a consensus for DNA barcode of plants comprising ITS+*matK*+*rbcL*. In addition, few other loci e.g., *rpoB*, *rpoC1* and *trnH-psbA* spacer were also found be suitable for some groups. As of today, plant DNA barcoding is well established as a powerful tool for identification and detection of species with a plethora of applications hitherto not possible with conventional taxonomic method with a well standardized methodology. In the lecture, emphasis will be on these two aspects of DNA barcoding, applications and the methodology, with examples from our own research efforts spanning a period of one and half decades.

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Quinoa's Role in Sustainable Agriculture: A Natural Solution to Heavy Metal Contamination

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Abstract

Quinoa (Chenopodium quinoa), a facultative halophyte, has gained attention for its potential in bioremediation, particularly in mitigating heavy metal pollution through phytoremediation. As a stress-tolerant crop, quinoa exhibits remarkable adaptability to abiotic challenges such as salinity, drought, and metal toxicity, making it a viable candidate for restoring polluted environments. The paper synthesizes current research on quinoa's phytoremediation capabilities, focusing on its ability to accumulate heavy metals, including cadmium (Cd), lead (Pb), nickel (Ni), chromium (Cr), copper (Cu), and arsenic (As). Key studies highlight quinoa's deep root system, high metal uptake efficiency, and robust growth in contaminated soils, along with genotypic variations that enhance its remediation potential. Additionally, quinoa's capacity to maintain safe metal concentrations in its seeds allows for dual benefits: environmental detoxification and food production. By exploring its physiological responses, metal tolerance mechanisms, and implications for sustainable agriculture, this review positions quinoa as a versatile crop for addressing heavy metal pollution while contributing to food security in contaminated regions.

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Wildlife Protection and Challenges

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Abstract

India is known for its abundant biodiversity, but habitat loss, poaching, illegal trafficking, and climate change pose serious threats to wildlife conservation. With an emphasis on important laws like the Wildlife Protection Act1972, the Forest Conservation Act1980, and the Biological Diversity Act 2002, we can analyse the legal frameworks put in place to safeguard India's wildlife. Despite being essential in establishing protected areas and controlling animal activity, these laws' efficacy is hampered by a number of issues.

The main problems are insufficient enforcement because of lack of budget, shortage of personnel, and lack of training within law enforcement organisations. Law enforcement is further hindered by political meddling and corruption. Conflicts and unlawful activity are also influenced by socioeconomic issues, such as the local inhabitants' reliance on forest resources. Degradation and fragmentation of habitat are also caused by rapid infrastructure development and urbanization. A multifaceted strategy should be made to solve these issues, like active community involvement in conservation initiatives, enhanced interagency collaboration, and the strengthening of enforcement agencies through greater resources and training.

To improve monitoring and protection, technological innovations including GIS, remote sensing, and animal forensics are recommended. To discourage wildlife crimes, legal reforms, harsher fines, and expedited judicial procedures are advised. Long-term success depends on combining conservation with sustainable development, encouraging ecotourism, providing local populations with alternate sources of income, and raising public awareness. India can guarantee the preservation of its priceless biodiversity and improve the efficacy of its animal conservation initiatives by using these all-encompassing techniques.

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THE ROLE OF INDIGENOUS MEDICINAL PLANTS IN INDIAN HEALTHCARE

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Abstract

1. Diversity and Importance: India, with its vast biodiversity, is home to numerous indigenous medicinal plants that have been used for centuries in traditional systems like Ayurveda, Siddha, and Unani. These plants play a crucial role in healthcare, particularly in rural and tribal communities.

2. Traditional Knowledge: Indigenous knowledge systems have developed detailed information on the medicinal properties of plants. Many plants are used to treat common ailments such as fever, cough, digestive disorders, skin conditions, and chronic diseases. This knowledge is often passed down through generations and integrated with spiritual and cultural practices.

3. Pharmacological Properties: Several indigenous plants have demonstrated significant pharmacological properties, such as antimicrobial, anti-inflammatory, anti-cancer, and antioxidant activities. Research continues to validate the efficacy of these plants, many of which contain bioactive compounds that contribute to their medicinal properties.

4. Integration with Modern Medicine: There is an increasing trend towards integrating traditional herbal medicine with modern healthcare systems. While challenges like quality control, standardization, and regulatory frameworks exist, the potential for indigenous plants to complement conventional medicine is significant.

5. Conservation Concerns: Many medicinal plants are under threat due to overharvesting, habitat loss, and climate change. There is a growing need for sustainable harvesting practices and conservation efforts to ensure these plants continue to benefit future generations.

Conclusions:

• Indigenous medicinal plants remain a valuable resource for healthcare, particularly in rural and underserved areas.

• Their use in modern healthcare should be encouraged through scientific validation, proper regulation, and collaboration between traditional practitioners and healthcare professionals.

• Protecting biodiversity and promoting sustainable practices will be essential for preserving these plants and their therapeutic potential.

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Climate Change and Plant Life

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Abstract

Climate change is one of the most urgent environmental issues of the twenty-first century, fueled by human activities like the burning of fossil fuels, deforestation, and industrial processes. With an emphasis on how changes in temperature, precipitation patterns, and atmospheric CO2 concentrations are influencing plant distribution, growth, reproduction, and survival, this study explores the effects of climate change on plant life. The study investigates the potential wider ecological repercussions of climate change as well as its direct and indirect effects on plants. Changes in plant phenology (the timing of seasonal events), species distributions, plant-pollinator interactions, and the impact on plant biodiversity are important research topics. The study also looks at how plant health, production, and ecosystem resilience are impacted by climate-induced stressors such heat waves, droughts, and an increase in the frequency of extreme weather events. The study also highlights the role of plants in mitigating climate change, particularly through their capacity to sequester carbon, and explores how changing plant dynamics may influence global carbon cycles.

The results show that the ideal growing conditions for many plant species are changing, which is causing changes in their geographic distributions. As temperatures rise, some species are moving toward higher latitudes or altitudes, while others are becoming more vulnerable as a result of habitat loss or shifting weather patterns. Furthermore, the research underscores the cascading effects that disruptions in plant life can have on food security, biodiversity, and ecosystem services, with significant implications for human societies.

The study's conclusion highlights the necessity of adaptive management techniques that take climate change into account when attempting to conserve plants. Developing strategies to protect ecosystems, maintain biodiversity, and ensure sustainable agricultural practices requires an understanding of the complex interactions between climate change and plant life. The study advocates for global efforts to mitigate climate change and enhance the resilience of plant species, ensuring their role in maintaining ecological balance and supporting the planet’s carbon sequestration capacity.

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Wildlife conservation AND food security

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Abstract

Plant and animal species which live and grow in those areas which are not inhibited by human being are known as wildlife. It is found in all kinds of ecosystems like oceans, rivers, plains, mountains, deserts, glaciers etc. Threats to wildlife begun with the evolution of civilization and gradually resulted into extinction of several species. Out of them, so many have been extinct unidentified. Main reason for biodiversity loss includes habitat destruction, habitat fragmentation, poaching, hunting, climate change, pollution, over exploitation of natural resources etc. Several efforts are being made through Governmental and non-governmental organizations to save wildlife by In-situ or ex-situ conservation methods. One of the these includes introducing wildlife to new habitats like conservation area or protected areas. This process faces so many challenges, one of them is to maintain the same environmental conditions and food habits and habitat. Many animal species feed upon specific grasses. So, to introduce animal species to new habitats, it is required to pre cultivate those grasses there and maintain them properly.

Climate change adaptation

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Abstract

Climate change is a unprecedented challenge with far-reaching impacts on ecosystems, biodiversity, and human societies. Increasing temperatures and altered precipitation patterns, and intensified extreme weather events disrupt ecological balance, threaten food security, and amplify resource scarcity. Adaptation to these changes is critical to ensure the resilience of both natural and human systems.

Ecosystem based approach, such as reforestation, wetland conservation, and sustainable agriculture, offer promising solutions to mitigate the adverse effects of climate change while preserving biodiversity. Naturebased strategies not only restore degraded ecosystems but also provide critical ecosystem services, including carbon sequestration and water regulation. Additionally, leveraging advanced technologies, such as geographic information systems (GIS) and predictive climate models, enables the development of targeted, data-driven adaptation frameworks.

The role of community involvement is equally and sometimes more important as localized knowledge and participatory governance ensure the relevance and effectiveness of adaptation strategies. Strengthening institutional capacities and fostering international collaboration can further facilitate the implementation of sustainable solutions at scale. The integration of scientific innovation, policy interventions, and traditional knowledge is essential for building climate-resilient systems that balance ecological preservation with human development.

Through a multidisciplinary lens, climate adaptation emerges as a cornerstone for safeguarding ecosystems, reducing vulnerabilities, and ensuring a sustainable future for generations to come. This holistic approach is pivotal for addressing the complex and dynamic nature of climate change impacts across the globe.

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Bioremediation Strategies for Sustainable Pollution Management

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Abstract

Pollution, driven by anthropogenic activities such as industrialization, agriculture, and urbanization, introduces hazardous contaminants into soil, water, and air, resulting in adverse ecological and human health impacts. Bioremediation, an emerging scientific intervention, harnesses the metabolic capacities of microorganisms and plants to degrade, transform, or immobilize pollutants, offering a sustainable alternative to conventional remediation techniques. Key bioremediation approaches include microbial degradation, phytoremediation, and enzymatic treatment, targeting pollutants such as hydrocarbons, heavy metals, and xenobiotics. Advances in genomics, proteomics, and bioinformatics have enhanced the understanding of microbial and plant-mediated pathways, enabling the development of tailored strategies for site-specific applications. Bioremediation represents a promising, cost-effective, and environmentally friendly solution to pollution, contributing significantly to ecosystem restoration and environmental sustainability.

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Wildlife protection and challenges

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Abstract

This article delves into the critical issues and strategies related to wildlife conservation and management in the context of the contemporary environmental crisis. Wildlife protection is vital for maintaining biodiversity and ecosystem health. It involves safeguarding animal and plant species from extinction while preserving their habitats. Challenges in wildlife protection include habitat destruction due to urbanization and agriculture, climate change, poaching, and illegal wildlife trade. Human-wildlife conflict also poses significant risks, often leading to negative perceptions and retaliatory actions against wildlife. Effective wildlife protection requires collaboration among governments, NGOs, and local communities. Conservation efforts, such as establishing protected areas and wildlife corridors, play a crucial role in mitigating these challenges. Additionally, raising public awareness about the importance of wildlife and the threats they face can foster support for conservation initiatives. Addressing these challenges requires an integrative approach, combining policy reforms, community engagement, technological innovation, and international cooperation. This abstract highlights the urgency of proactive wildlife protection and the multifaceted challenges that necessitate comprehensive and sustainable solutions. This article explores the strategies that can be employed to bolster effective wildlife conservation and management, encompassing habitat preservation, climate resilience, anti-poaching measures, invasive species management, pollution control, conflict mitigation, collaboration, research, sustainable practices, public engagement, and international

cooperation. However, it is heartening to recognize that effective strategies and concerted efforts can make a substantial difference in this critical endeavor. By prioritizing habitat conservation and restoration, we can provide sanctuaries for wildlife to flourish and thrive. Climate change mitigation measures ensure that species have the flexibility to adapt to changing environmental conditions, securing their survival in a rapidly transforming world.

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Integrating Socio-Economic Development and Environmental Sustainability: Insights from Rajasthan

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Abstract

The interdependence between socio-economic dynamics and environmental sustainability is particularly pronounced in arid and semi-arid regions like Rajasthan, India. This study examines how economic activities, social practices, and policy frameworks interplay with environmental challenges, comprehensively analysing their impacts on the region's ecological and social fabric. Rajasthan's unique geography, characterised by desertification, water scarcity, and fragile ecosystems, serves as a critical backdrop for understanding the socio-economic drivers of environmental degradation. Key issues explored include the overexploitation of groundwater, unsustainable agricultural practices, deforestation, and unplanned urbanisation. These challenges disproportionately affect vulnerable groups, such as smallholder farmers, women, and indigenous communities, intensifying poverty and social inequities. The research evaluates governmental and grassroots efforts to address these challenges, including innovative water conservation initiatives like the restoration of traditional harvesting systems and afforestation drives aimed at ecosystem restoration.

Using mixed methods, including field surveys and secondary data analysis, the study quantifies the socio- economic costs of environmental degradation. It identifies pathways to align socio-economic resilience with ecological sustainability. It underscores the importance of participatory governance, eco-friendly economic practices, and community empowerment in mitigating environmental challenges. The findings advocate for integrated policies that balance development objectives with ecological preservation. By presenting Rajasthan as a case study, the research offers valuable insights into global efforts to achieve sustainable development and foster social equity amid environmental challenges. Keywords: Environmental Sustainability, Resilience, Participatory Governance, Traditional Water Systems, Marginalized Communities, Ecological Conservation.

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Electronic Structure Study of Ternary Chalcogenides for catalysis applications

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Abstract

Indium gallium selenide (InGaSe) is emerging as a promising material for catalysis due to its unique electronic, optical, and structural properties. As a layered ternary chalcogenide, InGaSe exhibits a high degree of tunability in its electronic band structure, making it suitable for a wide range of catalytic applications, including water splitting, CO2 reduction, and hydrogen evolution reactions (HER). It has a moderate bandgap between 1.4–2.2 eV that is tuneable by the stoichiometric composition of In and Ga. This enables effective light absorption in the visible spectrum, therefore making it a suitable candidate for photocatalytic reactions. Additionally, the intrinsic anisotropy of its layered structure facilitates efficient charge separation and transport, reducing recombination losses. Surface modifications and defect engineering have shown potential to further optimize the adsorption and activation of reactant molecules on the InGaSe surface. In this work, Density functional theory (DFT) calculations has been conducted to elucidate that InGaSe can act as catalyst in a low reaction threshold energy and can stabilize reaction intermediates, making it an efficient and cost-effective alternative to conventional noble-metal catalysts. These properties are often enhanced by surface defects. This study aims to analyse the exact type of defect that is responsible for the enhancement of its catalytic properties and propose an alternative material for sustainable energy conversion.

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Wildlife Protection with Smart Devices

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Abstract

The integration of smart devices into wildlife conservation efforts has revolutionised ecological monitoring and protection strategies. This study explores advanced sensor technologies, GPS-enabled tracking, and AI-driven analytics to safeguard endangered species and mitigate human-wildlife conflict. By analysing case studies from global wildlife reserves, this work demonstrates how smart devices provide real-time insights into animal behaviour, habitat usage, and migration patterns. The findings emphasise the potential for technology to create sustainable coexistence between humans and wildlife.

Keywords: wildlife protection, smart devices, ecological monitoring, conservation, AI.

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Augmentation of Reserpine Content in Rauwolfia serpentina Cell Cultures Induced by Phytosynthesized Silver Nanoparticles

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Abstract

Plants demonstrate an inherent capacity to perceive a range of stress stimuli, which induces the initiation of protective responses by means of metabolic reconfiguration to mitigate harmful environments. The present investigation seeks to develop an optimized bioprocess to augment the reserpine concentration in Rauwolfia serpentina callus by utilizing elicitation with phytosynthesized silver nanoparticles. Initially, callus lines with high reserpine concentrations were generated. Subsequently, a procedure for the phyto synthesis of silver nanoparticles employing seed extract from Rauwolfia serpentina was effectively standardized. Phytosynthesized silver nanoparticle at a concentration of 1.0 mg L-1 in the culture medium enhanced the reserpine levels. Simultaneously, few of the key genes involved in the reserpine biosynthetic pathway were found to be upregulated. A significant elevation in MDA levels was recorded, alongside a reduction in the activities of antioxidant enzymes. Our findings strongly advocate for the enhancement of reserpine levels in the callus culture of Rauwolfia serpentina via the addition of silver nanoparticles. This approach presents a promising strategy for establishing a cost-efficient method for the commercial synthesis of reserpine.

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Climate Change and Life Science

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Abstract

In the period since the industrial revolution, human emissions of greenhouse gases from fossil fuel combustion, deforestation,and agricultural practices have led to global warming and climate change.Observed and anticipated changes in the climate include higher temperature, changes in rainfall patterns,changes in the frequency and distribution of weather events such as drought,storms,floods and heat waves,sea level rise and consequent impacts on human and natural systems.Many scientists argue that the impacts of climate change will be devastating for natural and human systems,and that climate change poses an existential threat to human civilization.However , action to respond to climate change has been slow. Climate change draws attention to the relationship between science and society, challenges global governance institution,and triggers new social movements.Engagemant with climate change by social scientist in promoting conceptual renewal in areas such as social practice theory, and transition and transformation studies.

Environmental pollution laws and practices

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Abstract

Environmental pollution is a pressing issue that affects the health and well-being of individuals, communities, and the planet as a whole. To combat this problem, governments and organizations have established laws and practices aimed at reducing pollution and promoting sustainability.

Laws and Regulations

1. *Clean Air Act (1970)*: Regulates air pollution in the United States by setting standards for emissions and pollution control.
2. *Clean Water Act (1972)*: Protects water quality in the United States by regulating pollution discharge and setting standards for wastewater treatment.
3. *Resource Conservation and Recovery Act (1976)*: Manages hazardous waste in the United States by regulating waste generation, transportation, and disposal.
4. *Paris Agreement (2015)*: An international agreement aimed at mitigating climate change by reducing greenhouse gas emissions.

Practices and Initiatives

1. *Sustainable Agriculture*: farming, per
2. *Renewable Energy*:
3. *Waste Reduction and recycling programs
4. *Eco-Friendly Technologies*:
5. *Conservation Efforts*:

Challenges and Opportunities

1. *Enforcement and Compliance*:
2. *Public Awareness and Education*:
3. *Technological Innovation*:
4. *International Cooperation*:

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Environmental Impact Assessment Report of Mining

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Abstract

Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc.

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Literary Aspects of Environmental Protection

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Abstract

This research article examines the complex interplay between nature, literature, and human health, highlighting the function of literary works in promoting environmental conservation. This study examines several literary forms, such as poetry, novels, essays, and indigenous tales, to explore how authors have emphasized the environmental problems of their eras and their effects on public health. Through the lens of ecocriticism, this research scrutinizes how literature portrays the relationship between a flourishing environment and human well-being, emphasizing the healing powers of nature and the consequences of environmental degradation.

Literature is crucial to understanding the relationship between environmental protection and human health. Romantic poetry's love of nature and dystopian literature's harsh warnings show how the environment affects human well-being. Literary representations illuminate the ethical, spiritual, and physical importance of world preservation. Literature shows that environmental degradation threatens human and environmental health. Nature protection may improve emotional, physical, and social health, according to research. The literary exploration of environmental issues warns and calls society to safeguard the environment for future generations. Understanding the literary aspects of environmental conservation improves our literary appreciation and equips us to protect the environment and human health.

The research examines how literature functions as an effective instrument for cultivating ecological consciousness and encouraging healthier lives. Ultimately, it contends that the literary examination of environmental problems serves as both a mirror of society's apprehensions and a summons for the preservation of the natural environment and human well-being.

Keywords: Literature, Human Health, Environmental Protection, Ecocriticism, Dystopian Literature

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Physico-chemical Study of Dye Effluent and Its Impact on Soil of Kaithun Region of Kota

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Abstract

The Kaithun area of Kota is home to numerous small dyeing and printing mills that either directly or indirectly release their waste into waterways on land. The current study examined a number of physico- chemical characteristics in the effluent from these industries,including temperature, pH, conductivity, hardness, total dissolved solids, chemical and biological oxygen demand, and heavy metals. The agricultural lands were irrigated with the tainted effluent. Analyses of the physico-chemical characteristics of effluent-contaminated soil revealed that the field watered with effluent-contaminated water had relatively higher soil parameters.

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Role of controlling emissions in environmental sustainability

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Abstract

We all have seen and experienced the wonderful reactions and manifestations of Earth's atmosphere to the lowering of emissions during covid-19 pandemic which lasted for nearly 3 and half years (January 2020 to May 2023). Due to PHEIC (PUBLIC HEALTH EMERGENCY OF INTERNATIONAL CONCERN, formal declaration by who) lock downs were implemented throughout the world. This brought the world to a semi halt like situation. By virtue of this the emissions were reduced to unbelievable extents. Despite the plethora of difficulties and afflictions faced by the global community, a transient yet inspiring display of the earth's atmospheric beauty was witnessed.

The stark contrast in the earth's atmosphere before and after the pandemic serves as a compelling imperative to accelerate efforts towards reducing emissions and promoting environmental sustainability.

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Climate change and plant life

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Abstract

This abstract from the U.S. National Park Service discusses how climate change can weaken plant resilience and disrupt ecosystems. It explains how rising temperatures can lead to droughts, wildfires, and invasive pests, which can cause plant species to lose out.

Plants and climate change complexities and surprises: This abstract reviews the literature on how species respond to climate change. It discusses how the impacts of climate change can affect phenology, distributions, ecophysiology, and more.

Plant Perspectives to Global Climate Changes: This abstract discusses how climate change can threaten agriculture in the 21st century. It explains how plants regulate their processes through soil-plant interactions.

Climate Change: Plant, Cell & Environment: This abstract discusses how climate change can affect plant growth, reproduction, and resilience. It also discusses how the impacts of climate change on natural vegetation and agriculture can be difficult to predict.

Plant Life Under Changing Environment: This abstract discusses how climate change can cause flooding, which can lead to grain yield loss. It also discusses how plants can vary in their vulnerability and tolerance to flooding.

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Exploring the Role of Social Support in Reducing Eco-Anxiety

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Abstract

Eco-anxiety, the chronic worry about the future of the environment, has become a growing mental health concern in recent years. This study aims to explore how social support can help reduce eco-anxiety. Social support is considered the independent variable (IV), while eco-anxiety is the dependent variable (DV). The study will use a cross-sectional survey design with participants aged 18-45, from both urban and rural areas.

Participants will complete the Eco-Anxiety Scale (EAS) to assess their anxiety levels related to environmental concerns, and the Multidimensional Scale of Perceived Social Support (MSPSS) to measure the level of support they feel from family, friends, and significant others. The study will examine whether individuals who perceive higher levels of social support experience lower levels of eco-anxiety.

The hypothesis of the study is that social support, especially emotional and informational support, plays a key role in reducing eco-anxiety. Data will be analyzed using regression analysis to determine the strength of the relationship between social support and eco-anxiety. This research will help in understanding the importance of social connections in managing eco-anxiety and suggest ways to build supportive communities to help individuals cope with climate-related stress.

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Environmental Management and Implication of Human Development

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Abstract

Environmental Management Involves the Sustainable Use, Conservation, And Restoration of natural resources to balance environmental, economic, and social objectives. The implications of human development on environmental management are profound, as they involve both challenges and opportunities. Here's an overview:

Human Development and its Environmental Implications

1. Urbanization and Industrialization Impact: Increased pollution, deforestation, and loss of biodiversity. Management Strategies: Promote sustainable urban planning (e.g., green infrastructure, smart cities). Enforce regulations to reduce industrial emissions and waste.
2. Agricultural Expansion Impact: Soil degradation, water scarcity, and habitat loss. Management Strategies: Adopt sustainable agricultural practices (e.g., agroforestry, organic farming). Encourage efficient irrigation systems and crop rotation.
3. Energy Production Impact: Greenhouse gas emissions, habitat destruction, and pollution. Management Strategies: Transition to renewable energy sources (e.g., solar, wind). Enhance energy efficiency in industries and households.
4. Population Growth Impact: Increased resource consumption and waste production. Management Strategies: Promote family planning and education. Encourage recycling and waste reduction practices.
5. Deforestation and Land Use Changes Impact: Loss of carbon sinks, soil erosion, and altered climate patterns. Management Strategies: Reforestation and afforestation projects. Enforce stricter laws against illegal logging. Environmental Management Approaches : Conservation and Preservation

Establishing protected areas, national parks, and wildlife sanctuaries. Pollution Control Implementing waste management systems and emission controls. Sustainable Development Goals (SDGs) Integrating environmental concerns into policies and development plans. Community Engagement Encouraging public participation in environmental conservation efforts

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Industrial Wastewater Treatment by Phytoremediation

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Abstract

Industrial wastewater pollution poses severe risks to human health and ecosystems. Conventional treatment methods, although effective, are resource-intensive and costly. Phytoremediation emerges as a sustainable, cost- effective, and eco-friendly alternative for treating industrial wastewater. This method leverages the natural capabilities of plants to absorb, stabilize, and detoxify pollutants, including dyes, heavy metals, inorganic elements, pesticides, hydrocarbons, and pharmaceutical compounds. Constructed wetlands employing aquatic plants such as Eichhornia crassipes, Salvinia molesta, Typha latifolia, and Canna indica have demonstrated significant efficacy in pollutant removal. The process utilizes mechanisms like phytoextraction, phytodegradation, and rhizo-filtration to treat contaminated water. Experimental setups include vertical and horizontal flow reactors filled with soil and sand substrates to optimize plant absorption and filtration efficiencies.

The study highlights the advantages of phytoremediation, including its low cost, minimal energy requirements, and potential for large-scale industrial applications. Findings indicate successful reduction of Biochemical Oxygen Demand (BOD), pH neutralization, and removal of toxic dyes and heavy metals from wastewater. Plants like Taro and Hyacinth further demonstrate adaptability under adverse conditions, making them ideal candidates for industrial wastewater management. Phytoremediation not only provides a viable alternative to traditional methods but also contributes to environmental conservation and public health by reducing pollutant levels in water bodies. Continued research and technological advancements in this domain can enhance its applicability, paving the way for sustainable wastewater management solutions globally.

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The Role of Microbiota in Animal Health and Productivity

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Abstract

The rise of sequencing technology brought about a surge of new methodologies that offered a new and deeper level of understanding of the role of the microbiome in the health and performance of livestock. This started a chain reaction in technology evolution, and a decade later, we have developed a new appreciation of a healthy gut and the role of early colonization and nutrition in developing the microbiome, and its subsequent impact on animal productivity. An abundance of new products flooded the livestock supplement market with the promise of improving the health of intestinal microbiota. However, the impact of these products and any potential gains they might provide have not always been quantified or validated. Further to this, the potential interactions with the microbial community naturally occurring in the feed-base have not commonly been considered. We have recently shown that animal feed carries a complex microbial community that can have various impacts, including negating farm biosecurity measures. The ruminant animal provides an even greater level of complexity where physiological drivers act to maintain ruminal homeostasis. Despite many advances, numerous knowledge gaps remain, and the methodologies are not without their challenges with almost constant evolution in analysing and interpreting data. In this paper, we will discuss the benefits, challenges and shortfalls of microbiome science, its interfaces with multi- omics research and the strategies of its contribution to animal production science.

Keywords: animal production, intestinal microbiota, livestock, cattle, sheep, pig, poultry.

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The Impact of Climate Change on Indigenous Medicinal Plants

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Abstract

Indigenous medicinal plants have been integral to the health and wellness of human beings. These plants are deeply rooted in the traditional knowledge passed down through generations and are often used for their healing properties. These plants not only offer pharmaceutical benefits but also play an important role in cultural and spiritual significance. The use of indigenous medicinal plants faces challenges, such as climate change overharvesting, habitat destruction, and the threat of losing traditional knowledge due to the encroachment of modern medicine. Therefore, considering their significance in traditional medicine practices and economic value, investigating the potential consequences of climate change on medicinal plants is specifically relevant. Indigenous medicinal plants are a valuable part of the world's biodiversity and cultural heritage. The distribution and life cycles of all vegetation, including medicinal plants, are significantly impacted by climate change. Various aspects related to climate change and its effects on medicinal plants are explored including the impact of increased carbon dioxide and ozone levels, the effect of low temperature, global warming, etc. on the production of secondary metabolites. Each of these environmental factors influences the productivity and quality of different products and components of medicinal plants, either positively or negatively. Their study offers not only a deeper understanding of traditional healing practices but also potential breakthroughs in modern medicine.

Keywords: Secondary metabolites, Biodiversity, Climate change, medicinal plants, Phenology.

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Wildlife Protection and challenges

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Abstract

some challenges and recent efforts to protect wildlife: Habitat loss Rapid urbanization and industrialization, as well as agricultural and livestock development, have led to habitat destruction. Pollution Global warming and environmental pollution have threatened wildlife and their habitats. Poaching Poachers kill animals for their body parts, which are then illegally traded. For example, elephants are poached for ivory, and rhinoceroses are poached for their horns.

Demand for animal products The global demand for animal fur, skin, meat, and bone has led to a decrease in wildlife populations. Limited resources Conservation efforts are often limited by resources such as money and manpower. Wildlife crime Wildlife crime can be hard to control because it is often clandestine. Climate change Wildlife conservation and climate action are intertwined, as combatting climate change helps save wildlife populations and vice versa. Some recent efforts to protect wildlife include: Montreal-Kunming Agreement

This agreement, agreed to by more than 190 states, aims to halt and reverse nature loss by 2030. It includes a target to conserve at least 30% of lands, inland waters, and oceans worldwide.

WWF-USAID partnership This partnership in Vietnam aims to protect and stabilize wildlife populations in protected areas. The partnership has removed thousands of snares from protected areas and supported biodiversity camera trap surveys

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Porous Silicon Nano Material Advances in Surface Engineering and its Biomedical Application

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Abstract

Porous silicon nanomaterial are attractive for biomedical application due to their incredible immense properties such as tunable morphology, versatile surface modification routes, simple and feasible fabrication procedures, biocompatibility and Biodegradability. Nanostructured material have emerged as promising multifunctional and versatile platforms for nano medicines in drug delivery diagnosis and therapy. In this review, major efforts are given on porous silicon nano particles regarding the production properties, efficient drug delivery and permeation across biological barriers and biomedical application.

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Greening the Curriculum - Integrating Climate Change in School Education for a Sustainable Tomorrow

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Abstract

Climate change is a burning issue the world has been facing day to day. The rising global temperature of 1.5 C is extremely worrying for humanity's future on this planet. Natural and human activities both are the root causes of it. The impacts are alarming and threatening whole planet .Education in school curriculum is a vital element to resolve the climate change issues. It helps students to understand and address the impacts of the climate crisis, global warming, empowering them with the knowledge, skills, values and attitudes needed to act as agents of climate change.

Adaptation and Mitigation are the two vital factors to empowering human beings for conserving natural resources and sustainable life. As their understanding of climate change deepens, understanding systemic change and the need for innovation are key to solving the climate challenge.

The lack of time and reported curriculum opportunities to address climate change in the classroom suggests a need for co-curricular and extra curricular activities like project and model making, science exhibitions, poster making, quiz, eco clubs and eco groups. Community initiative for student investigations and learning. It helps teachers integrate climate education in subjects in a simple and realistic way.

Teachers must encourage students to think critically and creatively about approaches to climate change mitigation, adaptation and develop their capacity to respond with meaningful actions.

Keywords: Climate change, School Education, Curricular activities, Sustainable Life , Climate Action.

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Climate Change, Biodiversity and Sustainability

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Abstract

Climate Change, Biodiversity and Sustainability are closely linked. Climate Change refers to long term shifts in temperatures and weather patterns. These shifts may be natural, but since 1800s human activities have been the main drivers of Climate Change, primarily due to the burning of fossil fuels (like Coal, Oil and Gas), which produces heat trapping gases. Current reality is that Global Warming is on track to exceed 2.5- 3.0 degree C by 2100, far surpassing 1.5 degree C. Over the past few hundred years, human activity has significantly altered both the surface of the earth and the composition of its atmosphere. These changes may be causing or contributing to the rise in global temperature observed over the past 150 years. Greenhouse gases such as Water vapour, Carbon dioxide, Methane and Nitrous Oxide exist naturally in the atmosphere but are released in the atmosphere I great quantities when fossil fuels are burnt and as a result of industrial and Agricultural activities. The increasing concentrations of these gases in the atmosphere are likely to intensify the greenhouse effect and rise global temperature. If greenhouse gas concentration continue to rise, global warming is likely to wide ranging effects on ice and snow, Oceans and Coasts, Hydrological cycles, Ecosystems, Water resources, Food and Agriculture, Coastal dwellers, human settlements and Biodiversity. Biodiversity is variability among living organisms from all sources including terrestrial, marine and other aquatic Ecosystems and the ecological complexes of which they are part, this includes diversity within Species, between Species and the ecosystems. The distribution and magnitude of Biodiversity that exists today is a product of over 3.5 billion years of evolution, involving speciation, migration, extinction and more recently human influences. The adverse effects of Climate Change and human impact on Biodiversity are increasing dramatically and threatening the very foundation of Sustainable Development. Loss of Biodiversity Resources and their diversity threatens our food supplies, sources of wood, Medicine and energy opportunity for creations and tourism and interferes with essential ecological functions. The conservation and Sustainable use of Biodiversity needs to become an integral component of ecologically Sustainable Economic Development.

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Bioassay-Guided Anti-Diabetic Activity by Isolation and Identification of Active Compounds from Tridax procumbens

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Abstract

Tridax procumbens, a ubiquitous medicinal herb known for its diverse pharmacological properties, has shown significant potential in managing diabetes. This study focuses on bioassay-guided isolation and identification of active compounds with anti-diabetic activity from Tridax procumbens. Employing a systematic and multidisciplinary approach, the herb's extracts were subjected to preliminary phytochemical screening to identify the presence of bioactive compounds such as flavonoids, alkaloids, and phenolic acids.

The extracts were then fractionated using chromatographic techniques, including column chromatography and HPLC. Fractions were subjected to in vitro bioassays to evaluate their inhibitory activity against key enzymes such as α-amylase and α-glucosidase, which play crucial roles in carbohydrate metabolism. Active fractions were further analyzed using spectroscopic methodsthe-mass spectrometry to elucidate the molecular structure of the compounds.

In vivo studies were conducted on animal models to confirm the hypoglycemic activity of the identified compounds, assessing parameters such as blood glucose levels, insulin sensitivity, and glycated hemoglobin. The findings revealed the presence of novel bioactive compounds exhibiting significant anti-diabetic properties. These results underscore the therapeutic potential of Tridax procumbens as a natural source for anti-diabetic drug development and emphasize its relevance in preventive and complementary medicine.

This study highlights the importance of exploring traditional medicinal plants like Tridax procumbens for the discovery of novel bioactive compounds and provides a foundation for future pharmacological and clinical investigations.

Keywords: Tridax procumbens, anti-diabetic activity, bioassay-guided isolation, α-amylase inhibition, α-glucosidase inhibition, natural products, phytochemistry

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GTW:A POSSIBLE HERBAL MALE BIRTH CONTROL PILL?

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Abstract

Present study was designed with higher dose level of *Tryptergium wilfordii* (15 mg/animal/day; oral of GTW) in male langur monkeys for 150 days based on the results we got from earlier study (6mg/animal/day; oral for 120 days) being done by our group in order to assess its potentiality to suppress fertility (spermatogenesis), mechanism of action, reversibility and possible side effects, if any. Semen examination, Semen biochemistry, Hematology and Blood biochemistry were done at monthly interval. Administration of GTW caused gradual decline in sperm density from 60-day onward and resulted into azoospermia (as 90-days semen examination revealed this state) alongwith decline in sperm motility & vitality significantly before reaching to azoospermic state. Sperm gradually started appearing in semen samples following 90-days of the cessation of GTW treatment and complete normalcy was reestablished during 150-days of discontinuation GTW treatment.

In conclusion, GTW treatment causes azoospermia without affecting the testosterone level & accessory sex glands functioning. GTW treatment effects were reversible, these results establish that the higher dose level of GTW suppresses the spermatogenesis process & findings of this langur monkey's study could be extrapolated for human studies in order to develop GTW as male contraceptive.

Key Words:- GTW, Male Contraceptive, Langur Monkey.

Plant Cell Culture Engineering Used in Increasing the Secondary Metabolites Production in Medicinal Plants

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Abstract

Adhatoda vasica Nees is used in the treatment of cold, cough, chronic bronchitis, and asthma. The plant species contain vasicine, vasicinone, 2-acetyl benzyl amine, adhatodine, vasicinolone, deoxyvasicinone, and vasicine acetate. *Alternaria alternata* (10%) increased the growth of cell biomass as well as anthranilate synthase and anthranilate N-methyl transferase activities. Similarly, *Alternaria alternata* showed maximum increase in the production of vasicine whereas other elicitors displayed moderate increase in alkaloid production. The expression quantities of 10 genes, involved in pyrroloquinazoline alkaloids biosynthesis, were determined in this study. The maximum expression level (11.38-fold) of anthranilate synthase was observed in elicited cells. The study results suggest widespread use of fungal elicitors in increasing the production of secondary metabolites as well as gene expression levels in plant cell cultures. Fourteen free amino acids were estimated from the elicited cells and found that sorbitol stimulated maximum accumulation of serine (8.2-fold) at 50 mM concentration. The anthranilate synthase activity was also determined in the elicited cells and observed that maximum AS activity (7.5±0.47 pkat/mg protein; 2.9-fold) was induced by the salicylic acid and sorbitol. Anthranilate synthase functions as rate limiting factor for biosynthesis of pyrroloquinazoline alkaloids. Our results support the widespread use of tryptophan and sorbitol as elicitors to raise the production of vasicinone, vasicine, 2-acetyl benzyl amine and other pyrroloquinazoline alkaloids in cell cultures of *A. vasica*. The maximum accumulation (5.56-fold higher than control) of demissidine was induced by sodium nitroprusside at 50 mM concentration whereas the highest growth of cell biomass (4.51-fold higher than control) stimulated by systemin at 30 mM concentration. The maximum accumulation of bioactive glycoalkaloids was achieved on day 10 in elicited cell cultures. A total of 17 genes of biosynthetic pathways of glycoalkaloids were characterized

from the cells of *S. xanthocarpum*. The greater accumulation of demissidine was confirmed with the expression analysis of 11 key biosynthetic pathway enzymes e.g., acetoacetic-CoA thiolase, 3-hydroxy 3-methyl glutaryl synthase, β-hydroxy β-methylglutaryl CoA reductase, mevalonate kinase, farnesyl diphosphate synthase, squalene synthase, squalene epoxidase, squalene-2,3-epoxide cyclase, cycloartenol synthase, UDP-glucose: solanidine glucosyltransferase and UDP-rhamnose: solanidine rhamno-galactosyl transferase. The maximum expression levels of UDP-rhamnose: solanidine rhamno-galactosyl transferase gene was recorded in this study. It suggests that this enzyme might be involved in the synthesis of demissidine in biosynthetic pathway.

भारत में पारिस्थितिकीय परिवर्तन का बदलता ऐतिहासिक परिदृश्य

डॉ रजनी मीणा
सह आचार्य इतिहास
राजकीय महाविद्यालय जयपुर

प्रकृति और पर्यावरण भारतीय दर्शन, ज्ञान विज्ञान का महत्वपूर्ण विषय रहा है। भारतीय परिवेश में पारिस्थितिकीय संतुलन से संस्कृति के विविध तत्वों का विकास हुआ। वैदिक साहित्य में पर्यावरण से संबंधित विविध परिदृश्यों का वर्णन विविध माध्यमों से किया गया है। मनुष्य ने प्रकृति के साथ जुड़ाव करके अपना आर्थिक, सांस्कृतिक एवं युगानुकूल विकास किया परंतु समय के साथ महत्वाकांक्षाओं के बढ़ने से पर्यावरण का दोहन किये जाने से अनेक असंतुलन उभर कर सामने आए । सैंधव सभ्यता का विनाश इसका एक उदाहरण है। सतत विकास की प्रक्रिया में पर्यावरण असंतुलन तेजी से बढ़ता गया। खनिजों का अंधाधुंध दोहन होने, जंगलों के विनाश से वन्य जीव जंतुओं का घटना ,वर्षा का कम होना , जल भराव कम होने आदि से प्राकृतिक संरचना में बदलाव तेजी से आया जिससे अनेक दुष्परिणाम सामने आया। स्वाधीन भारत में चहुंमुखी विकास की परिकल्पना को साकार करने के लिए हरित क्रांति को अपनाया गया परन्तु इस प्रयास में धरती माता को हानिकारक और जहरीले रसायनों से भर दिया गया जिससे कैंसर जैसी भयावह बीमारियां का तेजी से प्रसार हुआ।

दौसा जिले में लालसोट तहसील के बदलते भूमि उपयोग का विश्लेमाण

अवधेश कुमार शर्मा
शोधार्थी
श्याम विश्वविधालय लालसोट,दौसा,राजस्थान,

संक्षेप

भूमि उपयोग किसी भी क्षेत्र के विकास के लिए महत्वपूर्ण आधार है, भूमि उपयोग का परिवर्तन एक ऐसी प्रकिया है जिसके अन्तर्गत क्षेत्र का प्राकृतिक परिदृश्य प्रत्यक्ष व परोक्ष रूप से परिवर्तित होता दिखाई देता है अर्थात् उस क्षेत्र के उपस्थित प्राकृतिक परिदृश्य में परिवर्तन होते हैं एवं वहाँ बस्तियां, आर्थिक गतिविधियां, वानिकी गतिविधियां एवं वाणिज्यिक गतिविधियां बढने लगती हैं जो कि मानव प्रेरित कियाकलाप हैं, फलस्वरूप भूमि उपयोग परिवर्तित होता है। लालसोट तहसील में मुख्य रूप से कृमि योग्य भूमि है जो कि नविन तकनीकों को के कारण बढती है, लेकिन बढती हुई जनसंख्या एवं उसकी आर्थिक गतिविधियों के कारण कृमि योग्य भूमि के क्षेत्र मे कमी आती है। भूमि उपयोग परिवर्तन जलवायु परिवर्तन का आधार भी बनता है, जिससे समग्र वातावरण प्रभावित होता है। अध्ययन क्षेत्र में कृमिा भूमि उपयोग के अतिरिक्त अन्य प्रकार के भूमि उपयोग में भी तीव्र गति से परिवर्तन हो रहा है। बढते हुए भूमि प्रदूषण, जल प्रदूमाण, वायु प्रदूमाण, मृदा अवनयन एवं जलवायु परिवर्तन जैसे कारकों पर विशेमा ध्यान देना आवश्यक है क्योंकि इनसे भूमि उपयोग पर प्रतिकूल प्रभाव पडता है। फसलों की उत्पादकता में भी कमी आती है। मानवीय स्वास्थ्य गिरता है।

सूचक शब्दः– भूमि उपयोग, आर्थिक गतिविधियां, जलवायु परिवर्तन, मानवीय स्वास्थ्य।

आधुनिक हिंदी कविता में पर्यावरणीय चेतना

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संक्षेप

आधुनिक हिंदी कविता में पर्यावरणीय चेतना एक महत्वपूर्ण विमर्श के रूप में उभरी है। सामाजिक, आर्थिक, और सांस्कृतिक बदलावों के साथ पर्यावरणीय संकटों ने रचनाकारों का ध्यान आकर्षित किया। औद्योगीकरण, शहरीकरण और प्राकृतिक संसाधनों के अंधाधुंध दोहन ने न केवल पर्यावरण को क्षति पहुंचाई है, बल्कि मानवीय मूल्यों और अस्तित्व पर भी प्रश्नचिह्न लगाया है।

आधुनिक कवियों ने पर्यावरणीय संकटों को अपनी रचनाओं का हिस्सा बनाकर जागरूकता फैलाने का कार्य किया है। सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय', सर्वेश्वर दयाल सक्सेना, केदारनाथ सिंह, और कुंवर नारायण जैसे कवियों की कविताओं में प्रकृति के साथ मानवीय संबंधों का चित्रण मिलता है। ये कविताएं केवल सौंदर्य बोध तक सीमित नहीं रहतीं, बल्कि पर्यावरणीय असंतुलन और उसके दुष्प्रभावों पर सवाल उठाती हैं।

आधुनिक काल में प्रकृति के सौंदर्य का उपादान क्रूर दृष्टि का शिकार होना प्रारंभ हो जाता है मैथिलीशरण गुप्त के साकेत में चंद्र ज्योत्सना में रात्रि कालीन बेला की प्राकृतिक छटा का वर्णन है–

चारु चंद्र की चंचल किरणें
खेल रही है जल थल में
स्वच्छ चांदनी बिछी हुई है
अवनि और अंबर तल में

आधुनिक हिंदी कविताओं में पेड़–पौधों, नदियों, पहाड़ों और जंगलों के विनाश के प्रति चिंता, प्रकृति के संरक्षण का संदेश और पर्यावरणीय न्याय की मांग स्पष्ट रूप से दिखाई देती है। ये कविताएं पाठकों को चेताने और उन्हें प्रकृति के प्रति संवेदनशील बनाने का प्रयास करती हैं।

नरेश सक्सेना लिखते हैं कि ––– लिखता हूं अंतिम इच्छाओं में के बिजली के दाहघर में हो मेरा अंतिम संस्कार ताकि मेरे बाद एक बेटे और बेटी के साथ एक वृक्ष भी बचा रहे संसार में

इस प्रकार, आधुनिक हिंदी कविता में पर्यावरणीय चेतना केवल एक विषय नहीं, बल्कि सामाजिक और मानवीय चेतना का विस्तार है, जो हमें हमारी प्रकृति और पर्यावरण के साथ सामंजस्यपूर्ण संबंध स्थापित करने की प्रेरणा देती है।

रामकव्य में पर्यावरणीय चेतना''

डॉ प्रीति यादव
कार्यकारी प्राचार्या
राजकीय महाविद्यालय जाटूसाना, रेवाड़ी

सारांश

रामचरितमानस में भारतीय समाज के गौरवशाली अतीत की मधुर स्मृतियां संजोयी गयी हैं। देश की श्रेष्ठ पर्यावरणीय विरासत के प्रति समाज में जागरूकता पैदा करना भी मानसकार का लक्ष्य रहा होगा। मानसकार ने यह बताने का प्रयास किया है कि रामायण कालीन भारत में समाज में पेड़–पौधो, नदी नालों, व जलाशयों के प्रति लोगों में जैव सत्ता का भाव था। यही कारण है कि प्रकृति के अवयवों जैसे – नदी, पर्वत, पेड़–पौधें, जीव–जन्तुओं सभी का व्यापक वर्णन मानस में सर्वत्र मिलता है। नदी पर्यावरण का प्रमुख घटक है। दुनिया की सभी प्राचीन सभ्यताओं का विकास प्रायः नदियों के तट पर हुआ था। हमारे देश में काशी, मथुरा, प्रयाग, उजैन और अयोध्या जैसे आध्यात्मिक नगर नदियों के तट पर स्थित है। गंगा हमारे देश में प्राचीनकाल से पूण्य रही है, गोस्वामीजी लिखते है गंगा का पवित्र जल पथ की थकान को दूर कर सुख प्रदान करने वाला हैं। गंगा सकल मुद मूला। सब सुख करिन हरनि सब सूला ॥ इसलिए ईश्वर के स्वरूप श्रीरामचन्द्रजी स्वयं गंगा को प्रणाम करते हैं तथा अन्य से भी वैसा ही कराते हैं। उतरे राम देवसरि देखी। कीन्ह दंडवत हरषु विसैषी ॥ लखन सचिव सियँ किए प्रनामा। सबहि सहित सुखु पायउ रामा ॥ मानस में गंगा यमुना तथा संगम के चित्रण के अतिरिक्त सरयू नदी का विवरण भी है। सरयू का निर्मल जल आसपास के वायु मण्डल को भी शुद्ध किए हुए है। बहइ सुहावन त्रिविध समीरा। भइ सरजू अति निर्मल नीरा॥ इसके अतिरिक्त स्थान–स्थान पर सई, गोदावरी, मन्दाकिनी आदि नदियों का वर्णन रामचरितमानस में आया है उस समय की सभी नदियां स्वच्छ एवं पवित्र जल से परिपूर्ण थी सरिता सब पुनीत जलु बहहीं । पर्वत प्रकृति के महत्वपूर्ण अवयव हैं। पर्वतराज, हिमालय भारतमाता के मुकुट के रूप में प्राचीन काल से ही प्रतिष्ठित है। हिमालय के अतिरिक्त चित्रकूट पर्वत का चित्रण रामचरित मानस में विस्तृत रूप से आया है। पर्वत पर हरियाली थी एवं वन्य जीव ऋषि मुनियों के स्वाभाविक मित्र के रूप में आश्रमों में निवास करते थे। जहं–जहं मुनिन्ह सुआश्रम कीन्हे। उचित बास हिं मधुर दीन्हें। चित्रकूट गिरि करहु निवासु। तहं तुम्हार सब भांति सुपासू॥ सैलु सुहावन कानन चारू। करि केहरि मृग विहग बिहारू॥ मानस के अरण्य काण्ड में पम्पा सरोवर का वर्णन अत्यन्त मनोहारी हैं।

शोध पत्र शीर्षक – ''रामकव्य में पर्यावरणीय चेतना''

''पर्यावरण विज्ञान एवं ललित कलाओं का पारस्परिक अंतर्सम्बध तथा वर्तमान पर्यावरणीय परिप्रेक्ष्य में ललित कलाओं की प्रासंगिकता॥ एक विश्लेमाणात्मक अध्ययन''

डॉ. श्याम सुन्दर शर्मा
एम.ए., पीएच.डी. (संगीत) विभागाध्यक्ष संगीत विभाग
सेंट विल्फ्रेड पी.जी. कॉलेज, एवं ध्रुवपद गायक

शोध पत्र

प्रागेतिहासिक काल के आरंभ से ही मानव सभ्यता के विकास की क्रमिक यात्रा पर्यावरण–विज्ञान के विभिन्न पक्षों यथा भौतिक पर्यावरण, वानस्पतिक पर्यावरण, जैविक पर्यावरण इत्यादि से प्रभावित रही है साथ ही मानव सभ्यता के विकास एवं मानव की निरन्तर प्रगतिशील बने रहने की महत्वाकांक्षा ने भी पर्यावरण को प्रभावित कर पर्यावरण के मौलिक परिवेश में परिवर्तन किया है।

मानव सभ्यता के क्रमिक विकास के अन्तर्गत मानव के मनोगत भावों की अभिव्यक्ति को व्यक्त करने के सशक्त माध्यम के रूप में विभिन्न ललित कलाओं का उद्‌गम हुआ। मानव ने अपने आसदृपास के पर्यावरण से प्रभावित होकर अपनी जिज्ञासा, उत्कण्ठा एवं मानसिक एवं शारीरिक आवश्यकताओं को अभिव्यक्त करने के लिए विभिन्न ललित कला प्रकारों में कला सर्जन को माध्यम बनाया। विभिन्न कला प्रकारों के विकास में भी पर्यावरण के विभिन्न तत्वों का योगदान रहा है। कलादृप्रकारों के अन्तर्गत विभिन्न कलादृसृजन में पर्यावरण के तत्व यथा प्राकृतिक द्रश्य, जैविक पर्यावरण के दृश्य इत्यादि विमाय वस्तु के रूप में महत्वपूर्ण भूमिका का निर्वहन करते है। किसी भी कला सृजन में निर्माण सामग्री के अन्तर्गत विभिन्न प्राकृतिक पदार्थों, धातुओं इत्यादि का प्रयोग किया जाता है। अतरू पर्यावरणदृविज्ञान एवं विभिन्न ललित कलाओं का परस्पर अंतर्सम्बन्ध इस सन्दर्भ में रेखांकित होता है।

वर्तमान पर्यावरणीय परिप्रेक्ष्य में ललित कलाएँ ज़्यादा व्यवहारिक होते हुए इस सन्दर्भ में अपनी महता एवं उपयोगिता की प्रामाणिकता को सिद्ध करती है कि कलाएँ अपनी उपस्थिति की मूल भावना 'अभिव्यक्तिकरण' को इस प्रकार साकार करती है कि वर्तमान में विश्व बिरादरी विभिन्न पर्यावरणीय समस्याओं यथादृग्लोबलदृवार्मिंग, वानस्पतिक सम्पदा संरक्षण, जैविक सम्पदा संरक्षण, वायु प्रदूमाण, ध्वनि प्रदूमाण, प्लास्टिक कचरा निस्तारण समस्या इत्यादि से रूबरू हो रहे इन मुद्दों को ललित कलाओं के विभिन्न कला सृजनों पेन्टिग, मोर्डन आर्ट, वास्तुकला, संगीत रचनाओं, साहित्य कला–कविता, नाटक, मूर्तिकला इत्यादि के माध्यम से विश्व के विभिन्न राष्ट्रीय एवं अंतर्राष्ट्रीय मंचों पर समय–समय पर आयोजित कलाप्रदर्शनियों, कलामंचों कलादृसेमिनारों में इन समस्याओं के प्रति बुद्धिजीवी वर्ग एवं जनसामान्य को जागरूक करने एवं इन समस्याओं के निवारण हेतु सकारात्मक वातावरण बनाने में कारगर साबित हो रहे है। पर्यावरण–विज्ञान में वानस्पतिक–पर्यावरण एवं जैविक–पर्यावरण के अन्तर्गत वानस्पतिक सम्पदा एवं जैविका सम्पदा पर संगीत कला के विभिन्न प्रयोगों का सकारात्मक प्रभाव दृष्टिगत होता है।

इस प्रकार पर्यावरण–विज्ञान एवं ललित कलाओं का पारस्परिक अंतर्सम्बन्ध उजागर होता है जो कि वर्तमान में वैश्विक–पर्यावरणीय–परिदृश्य में ज़्यादा व्यवहारिक स्वरूप में अपनी महता, उपयोगिता एवं प्रासंगिकता को सिद्ध करता है।

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जलवायु परिवर्तन और प्रकृति संरक्षणः एक अवलोकन

डॉ. राजेश आयत

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सारांश

जलवायु परिवर्तन से तात्पर्य किसी क्षेत्र में लंबे समय तक तापमान और वर्षा जैसी औसत स्थितियों में होने वाले परिवर्तनों से है। बार–बार और तीव्र सूखा, तूफान, गर्म लहरें, समुद्र के बढ़ते स्तर, पिघलते ग्लेशियर और गर्म होते महासागर सीधे तौर पर जीव–जंतुओं और वनस्पतियों को नुकसान पहुंचा सकते हैं। यह उनके निवास स्थान को नष्ट कर सकते हैं और लोगों की आजीविका और समुदायों पर गंभीर प्रभाव डाल सकते हैं।

जलवायु परिवर्तन के कारण अनेक वनस्पतियाँ विलुप्त हो रही हैं। इन वनस्पतियों के संरक्षण के लिए ग्लोबल वार्मिंग को नियंत्रित करना होगा और जलवायु परिवर्तन के कारकों पर मानव जाति को विशेष ध्यान देना होगा। तभी जैव विविधता का संरक्षण सुनिश्चित किया जा सकता है।

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