International Conference on

"Biodiversity Conservation in a Changing Climate"

(ICBC³ - 2026)

on 30th January 2026

SOUVENIR

GOVERNMENT DEGREE COLLEGE

Yeleswaram-533429, Kakinada District.

Andhra Pradesh, India.

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Lima, Peru, South America

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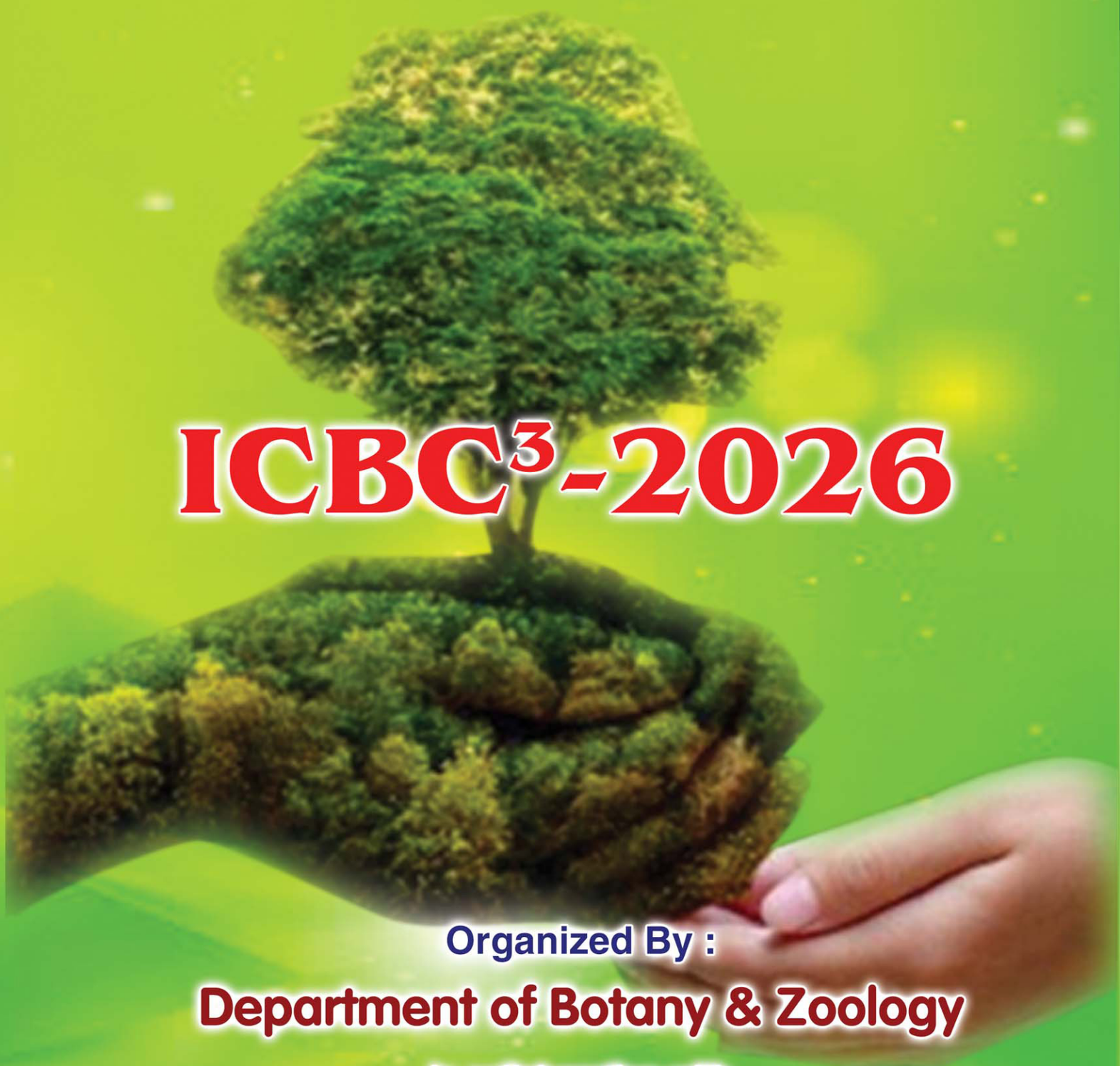


ICBC^3-2026

Organized By :

Department of Botany & Zoology

In collaboration with
AXIS POINT SOFTWARE SOLUTIONS PVT. LTD.,
Vijayawada.

International Conference on Biodiversity Conservation in a Changing Climate – 2026

Schedule of the Programme Date: 30-01-2026

S.No.	Time	Event	Resource Person
1	9.00 AM-9.30 AM	Registrations	
2	9.30 AM-10.00 AM	Welcoming guests, lighting the lamp, prayer song.	
3	10.00 AM-10.10 AM	Inaugural speech by President and launch of souvenir	Dr. D.Suneetha Principal
4	10.10 AM-10.15 AM	Message by JD sir CCE	Dr. Ch.Krishna Joint Director
5	10.15 AM-10.30 AM	Message by Chief Guest	Prof. K.Victor Babu Vice-Chancellor, Princonser University, Lima, Peru, South America
7	10.30 AM-11.00 AM	Keynote address	Prof. V. S.Raju Kakatiya University Telangana
8	11.00AM - 11.15AM	Tea break	
9	11.15AM-12.15AM	Session-1 Conservation of Endemic and Threatened plants of Eastern Ghats of India	Prof. Madhusudhana Reddy YV University, YSR Kadapa
10	12.15PM-1.15 PM	Session-2	Prof. V. S.Raju Kakatiya University Telangana

11	1.15 PM- 2.00 PM	Lunch	
12	2.00PM- 3.00PM	Session-3 Bamboo Diversity in a Changing Climate	Firoz Shah Baku, Azarbaijan
13	3.00PM- 4.00PM	Session-4 Plant Resources of Eastern Ghats of Northern Andhra Pradesh, India	Prof. M. Venkaiah Andhra University Visakhapatnam, A.P
14	4.00 PM - 4.30PM	Offline paper presentations	By the presenters
	4.30 PM- 5.30PM	Valedictory session	
NOTE	2.00PM- 4.00PM	Online paper presentations with separate link	By the presenters

INDEX

Dr. Narayana Bharath Gupta, IAS

Chief Patron

Director of Collegiate Education, Andhra Pradesh

Esteemed delegates, scholars, and biodiversity advocates,

I extend my heartfelt greetings to the International Conference on Biodiversity Conservation in a Changing Climate, hosted by Government Degree College, Yeleswaram, and organized by the Departments of Botany and Zoology. This timely gathering underscores the critical role of higher education in tackling global environmental challenges.

As climate change accelerates habitat loss and species decline—from our coastal ecosystems to inland forests—innovative conservation becomes imperative. This conference inspires us to explore resilient strategies, blending scientific research with practical action to preserve nature's richness. Let these discussions ignite partnerships, policies, and passion, ensuring biodiversity thrives for future generations. May the event yield transformative outcomes, strengthening our commitment to a sustainable planet.

Best wishes for a successful conference.

Regards,
Dr. Narayana Bharath Gupta, IAS

Dr. Chappidi Krishna

Patron
Joint Director of Collegiate Education, Andhra Pradesh

Distinguished participants and environmental stewards,

Warm greetings to the International Conference on Biodiversity Conservation in a Changing Climate at Government Degree College, Yeleswaram. This platform highlights the pivotal contribution of collegiate education to planetary well-being.

Climate variability poses profound risks to biodiversity—disrupting ecosystems, from riverine wetlands to upland forests in Andhra Pradesh. Yet, this conference sparks optimism through shared knowledge on adaptive conservation, restoration techniques, and sustainable practices. These deliberations will empower us to build resilient habitats and inspire collective action against environmental decline.

Let this event catalyze enduring change, safeguarding nature's legacy for tomorrow.

Congratulations on this inspiring initiative.

Best regards,
Dr. Chappidi Krishna

Dr. P. V. Krishnaji

Co-Patron

RJD, Zone I & II, Rajamahendravaram

My Dear Faculty Members, scholars and environmental champions,

I extend warm greetings to the International Conference on Biodiversity Conservation in a Changing Climate at Government Degree College, Yeleswaram. event highlights education's essential role in confronting ecological challenges.

In Zones I and II, climate change disrupts vital biodiversity—from coastal estuaries facing erosion to upland forests losing resilience. This conference inspires through focused discussions on habitat restoration, species protection, and climate-adaptive practices that promise renewal. Government Degree College, Yeleswaram, emerges as a dynamic center for such forward-thinking initiatives. Let these proceedings spark actionable ideas, fostering a legacy of thriving ecosystems and sustainable progress.

Wishing the conference great success and lasting influence.

Best regards,
Dr. P. V. Krishnaji

Prof. Dr. Koppula Victor Babu

Chief Guest

I am delighted to be associated with the International Conference on *"Biodiversity Conservation in a Changing Climate"* being organized by Department of Botany and Zoology of Government Degree College, Yeleswaram, Kainada district, Andhra Pradesh, India on 30th January 2026. Climate change poses unprecedented challenges to global biodiversity, threatening ecosystems, livelihoods, and ecological balance. India, with its rich biological heritage, has a crucial role to play in conserving biodiversity through scientific research, sustainable practices, and community participation. This conference provides an important platform for academicians, researchers, students, and policymakers to exchange knowledge, share experiences, and develop innovative strategies for biodiversity conservation in the face of climate change. I appreciate the efforts of the Principal and organizers in fostering awareness and scientific dialogue. I am confident that the deliberations of this conference will contribute meaningfully to conservation planning and sustainable development. I wish the conference every success.

With regards

Prof. Dr. Koppula Victor Babu
M.A., M.A., M.Phil., Ph.D., PDF, D.Litt.
VICE CHANCELLOR
Princonser University, Lima, Peru,
South America

Dr. D. Suneetha

President
Principal,
Government Degree College, Yeleswaram

Esteemed delegates and biodiversity advocates,

I extend sincere greetings to the International Conference on Biodiversity Conservation in a Changing Climate at Government Degree College, Yeleswaram. This significant gathering, driven by our Departments of Botany and Zoology, reaffirms higher education's crucial role in addressing global ecological imperatives.

Climate change imperils our rich biodiversity—altering local wetlands, forests, and species interactions across world. The conference inspires through explorations of restoration ecology, resilient agriculture, and innovative strategies to harmonize human needs with nature's vitality.

Government Degree College, Yeleswaram, serves as a vibrant nexus for such transformative dialogue. These sessions will equip us to champion sustainable futures, weaving science and stewardship into enduring action. May the deliberations yield profound insights and collaborative momentum for planetary health.

Warm regards,
Dr. D. Suneetha

Dr. Prayaga Murty Pragada

Convenor
Department of Botany,
Government Degree College, Yeleswaram

It gives me great pleasure to welcome you to the *International Conference on Biodiversity Conservation in a Changing Climate*, being conducted at Government Degree College, Yeleswaram, Kakinada District, Andhra Pradesh, India.

Biodiversity forms the foundation of ecological stability and human well-being, yet it is increasingly threatened by climate change and anthropogenic pressures. This conference aims to provide a common platform for academicians, researchers, policymakers, and students to share knowledge, exchange ideas, and discuss innovative strategies for conserving biodiversity under changing climatic scenarios.

I sincerely hope that the deliberations, technical sessions, and interactions during this conference will foster meaningful collaborations, enrich scientific understanding, and contribute to sustainable solutions for biodiversity conservation at local, national, and global levels.

I extend my warm welcome to all the participants and wish the conference every success.

Dr. Prayaga Murty Pragada
Convener
International Conference on Biodiversity Conservation in a Changing Climate
Government Degree College, Yeleswaram
Kakinada District,
Andhra Pradesh, India

COLLEGE HISTORY:

Yeleswaram village is well known as the "Gate way of agency" in Kakinada District (Erstwhile East Godavari District) as it is mostly surrounded by the tribal areas. It is located 50 kms away from the district headquarters Kakinada. The name Yeleswaram is derived from the local river called 'Yeleru'. There is a reservoir which is built on the river by its name Yeleru. People of Yeleswaram in and around mostly depend on Agriculture. It is known for rice, sugar cane, and banana crops. Sweet potatoes, Tomatoes and many other vegetables and lentils are also cultivated here. Alluri Seetharamaraju, one of the most eminent freedom fighters often visits saibaba metta in Yeleswaram at the time of freedom movement. A freedom fighter and Indian National Congress leader Chandaka Apparao belongs to this village. Yeleswaram became an independent panchayat in 1953 from Lingamparthi village and upgraded as Nagara Panchayat in 2013. There is a small Hydro Project (4.5MW) and a solar power plant in Yeleswaram. Govt. Degree College, Yeleswaram, was established in the academic year 2009, as per G.O. Ms. No.22, dated 28-02-2009 based on the representations of local leaders and the people. The college has been sharing accommodation with the Govt. Junior College buildings and run in the afternoon shift from 12.30 pm to 05.30pm. This college has been serving the students of poor and deprived sections belonging to the nearby 6 mandals.

Chronological Developments:

- 2009-2010: The college got permission to start four (04) conventional courses viz., B.A(HEP) - TM, B.Com. (General) - TM, B.Sc. (MPC) - TM & B.Sc. (BZC) – TM affiliated to Andhra University.
- 2012: 09 teaching posts (SMPC) were sanctioned in 2012 as per the G.O.Ms.No.04, dated 07-01-2012.
- 2012: 6 non-teaching posts were sanctioned on Outsourcing basis.(no sanctioned regular non-teaching posts till now)
- 2012-13: Affiliated to Adikavi Nannaya University, Rajamahendravaram.

- 2014: One NSS unit is functioning successfully from 2014-15 onwards.
- 2014: JKC was established and conducted training and placements through Jawahar Knowledge Centre from the year 2014-15.
- 2015: One History and one Mathematics Lecturer posts were sanctioned in the rationalization process.
- 2016: Transfer of 05 acres of land by the Government to the college.
- 2017: Handing over of 05 acres of permanent land to the college by the Government.
- 2018: One Commerce post (in 2018) was sanctioned in the rationalization process.
- 2018-19: 4 new Courses in English Medium were Introduced i.e. B.Sc.(MPC)-EM, & B.Sc.(BZC)-EM as conventional courses and B.Com.(Computer Applications)-EM & B.Sc.(Computer Science)-EM as restructured courses.
- 2020: Construction occurred with 03 classrooms and 01 Principal/ office room.
- 2021-22: All Telugu Medium Courses are converted into English Medium Courses.
- 2021-22: One new conventional course introduced i.e., B.A.(HPT)-EM.
- 2023-24: Following NEP-2020 Single Major System launched by the Govt. of A.P., Accordingly, 04 New Single Major programmes have been introduced w.e.f. AY 2023-24, viz., B.A.(Honours) - Economics, B.Com.(Honours) - General, B.Sc.(Honours) - Mathematics & B.Sc.(Honours) - Botany.

Vision Mission of the College:

Vision:

- Empowering the students of socially and economically deprived sections of distant agency and rural extents through the delivery of quality education and employability skills aiming at inclusive development.

Mission:

- Rendering quality and outcome-based education enriched with student centric programmes.
- Regular training on community-based projects as well as skill-oriented internships to acquire employability and entrepreneur skills to accomplish graduate attributes.
- Empowering girl students in psychological or professional dexterity through gender sensitization programmes.
- Facilitating field-based experiential and participative Teaching learning practices through field trips, Industry visits and collaborative functional linkages with institutions/ organizations.
- Prominence to inclusive education with special emphasis on character building, national integrity and updated knowledge at global level advancements.

Motto:

- We ensure our students to prove themselves to be not only qualified graduates but also very responsible and ideal citizens of our country.

Department of Botany:

The Department of Botany has been offering undergraduate instruction in Botany for the B.Sc. programme since its establishment in the academic year 2009–10. Regular field visits are an integral part of the curriculum, providing students with exposure to natural ecosystems and practical, real-world learning experiences.

The department is supported by one well-qualified permanent faculty member who consistently strives for academic excellence and effective dissemination of knowledge among the student community. The faculty member also serves as a member of the Board of Studies (BoS) for autonomous colleges and actively participates in national and international seminars on a regular basis.

Guest lectures are organized frequently to acquaint students with the latest developments and emerging trends in various research areas. The department is equipped with a well-maintained laboratory that adequately supports the conduct of regular practical sessions. In addition, the department plans to organize national seminars and workshops in innovative and emerging areas to enhance and update knowledge in diverse fields.

A significant number of students pursue higher education in reputed institutions and universities. Many students successfully qualify for competitive examinations conducted by government and private organizations, while some secure employment through job drives organized by the JKC placement cell.

Department of Zoology:

The Department of Zoology has been offering undergraduate instruction in Zoology for the B.Sc. programme since its establishment in the academic year 2009–10. Regular field visits form an integral part of the curriculum, enabling students to gain exposure to natural habitats and real-life biological systems.

The department is supported by one well-qualified faculty member who consistently strives for academic excellence and effective dissemination of knowledge among the student community. Guest lectures are organized frequently with the objective of familiarizing students with the latest trends and advancements in diverse research areas.

The department provides a platform for science faculty, students, and science enthusiasts from other departments to understand and appreciate recent developments in the field of science. The department is equipped with a well-maintained laboratory rich collection of zoological specimens preserved in the departmental museum since its inception.

A majority of the students pursue higher education in reputed institutions and universities. Several students successfully qualify for competitive examinations conducted by government and private organizations, while some secure employment through job drives organized by the JKC placement cell.

About PM-UShA:

Pradhan Mantri Uchchatar Shiksha Abhiyan (PM- UShA) is a centrally sponsored scheme launched by the Government of India to enhance access, equity, quality, and excellence in higher education. It is the revamped version of the Rashtriya Uchchatar Shiksha Abhiyan (RUSA) and aligns with the objectives of the National Education Policy (NEP) 2020.

PM- UShA aims to strengthen state higher educational institutions by providing financial assistance for infrastructure development, academic reforms, digital initiatives, research, innovation, and faculty development. The scheme focuses on improving learning outcomes, promoting multidisciplinary education, and enhancing employability skills among students. It also emphasizes equity by supporting institutions serving disadvantaged and underrepresented groups.

Under PM- UShA, funds are allocated for the creation and upgradation of classrooms, laboratories, libraries, hostels, and digital infrastructure. The scheme also supports the establishment of research facilities, innovation hubs, incubation centers, and skill development programs. Capacity building of faculty through training, workshops, and exposure to emerging technologies is another key component.

PM- UShA encourages institutional autonomy, performance-based funding, and accountability through outcome-based monitoring. It promotes the use of renewable energy, sustainable practices, and digital governance in higher education institutions.

Overall, PM- UShA plays a significant role in transforming the higher education ecosystem by fostering quality teaching, research excellence, inclusivity, and holistic development of students, thereby contributing to national development and global competitiveness.

About the Conference:

Biodiversity forms the foundation of ecosystem stability and human well-being, yet it is increasingly threatened by climate change–induced alterations in temperature, precipitation patterns, and extreme weather events. The International Conference on **Biodiversity Conservation in a Changing Climate** aims to provide a multidisciplinary platform for researchers, academicians, policymakers, conservation practitioners, and students to share knowledge, research findings, and innovative strategies for safeguarding biodiversity under changing climatic conditions.

The conference focuses on understanding climate impacts on ecosystems, species diversity, and ecological processes, while emphasizing conservation planning, sustainable resource management, traditional knowledge systems, and policy frameworks. Through keynote addresses, technical sessions, and interactive discussions, the conference seeks to promote collaborative approaches and evidence-based solutions for mitigating biodiversity loss, enhancing ecosystem resilience, and ensuring sustainable development. The deliberations are expected to contribute to informed decision-making and strengthen global efforts toward biodiversity conservation in the face of climate change.

Biodiversity Conservation of Eastern Ghats of Andhra Pradesh in a Changing Climate

Keynote address

Prof. Vatsavaya S. Raju,

Resource Person

Plant Systematics Laboratory, Kakatiya University, Warangal–506 009, Telangana

Climate change in the Eastern Ghats of Andhra Pradesh is marked by warming, erratic rainfall, droughts, frequent storms and cyclone, forest stress, biodiversity loss, and livelihood vulnerability, making climate-resilient conservation and sustainable forest management essential. *Climate change* means long-term changes in Earth's average weather patterns—like temperature, rainfall, and storms—over decades or longer, and the term is popularly used since 1970s. In the present context, it is discussed different from the global warming concept. On the other, the word "biodiversity" was coined by Walter G. Rosen in 1985. *Biological diversity* means the variety of live on Earth at three levels of conception such as genes, species and ecosystems. And, conservation is

The Eastern Ghats region of Andhra Pradesh has been experiencing a steady increase in average temperatures, leading to more hot days and heat waves, especially in summer. *Erratic rainfall patterns:* Monsoon rainfall has become highly variable and unpredictable—with short spells of intense rainfall followed by long dry periods. This affects forest health and agriculture. Increased drought frequency: Many hill and foothill areas now face frequent droughts, reducing soil moisture and water availability in streams and springs. *Forest stress and biodiversity impacts*: Climate stress has led to forest degradation, increased forest fires, and changes in species distribution,

especially for endemic and moisture-dependent plants. *Impact on wildlife*: Reduced water sources and habitat quality force wildlife to move closer to human settlements, increasing human–wildlife conflict. *Effects on tribal livelihoods*: Changes in climate affect non-timber forest products (NTFPs) like honey, bamboo, tubers, and medicinal plants, impacting tribal communities dependent on forest resources. *Extreme weather events*: The region is increasingly affected by cyclones, heavy rainfall events, landslides (in hill slopes), and floods linked to climate change.

Many threatened plant species like *Andrographis beddomei, Pimpinella tirupatiensis, Syzygium alternifolium, Cycas beddomei, Hildegardia populifolia*, etc. are endemic to Andhra Pradesh region of Eastern Ghats and face habitat loss or restricted distribution. On the faunal/animal side, the Jerdon's Courser is one of the world's rarest birds and Critically Endangered in the scrub habitats of the Eastern Ghats. Species such as the Great Indian Bustard and Indian Pangolin, which are globally threatened but historically present in the region. King Cobra and *Lissemys punctata* represent reptile/turtle taxa are of conservation concern in Eastern Ghats protected areas.

Recently several new species of animals and plants were described from Andhra Pradesh. To mention some of these: *Hemiphyllodactylus venkatadri* (Slender Gecko) from the Seshachalam Biosphere Reserve; *Tiphia andhraensis* (Wasp) from the Mudasarlova reservoir area in Visakhapatnam; *Phintella luna* (Jumping Spider) from Kittukuru, East Godavari; named for its crescent-shaped anatomy and in honour of the Chandrayaan-3; *Myllocerus depressus* (Curculionid Beetle) from the specimens in Dowleswaram; *Pseudorhombus bahudaensis* (Flounder), a new fish species identified in the coastal waters of the Bahuda Estuary near the Andhra Pradesh-Odisha border; *Amphibians* such as *Hylarana gracilis* (Koundinya Wildlife Sanctuary) and *Pseudophilautus regius* (Eastern Ghats), both previously thought to be native only to Sri Lanka; *Aquatic Insects* such as *Sigara striata* (Water Boatman) in Papikonda National Park and *Ranatra cardamomensis* (Water Scorpion) in Visakhapatnam reservoirs; and *Plant species* such as *Ficus duerrii* (Wild Fig), a woody shrub from the rocky crevices of Orvakallu, Kurnool district, *Crotalaria lamelliformis* (Rattlepod), an

ascending herb from the Sadasivakona grove in Chittoor district and *Lophopogon prasannae* (Grass): from the Nigidi forest. Two important national seminars were held under the initiation of EPTRI, Hyderabad (in 1998 at AU–Waltair and 2007 at Chennai) which were focused on the Biodiversity conservation of Eastern Ghats; the proceedings of these are available as data base to compare to the present data in view of climate change and habitat loss in the region.

Biodiversity Conservation significance of Eastern Ghats: (i) *Part of a major Eastern Ghats biodiversity landscape*: These forests lie within the Papikonda–Rampachodavaram Eastern Ghats belt, one of the most intact forest tracts in Andhra Pradesh, the present Alluri Sitaramaraju district. They act as an important ecological corridor linking hill ranges and river valleys of the Godavari basin. *Addateegala and Eleswaram forests are biologically special because they combine high biodiversity, endemic and medicinal species, critical wildlife habitat, and deep human–nature relationships within the Eastern Ghats ecosystem*; (ii) *High floral diversity and endemism*: Dominated by tropical moist and dry deciduous forests with patches of semi-evergreen vegetation. It is rich in endemic and threatened plant species such as Red sanders, *Syzygium, Hildegardia, Terminalia*, *Emblica*, and many medicinal herbs. A storehouse of medicinal plants used in traditional tribal healthcare; (iii) *Important wildlife habitat*: These forests support key Eastern Ghats fauna including Asian elephant (Chittoor), leopard, sloth bear, sambar, chital, mouse deer, and diverse reptiles and birds. Rich in avian diversity, including forest and riparian bird species; (iv) Rich non-timber forest resources (NTFPs): Abundant bamboo, honey, beverages, gums, resins, tubers, gingers, fruits, and fuelwood. These bioresources form the economic backbone of tribal livelihoods; (v) *Strong link with indigenous communities*: inhabited by Koya, Kondareddy, Valmiki and other tribal groups. Traditional ecological knowledge helps in sustainable use and conservation of biological resources; and (vi) *Watershed and ecosystem services*: The forests protect hill streams and tributaries of the River Godavari. They help in soil conservation, groundwater recharge, climate regulation, and carbon storage. Although biologically rich, the region faces threats from shifting cultivation, logging, mining pressures, roads, and development

projects. Hence, these forests are considered priority areas for biodiversity conservation in the Eastern Ghats. There are scores of wildlife sanctuaries and important national parts devoted to onsite biodeiversity conservation along the Eastern Ghats of Andhra Pradesh. To mention the important one are Gundla Brahmeswaram Sancturay, Kambalakonda Sanctuary, Koundinya Sanctuary, Nagarjunsagar-Srisailam Sanctuary: Nelapattu, Pulicat Lake and Rollapadu for birdstuary, Papikondalu bioreserve, Sri Lankamalleswara Sanctuary, Sri Penusila Narasimha Sanctuary, Sri Venkateswara Sanctuary: Buffer ecosystem supporting National Park wildlife, etc.

Numerous wildlife sanctuaries and national parks have been established by the central and state governments to conserve in situ biodiversity along the Eastern Ghats of Andhra Pradesh. Important protected areas include the Gundla Brahmeswaram, Kambalakonda, Papikondalu Biosphere Reserve, Kaundinya, and Nagarjunsagar–Srisailam sanctuaries, as well as major bird sanctuaries such as Nelapattu, Pulicat Lake, and Rollapadu. Other notable sanctuaries are Sri Lankamalleswara, Sri Penusila Narasimha, and Sri Venkateswara. Together, these ecosystems play a vital role in preserving regional wildlife. For *ex situ* conservation, botanical gardens have been established, or are being developed, at Kadapa and Visakhapatnam, under the care of local universities.

BAMBOO DIVERSITY IN A CHANGING CLIMATE

Firoz Shah

Resource Person

Founder, WePlantGreen.org

Introduction:

Bamboo, often called "green gold," is not just a plant—it's a powerhouse of ecological resilience and human utility. With over 1,600 species worldwide, bamboo's genetic and functional diversity holds untapped potential for climate adaptation and mitigation. As our planet warms, bamboo's rapid growth, carbon sequestration capacity, and versatility make it a strategic resource for a sustainable future.

Why Bamboo Matters in the Climate Crisis

1. *Carbon Sequestration Champion*

- Certain bamboo species can sequester up to 12 tons of carbon per hectare annually—surpassing many tree species.

- Its extensive root system prevents soil erosion and stores carbon underground long-term.

2. *Climate-Adaptive Diversity*

- From cold-resistant species in the Caucasus to drought-tolerant varieties in drylands, bamboo's genetic pool offers solutions for diverse climatic zones.

- Species like Dendrocalamus asper (giant bamboo) thrive in flooded conditions, making them ideal for Bangladesh's flood-prone regions.

3. *Biodiversity & Ecosystem Services*

- Bamboo forests create microhabitats for endangered species (e.g., pandas, lemurs, and tropical birds).

- They improve water retention, reduce landslide risks, and restore degraded soils.

Threats to Bamboo Diversity

- *Habitat Loss:* Deforestation for agriculture and urbanization.

- *Monoculture Farming:* Commercial focus on few high-yield species reduces genetic resilience.

- *Climate Stress:* Altered rainfall patterns and prolonged droughts threaten native bamboo ecosystems.

WePlantGreen.org's Bamboo Initiative

Our work focuses on:

- *Conservation Nurseries:* Preserving rare and indigenous bamboo species.

- *Community Agroforestry:* Training farmers in Bangladesh, Azerbaijan, and Turkey to integrate bamboo into sustainable farming systems.

- *Research Partnerships:* Collaborating with institutes like Istanbul Language Institute (where I studied) to promote bamboo literacy and innovation.

Call to Action

- *Governments:* Integrate bamboo into national climate strategies and reforestation pledges.

- *Researchers:* Study underutilized species for climate adaptation.

- *Individuals:* Support bamboo-based products and plant bamboo in suitable regions.

Conclusion

Bamboo is more than a plant—it's a promise of resilience. By safeguarding its diversity, we invest in a living toolkit for climate survival. At WePlantGreen.org, we believe that every bamboo planted is a step toward a cooler, greener, and more equitable planet.

Conservation of Endangered and Endemic plants from India's Eastern Ghats in their natural habitat.

Prof. A. Madhusudhana Reddy

Resource Person

Department of Botany, Yogi Vemana University, Vemanapuram, Kadapa, A.P-516005

Corresponding with: grassced@gmail.com

ABSTRACT

A significant loss of biological diversity has resulted from the recent global devastation of the natural environment. This concerning circumstance has made it necessary to do extensive research on the present state of various life forms. In this context, special consideration should be given to two crucial aspects of biodiversity: species richness and endemism. Since human activity is predicted to put species in ecosystems at the greatest risk over the next few decades (Caldecott et al., 1996), a critical taxonomic assessment of living forms ought to be given top attention.With reference to Article 7 of the Convention of Biological Diversity (WRI, 1994), there is an urgent need to conduct biodiversity inventories and surveys and develop a system for organising and maintaining this information.

Biodiversity refers to the variability among living organisms from all sources; including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems (United Nations, 1992). Biodiversity has emerged as a scientific discipline in the recent past basically in response to fast extinction of wild species due to human activity. The 6th mass extinction of life of earth (Ceballos *et al.,* 2015), with extinction rates 1000 times greater than background rates (De Vos *et al.,* 2015), has galvanized

attempts to collate and consolidate existing knowledge of the world's plants. In the last 500 million years already five mass extinctions have been occurred it caused more than 50 percent of species extinction (Myers, 1997; Erwin, 1998). Nevertheless, we are in the starting stage of sixth mass extinction (Myers 1993) which is anticipated by the human affected (Eldredge, 2008).

In the other hand, the unparalleled human effect has already disrupted the speciation process it posing a significant threat to future biodiversity, which is being seriously affected by the elimination of adjacent biotic habitats (Erwin, 1991). Natural habitat disturbances, over utilization of natural resources, exotic species and environmental alteration by the human beings to create the damage to biodiversity at an unusual rate according to current Global Biodiversity Outlook (CBD, 2014). Based on above negative impacts, conservation of endemic and threatened species are most urgent need, with *in-situ* and *ex-situ* strategies. *Ex-situ* conservation is playing important roles that are not fulfilled by *in-situ* conservation and such goals include conservation of species extinct in the wild (Oldfield, 2009; O'Donnell & Sharrock, 2017).

Furthermore, a cost of *ex-situ* conservation is very low and species can be conserved for hundreds of years in a relatively small place (Li & Pritchard, 2009; Mounce, 2017). In this contest, Botanical gardens offer the opportunity to conserve and mange a wide range of plant diversity including endemic, threatened, medicinal, ornamental and edible species in *ex-situ*. The Botanical gardens maintains scientifically planned collections of plant species for conservation, educational, scientific and public awareness.

Despite being older than the Himalayas and the Western Ghats, the Eastern Ghats, an ancient discontinuous low mountain range that spreads along the East coast of the Indian Peninsula, never got its due. The geographical extent of the Eastern Ghats is about 75,000 kilometres, spread over the states of Odisha (25 %), Andhra Pradesh (40%), Telangana (5%), Karnataka (5%) and Tamil Nadu (25%). Though it is bestowed with rich bio-diversity and is home to different tribal communities, there has never been a clear policy in place for its conservation. The vegetation is a unique mix of the dry deciduous, semi-evergreen deciduous and moist deciduous types, *Cycasbeddomei,*

Hildegardiapopulifolia, Pterocarpus santalinus, Terminalia pallida, Syzygiumalternifolium, Shoreatumbuggaiaand Boswellia ovalifoliolata are endemic plants to Eastern Ghats. These are the richest floristic hot spot harbouring many endemic and rare plants.

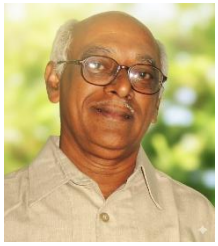
Eastern Ghats Face mass extinction: Eastern Ghats has decreased by almost 32,200sq km between 1920 and 2015. The overall forest cover,

spread over 43.4 per cent of Eastern Ghats in 1920, reduced to 27.5 per cent by 2015. The areas to have lost maximum green cover are Mahabubnagar of Telangana and Gajapathi in Odisha.It's not just loss of green cover. Plants and trees endemic to the Eastern Ghats (native to the region and not found elsewhere) are now facing mass extinction. These Rare, Endangered and Threatened (RET) species have already lost 11.4 per cent of their primary. Eastern Ghats forest land being diverted for agriculture — 1,407 sq km was lost between 1920 and 2015.Conversion of forest land to scrub/grassland, rise in mining area — by 340 sq km — and increase in settlements have also contributed to this.

In this region, endemic and threatened species are at present great danger of depletion and erosion due to following factors. Known natural threats are climate change (unusual-rains, floods, temperature, and soil erosion), natural competition between species (native species and invasive species), lack of pollination (effect on seed formation) and natural degeneration *etc.* Man made threats includes forest encroachment, mining activity, developmental activities, annual forest fires, grazing, illegal trade. Several gaps in the earlier works on the study area are being minimized in the present study with the intervention of Lead Botanical Garden (LBG), Ministry of Environment & Forest and Climate Change (MoEF), Government of India. LBG, a comprehensive programme has been initiated in 1991 to promote *ex-situ* conservation and propagation of endemic and threatened plants in Eastern Ghats along with other parts of India. The present work is possible out of this programme and the investigator is part of research group working in Eastern Ghats.

The present work is aimed to providing a sampled inventory of endemic and threatened species of Eastern Ghats carried out for a period of 15 years during 2009-24 and to study their current distribution pattern and conservation status, to analyze the threats, propagation, *ex-situ* conservation in YVU botanic garden and reintroduction of propagated seedlings. The present investigation has revealed enthusiastic results and brought out valuable information to light.The present study on the endemic and threatened plants of Eastern Ghats revealed that the occurrence of 150 taxa belonging to 75 genera under 65 families. All the collected endemic and threatened plants were systematically enumerated in alphabetical order of families. Species citation includes protologue reference followed by technical description, their flowering and fruiting and habitat information are presented. Their distributed pattern at different levels like, strict endemics to study area or endemic to South India, Peninsular India, India and outside India information are provided. The collected specimens are prepared herbarium by following standard methodology and notes on introduced plants at YVU BG are also provided. Macro-propagation studies of selected species and graphical representation (distribution information, seed germination percentage and seedlings survival percentage) also provided.

Plant Resources of Eastern Ghats of Northern Andhra Pradesh, India



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The Eastern Ghats are a discontinuous chain of ancient hills along India's eastern coast, running from Odisha in the north to Tamil Nadu in the south. In northern Andhra Pradesh, these hills form part of a larger ecological landscape that supports diverse vegetation under tropical monsoon climatic conditions, with distinct wet and dry seasons. The plant communities in the Eastern Ghats exhibit considerable variation with elevation, rainfall, and soil type. The Major forest types are Dry deciduous forests (dominant in lower elevations), Moist deciduous forests in wetter pockets, Semi-evergreen and evergreen patches in higher or sheltered areas, Scrub and thorny vegetation in drier ridges. This structural diversity is reflected in differences in species composition, canopy layering, and understorey flora. The Eastern Ghats region as a whole is rich in plant diversity: Over 4,500 flowering plant species are recorded across the entire Eastern Ghats, constituting about 13% of India's angiosperm flora. Northern Andhra Pradesh, specifically, hosts hundreds of tree species, with documented tree inventories identifying around 270 species representing 55 families. Dominant tree families include Fabaceae, Rubiaceae, Malvaceae, Moraceae, and Phyllanthaceae. Genera with high species richness in the region include *Ficus*, *Diospyros*, *Albizia*, *Grewia*, and *Acacia*. The plant resources of the Eastern Ghats are significant for both ecological and economic reasons. Important tree and forest species include: Sal (*Shorea robusta*), Teak (*Tectona grandis*), and other timber species valued for wood products. Red sandalwood (*Pterocarpus santalinus*), an endemic and high-value timber

species, largely found in the Seshachalam hills of Andhra Pradesh. Bamboo, Indian rosewood (*Dalbergia sissoo*), tamarind, and other non-timber forest products (NTFPs) utilized by local communities. Additionally, numerous species in the region are used in traditional medicine, fuelwood, fodder, and other local uses. The Eastern Ghats harbour a number of endemic and rare species due to their isolation and varied microhabitats: Several species are recognized as endemic to the Eastern Ghats, including unique angiosperms and forest herbs (e.g., species listed by the Botanical Survey of India). Recent botanical surveys continue to add to known diversity, with new species discoveries such as *Dicliptera srisailamica* in the Andhra Pradesh portion of the Ghats, underscoring ongoing biodiversity research in the region. The plant resources of the Eastern Ghats face multiple pressures:

- Habitat fragmentation and degradation due to agricultural expansion, grazing, and settlement.
- Overexploitation of valuable timber and NTFPs, including illegal extraction of red sandalwood, which is regulated under international trade agreements.
- Sensitivity of endemic and newly described species to environmental change, emphasizing the need for targeted conservation measures.
- Sustainable management efforts focus on community-based forest use, conservation reserves, and scientific monitoring to balance ecological integrity with livelihoods.
- The Eastern Ghats of northern Andhra Pradesh are a botanically rich and structurally complex landscape.
- Forest types range from dry deciduous to evergreen patches, supporting high species richness and ecological diversity.
- Economic plant resources include timber, NTFPs, medicinal plants, and culturally important species.
- Endemic taxa and ongoing discoveries highlight the Ghats' significance for biodiversity research and conservation.
- Sustainable use and conservation strategies are critical to preserving plant resources in the face of anthropogenic pressures.

Biodiversity Policies and Governance: Global Frameworks, National Strategies, and Implementation Challenges

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Abstract

Biodiversity underpins ecosystem services, socio-economic development, and human well-being. However, anthropogenic pressures continue to drive unprecedented biodiversity loss worldwide. In response, global and national policy frameworks have evolved to conserve biological diversity, mainstream its values, and integrate governance mechanisms that address complex socio-ecological challenges. This paper synthesizes key international agreements—primarily the Convention on Biological Diversity (CBD) and the Kunming–Montreal Global Biodiversity Framework—alongside India's national strategies including its updated National Biodiversity Strategy and Action Plan (NBSAP). The analysis emphasizes comparative insights between India and global policy practices, institutional instruments, regulatory mechanisms, and persistent implementation challenges such as enforcement limitations, resource constraints, and stakeholder participation gaps. The paper concludes with recommendations for strengthening adaptive biodiversity governance that aligns national priorities with global targets.

Keywords: biodiversity policy; Kunming–Montreal Global Biodiversity Framework; India; national biodiversity strategies; environmental governance.

Habitat Fragmentation, Mining and Forest loss: India's Ongoing Biodiversity Challenge

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Abstract:

India's biodiversity is under mounting pressure from forest degradation, mining and habitat fragmentation, which together erode species richness,

genetic diversity and ecosystem functioning across multiple biomes. Forest degradation through selective logging, encroachment and conversion to plantations reduces structural complexity, promotes invasive species and disproportionately affects forest-interior and endemic taxa in hotspots such as the Western Ghats and Eastern Himalaya. Mining for coal, iron ore and bauxite in central and eastern India causes direct habitat loss, soil and hydrological disruption, and long-term landscape scars, while associated infrastructure amplifies disturbance and restricts movement of wide-ranging species like elephants and large carnivores. Habitat fragmentation from roads, railways, canals and expanding settlements breaks once-contiguous habitats into small, isolated patches, weakening connectivity, limiting dispersal and Ch. increasing local extinction risk for many vertebrates and pollinator guilds. The combined effects of these drivers accelerate biodiversity loss and reduce ecosystem resilience to climate change, underscoring the urgency of integrating strict protection, impact zoning, ecological restoration and functional wildlife corridors into India's development planning..

Key Words: biodiversity, forest degradation, habitat fragmentation, invasive species, landscape, vertebrates, habitats, ecosystem,

"Ecological Role of Honey Bees in Biodiversity Conservation and Ecosystem Stability"

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Abstract

Honey Bees are among the most important pollinators, providing essential ecosystem services that support both ecological stability and economic productivity. Honeybees (Apis mellifera), in particular, play a crucial role in maintaining plant biodiversity, enhancing crop yield, and improving the quality of agricultural produce. Through their pollination activities, honeybees contribute to the reproduction of a wide range of wild and cultivated plant

species, thereby sustaining food webs and ecosystem resilience. Although honeybees have been managed by humans in organized hives for thousands of years, they remain a non-domesticated species, making apiculture a distinctive and complex animal production system.

In recent decades, a significant global decline in insect pollinator populations has been observed, driven by factors such as habitat loss, pesticide use, climate change, pathogens, and reduced floral diversity. This decline poses a serious threat to food security and human well-being, as a substantial proportion of global food crops rely on animal-mediated pollination to achieve optimal productivity and nutritional quality. Beyond agriculture, pollinators indirectly influence oxygen production, soil health, and the survival of numerous plant and animal species, emphasizing their foundational role in ecosystem functioning.

The preservation of honeybee populations is therefore not only an environmental concern but also a socioeconomic necessity. Effective conservation strategies, sustainable agricultural practices, and increased public awareness are essential to mitigate pollinator decline. Protecting bees ultimately supports biodiversity conservation, ecological balance, and long-term sustainability of natural and managed ecosystems.

Keywords: Honeybee; Pollination; Biodiversity; Conservation; Sustainability; Ecosystem services

Role of Koringa Mangroves in Blue Carbon Sequestration and Climate Mitigation.

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Abstract:

Mangrove ecosystems are among the world's most carbon-dense coastal systems and play a crucial role in sequestering and storing "blue carbon"—

organic carbon fixed by marine and coastal ecosystems. The Coringa (locally Koringa) mangrove complex in the Godavari delta (Coringa Wildlife Sanctuary, Andhra Pradesh, India) is one of the largest mangrove forests in India and stores substantial carbon in biomass and in sediments. This paper synthesizes recent field assessments, regional monitoring, and national blue carbon reviews to evaluate the carbon stocks, sequestration rates, and mitigation potential of the Koringa mangroves. We compare sediment carbon stocks measured at Coringa with those from other Indian mangrove sites (Bapatla, Thane Creek) and the Sundarbans, discuss drivers of carbon accumulation (species composition, hydrology, sedimentation), assess threats and management challenges (land-use conversion, aquaculture, pollution), and explore the potential role for national blue carbon accounting and carbon finance mechanisms. Using published sediment and biomass carbon values, we estimate the local and regional mitigation potential and present a practical monitoring and restoration framework for enhancing blue carbon in Koringa. Results show that Coringa's sedimentary carbon stock (mean ~158 Mg C ha^{-1}) compares favorably with many Indian sites, though it is lower than the highest global and Sundarbans values (≈300–370 Mg C ha^{-1} in some studies). Conservation and strategic restoration in Coringa can therefore yield measurable greenhouse gas (GHG) benefits while delivering co-benefits for biodiversity and coastal resilience. We conclude by offering management recommendations, monitoring priorities, and policy pathways to integrate Koringa mangroves into India's blue carbon strategies and climate mitigation planning.

Additions to the Flora of Srikakulam District, Andhra Pradesh, India

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Abstract

Srikakulam district is one of the biodiversity rich areas of Eastern Ghats. The district is the extreme Northeastern district of Andhra Pradesh

situated within the geographic co-ordinates of 18°-20' and 19°- 10' of Northern latitude and 83°-50' and 84°-50' of Eastern longitude and bounded by Odisha on the north, Vizianagaram district on the west and south, Bay of Bengal on the east. The district has a seacoast of 193 Kms. The district derived its name from Srikakulam, its headquarters town. The Geographical area of the district is 4,591 sq. km with 03 revenue divisions, 30 Mandals and 1865 revenue villages. The district is situated in the North Coastal Plain of the Agro-Climatic Zone and partly in hilly Areas. The district has two Natural Regions namely the Hilly Region and the Plain Area. The Nagavali, Vamsadhara, Suvarnamukhi, Vegavathi, Mahendratanaya, Gomukhi, Champavathi, Bahuda and Kumbikota Gedda are important rivers of the district, which are contributing to the preservation of biodiversity.

While exploring the floristic wealth of Srikakulam district of Andhra Pradesh, more than 500 species documented from 2023-2025, of these 50 species of angiosperms belonging to 33 genera and 16 families have been reported as an addition to the 'Flora of Srikakulam district, Andhra Pradesh'. Citation of the species, short description, family, habit, phenology, habitat, and specimens examined and important photographs are provided for easy identification.

Keywords: additions; Andhra Pradesh, Flora, Srikakulam District

Anthropogenic Disturbances and Their Influence on Forest Ecosystems and Habitat Connectivity

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Abstract

Forest ecosystems are increasingly threatened by human-induced disturbances, particularly forest degradation, mining activities, and habitat fragmentation. These pressures significantly alter ecosystem structure, reduce biological diversity, and impair essential ecological functions. Forest

degradation, driven by selective logging, biomass extraction, and repeated disturbances, leads to the loss of habitat quality, reduced species richness, and weakened ecosystem resilience. Although degraded forests may retain tree cover, their ability to support native flora and fauna and provide ecosystem services is substantially diminished. Mining activities represent an intense form of land-use change, resulting in large-scale vegetation removal, soil erosion, and contamination of surrounding environments. The ecological impacts of mining extend beyond extraction sites, affecting nearby forests through pollution, altered hydrology, and increased human access. Such disturbances disrupt wildlife behavior, reduce population sizes, and hinder natural regeneration processes. Habitat fragmentation further exacerbates these impacts by dividing continuous forest landscapes into smaller, isolated patches. Fragmentation limits species movement and gene flow, increases edge effects, and heightens the vulnerability of populations to environmental stress and local extinction. The combined effects of degradation, mining, and fragmentation act synergistically, accelerating biodiversity loss and ecosystem instability. This highlights the need to understand these interconnected disturbances for effective conservation planning. Sustainable land-use practices, habitat restoration, and landscape-level management strategies are essential to reduce ecological degradation and ensure the long-term conservation of forest biodiversity.

Keywords Forest degradation, Mining activities, Habitat fragmentation, Biodiversity loss, Ecosystem stability

The Paradox of Petals: An Ecological and Management Study of Eichhornia crassipes in the Mandapeta Irrigation Network

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Abstract

This study investigates the socio-ecological impact of Eichhornia crassipes within the specialized canal ecosystem of Mandapeta, Andhra

Pradesh. By analyzing the intersection of government irrigation management and local biodiversity, the report highlights the dual nature of the 'Water Hyacinth'—as both a pollutant hindering water flow and a plant of significant aesthetic and phytoremediation potential. Through field observations of local ponds and canal networks, this paper proposes a community-driven awareness model to transform an environmental challenge into an ecological asset."

Keywords: Eichhornia crassipes, Mandapeta, Irrigation Management, Terror of Bengal, Hydro-biodiversity, Phytoremediation.

Assessment Of Traditional Medicinal Plants as Antibiotic Adjuncts: Comprehensive Pharmacognostic And Antibacterial Evaluation of Neem, Pepper, Garlic, And Ginger With Herb–Streptomycin Interaction Analysis

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Abstract

The current study was initiated to examine the antimicrobial properties of commonly used herbal draughtsmen Azadirachta indica (Neem), Piper nigrum (Pepper), Allium sativum (Garlic), and Zingiber officinale (Ginger) as potential adjuncts in the fight against drug-resistant pathogenic bacteria. The current study was initiated in response to the increasing concern over antimicrobial resistance (AMR) globally, which has been affecting antibiotic medications in many ways. Following a series of pharmacogenetic tests, including powder microscopy, powder extractive value, and other analyses, the authenticity of the chosen plant drug was ascertained. On analyzing, it was found that garlic has a high value of extractive yield, while microscopy tests

showed characteristic features that allowed ascertaining that all four plant samples were true to their type. Further phytochemical screening tests also proved that all plant samples contained prominent standard metabolites, such as alkaloids, tannins, flavonoids, and terpenoids. Agar well diffusion tests further proved that pepper and ginger plant samples contained prominent antibacterial properties. Further tests were done using minimum inhibitory concentration analysis. Contrary to expectations, the minimum inhibitory concentration of streptomycin and the extract mixture was found to be higher (15.62 µg/mL) than that of streptomycin alone, which stood at 7.81 µg/mL, with a FIC index of 3.0, proving it to be an antagonistic property. These findings clearly point towards using these plant combinations in relation to streptomycin, which would further hamper potency.

Keywords: Antibacterial activity, Streptomycin, Garlic, Terpenoids, Secondary metabolites

Impacts of Climate Change on Biodiversity: Patterns, Processes, and Conservation Challenges

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Abstract

Climate change has emerged as one of the most significant global threats to biodiversity, influencing species, ecosystems, and ecological processes across terrestrial, freshwater, and marine environments. Rising temperatures, altered precipitation patterns, increased frequency of extreme weather events, and sea-level rise are reshaping habitats and disrupting long-established ecological balances. These changes affect biodiversity at multiple levels, including genetic diversity, species distribution, population dynamics, and ecosystem functioning. Many species are shifting their geographic ranges toward higher latitudes or elevations in response to changing climatic conditions, while others face heightened risks of population decline or

extinction due to limited adaptive capacity. Climate change also alters species interactions, such as predator–prey relationships, pollination networks, and host–pathogen dynamics, thereby affecting ecosystem stability and resilience. Furthermore, the combined effects of climate change with other anthropogenic pressures such as habitat loss, land-use change, pollution, and invasive species intensify biodiversity loss. Vulnerable ecosystems, including coral reefs, alpine regions, wetlands, and tropical forests, are particularly at risk due to their sensitivity to climatic fluctuations. Understanding the impacts of climate change on biodiversity is essential for developing effective conservation and adaptation strategies. Integrating climate projections into biodiversity management, promoting ecosystem-based approaches, and enhancing species' adaptive capacity can help mitigate negative impacts. Though there are many mechanisms through which climate change affects biodiversity, have to be made coordinated global efforts to conserve biological diversity in a rapidly changing climate.

key words: Climate change, biodiversity impacts, species distribution, ecosystem resilience.

Seasonal Dynamics of Water Quality and Ecological Status in a Freshwater Lake, Karimnagar District, Telangana State, India.

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Abstract

Freshwater lakes are vital for sustaining ecological integrity and supporting human livelihoods, particularly in semi-arid regions like Telangana. This study investigates the seasonal variation of physico-chemical parameters of Bommakal Freshwater Lake, Karimnagar district, Telangana, over a one-year period (June 2022–May 2023). Water samples were collected monthly, covering monsoon, post-monsoon, and pre-monsoon seasons, and analyzed for key parameters including Temperature, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Transparency, Dissolved oxygen (DO), Biochemical

Oxygen Demand (BOD), free CO_2, total alkalinity, Total Hardness, Chlorides, Nitrates, Phosphates, Sodium, Potassium, and Ammonia. Results revealed clear seasonal trends. Temperature ranged from 22.15–34.57 °C, with monsoon (27.41 °C) and pre-monsoon (33.40 °C) extremes, while pH varied from 7.03–7.66, showing increased alkalinity during pre-monsoon. EC and TDS were lowest during monsoon (0.30 µS/cm; 137.68 mg/l) due to dilution, and peaked in pre-monsoon (0.38 µS/cm; 341.81 mg/l) due to high evaporation. Transparency increased from monsoon (56.00 cm) to pre-monsoon (73.12 cm), whereas DO declined from monsoon (8.69 mg/l) to pre-monsoon (5.94 mg/l). BOD values peaked post-monsoon (13.00 mg/l), indicating higher organic load. Nutrients showed distinct seasonal variation: nitrates were highest in monsoon (0.60 mg/l) and lowest in pre-monsoon (0.34 mg/l), while phosphates peaked during monsoon (2.22 mg/l). Major ions including sodium (6.59 ppm) and potassium (1.79 ppm) also displayed seasonality; with ammonia remaining relatively stable (1.14–1.24 ppm). Total alkalinity and hardness increased progressively from monsoon (136.56 mg/l; 78.43 mg/l) to pre-monsoon (192.75 mg/l; 175.25 mg/l), reflecting concentration effects. Overall, Bommakal Lake exhibits strong seasonal dynamics, with dilution during the monsoon, nutrient accumulation post-monsoon and evaporative concentration during pre-monsoon. These variations directly influence aquatic productivity, nutrient cycling, and ecological health. The study provides baseline data critical for sustainable management, water quality monitoring, and conservation of freshwater ecosystems in semi-arid regions.

Keywords: Bommakal Fresh Water Lake, Seasonal Variation, Water Quality, Physico-Chemical parameters,

Thrips Act As Vectors For Tospoviruses

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Abstract

Thrips-transmitted tospo viruses (genus *Tospovirus*, family *Bunyaviridae*) are a major group of plant viruses and have a wide host range

affecting at least 1,090 host-plant species worldwide. So far, 20 *Tospo virus* species have been identified globally along with 14 thrips species in the family Thripidae that serve as vectors with an annual loss of over $1 billion from a single *Tospovirus*, *Tomato spotted wilt virus* worldwide. Based on 10 years of data from Georgia alone, estimated annual average losses were $12.3 million in peanut, $11.3 million in tobacco and $9 million in tomato, pepper for a total of $326 M (Riley *et al*,2011). Thrips are known to transmit tospo viruses in a persistent propagative manner. Both larval and adult stages of thrips vectors can actively feed on virus infected host plants, but only early larval instars can acquire the virus and later instar larvae and adults can transmit the virus after a latent period.

TSWV was first described in Australia in 1919 (Brittlebank,1919) and is considered as the type member of the genus and hence its name *Tomato spotted wilt virus* formed the basis for coining the genus name Tospo viruses have been grouped into three based on the amino acid sequence of the N proteins: American, Eurasian and Asian With the exception of TSWV, INSV and IYSV. This grouping indicates the geographical distribution of tospoviruses. Of the 21 tospovirus species characterized globally,15 species have been reported present in Asia (Hassani-Mehraban *et al.* 2011)

Generally, the viruses infect salivary glands via midgut and hoemocoel. Often, a second pathway involving translocation of the virus via ligament connecting the midgut and salivary glands. Infection in the ligaments that precedes the salivary glands / the salivary gland infection is always accompanied by ligament infection. The ability, inability or partial ability to transmit the virus depends on the degree to which salivary glands become infected before pupation (Whitfiled *et al*., 2005).

Shreshta *et al*.,2015 evaluated factors influencing the TSWV transmission efficiency in peanut plants. Greater incidence of TSWV infection was obtained with thrips mediated inoculation when compared with mechanical inoculation and the infection maximized when the plants were inoculated with 3 thrips at 1-2 week old.

Relevante, *et al*., 2014 worked on the identification of sources of resistance, breeding for resistance and characterization of tospovirus species in the Philippines and Thailand. Some field resistant genotypes besides imparting resistance against TSWV, also suppress thrips feeding and development which influence the evolution, epidemiology and management of TSWV (Sundaraj *et al*., 2014).

Biodiversity informatics and technology applications: Tools, Trends and future perspectives

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Abstract

Biodiversity informatics is in disciplinary domain that integrates biodiversity sciences with information technology to collect ,store, analyze visualize and disseminate data related to biological diversity. with accelerating biodiversity loss driven by climate change, habitat degradation and anthropogenic pressure the need for robust ,data- driveapproaches has become critical advance in computational tools, Big Data analytics ,remote sensing, molecular techniques and artificial intelligence have transformed biodiversity research and conservation practices .This review present a comprehensive overview of biodiversity informatics, it's conceptual foundations, data infrastructure ,analytical methods major technology applications it. also highlights key global initiative challenges ethical considerations,and future prospects .The review aims to surve as a references for students ,researchers and policy makers engaged in biodiversity sciences and conservations.

One Health and Biodiversity Conservation: Linking Ecosystem Integrity with Human and Animal Health

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Abstract:

The One Health approach acknowledges the essential interdependence of environmental, animal, and human health. Although ecosystem degradation and biodiversity loss are important but underappreciated causes of disease emergence, there is still little integration of these factors into public health frameworks. This study examined how biodiversity conservation functions as a preventive public health strategy and summarizes the most recent research relating ecosystem integrity to health outcomes. This study was conducted through a comprehensive literature review of peer-reviewed studies published between 2020 and 2026, that looked at the connections between ecosystem integrity, biodiversity, and human-animal health outcomes. Mechanistic pathways, empirical case studies, and integrated management frameworks. Multiple sources of evidence show that healthy ecosystems serve as barriers to the spread of disease. These protections are compromised by biodiversity loss through three main mechanisms: (1) changing host and vector communities to favor competent disease reservoirs (dilution effect), (2) increasing human-wildlife contact pathways through habitat fragmentation and, (3) decreasing ecosystem resilience to anthropogenic stressors. Zoonotic spill over events are accelerated by anthropogenic factors such as wildlife trade, intensive land-use change, and deforestation. Indigenous land stewardship and forest conservation are associated with significantly lower incidences of vector-borne and zoonotic diseases, according to landscape-scale analyses. Resilience-building through collaborative co-design is emphasized by integrated frameworks like socio-ecological systems health (SESH). Embedding ecosystem health within public health frameworks offers a transformative pathway toward sustainable disease prevention. Key implementation priorities include: ecosystem restoration,

recognition of Indigenous stewardship practices, enhanced cross-sectoral surveillance systems, and co-designed interventions addressing biodiversity conservation and health simultaneously. Significant barriers persist, including inadequate integration of conservation actors into health governance and data gaps in quantifying biodiversity-health relationships. In order to operationalize One Health principles and reduce future pandemic risks through proactive ecosystem protection, this research highlights the critical need for transdisciplinary collaboration between the conservation, public health, and veterinary sectors.

Keywords: One Health, biodiversity conservation, ecosystem integrity, zoonotic diseases, disease emergence, socio-ecological systems

Adaptive Conservation Approaches for Endemic and Threatened Species in a Changing Climate

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Abstract

Endemic and threatened species are particularly vulnerable to climate change because they have limited geographic ranges, specific ecological requirements and low capacity to adapt. Drawing on peer-reviewed review articles, global assessments, and synthesis reports, this paper examines how climate change interacts with human-driven pressures to accelerate biodiversity loss. It reviews the mechanisms that make species climate-sensitive, evaluates the effectiveness of current conservation strategies, and synthesizes emerging adaptive approaches such as climate-smart protected areas, assisted migration, and genetic rescue. The review also identifies key research gaps and policy challenges, highlighting the importance of integrative, forward-looking, and

adaptive conservation frameworks to ensure the long-term survival of endemic and threatened species under future climate scenarios.

Keywords: Climate change, climate adaptation, Endemic species, threatened species

Climate Change and Biodiversity Conservation in Andhra Pradesh, India: A Zoological Review

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Abstract :

Climate change has emerged as one of the most significant drivers of biodiversity loss globally, with tropical regions experiencing disproportionate ecological impacts. Andhra Pradesh, located along the southeastern coast of India, harbours diverse terrestrial, freshwater, and marine ecosystems that are increasingly vulnerable to climate-induced stressors such as rising temperatures, altered rainfall patterns, extreme weather events, and sea-level rise. This review synthesizes recent data (2020–2025) on climate variability and its impacts on faunal diversity in Andhra Pradesh, emphasizing changes in species distribution, population dynamics, physiological stress, and habitat degradation. Evidence from forest ecosystems, wetlands, agro-ecosystems, and coastal zones indicates increasing fragmentation, decline of sensitive taxa, and shifts in community composition. Case studies from the Eastern Ghats, Pulicat Lake, and coastal fisheries illustrate how climate change is reshaping biodiversity patterns across trophic levels. The paper also highlights the role of conservation-oriented practices, protected areas, and zoological research in building climate-resilient biodiversity conservation strategies. The review underscores the urgent need for region-specific monitoring, integrative conservation planning, and adaptive management to safeguard Andhra Pradesh's rich faunal heritage under a changing climate.

Keywords: Climate change, Biodiversity conservation, Faunal diversity.

Role Of Climate Change on Medicinal Plant Diversity and Its Implications for the Pharmaceutical Industry

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Abstract:

Biodiversity plays a crucial role in maintaining ecosystem balance and serves as a primary source for medicinal plants used in traditional and modern pharmaceutical practices. Climate change has emerged as a major threat to medicinal plant diversity through rising temperatures, altered rainfall patterns, habitat loss, and increased frequency of extreme climatic events. These changes have significantly affected the growth, distribution, availability, and therapeutic potential of medicinal plants across different regions. The decline in medicinal plant biodiversity not only threatens ecological stability but also poses serious challenges to the pharmaceutical industry, which relies heavily on natural resources for drug discovery and development.

This paper highlights the impact of climate change on medicinal plant diversity, emphasizing the loss of native and endangered species and its consequences on healthcare systems. It also discusses how climate-induced stress can alter the phytochemical composition of medicinal plants, thereby affecting their efficacy and safety. The paper further explores the importance of conservation strategies such as sustainable harvesting, cultivation practices, protection of natural habitats, and the integration of traditional knowledge with modern conservation approaches. Strengthening biodiversity conservation is essential to ensure the sustainable availability of medicinal plants and to support future pharmaceutical innovations. Addressing climate change through effective conservation measures is vital for safeguarding biodiversity and promoting sustainable healthcare.

Keywords: Climate change; Medicinal plants; Biodiversity; Phytochemicals; Pharmaceutical industry; Conservation.

Ethnomedicine of Primitive Porja Tribe of Munchangiput Mandal, Alluri Sitaramaraju District, Andhra Pradesh

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Abstract

An ethnomedicinal survey was carried out in Munchangiput Mandal, Alluri Sitaramaraju District, Andhra Pradesh, India. For documentation of important ethnomedicinal plants and information from local community about their medicinal uses. The traditional knowledge of primitive Porja tribe traditional uses was collected through questionnaire and personal interviews during field trips. The identification and nomenclature of the listed plants were based on the Flora of Andhra Pradesh. A total of 35 plants species belong to 34 genera and 26 families were identified by taxonomic description and locally by ethnomedicinal knowledge of people existing in the region.

Keywords: Ethnomedicinal practice, Porja primitive tribal communities, Munchangiput Mandal, Alluri Sitaramaraju District.

Ethnomedicinal plants and Indigenous veterinary practices using Traditional knowledge in North Coastal Districts of Andhra Pradesh, India.

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Abstract

India has a long history of traditional medicinal systems such as Ayurveda, Siddha and Unani which are in coexistence with the various systems

of ethnomedicine practiced in the region. Of these, the North Costal part of India is extremely rich in terms of indigenous knowledge, due to its ecological diversity and cultural traditions of the many aboriginal people that comprise the region. The North Costal region of Andhra Pradesh is a land of extraordinary biological cultural diversity that is replete with the traditional ethnomedicinal information that is entrenched in the operations of the indigenous people in that region. This review examines how indigenous plants are used in the alternative health care system that is in existence among the tribes and subtribes have continued to use indigenous plant in the prevention and healing of various animal ailments over the years with numerous plant species possessing notable relevance to traditional veterinary practice. The area, which is believed to be part of the biodiversity, hosts a huge reservoir of endemic and useful as therapeutic plants. They are applied in the therapy of a broad range of disorders like common infections and gastrointestinal disorders to chronic diseases like diabetes, hypertension, and inflammation. The review is a synthesis of ethnobotanical information of published and field literature to bring out the main medicinal plants, their therapeutic uses, preparation modes with oral and topical applications were the most common methods of administration and phytochemical compounds. The particular focus is placed on the socio-cultural and ecological environment where this knowledge is perpetuated and issues of modernization, loss of habitats, and erosion of knowledge. This paper has put forward a strong argument on the importance of the ethnomedicinal heritage of India in community health care, and also highlighted the potential untapped by it in the discovery of drugs through natural products also facilitating their validation for veterinary applications and highlighting their ecological, cultural, and practical value. The scientific justification and the records of these traditional practices are not only necessary to preserve cultural heritage but also the promotion of integrative and sustainable health care systems in India. The collected data contribute to preserving and expanding traditional knowledge about animal remedies in ethnopharmacology, but can also form a scientific basis for further pharmacological research.

Keywords: Ethnomedicinal, Indigenous veterinary practices, Local healer, Traditional knowledge, Animal diseases, North Coastal Districts.

Wild Edible Plant Diversity and Utilization in the Rampachodavaram Forest Division of the Eastern Ghats, Andhra Pradesh, India

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Abstract

The Eastern Ghats of Andhra Pradesh harbor rich floristic diversity that supports the subsistence, nutrition, and healthcare needs of indigenous communities. The present study documents the diversity and ethnobotanical significance of wild edible plants used by tribal communities of the Rampachodavaram Forest Division in the Alluri Sitarama Raju District. Ethnobotanical data were collected through repeated field visits, semi-structured interviews, free listing, guided field walks, and voucher specimen collection for taxonomic authentication. A total of 50 wild edible plant species belonging to 44 genera and 27 families were recorded. Amaranthaceae and Fabaceae emerged as the dominant families, reflecting their ecological adaptability and nutritional importance. Habit-wise analysis revealed the predominance of herbs (44%), followed by trees (28%), climbers (18%), and shrubs (10%). Leaves constituted the most commonly consumed plant part (46%), followed by fruits (22%), tubers/corms (20%), seeds (8%), and flowers or young shoots (4%). Most species were consumed in cooked form, while fruits were often eaten raw. Seasonal availability of wild edibles ensures year-round dietary supplementation and plays a crucial role in food security during lean agricultural periods. Several species exhibited dual food and medicinal roles, highlighting the integrated nature of traditional food and healthcare systems. Despite their significance, many wild edible plants face threats from habitat degradation and erosion of indigenous knowledge. The study emphasizes the need for systematic documentation, sustainable harvesting, and community-based conservation to ensure long-term utilization and conservation of these valuable bioresources. The findings provide baseline data for future ethnobotanical, nutritional, and conservation-oriented research in the Eastern Ghats region.

Key word: Wild edible plants; Ethnobotany; Tribal communities; Eastern Ghats; Rampachodavaram Forest Division

Diversity of Monocot Flora of Vizianagaram District, Andhra Pradesh, India

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Abstract

Monocotyledons (monocots) represent a major clade of angiosperms with significant ecological, economic, and cultural importance. This study examines the monocot flora of Vizianagaram District, situated in the Eastern Ghats region of Andhra Pradesh, India. While comprehensive district flora lists specifically for monocots are limited, broader floristic data for Andhra Pradesh and vegetation surveys indicate the presence of diverse monocot families, including Amarillydaceae (Amaryllids) Araceae (Aroids), Arecaceae (palms), Bambusoideae (bamboos), Cyperaceae (sedges), Hydrocharitaceae (Hydrophytes), Orchidaceae (orchids), Poaceae (grasses), Zingiberaceae (Gingers) and other herbaceous taxa. The paper integrates regional vegetation patterns, habitat variation, and representative monocot taxa to highlight diversity, distribution, and eco and ecological significance. Findings emphasize the need for systematic field surveys to document local monocot diversity accurately and underscore conservation priorities within the district's varied habitats.

Keywords: Andhra Pradesh, Biodiversity, Eastern Ghats, Monocots, Orchidaceae, Poaceae, Vizianagaram flora.

Biodiversity Credits: A New Market Mechanism for Sustainable Business Growth

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Abstract

Biodiversity loss has emerged as one of the most critical global challenges of the twenty-first century, directly threatening ecosystem stability, economic resilience, and long-term business sustainability. Traditional regulatory approaches and voluntary corporate social responsibility initiatives have proven insufficient to halt biodiversity degradation at scale. In response, market-based instruments are increasingly being explored as innovative tools to align economic incentives with conservation outcomes. Among these instruments, biodiversity credits represent a promising mechanism for integrating biodiversity conservation into mainstream economic and commercial systems. This paper examines biodiversity credits as a novel market mechanism capable of promoting sustainable business growth while contributing to global biodiversity conservation goals.

Biodiversity credits function as tradable units that represent measurable and verified positive biodiversity outcomes, such as habitat restoration, species protection, or ecosystem enhancement. Businesses that generate biodiversity impacts through their operations can purchase these credits to offset residual ecological damage or proactively invest in nature-positive outcomes. Unlike traditional conservation funding or philanthropy, biodiversity credits create a structured market that monetizes biodiversity value, enabling conservation activities to attract private investment and scale effectively.

The paper explores the economic rationale underpinning biodiversity credit markets, drawing on theories of externalities, natural capital valuation, and market-based environmental governance. Biodiversity loss is framed as a negative externality resulting from economic activity, while biodiversity credits internalize this externality by assigning economic value to conservation outcomes. By embedding biodiversity considerations into corporate decision-making, credits incentivize firms to reduce ecological risks, strengthen supply chain resilience, and align with emerging sustainability regulations and investor expectations.

The study further analyzes how biodiversity credits can contribute to sustainable business growth. Companies engaging in biodiversity credit markets may benefit from enhanced corporate reputation, improved access to sustainable finance, regulatory risk mitigation, and long-term operational stability. For sectors highly dependent on ecosystem services—such as agriculture, forestry, mining, infrastructure, and tourism—biodiversity credits offer a strategic pathway to manage nature-related risks while supporting economic competitiveness.

However, the paper also critically evaluates the challenges associated with biodiversity credit implementation. These include measurement complexity, standardization of metrics, risks of greenwashing, governance limitations, and equity concerns for local and Indigenous communities. Effective biodiversity credit systems require robust monitoring, reporting, and verification frameworks, transparent governance structures, and strong safeguards to ensure ecological integrity and social inclusion.

The paper concludes that biodiversity credits have the potential to become a transformative market mechanism that bridges the gap between conservation and commerce. When designed and governed effectively, biodiversity credit markets can mobilize private capital at scale, support sustainable business growth, and contribute meaningfully to global biodiversity targets. Policy support, scientific rigor, and ethical governance will be essential to realizing this potential and ensuring that biodiversity credits deliver genuine, long-term environmental and economic benefits.

Endemic and Threatened Species: Conservation Challenges and Strategic Interventions — A Review

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Abstract

Endemic species represent unique evolutionary lineages and contribute disproportionately to global biodiversity; however, their restricted geographic ranges make them highly vulnerable to extinction. A large proportion of

endemic taxa are currently classified as threatened due to accelerating anthropogenic pressures and environmental change. This review synthesizes peer-reviewed literature from Scopus-indexed journals to examine the major conservation challenges facing endemic and threatened species and to evaluate strategic interventions implemented across diverse ecosystems. The review highlights habitat loss and fragmentation, climate change, invasive alien species, overexploitation, and genetic erosion as the primary drivers of population decline and extinction risk. Patterns of endemism and threat status reveal that biodiversity hotspots and island ecosystems are particularly vulnerable, with plants, amphibians, and reptiles exhibiting high levels of endangerment. Current conservation strategies, including in situ and ex situ approaches, community-based conservation, policy frameworks, and emerging technological tools such as remote sensing, molecular techniques, and artificial intelligence, are critically assessed. While protected areas remain central to conservation efforts, their effectiveness depends on integrative management, stakeholder participation, and adaptive governance. The review further identifies key research gaps, including taxonomic and geographic biases, limited long-term monitoring, and inadequate integration of climate resilience into conservation planning. It concludes that conserving endemic and threatened species requires coordinated, interdisciplinary, and evidence-based interventions that align scientific innovation with policy implementation and local community engagement to ensure long-term biodiversity persistence.

Keywords: Endemic species; Threatened species; Biodiversity conservation; Conservation challenges; Habitat loss; Climate change; Invasive alien species; In situ and ex situ conservation; Community-based conservation; Conservation policy

CONSERVATION POTENTIAL OF TELANGANA BOTANICAL GARDEN, JADCHERLA, TELANGANA.

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Abstract

Telangana Botanical Garden (TBG) was established in 2020 at Dr. Burgula Ramakrishna Rao Government Degree College, Jadcherla, Mahabubnagar District, Telangana with a unique idea and shape. The garden was established in 6.5 acres in the college premises. Out of 6.5 acre, 3 acres are in the shape of the geographical map of Telangana State with demarcation of 33 districts. A total of 6500 saplings belonging to 827 species were planted and conserving in the garden. Among them around 130 species are medicinally important, 20 palm trees, 70 ornamentals, 153 indigenous trees, 10 threatened species, 10 Endemic species, 10 Gymnosperms, 10 species of spices. Threatened species viz. Albizia thompsonii, Cycas beddomei, Decalepis hamiltonii, Eriolaena lushingtonii, Hildgardia populifolia, Pterocarpus santalinus endemic plants such as Andrographis nallamalayana, Brachystelma nallamalayanum, B. bilobatum, Ceropegia spiralis, Caralluma indica, C. stelagmifera, C. umbellata, C. diffusa, Euphorbia telanganense, Pancratium bramarambae and P. telanganense are being conserved in the garden. These seedlings and saplings were collected from Eastern Ghats especially Nallamalais of Andhra Pradesh and Telangana.

Presently a total of 153 indigenous tree species of Eastern Ghats are conserving in the garden and also 2000 saplings of indigenous trees like Careya arborea, Syzygium cumini (wild population), Strychnos nux-vomica, Saraca asoca are maintaining in the garden. So far, a total of 800 saplings of medicinal plants like Aloe vera, Ocimum tenuiflorum, Withania somnifera, Costus pictus etc are conserving in the garden. To create awareness among the public towards biodiversity conservation, Butterfly Garden, Rasi Vanam, Nakshatra Vanam, Sacred Forest, Kartheeka Vanam, Pancha Vatavanam, timber yielding plants, Gum yielding parts, wild edible plants, wild ornamentals and fruits sections were established in the garden. A total of 28 orchids and 152 cactus species are protecting in the garden.

The present paper dealt with the Telangana Botanical Garden capacity of conservation and rehabilitation of indigenous, endemic and threatened plant species.

Conservation of Endemic and Threatened Species

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Abstract:

Endemic and threatened species face a high risk of extinction due to their limited geographic range and increasing human-induced pressures. Habitat destruction, climate change, pollution, invasive species, and overexploitation are major factors responsible for their decline. Conserving these species is essential for maintaining ecosystem stability and preserving unique genetic diversity.

Conservation measures focus on protecting natural habitats, restoring degraded ecosystems, and applying species-specific management strategies. In-situ conservation plays a key role by safeguarding species within their natural environments, while ex-situ methods such as captive breeding, seed banks, and gene conservation provide support when populations are critically reduced. Scientific research and regular monitoring help improve conservation planning and effectiveness.

Protected areas and habitat corridors reduce population isolation and enhance species survival. Community participation and awareness programs promote sustainable practices and minimize threats to wildlife. Strong conservation policies and cooperation at national and international levels further strengthen protection efforts. An integrated approach combining habitat protection, restoration, scientific management, and public involvement is essential for the long-term survival of endemic and threatened species.

Plant polyphenols and antiaging properties to slow down senescence: Profiling biodiversity of Southern India for novel source of Senolytic compounds

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Abstract

Senescence is hallmark of human diseases where metabolic functions of cell/s become impaired partially and completely. Senescence is natural process for any living organism including cell/s. it has been reported that the cells underway to aging there are discrete changes in energy homeostasis, cellular communication, repair mechanisms, and secretary system etc. In consequence to the failed energy homeostasis cell force to opt alternate mechanism to fulfill energy requirement that results in production of bioactive (toxic) metabolites further damage the cell/tissue. It became imperative reengineer the cellular energy optimize to fulfill the energy need and normal functions. There are several approaches to reset the cellular energy homeostasis focusing on the external administration of bioactive molecules. Plant based secondary metabolites showed tremendous scope in reshaping cellular metabolism as nutraceuticals. In this category, plant polyphenols demonstrated antiaging properties via different mechanism including antioxidant properties. Southern India rich in the plant biodiversity where naturally occurring phytochemicals with promising bioactive effects are Quercetin and its derivatives. it has been thoroughly studied for its antidiabetic, anti-inflammatory, antioxidant, antibacterial, anti-Alzheimer's, anti-arthritic, cardiovascular, and wound-healing properties. Its anticancer activity against various cancer cell lines has also recently been revealed. The majority of the Western diet contains Quercetin and its derivatives, therefore consuming them as part of a meal or as a food supplement may be sufficient for people to take advantage of their preventive effects. Plants are ideal and potential source of polyphenols including Quercetin offer a wide range of biological activity.

Keywords: Senescence, antiaging, plant secondary metabolites, polyphenols, quercetins and energy homeostasis.

Chemical Constituents and Medicinal Applications of Aloe vera and Amla

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Abstract

Aloe vera is one of the oldest and most widely used medicinal plants, valued for its extensive health and skincare benefits. It is well known for soothing burns, skin irritations, cuts, insect bites, itching, and swelling due to its bactericidal and healing properties. Aloe vera also helps slow the appearance of wrinkles, repairs damaged skin cells, and acts as a detoxifier, antiseptic,and nervous system tonic. Additionally, it supports immunity, has antiviral properties, and improves digestion when included in the diet. Aloe vera gel is nutritionally rich, containing vitamins A, B-group (including B12), C, E, folic acid, and most essential amino acids required by the human body.

Amla (Emblica officinalis), also known as amalaki in Sanskrit, is a key plant in Ayurveda and is widely used in Indian medicine to boost immunity and treat various diseases. Research indicates that amla and its phytochemicals—such as gallic acid, ellagic acid, and pyrogallol—possess strong anti-inflammatory and anti-aging properties. It is an excellent natural source of vitamin C and contains beneficial compounds like alkaloids, tannins, and flavonoids. Amla is used to treat conditions such as peptic ulcers and acid reflux and is processed into various value-added products, with drying commonly used to enhance shelf life and ease of distribution.

Key words: Aloe Vera, Nervous System, Immune-Boosting, Anti-Viral Properties. Skin Healer. Amla, Chemical constituents, Methods, benefits.

Assessing Toxicity of Heavy metals: Arsenic, Copper, Iron and Lead using Allium cepa Bioassay

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Abstract

Allium cepa is one of the angiosperms used as an appropriate genetic model to evaluate the toxic effect of various environmental mutagens by

monitoring DNA damages like chromosomal abnormalities. This study was aimed to assess the toxicity of arsenic, copper, iron, lead using A. cepa bioassay. All heavy metals induced dose dependent affect with various types of chromosomal aberrations including chromosome break, chromosome bridge, vagrant, multipolarity, c-mitosis, stickiness, binucleated cell, double anaphase and delayed anaphase. Each dose of lead, arsenic and copper caused severe toxic effects on A. cepa cells with highest mitotic inhibition and abnormalities % and the strongest toxic effect was observed at the dose level of 20 mgL^{-1} lead treatment. Iron exhibited less toxic effect compared to other heavy metals. Iron exhibited less toxic effect compared to other heavy metals. Order of toxicity: Lead > Arsenic > Copper > Iron.

Keywords: Allium cepa, heavy metals, mitotic index, chromosomal aberrations, toxicity.

Investigating the Use of Herbal Remedies for Treating Cancer: A Comprehensive study of Ethnomedicinal Knowledge and Scientific Findings

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Abstract

Cancer remains a significant global public health concern, ranking as the second leading cause of death worldwide after cardiac disorders. With the limitations of conventional therapies and the serious side effects of chemotherapy, there is an increasing need for alternative treatments. Throughout history, medicinal plants have been utilized for their healing properties in various diseases, including cancer. Natural products derived from

plants play a crucial role in the fight against cancer and provide valuable resources for the development and testing of new therapeutic agents. The bioactive secondary phytochemicals found in medicinal plants, such as alkaloids, phenolics, flavonoids, carotenoids, and other secondary metabolites, have shown promise in the discovery and development of anticancer drugs. These therapeutic plants and their constituents exhibit anti-cancer effects through various mechanisms, including the induction of apoptosis, scavenging of free radicals, antioxidant effects, inhibition of angiogenesis, and cell cycle arrest. This study provides an overview of potential therapeutic plants, highlighting their pharmacological effects and mechanisms of action in combating cancer. By exploring the medicinal properties of these plants and their bioactive compounds, researchers aim to uncover new avenues for the treatment of cancer and improve patient outcomes.

Key words: Medicinal Plants, Anticancer Agent, secondary metabolites

A Comprehensive Study of Medicinal Plants with Antidiabetic Properties

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Abstract:

This study focuses on the use of Indian herbal drugs and plants in treating diabetes, particularly in India. Diabetes is a significant health issue affecting people from all walks of life in various countries, and it is a major cause of death and disability worldwide. Natural products derived from medicinal plants, whether as pure compounds or standardized extracts, offer immense potential for discovering new drug candidates due to the vast chemical

diversity they provide. With the rising demand for chemical diversity in drug discovery efforts focusing on natural products, interest in edible plants has increased globally. Botanicals and herbal preparations used for medicinal purposes contain a wide range of bioactive compounds. Phytochemicals isolated from medicinal plants present a promising opportunity for developing novel therapeutics for diabetes mellitus. Among the most common phytochemical groups found in these plants are alkaloids, glycosides, polysaccharides, and phenolics such as flavonoids, terpenoids, and steroids. Some examples of these medicinal plants include Allium sativum, Eugenia jambolana, Ocimum sanctum, Momordica charantia, ginger,, Pimpinella tirupatiensis, Tinospora cordifolia, Trigonella foenum graecum, and Withania somnifera. Despite the fact that many plants are recommended, further pharmacological and chemical study is needed to fully understand the mechanism of hypoglycaemic action.

Keywords: Phytochemicals, diabetes, bioactive compounds, Natural products

Conserving Microbial Biodiversity to Enhance Nutrient Cycling under a Changing Climate

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Abstract

Ecosystem resilience and sustainable agricultural output are at risk due to the increasing disruption of soil nitrogen cycle mechanisms caused by climate change. Therefore, maintaining the local microbial biodiversity that controls nutrient transformation and uptake is essential for climate adaptation. This study assessed the contribution of microbial consortia obtained from forests to improving the efficiency of nitrogen cycling in rainfed agro-ecosystems. From evergreen, deciduous, and degraded forest soils, native isolates of Bacillus species, fluorescent pseudomonads, photosynthetic bacteria, and arbuscular mycorrhizal fungi were created into microbial consortia that

were compatible. Microbial inoculation considerably increased plant nutrient uptake when compared to uninoculated controls, according to a field evaluation conducted on rainfed wheat. At harvest, nitrogen uptake rose from 6.49 kg ha^{-1} in the control group to 29.23 kg ha^{-1} in treatments that received integrated nutrition management together with a liquid-based microbial consortia and potassium uptake significantly increased from 11.20 to 46.09 kg ha^{-1}, while phosphorus uptake varied from 2.32 to 12.21 kg ha^{-1}. Increased soil enzymatic activity, such as phosphatase, urease, and dehydrogenase, supported enhanced nitrogen absorption and suggested improved microbial-mediated nutrient transformation. The results show that maintaining functionally varied microbial communities improves soil resistance to climate stress and nutrient cycle mechanisms. In order to manage agro-ecosystems in a way that is both sustainable and climate-adaptive, this study emphasizes the conservation of microbial biodiversity.

Keywords: Microbial biodiversity; Nitrogen cycling; Climate adaptation; Soil enzymes; Sustainable agro-ecosystems.

Sociological and Technical barriers hindering the universal adoption of Biodiversity Informatics

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Abstract

Biodiversity informatics has emerged as a critical interdisciplinary field that integrates biological sciences with information and computational technologies to support large-scale biodiversity research, conservation planning, and environmental decision-making. Despite substantial advances in data standards, digital infrastructures, and global data-sharing initiatives, the

adoption of biodiversity informatics remains uneven across regions and research communities. This paper examines the underlying sociological and technical constraints that hinder the universal uptake of biodiversity informatics. Sociological barriers include disparities in computational skills, misaligned academic incentive structures, cultural resistance to open data practices, and concerns related to data ownership and ethical use. Technical challenges arise from inconsistent data quality, limited semantic interoperability, fragmented data infrastructures, and unequal access to computational resources. Through a critical synthesis of existing literature, this study highlights how these barriers are deeply interconnected and mutually reinforcing. The study further proposes an integrated socio-technical framework that emphasizes capacity building, incentive realignment, inclusive platform design, improved standardization, and equitable infrastructure development. By addressing both human and technological dimensions simultaneously, the proposed approach aims to foster broader participation, enhance data reuse, and support the long-term sustainability of biodiversity informatics initiatives. Overcoming these challenges is essential for enabling globally inclusive biodiversity knowledge systems capable of responding effectively to contemporary environmental and conservation challenges.

Keywords: Biodiversity Informatics, Sociotechnical Barriers, Data Interoperability, Open Biodiversity Data, Scientific Infrastructure.

Biodiversity Informatics and Technological Applications

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Abstract

Biodiversity informatics is an interdisciplinary field that integrates biological sciences with advanced information technology to collect, store,

analyze, and interpret biodiversity data. With global threats such as habitat loss, climate change, invasive species, and pollution, large-scale biodiversity data has become essential for conservation planning and environmental management. This field uses tools such as species databases, Geographic Information Systems (GIS), remote sensing, DNA barcoding, molecular informatics, artificial intelligence, and ecological modelling. Technological applications—including automated species identification, cloud-based ecological analysis, predictive modelling, and conservation planning software—significantly improve biodiversity assessment and decision-making. This paper discusses the scope, importance, tools, challenges, and future directions of biodiversity informatics, emphasizing its vital role in supporting global biodiversity conservation and sustainable resource management.

Impacts of Agrochemicals on Ecosystems and Biodiversity: A Chemistry Perspective

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Abstract

The widespread use of chemical fertilizers, insecticides, pesticides, and germicides has played a major role in increasing agricultural productivity since the mid-20th century. However, growing scientific evidence indicates that excessive and indiscriminate application of these agrochemicals poses serious risks to ecosystems and biodiversity. From a chemistry research perspective, this paper critically examines the chemical nature, environmental fate, and ecological impacts of major agrochemicals. It synthesizes evidence from reputed peer-reviewed journals and trusted scientific reports to explain how nutrient runoff, persistence of synthetic pesticides, bioaccumulation, and non-target toxicity contribute to soil degradation, water pollution, and biodiversity loss. The paper further evaluates sustainable alternatives, including green chemistry approaches, biofertilizers, biopesticides, and integrated nutrient and pest management systems. The study concludes that a transition

toward environmentally benign chemical practices is essential to safeguard ecosystem health while maintaining food security.

Keywords: Agrochemicals, biodiversity loss, ecosystem, toxicity, pesticides, fertilizers, green chemistry, sustainability etc.,

Climate Change and Ecosystems: Impacts, Adaptation, and Conservation Strategies with Special Reference to India

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Abstract

Climate change represents one of the most profound environmental challenges of the twenty-first century, exerting wide-ranging impacts on natural ecosystems and the services they provide to human societies. Rising global temperatures, changing precipitation patterns, sea-level rise, ocean acidification, and the increasing frequency of extreme weather events are altering terrestrial, freshwater, marine, and polar ecosystems worldwide. India, owing to its vast geographical diversity and climatic variability, is particularly vulnerable to these changes. This paper examines the causes and characteristics of climate change and analyses its impacts on ecosystems at global and national levels, with special emphasis on Indian ecosystems such as the Himalayas, forests, wetlands, rivers, coastal zones, mangroves, and coral reefs. Recent Indian case studies, policy responses, and ecosystem-based adaptation strategies are discussed to highlight both challenges and opportunities. The study emphasizes that protecting ecosystems is essential not only for biodiversity conservation but also for sustainable development, climate resilience, and human well-being. An integrated approach combining mitigation, adaptation, scientific research, community participation, and effective governance is necessary to safeguard ecosystems in a changing climate.

Keywords: Climate change, ecosystems, biodiversity, India, adaptation, mitigation, conservation

Biodiversity Informatics and Technological Applications

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Abstract:

Biodiversity informatics is an emerging interdisciplinary field that integrates biological science, information technology, data analytics, and geospatial tools to document, analyse, and conserve global biodiversity. Rapid advances in remote sensing, cloud computing, artificial intelligence, open-access databases, and molecular technologies have transformed how biological data are collected, curated, shared, and applied in decision-making. This paper reviews the conceptual foundations of biodiversity informatics and examines technological applications ranging from species occurrence databases and DNA barcoding to predictive modeling and ecosystem monitoring. The study highlights the importance of standardized data management, interoperability, FAIR data principles (Findable, Accessible, Interoperable, Reusable), and collaborative platforms for conservation planning. Key challenges—including data gaps, limited digitization, privacy and ethics, funding constraints, and capacity building—are discussed alongside opportunities for future innovation. The paper concludes that biodiversity informatics plays a critical role in sustainable development and environmental governance by supporting evidence-based policies and enhancing our ability to manage ecosystems in a rapidly changing world.

Keywords: geographical information systems - Remote sensors – Drones - Taxonomic informatics – CBD (Convention on Biological Diversity), SDGs (Sustainable Development Goals).

The Role of Traditional Knowledge in Biodiversity Management: Integrative Pathways for Sustainable Ecosystems

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Abstract:

Traditional ecological knowledge (TEK) encompasses the cumulative wisdom, practices, and beliefs developed by Indigenous and local communities through long-term interaction with their natural environments. As global biodiversity continues to decline due to habitat loss, climate change, and unsustainable resource extraction, there is increasing recognition that conventional scientific approaches alone are insufficient for holistic biodiversity management. This paper examines the conceptual foundations, empirical evidence, and operational mechanisms through which traditional knowledge contributes to the conservation, sustainable use, and restoration of biological diversity. Drawing on interdisciplinary literature and case studies from Asia, Africa, and Latin America, we identify key domains in which TEK enhances biodiversity outcomes—such as resource governance, species monitoring, agro ecological management, and cultural ecosystem services. We analyze the institutional challenges and power asymmetries that often hinder integration between traditional knowledge systems and formal environmental policy frameworks. The paper also assesses methodological approaches for ethical engagement with Indigenous communities, ensuring respect for intellectual property rights and benefit sharing consistent with the Convention on Biological Diversity. Our findings reveal that locally grounded knowledge systems frequently outperform conventional conservation strategies in maintaining ecosystem resilience, particularly where adaptive management, portfolio resource use, and social networks are strong. However, threats like globalization, socio-economic marginalization, and legal exclusion risk eroding these knowledge systems. To address these challenges, we propose a framework for co-production of knowledge that promotes equitable partnerships, reinforces customary governance structures, and supports hybrid knowledge platforms. We argue that meaningful integration of traditional

knowledge into biodiversity management not only supports environmental sustainability but also advances social justice, cultural identity, and community well-being. This paper concludes with policy recommendations targeted at researchers, governments, and multilateral institutions to operationalize traditional knowledge in biodiversity planning, monitoring, and governance.

Keywords: Traditional ecological knowledge, Biodiversity management, Indigenous knowledge, conservation policy, co-production, sustainability

Study On Biodiversity And Conservation Bairluty Division Of Nallamala Forest Area, Andhra Pradesh

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Abstract:

The state of Andhra Pradesh is located between latitudes 12°41' and 22°N and longitudes 77° and 84°40'E. The state's geographical area is 1,62,440.1 km2 , accounting for 5.13% of the country's landmass, and it has 974 km of coastline. The Nandyal Forest Division is in the south-eastern part of the Kurnool district. It is between140 53'58.56" and 150 40'58.08" N and 780 20'27.6" and 780 46'40.08" E in terms of latitude and longitude. The Division covers 2,600 km2, which is 14.73 percent of the total area of the district. Climate the average annual rainfall in this Division is around 914 millimeters, with most of the precipitation coming from the South-west monsoons, and the climate is typically dry, with temperatures ranging from 200 C to 400 C. Black cotton soil, alluvial soil, brown loamy soil, and red soil are the most common soil types Frequency, Abundance, Basal area of woody species, Relative Density, Relative Frequency, Relative Dominance and IVI. Phyto sociological structure of Tree Species The total number of each individual species, namely Trees (26), Shrubs (16), Herbs (23), and Climber (15) species, is found in Phyto sociological Analysis of the Nandyal Forest Division. Frequency of Tree Species 100.00, Density of Tree Species (8.3), Abundance of Tree Species (8.25), Basal Area of Tree Species (cm2) (283.53) Relative Density of Tree Species (10.71) (9.09), Relative Frequency of Tree Species (6.45), Relative

Dominance of Tree Species: (8.53), Importance Value Index (IVI) of Tree species: (22.13) (22.59) and Shrub Species Division contains the total number of each individual species, particularly Shrubs (16) species. Frequency of Shrub Species 100.00, Density of Shrub Species (100m2): (7.5), Abundance of Shrub Species (7.5), Basal Area of Shrub Species (cm2) (122.72), Relative Density of Shrub Species (10.10), Relative Frequency of Shrub Species (6.15), Relative Dominance of Shrub Species: (10.63), Importance Value Index (IVI) of Shrub species: (28.48) . Herb Species- Division contains the total number of each individual species, particularly herbs (23) species. Frequency of Herb Species 100.00, Density of Herb Species (4.0), Abundance of Herb Species: (6.67), Basal Area of Herb Species (cm2) (31.17), Relative Density of Herb Species (12.50 m2) Relative Frequency of Herb Species (7.69), Relative Dominance of Herb Species (25.20), Importance Value Index (IVI) of Herb species (38.05) and (28.16). Climbers Division: physiology: The total number of each individual species, namely Climber (15) species, are found. Frequency of Climbers: 100.00, Density of Climbers (3.5). Abundance of Climbers (5.0), Basal Area of Climbers: (59.45), Relative Density of Climbers (15.38), Relative Frequency of Climbers: (9.52), Relative Dominance of Climbers, Importance Value Index (IVI) (51.93)(34.12) Keywords: Nandyala Nallamala Forest, Frequency, Density, Abundance, Basal Area, Relative Density, Relative Frequency, Relative Dominance, Importance Value Index (IVI) . Nagarjunasagar Srisailam Tiger Reserve epitomizes a typical tropical dry and moist deciduous vegetation, characterized by hilly terrain with plateaus, ridges, gorges and deep valleys with an under growth of Bamboo and grass. NSTR is endowed with a rich floral diversity comprising of trees, shrubs, herbs and climbers. Around 1521 Angiosperm taxa spread over 149 families along with 29 species of grass and 353 species of medicinal plants have been documented. The faunal diversity documented in NSTR includes 50 species of mammals, 200 species of birds, 54 species of reptiles, 18 species of amphibians, 55 species of fishes, 89 species of butterflies, 57 species of moths, 45 species of beetles, 30 species of dragonflies and damselflies. Nagarjunasagar Srisailam Tiger Reserve supports a wide variety of animals, birds, insects, reptiles and amphibians.

Challenges and Strategies of the present Wildlife Conservation Management in the Global Scenario, Andhra prudish, India.

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Abstract:

Wild life refers to those fauna and flora grows and lives in the areas unindicted by human. It includes all domestic and wild organisms like animals, plants, fungi, bacteria and virus. Developing human civilization and over technologies are majorly impact on the wild life conservation. In the present context delves about the strategies related to wild life conservation management in the contemporary environmental crisis. It is major important factor for the balancing of ecosystem and the global ecological niche. The major challenges of wild life conservation consent of climatic change impact, habitat destruction and Ecological fragmentation, the threat of illegal wild life trade and poaching, the elemental effects of pollution, the introduction and spread of invasive species, illegal hunting along with indiscriminate anthropogenic activities. After investigation of my study identified the given challenges about the wild life threat:

- Increasing pandemic infections and diseases of the migratory birds and animals.
- Habitat loss and major deforestation at the high biodiversity regions for the development without fallow the conservation rules. (Wild life act 1972)
- Natural disasters like droughts, cyclones, earthquakes etc are major challenge to the present conservation sustainability may be cause to indiscriminate pollution.
- Over hunting and collection of the unique species of flora and fauna for experimental activities and illegal exports.

- Inorganic feticide (Agricultural) and industrial (wastes are causes to the aquatic life.
- Most fauna and flora was effected the life threat by the illegal mining without fallowing the National Green Tribunal rules.
- Environmental changes are majorly effecting on the wild life organisms life style such as Breeding, Flowering, Migration timings and disrupt species life cycles.

Note: The above reasons will not control in the future, it is not only effect to the wild life but also affect the humans feature.

Climate Change and Ecosystems

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Abstract :

Climate change is increasingly altering the structure, functioning, and stability of ecosystems across the globe. Anthropogenic greenhouse gas emissions have led to rising temperatures, shifts in rainfall patterns, ocean acidification, melting glaciers, and an increase in the frequency and intensity of extreme climatic events such as droughts, floods, cyclones, and heatwaves. These climatic changes exert significant pressure on terrestrial, freshwater, and marine ecosystems, affecting species composition, population dynamics, nutrient cycling, and ecosystem productivity. Many species are forced to migrate, adapt, or face extinction due to changes in habitat suitability and disrupted ecological interactions. Sensitive ecosystems such as coral reefs, mangroves, wetlands, forests, and polar regions are particularly vulnerable to climate-induced disturbances.

Climate change interacts with existing environmental stressors including deforestation, habitat fragmentation, invasive species, and pollution, thereby accelerating ecosystem degradation and biodiversity loss. The decline in ecosystem services such as carbon sequestration, water purification, soil fertility, and climate regulation poses serious threats to human livelihoods, food

security, and sustainable development. This study explores the multidimensional impacts of climate change on ecosystems, identifies key ecological indicators of change, and discusses adaptation and mitigation approaches such as ecosystem restoration, biodiversity conservation, and nature-based solutions. Strengthening ecosystem resilience through integrated management and policy interventions is essential to mitigate the adverse effects of climate change and to ensure ecological and socio-economic sustainability in the long term.

Keywords: Climate Change, Ecosystems, Biodiversity Loss, Global Warming, Ecosystem Services.

Climate Change–Driven Ecosystem Reorganization and Regime Shifts: Mechanisms, Thresholds, and Global Implications.

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Abstract

Climate change is fundamentally reorganizing ecosystems across the globe, altering species composition, ecosystem functioning, and long-term stability. This review synthesizes scientific advances from the past fifteen years on climate change–driven ecosystem reorganization and regime shifts, with a focus on the mechanisms, thresholds, and feedbacks that underpin nonlinear ecological responses. Rising temperatures, altered precipitation regimes, ocean warming and acidification, and increasing climate extremes are intensifying disturbance regimes and eroding ecosystem resilience across terrestrial, freshwater, and marine systems. These pressures are pushing many ecosystems

toward critical tipping points, beyond which abrupt and persistent transitions to alternative stable states may occur. Such regime shifts threaten biodiversity, disrupt biogeochemical cycles, and undermine ecosystem services essential for human well-being. This review further evaluates emerging approaches for detecting early warning signals, improving predictive capacity, and implementing resilience-based and adaptive management strategies. Understanding climate-driven ecosystem reorganization is crucial for anticipating irreversible ecological change and informing effective conservation and policy responses in an era of accelerating global change.

Conservation of Endemic and Threatened Plant Species of Andhra Pradesh

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Abstract

Andhra Pradesh (AP), a bio diverse state in south-eastern India, harbours a rich assemblage of endemic and threatened plant species — especially within the Eastern Ghats, coastal belts, and biosphere reserves. However, rapid habitat loss, land-use change, invasive species, and anthropogenic pressures have placed many of these species at risk. This paper examines the distribution and significance of endemic flora, identifies primary threats, and reviews conservation strategies and initiatives (both in-situ and ex-situ) aimed at safeguarding plant biodiversity in Andhra Pradesh. Integrating botanical surveys, regional conservation efforts, and emerging research, this work provides a comprehensive account of plant conservation challenges and opportunities in the state.

Key words: Conservation,Endemic,Threatened,Plant species of Andhra Pradesh

Conservation of Endemic and Threatened Species under Climate Change and Anthropogenic Pressures: Biodiversity Management with Special Reference to the Seshachalam Forest and the Tirumala–Tirupati Landscape

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Abstract

The Seshachalam Forest and Tirumala–Tirupati landscape in the Eastern Ghats of Andhra Pradesh, India, represents a critical biodiversity hotspot facing unprecedented pressures from climate change, rapid urbanization, industrialization, and intensive pilgrimage activities. This paper examines the synergistic impacts of these stressors on endemic and threatened species, with particular emphasis on the unique conservation challenges posed by sacred landscape management. Climate projections indicate potential habitat loss of 40-60% for rare, endangered, and threatened (RET) and endemic plant species, while anthropogenic pressures including urban expansion, industrial pollution, and annual pilgrim influx exceeding 30 million visitors to Tirumala Tirupati Devasthanams compound biodiversity threats. The paper synthesizes current scientific evidence on species vulnerability, habitat fragmentation, and ecosystem service degradation, while proposing integrated conservation strategies that balance ecological imperatives with socio-cultural realities. Key recommendations include climate-resilient landscape-level planning, regulation of urban-industrial growth near forest boundaries, sustainable pilgrimage management based on carrying capacity assessments, strengthened in-situ conservation, and enhanced community participation. The paper emphasizes the urgent need for integrated governance frameworks involving state forest departments, Tirumala Tirupati Devasthanams, urban planners, and local communities to ensure long-term biodiversity conservation in this ecologically significant yet anthropogenically stressed sacred landscape.

Keywords: Seshachalam Forest, Eastern Ghats, endemic species, climate change, pilgrimage ecology, sacred landscapes, biodiversity conservation, Tirumala Hills, anthropogenic pressures, integrated conservation management

Propagation Protocol for *Decalepis hamiltonii* (Nannari), an Endemic and Endangered Medicinal Climber of Peninsular India

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Abstract

Decalepis hamiltonii Wight & Arn. (Apocynaceae) is an endemic, endangered, and medicinally important climber distributed in the southern peninsular region of India. The aromatic tubers of this species possess numerous medicinal properties and are widely used in Ayurvedic formulations. They are also utilized in the preparation of the traditional health drink "Nannari," valued for its cooling effect during summer. Owing to its high medicinal and economic importance, the species has been severely overexploited, often harvested before attaining reproductive maturity, leading to poor natural regeneration. In addition, D. hamiltonii faces serious threats from habitat destruction, invasive species, agricultural expansion, and climate change, resulting in its categorization as Endangered in the IUCN Red List (2015). Seed germination studies of D. hamiltonii revealed low seed germination (13%) and poor seedling establishment (6%). Therefore, the present study aimed to enhance mass propagation through seed germination by evaluating the effect of pre-sowing treatments and identifying suitable growth media for seed germination and seedling development. Seeds were subjected to various pre-sowing treatments, including water, cow urine, hydrogen peroxide, sulphuric acid, and gibberellic acid (GA_3). Two growth media namely cocopeat and cocopeat + sand were tested. Cocopeat alone resulted in the highest germination percentage (70%) in untreated seeds, while cow-urine treatment

showed no germination. Soaking seeds in 0.4% sulphuric acid for 60 minutes produced an optimum germination rate of 65%. The results demonstrate that cocopeat is the most effective medium for seed germination, Sulphuric acid treatment significantly improves germination success, and water soaking enhances subsequent seedling growth. The developed protocol is suitable for large-scale propagation and *ex-situ* conservation, and may help mitigate the decline of natural populations.

Keywords: Apocynaceae, Endangered, Nannari, Peninsular India, seed germination

Major Climatic Effects on Ecosystems and Drivers of Climate Change: Research Gaps and Future Directions

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Abstract

Climate change represents one of the most significant drivers of ecosystem transformation in the 21st century, profoundly affecting the structure, function, and resilience of natural systems worldwide. Rising global temperatures are altering species distributions, disrupting phenology, and increasing the frequency and intensity of extreme events, including heatwaves, droughts, floods, and wildfires. Changes in precipitation patterns are reshaping freshwater availability, wetlands, and riverine ecosystems, while accelerating desertification in vulnerable regions. In marine environments, ocean warming, acidification, and deoxygenation contribute to coral bleaching, shifts in plankton communities, and declines in fisheries productivity. Cryospheric changes, including glacier retreat and permafrost thaw, are modifying hydrological cycles and releasing stored greenhouse gases, creating feedback

mechanisms that further intensify climate impacts. Biodiversity loss is emerging as a critical consequence, as many species are unable to adapt or migrate quickly enough to survive rapid environmental change. Ecosystem services essential for human wellbeing—including food production, carbon sequestration, water regulation, and coastal protection—are increasingly at risk. Understanding these major climatic impacts on ecosystems is crucial for developing effective adaptation, mitigation, and conservation strategies aimed at enhancing ecosystem resilience under a changing climate.

Keywords: Climate change, ecosystems, biodiversity loss, extreme events, ocean acidification, ecosystem services, resilience

A review on conservation of cancer curing Ethnomedicines of pandavula metta (near peddapuram) Kakinada district.AP,INDIA.

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Abstract:

Cancer is the world's most prevalent cause of death, accounting for roughly 10 million fatalities in 2020 and approximately 4,00,000 children are diagnosed with cancer annually . As reported by the international Agency for Research on Cancer (IARC), there were 17.0 million new cases and 16.3 million deaths from cancer. Medical breakthroughs to treat and prevent this disease are always in demand and attention towards plant-derived compounds reduces the risk of side effects compared to current chemotherapy treatments. Despite of these challenges, in this review, An ethno botanical survey conducted in the vicinity of pandavula metta (near peddapuram) of Kakinada district to conserve rare, endangered thretend cancer curing ethno drugs through quationaries among tribal and enlisted

Keywords. Ethnobotany, conserve, endangerd, ethnodrugs,cancer.

In Vitro Antifungal Activity of Selected Mangrove Leaf Extracts from Gilakaladindi, Andhra Pradesh, India

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Abstract:

Four mangrove medicinal plants viz., Bruguiera cylindrica, Excoecaria agallocha, Sesuvium portulacastrum and Avicennia marina were collected from the Mangrove forests of Gilakaladindi, Andhra Pradesh, India. The selected plant leaf extracts were screened for their antifungal activity. The mangrove plant leaves were first dried and crude extracts were made by using the Soxhlet extraction method. The extracts thus obtained were evaporated by using the rotary evaporator. Different solvents were used in the preparation of the crude extracts which are; Petroleum ether, water, Acetone, and Diethyl ether. These crude extracts were then evaluated for their antifungal activity through Disc Diffusion method and the diameters of the Zone of Inhibition were calculated. An antifungal agent, Streptomycin (300 mg/mg) was used as a positive control. The antifungal activity of the mangrove leaf extracts was tested against four strains of Fungi viz., Rhizopus, Mucor, Penicillium and Puccinea. In the study, it was found that, Bruguiera cylindrica showed great antifungal activity against Penicillium with 2.1 mm Zone of Inhibition through Petroleum ether extract and it showed the least the Zone of Inhibition against Puccinea (0.5 mm) in the aqueous leaf extract. Moderate antifungal activity was observed against Rhizopus and Mucor. Exocoecaria agallocha plant extract in petroleum ether against Rhizopus showed great inhibition (1.8 mm). The antifungal activity against Puccinea (0.5 mm) the least Zone of Inhibition. The Zones of Inhibition against Mucor and Penicillium were moderate. Sesuvium portulacastrum plant extract showed different antifungal activity in same solvent i.e., water. Sesuvium portulacastrum in water against Rhizopus showed greater Zone of Inhibition (1.7 mm), the antifungal activity against Puccinea showed 0.5mm Zone of Inhibition. Moderate antifungal activity was seen against Mucor and Penicillium. Avicennia marina plant extract made of diethyl ether and acetone

were separately tested against the Fungi, with diethyl ether leaf extract showing the highest Zone of Inhibition (1.4 mm) against Puccinea, and the smallest Zone of Inhibition (0.2 mm) against Acetone leaf extract. The crude extracts showed moderate effect on Rhizopus, Mucor and Penicillium. Overall, Bruguiera cylindrica has shown the highest Zone of Inhibition against the fungi than the rest of the Mangrove samples taken. It can also be concluded that, mangrove leaf extracts have the least antifungal effect on Puccinea.

Keywords: Mangrove leaf extracts, antifungal activity, Gilakaladindi, disc diffusion method, Bruguiera cylindrica, Excoecaria agallocha, Sesuvium portulacastrum, Avicennia marina, Zone of Inhibition, Rhizopus, Mucor, Penicillium, Puccinea.

Edaphic Stress responses

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Abstract

Edaphic stress refers to stress imposed on plants due to unfavourable soil conditions. Edaphic stress responses are the adaptive reactions of plants—physiological, morphological, and biochemical—that help them survive under such constraints. These stresses arise from soil related factors such as nutrient deficiency or toxicity, salinity, acidity or alkalinity, compaction, poor drainage, drought, or waterlogging. The soil profile plays a critical role in determining root penetration, moisture availability, and nutrient distribution, all of which influence plant stress responses. Soil is a dynamic natural body formed through the interaction of parent material, climate, organisms, topography, and time. It provides physical support, water, air, and nutrients essential for plant growth. The soil profile is made up of distinct horizons (O, A, B, C, and R) that reflect processes of soil formation and nutrient movement. The origin of soil is closely linked to the nature of parent rocks—igneous, sedimentary, or metamorphic—which influence soil texture, mineral composition, and fertility. Weathering processes, including physical disintegration, chemical decomposition, and

biological activity, transform rocks into soil material and initiate soil development. Edaphic stress responses are strongly related to soil formation processes and the factors affecting soil development. Climate controls moisture and temperature regimes, organisms influence organic matter content, topography affects drainage, and time determines soil maturity. Understanding the relationship between soil origin, formation, and edaphic stress responses is essential for sustainable soil management, crop productivity, and ecological balance.

Disease cure, Endangered and Rare Medicinal Plants

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Abstract

Medicinal plants are rich in secondary metabolites such as alkaloids, glycosides, coumarins, flavonoids, and steroids, which are potential sources of drugs. These plants have been used Traditionally to treat a wide range of diseases, including cough, fever, skin problems, and digestive disorders. Common medicinal plants like Turmeric, Neem, Tulsi, Ginger, and Aloe vera are widely used in home remedies and traditional medicine systems. Several medicinal plants. Endangered, including Sarpagandha, Jatamansi, Kuth, and Himalayan species, due to overexploitation and habitat loss. Rare medicinal plants, found in limited geographic areas, are at risk of extinction but are highly valued for their therapeutic properties, including treatment of cancer, diabetes, and heart diseases. The Indian system of medicine (ISM), which is predominantly plant-based, extensively utilizes native plants. India is home to approximately 2,000 species of medicinal plants and is a major exporter of these resources. It is estimated that raw materials and medicinal products worth around ₹86 crores are exported annually from India. Conservation of endangered and rare medicinal plants is essential to sustain traditional medicine and pharmaceutical industries.

Ethnozoological Importance of *Channa striata* in Traditional Medicine

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Abstract

Channa striata, is a freshwater murrel fish that belongs to Channidae family and is widely consumed in Southeast Asia. It is the state fish of Andhra Pradesh and Telangana states. It is commonly called "Korameenu" in the Telugu states. This fish is well known for its nutritional and therapeutic value in traditional medicine. Its biochemical composition with high quality proteins, bioactive peptides, essential amino acids such as glycine, arginine, glutamic acid, and polyunsaturated fatty acids like Arachidonic acid (AA), Eicosapentaenoic acid (EPA) Docosahexaenoic acid (DHA), is the reason for its pharmacological activities. Experimental studies proved that its extracts have wound healing, anti-inflammatory, anti-oxidant, anti-microbial, and analgesic properties. The C.striata fingerlings has been used as traditional fish medicine for a long time. Clinical investigations have also suggested its role as an adjunct therapy in tuberculosis, enhancing sputum conversion and nutritional recovery. Apart from systemic effects, its helps in healing post-partum wounds after caesarean delivery. Some studies also proved that its extracts have potential roles in cardiovascular protection, neuro regeneration, osteoarthritis management, and glycemic control in animal models. This review discusses on C. striata as a promising nutraceutical and therapeutic resource, emphasizing its ethnozoological importance in traditional medicine.

Keywords: Channa striata; ethnozoological; traditional medicine; nutraceuticals; pharmaceutical.

Abbreviations: AA-Arachidonic acid, EPA- Eicosapentaenoic acid, DHA-Docosahexaenoic acid.

"Government Policy Frameworks for Sustainable Conservation of Biodiversity in India's Eastern Ghats"

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Abstract

Climate change poses existential threats to biodiversity in India's Eastern Ghats, where rising temperatures, erratic monsoons, and habitat fragmentation endanger endemic species like the Indian gaur and red panda. This paper investigates policy frameworks for climate-resilient biodiversity conservation, adopting a political science approach to bridge ecological imperatives with governance challenges in Andhra Pradesh's Kakinada region. The objective is to evaluate the efficacy of existing regimes, including India's Biological Diversity Act (2002), the Convention on Biological Diversity (CBD), and Nationally Determined Contributions under the Paris Agreement. Methodologically, we employ doctrinal legal analysis, comparative case studies of conservation hotspots (e.g., Yeleswaram and Papikonda), and semi-structured interviews with 25 policymakers, NGOs, and local leaders conducted in 2025.Findings highlight systemic gaps: fragmented federal-state coordination, weak enforcement of community reserve protocols, and underutilization of Panchayati Raj Institutions for adaptive management. Successful models, such as community-led micro-reserves, demonstrate that integrating top-down climate finance with bottom-up participation yields 30% higher resilience metrics.We propose a "Climate-Biodiversity Governance Compact"—a multi-scalar policy architecture mandating joint task forces, incentivized local stewardship, and CBD-aligned monitoring. This framework ensures sustainable conservation, fostering equitable resilience amid global environmental flux. Policymakers must prioritize such reforms to safeguard biodiversity legacies for future generations.

Keywords: Biodiversity governance, climate resilience, Eastern Ghats, policy frameworks, federalism.

Green Gold Caused By Black Gold

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Abstract:

Forests, often referred to as Green Gold, are vital natural resources that support biodiversity, regulate climate, conserve soil, and sustain human livelihoods. In contrast, minerals such ascoal, petroleum, iron ore, and bauxite are termed Black Gold due to their significant economic value and contribution to industrial development. While mining plays a crucial role in economic growth, unregulated and excessive mining activities have emerged as one of the major causes of forest degradation worldwide. Mining operations lead to large-scalede forestation through land clearing, infrastructure development, and waste disposal. The yalso cause soil erosion, water and soil pollution, biodiversity loss, and increased carbon emissions, contributing to climate change. Regions such as the Amazon Basin, South east Asia, Africa, and several parts of India-including Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh, and Andhra Pradesh-have experienced severe environmental degradation due to mining. Effective management strategies such as strict enforcement of environmental laws, sustainable mining practices, land reclamation, satellite monitoring, and community participation are essential to mitigate these impacts. Balancing economic development with environmental conservation is critical to protecting forest ecosystems and ensuring sustainable development for future generations.

Keywords: Biodiversity Loss, Black Gold, Biodiversity Loss, Climate Change, Deforestation, Environmental, Forest Conservation, Green Gold, Sustainable Mining

Herbal Interventions in Parkinson's Disease: A Systematic study of Preclinical Studies

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Abstract:

Parkinson's disease (PD) is a neurological condition characterized by the degeneration of dopaminergic neurons, leading to decreased levels of dopamine. Physical symptoms of PD include resting tremors, stiffness, bradykinesia or akinesia, instability, and freezing. Damage to the substantia nigra (SN) and other brain regions is associated with PD. Reactive oxygen species (ROS) play a significant role, and oxidative stress may contribute to the disorder. Herbal treatments containing active components with antioxidant properties have shown promise in managing PD. This study focuses on the pathogenesis of Parkinson's disease and explores the potential benefits of various herbal extracts in its treatment. The chemical components present in herbs such as Mucuna pruriens, Centella asiatica, Bacopa monnieri, Cinnamomum verum , Sida cordifolia, Juglandis semen, Camellia sinensis, Curcuma longa, and Withania somnifera are discussed. The findings of this review may inform future drug development for more effective treatments of Parkinson's disease.

Key words: Parkinson's disease, Neurodegenerative diseases, Medicinal plants, Antioxidant activity

Impact of Climate Change on Medicinal Plant Diversity and Its Implications for the Pharmaceutical Industry

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Abstract

Climate change has emerged as one of the most critical global challenges, significantly affecting ecosystems, biodiversity, and natural

resources. Medicinal plants, which form the foundation of traditional medicine systems and contribute extensively to modern pharmaceutical development, are highly sensitive to climatic variations. Changes in temperature, precipitation patterns, atmospheric carbon dioxide concentration, and the increased frequency of extreme climatic events influence the growth, distribution, productivity, and phytochemical composition of medicinal plants. These climatic stresses may result in reduced availability of medicinal plant raw materials, inconsistency in bioactive compounds, and loss of valuable genetic diversity. Such impacts present serious challenges to the pharmaceutical industry, particularly in drug discovery, quality assurance, standardization, and supply chain sustainability. This paper reviews the impact of climate change on medicinal plant diversity and discusses its implications for the pharmaceutical industry. Furthermore, the importance of conservation strategies and adaptive approaches to ensure sustainable utilization of medicinal plant resources is emphasized.

Keywords Climate change; Medicinal plants; Biodiversity; Phytochemicals; Pharmaceutical industry; Conservation

Integrating Policies and Local Engagement For Heavy Metal Pollution Control in Kolleru Lake Under Climate Shifts

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Abstract

Kolleru Lake situated in Andhra Pradesh, India, stands as an essential Ramsar-listed wetland, fostering a diverse array of migratory avian species, aquatic life, and economic activities for nearby residents. Yet, human-induced factors such as pesticide-laden runoff from farms, discharges from fish farming, and the spread of toxins during floods, worsened by shifting weather patterns, have caused substantial buildup of heavy metals. This issue peaked during the enigmatic health crisis in Eluru in 2020, impacting more than 545 people who suffered from nerve-related issues tied to organophosphate compounds like Triazophos, along with metals including lead and nickel found in fluids and

tissues. Our research delves into regulatory structures based on India's Wildlife Protection Act of 1972 and the Ramsar agreement, combined with grassroots involvement in preservation activities, to combat the decline in natural diversity amid evolving environmental conditions. By conducting an in-depth examination of documents from key institutions (such as AIIMS-All India Institute of Medical Sciences, NEERI-National Environmental Engineering Research Institute, and ICMR- Indian Council of Medical Research) and recent scholarly works, we explore the origins of pollutants, their effects on communities, and analyses of lingering traces. Findings highlight varied concentrations of heavy metals in the lake's waters (for instance, Cr ranging from 4.5 to 80 µg/L, Mn from 1 to 313 µg/L), where seasonal inundations heighten the movement of substances from farming chemicals and extraction operations. Quantitative evaluations show increased dangers, featuring hazard indices under 1, though cancer-related threats from Cr surpass USEPA limits (0.00154 for mature individuals). The discourse points out deficiencies in regulatory application and the importance of locally managed oversight in places like Kaikaluru and Eluru. In summary, we stress the necessity for unified strategies to bolster ecosystem durability, suggesting tougher controls on agrochemicals, structures resistant to overflows, and greater local input. This approach provides a blueprint for safeguarding marshlands facing climatic pressures, encouraging balanced growth in areas prone to toxins.

Keywords: Ecosystem preservation, Weather variability, Toxic metals, Kolleru wetland, Regulatory structures, Grassroots involvement.

Traditional ethnoveterinary medicinal plants used to treat cattle ailments in YSR Kadapa District, Andhra Pradesh, India

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Abstract

An ethnoveterinary survey was conducted in selected rural and tribal villages of Kadapa district, Andhra Pradesh, India, to document traditional

medicinal plants used in the treatment of various cattle ailments. Primary data were collected through semi-structured interviews, group discussions, and field observations involving local livestock rearers, traditional healers, and elderly informants. The study documented 46 medicinal plant species belonging to 39 genera and 28 families, used for treating 16 different cattle ailments, including digestive disorders, wounds, fractures, fever, mastitis, parasitic infections, respiratory problems, and reproductive disorders. The families Fabaceae (6 species), Euphorbiaceae (4 species), and Lamiaceae (3 species) were dominant. Analysis of plant habits revealed that herbs (40%) were the most frequently used, followed by trees (31%), shrubs (20%), and climbers (9%). Among plant parts utilized, leaves (46%) were most commonly employed, followed by roots (22%), bark (14%), seeds (10%), and whole plants (8%). Remedies were predominantly prepared as pastes (38%), decoctions (29%), powders (21%), and raw formulations (12%), administered either orally or topically. Gastrointestinal ailments accounted for the highest proportion of treatments (27%), followed by skin-related problems (22%) and musculoskeletal disorders (18%). The continued reliance on ethnoveterinary practices is driven by cost-effectiveness, ease of preparation, and limited access to modern veterinary healthcare. The results highlight the rich indigenous knowledge base in Kadapa district and emphasize the urgent need for scientific validation, conservation of medicinal plant resources, and integration of effective traditional practices into sustainable livestock healthcare systems.

Keywords: Traditional medicinal plants,

Living Jewels of the Earth

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Abstract

The Earth is richly adorned with living jewels in the form of its diverse flora and fauna, which together create the foundation of life on the planet. Flora includes all plant life such as forests, grasslands, flowering plants, and aquatic vegetation that provide oxygen, food, medicines, and raw materials essential

for survival. Fauna comprises a vast range of animals, birds, insects, and microorganisms that contribute to the beauty and vitality of nature. Together, flora and fauna maintain ecological balance and support interconnected life systems, making the Earth a vibrant and self-sustaining planet. Flora and fauna play a crucial role in regulating natural processes and sustaining biodiversity. Plants help control climate by absorbing carbon dioxide, preventing soil erosion, and supporting water cycles. Animals assist in pollination, seed dispersal, pest control, and nutrient recycling, ensuring the continuity of ecosystems. The interdependence between plant and animal life highlights the delicate balance of nature, where the survival of one species often depends on the existence of another. This harmonious relationship makes biodiversity one of the most valuable treasures of the Earth. Despite their importance, these living jewels face severe threats due to deforestation, habitat destruction, pollution, climate change, and overexploitation of natural resources. Human activities have led to the extinction of many species and continue to endanger countless others. Conserving flora and fauna through sustainable practices, wildlife protection laws, and environmental awareness is essential for preserving the Earth's natural wealth. Protecting these living jewels ensures ecological stability and a healthy future for generations to come.

Effects of Water Pollution and Industrial Effluents on Fish Diversity in the Godavari River.

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Abstract

The Godavari River, India's second-longest river supports rich freshwater and estuarine fish assemblages and sustains important inland and coastal fisheries. Over the last few decades, accelerated urbanization, industrialization, agricultural intensification and inadequate wastewater treatment across the basin have increased inputs of organic loads, nutrients, heavy metals and emerging contaminants (e.g., microplastics) — driving

spatially heterogeneous deterioration of water quality and habitat structure. This paper synthesizes peer-reviewed studies, government monitoring and basin-level assessments through 2025 to: (1) characterize pollution sources and gradients along the Godavari; (2) document evidence linking pollution and industrial effluents to changes in fish community composition and fisheries; (3) assess the state of heavy-metal contamination, bioaccumulation and the emerging microplastics problem; and (4) recommend prioritized monitoring and management actions. Results indicate consistent patterns: elevated biochemical oxygen demand (BOD) and chemical oxygen demand (COD) in urban/industrial stretches, recurrent low dissolved oxygen (DO) episodes, measurable concentrations of Pb, Cd, Cr and Ni in water and sediments near industrial outfalls, and the first basin-scale reports of microplastics in water, sediment and fish tissues (2024–2025). Biological surveys document reduced abundance of large-bodied and migratory fishes and increased prevalence of pollution-tolerant taxa in impacted stretches; the Gowthami–Godavari estuarine complex retains high species richness but exhibits local declines in threatened taxa (e.g., Wallago attu, Tenualosa toli). Addressing these trends requires coordinated basin-scale monitoring (chemical, sediment and tissue residue), strengthening and enforcing effluent treatment (STPs/CETPs), habitat protection/restoration (spawning grounds and mangrove nurseries) and fisher-inclusive management and livelihood support.

Keywords: Godavari River; water pollution; industrial effluents; fish diversity; heavy metals; microplastics; BOD/COD..

Mating Strategies And Courtship Behaviour Of Mud Crab Scylla Serrata (Forskal, 1775) Under Natural Vs. Captive Conditions.

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Abstract

The mud crab Scylla serrata is a highly valuable crustacean supporting coastal fisheries and aquaculture throughout the Indo-Pacific region. Understanding its mating strategies and courtship behaviour is essential for both sustainable wild harvest and the optimisation of hatchery based seed production. In natural mangrove estuarine habitats, S. serrata displays complex courtship, precopulatory guarding, and soft-shell mating associated with female pubertal moults, typically followed by offshore spawning migrations. In captivity, environmental confinement, altered sex ratios, stocking densities and husbandry practices (such as eyestalk ablation and controlled feeding) can significantly modify reproductive timing, mate choice, guarding duration and mating success. This review synthesises published information up to 2025 on sexual dimorphism, reproductive cycles, courtship displays, copulatory patterns, and post-copulatory behaviour of S. serrata, contrasting natural and captive conditions. We integrate insights from comparative studies on other Scylla species where behavioural details for S. serrata are limited, with special attention to the effects of sex ratio, stocking density, environmental cues and hormonal regulation on mating success and broodstock performance. Conceptual and summary data are presented in tables and figures, including timelines of courtship phases, comparative mating success under different culture regimes, and schematic photographs illustrating key mating postures. We highlight how captivity may shorten or disrupt courtship, alter male to male competition, facilitate interspecific mating, and change reproductive outputs such as spawning frequency and fecundity. The article concludes that a deeper ethological understanding of S. serrata including natural mate choice criteria, chemical signalling, and the interaction between endocrine status and environmental cues will be critical for refining broodstock management protocols and for developing ecosystem based management of mud-crab fisheries.

Keywords: Mud crab, Scylla serrata, courtship behavior, mating strategies, captive breeding, broodstock management, natural mangrove habitats.

Ecological Importance of Flora and Fauna Diversity in Biodiversity Maintenance

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Abstract

Biodiversity refers to the variety and variability of life forms on Earth, including flora, fauna, and microorganisms, and the ecosystems in which they exist. Flora and fauna diversity play a crucial role in maintaining ecological balance, ecosystem stability, and sustainable environmental processes. This review article synthesizes findings from selected research studies to examine patterns of flora and fauna diversity across different ecosystems, with particular emphasis on soil ecosystems, urban environments, and alpine aquatic systems. The reviewed studies highlight the importance of plant diversity in supporting faunal communities, the role of soil microorganisms in ecosystem functioning, and the unique adaptations of flora and fauna in extreme environments such as alpine waters. The analysis also identifies major threats to biodiversity, including habitat fragmentation, environmental degradation, and climate change. Based on the reviewed literature, this paper discusses research gaps and outlines future directions for biodiversity conservation and management. The review emphasizes the need for integrated conservation strategies to protect flora and fauna diversity for long-term ecosystem sustainability.

Native Medicinal Plants, Functional Foods, and Algae in Cancer Prevention and Therapy: Mechanistic Insights, Translational Challenges, and Nano-Enabled Opportunities

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Abstract

Cancer continues to be a major global health burden, accounting for high rates of illness and death despite substantial progress in diagnostic techniques and therapeutic interventions. Conventional cancer treatments are often limited by issues such as systemic toxicity, development of drug resistance, high economic burden, and restricted availability, highlighting the need for complementary, preventive, and more accessible strategies. Natural bioresources—including medicinal plants, edible vegetables and fruits, algae, aquatic flora, and wild forest species—represent an extensive and largely underexplored source of bioactive molecules with proven anti- cancer properties. The successful development of several modern anticancer drugs from natural origins underscores their scientific and clinical significance.

This review critically synthesizes existing evidence on bioactive compounds derived from plants and algae that exhibit anti-cancer activity. Key mechanisms discussed include induction of programmed cell death, suppression of uncontrolled cell proliferation, inhibition of angiogenesis and metastatic progression, modulation of immune responses, antioxidant protection, and chemo preventive effects. The review also addresses major challenges such as toxicity concerns, low bioavailability, variability in phytochemical composition, lack of standardization, and regulatory hurdles. Particular emphasis is placed on nano-based drug delivery systems as promising tools to enhance therapeutic efficacy, safety, and reproducibility. Ethical, legal, and regulatory considerations are examined in accordance with ICMR, UGC, and FDA guidelines. Overall, the review emphasizes that while effective treatments exist for many diseases, cancer requires integrated, multi-targeted therapeutic approaches, positioning natural bioresources as valuable candidates for future translational and preventive oncology research.

Floristic Analysis of the Nageswaraswamy Sacred Grove of Khajipeta Mandal, YSR Kadapa District, Andhra Pradesh, India

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Abstract

The present study deals with the floristic diversity of Nageswaraswamy Sacred grove of Khajipeta Mandal, YSR Kadapa District. It lies between $14^{o}40^{I}$ 8^{II} north latitude 78^{0} 47^{I} 57^{II} East longitude. It is situated in the Eastern Ghats of Andhra Pradesh. The average annual temperature varies between 31 °C in December and 46 °C in May. The average annual rainfall is 700mm. The type of forest in this area is a dry deciduous forest. A comprehensive floristic inventory in the study area of Nageshwara Swamy Sacred Grove yielded a total of 45 genera, 55 species, and 37 families. Among them, trees (44%) represent 24 species, 17 genera, and 13 families. Herbs (27%) represent 14 species,15 genera, and 12 families. Shrubs (18%) with 10 species, 8 genera, and 7 families. The climbers (9%) include 5 species, 5 genera, and 5 families. Only 1 parasite species was recorded.

In the sacred grove of Nageswaraswamy, among all families Euphorbiaceae is dominant family with 7 species, 4 genera, Fabaceae with 5 species, 5 genera, followed by Caesalpiniaceae with 4 species, 3 genera, Rubiaceae with 3 species 3 genera, Mimosaceae with 4 species,2 genera, Asclepiadaceae with 3 species, 2 genera, Moraceae with 3 species,1 genera. The other main contributing families are Amaranthaceae 2 Species, 2 genera, Apocyanacae 2 species, 2 genera, Asteraceae 2 species, 2 genera, Malvaceae 3

species,3 genera, Rubiaceae 2 species, 2 genera, Poaceae 2 species, 2 genera, Sapindaceae 2 species, 2 genera, Rhamnaceae 2 species, 2 genera and 13 other familes have only one species in each of them.

Keywords: Floristic analysis, Genera, Species, Families, Sacred grove

Palynomorphological diversity among some species of Acanthaceae belong to the state of Telangana

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Abstract

Palynomorph logical diversity among some species of Acanthaceae belong to the state of Telangana Devarinti Srihari Reddy Associate Professor of Botany Department of Botany, Government Degree College, Maheshwaram, Telangana. srihariacademic@gmail.com Abstract The family Acanthaceae belongs to the order Lamiales, which shows the most diverse pollen morphology among the taxa, a condition referred to as eurypalynous. Diversity in pollen morphological characteristics is a basis for taxonomic classification and identification of evolutionary relationships within the family. The Pollen morphology of the flora, which belongs to the Acanthaceae family, is distinct from many other families (Scotland, 1992), with the aperture morphology varying from bicolporate to tricolpate to tricolporate to pantoporate, shape from oblate spheroidal to spheroidal to prolate spheroidal to prolate, and the presence of pseudocolpi makes this family uniquIn the present work, the pollen morphology of 12 species of the family Acanthaceae, which belong to the state of Telangana, is described. Keywords: Diversity in Pollen morphology, Acanthaceae, Eurypalynous, Palynotaxonomy;

Physiological and Signaling Mechanisms Underpinning Plant Survival and Biodiversity under Climate Change

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Abstract

Climate change is intensifying the frequency and complexity of abiotic and biotic stresses experienced by plants, posing serious threats to global biodiversity and ecosystem stability. As sessile organisms, plants rely on finely tuned stress perception, signaling, and physiological adjustment mechanisms to survive under changing environmental conditions. This review synthesizes current knowledge on plant stress physiology, tracing responses from early stress signaling—mediated by reactive oxygen species, phytohormones, and transcription factors—to whole-plant physiological adaptations that determine survival, reproduction, and distribution. Particular emphasis is placed on multifactorial stress combinations, which elicit unique physiological and molecular responses distinct from single stresses. The chapter further highlights how physiological insights can be translated into practical biodiversity conservation strategies, including ex situ germplasm conservation, in situ habitat management, assisted migration, genetic and microbial interventions, and community-based restoration. By integrating mechanistic plant stress physiology with conservation planning, this review proposes a framework for enhancing plant resilience and supporting species persistence under ongoing and future climate change.

Keywords: Plant stress physiology; Climate change; Multifactorial stress combinations; Stress signalling pathways; Biodiversity conservation; Ecophysiology; Plant resilience; Species survival

Phyto Diversity Studies Of Sri Penusila Narasimha Wild Life Sanctuary, Andhra Pradesh

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Abstract

Penchalakona, a mountainous region and the highest point of Sri Penusila Narasimha Wildlife Sanctuary in the Eastern Ghats of Nellore district, Andhra Pradesh, harbors rich phyto diversity that plays a crucial role in the traditional healthcare systems of local tribal communities. The present phyto diversity study documents and analyzes the medicinal plant wealth of the Penchalakona Hills based on extensive field surveys and ethnobotanical investigations. A total of 361 medicinal plant taxa belonging to 283 genera and 89 families were recorded as being used in the treatment of various ailments. Habitat-wise analysis revealed that these taxa are well distributed across diverse ecological niches within the sanctuary. Life-form analysis showed predominant use of trees (135 species), followed by herbs (117), shrubs (75), climbers (33), and one partial stem parasite. The continued dependence of indigenous tribes on these plant resources highlights the ecological, medicinal, and cultural significance of the region's phytodiversity. The study emphasizes the need for conservation and sustainable utilization of this valuable plant wealth, as it represents both a biological heritage and a vital component of traditional knowledge systems.

Polyembryony in Syzygium salicifolium: A Novel Propagation Strategy for an Endemic Indian Tree Species

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Abstract

Polyembryony has been recorded for the first time in the seeds of Syzygium salicifolium (Wight) J. Graham commonly known as Kath Jamun, is an endemic tree species in India and belonging to the family Myrtaceae. This trait can be effectively utilized in nurseries to produce true-to-type seedlings. The expression of polyembryony is influenced by several factors, including environmental conditions. The aim of the present research was to evaluate the influence of different chemical treatments and soaking durations on the expression and rate of polyembryony in S. salicifolium seeds for rapid propagation of the species. To carry out this study, fresh seeds were collected from Western ghats of Maharashtra during monsoon season. The collected seeds were treated with five chemical treatments namely Thiourea, GA_3, KNO_3, H2O2 and normal water (control). Each treatment was applied under four soaking durations (12, 24, 48, and 72 hours). After soaking, the seeds were sown in germination clay pots under uniform nursery conditions, and the emerging seedlings were monitored to record the number of embryos per seed. Polyembryony percentage was calculated based on the proportion of seeds producing more than one seedling. The study revealed that thiourea showed the highest polyembryony rate, whereas normal water recorded the lowest. Additionally, prolonged soaking time was found to reduce the occurrence of polyembryony across treatments.

Keywords: Endemic, Myrtaceae, Polyembryony, Syzygium salicifolium, Ex-situ conservation

Hydrophytic Flora of Timmaraju Pond, Yeleswaram, Kakinada District, Andhra Pradesh, India: A Floristic Survey

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Abstract

The present study analyzes the hydrophytic flora of Timmaraju Pond, Yeleswaram, Kakinada District, Andhra Pradesh, India, with emphasis on species composition and ecological distribution. Field investigations recorded

a total of 28 hydrophytic species belonging to 24 genera and 16 families. Based on growth forms, the documented taxa were classified into emergent, submerged, free-floating, rooted floating, and amphibious hydrophytes. Among these, emergent hydrophytes were dominant (11 species; 39.3%), followed by submerged species (7 species; 25%), free-floating species (5 species; 17.9%), rooted floating species (3 species; 10.7%), and amphibious species (2 species; 7.1%). Family-wise analysis revealed the dominance of Cyperaceae and Poaceae, followed by Hydrocharitaceae, Araceae, and Pontederiaceae, indicating the prevalence of shallow littoral and marshy habitats. Genus- and species-level distribution suggested a higher representation of herbaceous taxa adapted to nutrient-rich and seasonally stable freshwater conditions. Submerged species played a significant role in oxygenation and nutrient cycling, while free-floating species were largely confined to eutrophic zones of the pond. The results demonstrate that Timmaraju Pond supports a diverse and functionally important assemblage of aquatic macrophytes, contributing to freshwater ecosystem stability. However, the dominance of certain fast-growing hydrophytes indicates early signs of nutrient enrichment. The present study provides baseline quantitative data essential for ecological monitoring, conservation planning, and sustainable management of freshwater bodies in the Yeleswaram region.

Keywords: Hydrophytic flora; Aquatic macrophytes; Species diversity; Freshwater pond; Timmaraju Pond; Yeleswaram; Andhra Pradesh.

Ex-situ Conservation and Propagation Protocol for Red Sanders, an Endemic and Endangered Tree of the Eastern Ghats, India

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Abstract

Pterocarpus santalinus L.f. commonly known as Red Sanders, is an Endemic and Endangered tree species restricted to the Southern Eastern Ghats of India, particularly in Andhra Pradesh. The species has a very limited

geographic range, with less than 5% of its original trees remaining in the wild. Historically, Red Sanders has been part of the international trade since the 16th century, when it was exported to Europe as a source of red dye. Overexploitation and illegal harvesting for its highly valued timber and dye have resulted in a population decline of approximately 50–80%. Restrictions on its harvest were first introduced in the 1920s, followed by additional national and international legislations aimed at preventing overexploitation. A recent study (2019) by the first author from Botanical Survey of India (BSI) revealed that only 2.19% of the wild population is of harvestable size, underscoring the species extreme vulnerability. Although listed under Appendix II of CITES, trade in Red Sanders is not completely prohibited, and illegal demand and supply continue to threaten its survival. At the state level, Andhra Pradesh has imposed stricter regulations; however, illicit trade persists. The species thrives on quartzite soil, in dry, hilly regions, often on rocky terrain. It is light-demanding tree and does not tolerate shade or waterlogging. Pollination is primarily carried out by bees; however, habitat loss and a tendency toward self-pollination result in low fruit set due to a high rate of seed abortion, thereby hindering natural regeneration. Although seed germination occurs soon after the rainy season, overall reproductive success remains low due to multiple limiting factors.

Whie working on the 'Ex-situ Conservation of Endemic and Threatened Plants of India', the Botanical Survey of India, AJC Bose Indian Botanic Garden, collected germplasm of P. santalinus from the Seshachalam Biosphere Reserve and conducted experiments to identify suitable propagation media and methods for large-scale production. Three different experiments were carried out, and the results indicated that sand is the most effective medium for seed germination and seedling growth. The highest germination rate (70%) was recorded when trimmed pods were soaked in water for 72 hours, followed by treatment with GA_3 (600 ppm) for 24 hours. In this treatment, 50% germination was achieved within less than 10 days, whereas in the control, 50% germination occurred only after 40 days. The developed propagation protocol provides an effective strategy for rapid and large-scale multiplication of this threatened

endemic species, facilitating ex situ conservation, population reinforcement, and restoration of declining natural populations.

Keywords: Andhra Pradesh, Endemic, Endangered, *Ex-situ* Conservation, Propagation Protocol

Role Of Artificial Intelligence (Ai) In Conservation Of Biodiversity In Future

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Abstract

Biodiversity conservation has become one of the most critical global challenges due to accelerating climate change, habitat destruction, and anthropological pressures. Traditional conservation methods often suffer from limitations related to scale, time, and accuracy. Artificial Intelligence (AI) has emerged as a powerful tool capable of transforming biodiversity conservation through automated species identification, predictive modelling, ecosystem monitoring, and decision-support systems. This paper examines the role of AI in biodiversity conservation, focusing on its current applications, methodologies, and future potential. Using a comprehensive literature review and case-based analysis, the study highlights how AI improves monitoring efficiency, enhances predictive accuracy, and supports evidence-based conservation planning. The results indicate that AI-driven approaches significantly outperform conventional methods in data processing and early threat detection. However, challenges such as data bias, ethical concerns, and unequal access to AI technologies remain. The paper concludes that while AI is not a replacement for ecological expertise, it is a vital complementary tool for achieving sustainable and scalable biodiversity conservation in the future.

Keywords: Artificial Intelligence, Biodiversity Conservation, Machine Learning, Ecosystem Monitoring, Sustainability

Winter blooming wild flora of Kakinada

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Abstract

Kakinada, a coastal city in Andhra Pradesh, India, is characterized by rich floral diversity shaped by its tropical climate and proximity to the Bay of Bengal. Winter is an ecologically significant season for several wild plant species, as many initiate flowering and reproductive activities during this period. The present study documents the winter-blooming wild flora of Kakinada with the aim of understanding their diversity, ecological roles, and potential applications. Thirteen wild and semi-wild species belonging to diverse families such as Fabaceae, Amaranthaceae, Verbenaceae, Lamiaceae, Solanaceae, Asteraceae, Poaceae, and Brassicaceae were recorded from varied habitats including roadsides, wetlands, agricultural fields, and disturbed urban areas.

These winter-flowering species play a crucial role in sustaining pollinators like bees and butterflies when floral resources are otherwise limited, thereby contributing to ecosystem stability and biodiversity conservation. Several documented taxa also possess medicinal, nutritional, aromatic, and agroforestry significance, highlighting their value in traditional medicine and sustainable agriculture. The study further emphasizes the adaptability of these species to coastal environmental conditions and their potential resilience to climate change and urban expansion. This documentation provides baseline information for future ecological, conservation, and phytochemical studies and supports the sustainable utilization and conservation of winter-blooming wild flora in coastal Andhra Pradesh.

Keywords: Winter-blooming flora; Wild plants; Coastal Andhra Pradesh; Kakinada; Biodiversity; Pollinators; Medicinal plants.

Ethnomedicinal Uses of Nyctanthes arbortristis: A Comprehensive Review of Traditional Medicine Systems and Contemporary Applications

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Abstract

Nyctanthes arbortristis Linn. (Oleaceae), commonly known as Night Jasmine, Parijat or Harsingar, is a sacred medicinal plant with extensive ethnobotanical significance across South and Southeast Asia. This review comprehensively examines the traditional uses of N. arbortristis in classical Indian medicine systems including Ayurveda, Siddha and Unani, its ethnomedicinal applications, phytochemical composition, pharmacological activities and contemporary commercial applications in pharmaceuticals and cosmetics. The plant has been traditionally employed for treating fever, arthritis, sciatica, malaria, skin disorders and various inflammatory conditions. Modern scientific research has validated many of these traditional uses through in-vitro and in-vivo studies, demonstrating anti-inflammatory, antipyretic, hepatoprotective, antimalarial and antioxidant properties. This review also highlights the current utilization of N. arbortristis in homeopathic medicines, herbal products and cosmetic formulations, emphasizing the bridge between traditional wisdom and modern therapeutic applications.

Keywords: Nyctanthes arbortristis, ethnomedicine, Ayurveda, Siddha, Unani, phytochemicals, pharmacological activities.

Survey of Home Remedies for Common Ailments in Lingamparthy Village, Yeleswaram Mandal, Kakinada District, Andhra Pradesh, India

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Abstract

A comprehensive survey was conducted in Lingamparthy village of Yeleswaram Mandal, Kakinada District, Andhra Pradesh, India, to document traditional home remedies used by the local population for various ailments. Home remedies are medicinal preparations made from readily available household ingredients such as spices, fruits, vegetables, and plant parts, often derived from knowledge passed down orally through generations. The study was carried out during the summer of 2021 through intensive field trips, interviews, and discussions with elder villagers, housewives, and knowledgeable informants. Collected information on plant usage, local names, parts used, method of preparation, and therapeutic applications was cross-verified and scientifically authenticated using standard literature including *Flora of Andhra Pradesh* (Pullaiah & Chennaiah, 1997), *Flora of East Godavari* (Rao et al., 1986), and *Weed Flora of North Coastal Andhra Pradesh* (Prayaga Murty, 2009). The study recorded 28 plant species belonging to 25 genera and 19 families that are traditionally employed in treating ailments such as wounds, cough, cold, fever, digestive disorders, diabetes, skin infections, earache, constipation, and jaundice. Among the families, Euphorbiaceae was the most dominant with five species, followed by Apiaceae and Myrtaceae (three species each), and Lamiaceae and Combretaceae (two species each). Analysis of plant parts used revealed that leaves (32%) and fruits (29%) were the most commonly utilized parts, followed by seeds, stems, flowers, whole plants, and rhizomes. Commonly used household ingredients such as honey, turmeric, ginger, garlic, and green tea were also documented for their therapeutic roles. The findings highlight the rich traditional knowledge of home remedies in Lingamparthy village and the need for further phytochemical and pharmacological studies to validate the medicinal properties of these plants. This documentation is essential for preserving indigenous knowledge and promoting sustainable use of medicinal flora for community healthcare.

Keywords: Home remedies, Ethnobotany, Medicinal plants, Lingamparthy village, Andhra Pradesh, Traditional knowledge.

Documentation of Ethnomedicinal Practices among Ethnic Groups of Vathangi Panchayat, Rajavommangi Mandal, Alluri Sitarama Raju District, Andhra Pradesh, India

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Abstract

An ethnobotanical investigation was conducted in Vathangi panchayathi of Rajavommangi Mandal, Alluriseetha Rama Raju District, Andhra Pradesh, India, to document traditional knowledge related to medicinal plants used by local tribal and rural communities. The study was based on extensive field surveys, personal interviews, and group discussions with traditional healers, elderly villagers, and knowledgeable informants. Ethnomedicinal data were collected following standard ethnobotanical methodologies, and each medicinal claim was cross-verified with multiple informants to ensure authenticity and reliability. Collected plant specimens were identified and authenticated using standard floristic literature. The present study documented 28 medicinal plant species belonging to 22 genera and 16 families, commonly used in local healthcare practices. The documented plants represent diverse families such as Euphorbiaceae, Apiaceae, Lamiaceae, Myrtaceae, Combretaceae, Fabaceae, and Amaranthaceae, indicating broad taxonomic representation and ethnomedicinal relevance.

Different plant parts including leaves, fruits, rhizomes, seeds, flowers, buds, wood, stem, oil, and whole plants were utilized for the preparation of herbal remedies. Among these, leaves and fruits were the most frequently used plant parts, followed by seeds and whole plants. Preparation methods varied and included pastes, powders, decoctions, juices, oils, and direct consumption, reflecting simplicity and accessibility of traditional practices. Remedies were administered both orally and externally, depending on the nature of the ailment.

The documented medicinal plants were primarily used to treat common health problems such as wounds, cough, cold, asthma, constipation, acidity, indigestion, diabetes, kidney stones, jaundice, skin diseases, earache, toothache, and hair-related disorders. Several species, including Curcuma longa, Azadirachta indica, Ocimum tenuiflorum, Aloe vera, and Phyllanthus emblica, were reported for multiple therapeutic applications, highlighting their importance in primary healthcare.

The study emphasizes the continued reliance on plant-based remedies for day-to-day health management and underscores the importance of documenting traditional medicinal knowledge for its conservation, pharmacological validation, and sustainable utilization. Such ethnobotanical documentation provides valuable baseline data for future research and community healthcare development.

Keywords: Medicinal plants; Traditional medicine; Ethnobotany; Plant-based remedies; Indigenous knowledge.

The genus Dichanthium P.Willemet (Poaceae: Andropoganae) in Telangana, India

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Abstract

Dichanthium P.Willemet is an important genus of perennial grasses belonging to the tribe Andropogoneae of the grass family Poaceae, commonly known as marvel grass. It plays a significant role in agriculture, ecology and rural livelihoods, especially in dry and semi-arid regions of India. The genus Dichanthium comprises about 20 species worldwide. In India, it is represented by 10 species, of which 06 species are endemic to the country. Dichanthium species, widely distributed in the semi-arid regions of Telangana state. Weather of the state is characterized by irregular rainfall, prolonged dry periods, and

predominantly rainfed agriculture, where sustainable fodder resources are crucial for livestock-based livelihoods. Dichanthium is well adapted to these agro-climatic conditions and grows successfully in natural grasslands, grazing fields, fallow lands, and degraded soils. The grass is highly palatable and nutritious, providing quality forage for cattle, sheep, and goats, particularly during the monsoon and early dry seasons. Its strong root system and dense ground cover help in soil conservation by reducing erosion and improving soil structure. In addition, Dichanthium shows good regeneration after grazing and cutting, making it suitable for permanent pastures and rangeland improvement programs. The low input requirement and drought tolerance of this grass make it economically viable for small and marginal farmers in Telangana. Thus, to understand the ecology of Dichanthium species, extensive field explorations were carried out in different habitats of Telangana state during the period 2019–2025. The present taxonomic investigation of the genus Dichanthium revealed the occurrence of five species in Telangana. Detailed taxonomic accounts of all the recorded species, including diagnostic characters, ecology, geographical distribution, and intraspecific variations are discussed.

Keywords: Genus, Dichanthium, Andropogoneae, Poaceae, Telangana.

Harnessing Indigenous Knowledge for Global Biodiversity and Environmental Sustainability

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Abstract

Traditional knowledge plays a crucial role in biodiversity management by guiding the sustainable use, conservation and restoration of biological resources. Developed over generations through close interaction with nature, indigenous and local knowledge systems encompass practices related to agriculture, forestry, medicine and ecosystem stewardship. These systems are

often location-specific, adaptive and based on ethical principles that promote balance between human needs and environmental protection. Traditional biodiversity management practices such as mixed cropping, sacred groves, seasonal harvesting and use of medicinal plants contribute to the conservation of species diversity, soil health and ecosystem resilience. In the context of increasing environmental degradation, climate change and biodiversity loss, traditional knowledge offers cost-effective and ecologically sound solutions that complement modern scientific approaches. Integrating traditional knowledge with contemporary conservation strategies can enhance community participation, strengthen sustainable livelihoods and ensure long-term ecosystem stability. However, erosion of traditional practices due to modernization, cultural change and inadequate policy recognition poses a serious challenge. Protecting traditional knowledge through documentation, legal frameworks and equitable benefit-sharing is essential for effective biodiversity governance. Recognizing the value of traditional knowledge not only supports biodiversity conservation but also reinforces cultural identity and promotes inclusive, sustainable development.

Keywords: Biodiversity management, ecosystem resilience, indigenous practices, traditional knowledge.

Ethnobotany and Ethnomedicine: Convergence of Traditional knowledge and Modern Healthcare.

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Abstract

Ethnobotany and Ethnomedicine are interrelated studies associated with the analysis of interactions between humans and plants by indigenous people. This review blends with the traditional knowledge system and modern pharmacological research, by documenting plant-based remedies used by indigenous communities for healthcare, across diverse geographical regions in

India, while underlining the essential methods for conserving this knowledge. The study of natural resources is traditionally used to cure or manage ailments. The implementation of Medicinal plants often becomes a source of advanced materials for the manufacture of new effective medicines that improve the quality and duration of drug life. Numerous compounds found in plants, referred to as phytochemicals, have been shown to exert anti-cancer, anti-metabolic, and anti-degenerative effects. An increase of interest in the pharmaceutical industry to develop new medications from plants is because of their potential to produce fewer side effects, holistic action, natural sourcing and synergistic action with the body's immune support. Despite their proven potential, ethnomedicinal resources face challenges, including the erosion of traditional knowledge, lack of standardization, insufficient clinical validation, and overexploitation of medicinal plants. This article further discusses conservation strategies, ethical considerations, and the importance of integrating ethnobotanical knowledge with modern scientific approaches.

Biodiversity Conservation in Changing Climate-Challenges and Strategies of the Present Wildlife Conservation Management in the Global Scenario, Andhra Pradesh, India.

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Abstract:

Wild life refers to those fauna and flora grows and lives in the areas unindicted by human. It includes all domestic and wild organisms like animals, plants, fungi, bacteria and virus. Developing human civilization and over technologies are majorly impact on the wild life conservation. In the present context delves about the strategies related to wild life conservation management in the contemporary environmental crisis (17). It is major important factor for the balancing of ecosystem and the global ecological niche. The major challenges of wild life conservation consent of climatic change impact, habitat destruction and Ecological fragmentation, the threat of illegal wild life trade and poaching, the elemental effects of pollution, the introduction and spread of

invasive species, illegal hunting along with indiscriminate anthropogenic activities. After investigation of my study identified the given challenges about the wild life threat: (19)

- Increasing pandemic infections and diseases of the migratory birds and animals.
- Habitat loss and major deforestation at the high biodiversity regions for the development without fallow the conservation rules. (Wild life act 1972)
- Natural disasters like droughts, cyclones, earthquakes etc. are major challenge to the present conservation sustainability may be cause to indiscriminate pollution.
- Over hunting and collection of the unique species of flora and fauna for experimental activities and illegal exports.
- Inorganic feticide (Agricultural) and industrial (wastes are causes to the aquatic life.
- Most fauna and flora were affected the life threat by the illegal mining without fallowing the National Green Tribunal rules.
- Environmental changes are majorly affecting on the wild life organism's life style such as Breeding, Flowering, Migration timings and disrupt species life cycles.

Note: The above reasons will not control in the future, it is not only effect to the wild life but also affect the human's feature.

Keywords: Wildlife conservation, biodiversity, habitat loss, climate change, ecol ogical balance

Native Medicinal Plants

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Abstract:

Native medicinal plants have been an integral part of traditional healthcare systems since ancient times. These plants, naturally occurring in specific regions, possess therapeutic properties due to the presence of bioactive

compounds such as alkaloids, flavonoids, tannins, glycosides, and essential oils. Indigenous communities have extensively used native medicinal plants for the prevention and treatment of various ailments including infections, inflammation, diabetes, digestive disorders, and skin diseases. With increasing interest in natural and herbal medicines, native plants have gained significant attention in modern pharmacological research. Scientific validation of their medicinal properties has led to the development of several plant-based drugs with improved safety and efficacy. Moreover, native medicinal plants contribute to biodiversity conservation and sustainable healthcare practices. However, challenges such as overexploitation, habitat loss, and lack of standardization threaten their availability. Therefore, systematic documentation, conservation strategies, and pharmacological evaluation of native medicinal plants are essential to preserve traditional knowledge and promote their potential in drug discovery and development.

Microbial And Fungal Remedy for Marine Microplastic Pollution

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Abstract

Microplastic contamination in marine environments has become a widespread and persistent ecological challenge, adversely affecting aquatic organisms, ecosystem stability, and food webs. Existing physical and chemical remediation methods often prove inadequate due to their limited efficiency, high operational costs, and potential environmental side effects. As a sustainable alternative, microbial and fungal remediation approaches are increasingly being explored for their ability to interact with and transform plastic pollutants under natural marine conditions. Several marine-associated bacteria and fungi can adhere to microplastic surfaces, forming biofilms and secreting polymer-degrading enzymes that initiate surface erosion and molecular breakdown of synthetic plastics. Fungi, in particular, demonstrate notable potential through their extensive hyphal networks and oxidative

enzyme systems, which enhance plastic surface modification and degradation. This article examines current knowledge on microbial and fungal interactions with marine microplastics, outlines the biochemical pathways involved in polymer transformation, and evaluates environmental factors influencing degradation efficiency. Emerging strategies such as the use of microbial consortia, enzyme optimization, and biotechnology-driven enhancements are also discussed. Despite promising outcomes, limitations related to degradation rate, ecological risk assessment, and field-scale implementation persist. Nevertheless, microbial and fungal remediation offers a promising, environmentally compatible strategy for addressing marine microplastic pollution.

Key Words: Marine microplastics, Microbial remediation, Fungal biodegradation, Plastic-degrading enzymes, Biofilms, Marine pollution, Sustainable bioremediation& Polymer degradation.

Integrating Environmental Regulatory Frameworks and Biodiversity Informatics for Sustainable Development in India

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Abstract

India's environmental governance framework integrates biodiversity conservation with developmental decision-making through statutory clearance mechanisms such as Environmental Clearance (EC), Forest Clearance (FC), Wildlife Clearance (WC), Coastal Regulation Zone (CRZ) Clearance, and compensatory afforestation under the National CAMPA. With increasing project complexity and ecological sensitivity, biodiversity informatics and digital governance platforms have become essential for transparent, efficient, and science-based regulation. This paper critically examines India's environmental clearance mechanisms under key environmental legislations and

highlights the role of biodiversity informatics and digital platforms such as PARIVESH 2.0 in strengthening environmental decision-making. The study demonstrates how legal frameworks, technological tools, and biodiversity data integration collectively contribute to sustainable development and conservation outcomes.

Keywords: Environmental Clearance, Forest Conservation Act, Wildlife Clearance, CRZ, National CAMPA, Biodiversity Informatics, PARIVESH 2.0.

Traditional medicinal plants of Kanchili mandal of Srikakulam district, Andhra Praesh, India

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Abstract

This study presents an ethnobotanical documentation of medicinal plants used by local communities in Kanchili Mandal of Srikakulam district, Andhra Pradesh, India. The region, situated in the northern Eastern Ghats, is characterized by diverse vegetation and traditional reliance on plant resources for primary healthcare. Information on medicinal plant use was collected through structured interviews with local healers, elders, and knowledgeable informants, complemented by field observations and specimen identification. A diverse array of wild and semi-wild plants, representing multiple botanical families, are traditionally used by tribal and rural populations to manage a range of health conditions such as gastrointestinal and respiratory ailments, fever, dermatological problems, and women's health issues. These findings align with broader ethnomedicinal studies in Srikakulam district, which report extensive plant use for treating stomach ache, ulcers, eye diseases, and malaria among tribal groups (e.g., Savaras, Jatapus, Gadabas) living in forested areas. The documented traditional knowledge highlights the ecological and cultural importance of medicinal flora in the mandal and underscores the need for systematic documentation, conservation measures, and scientific validation to

preserve indigenous healthcare practices and explore their potential pharmacological applications also.

Keywords: Medicinal plants; Traditional knowledge; Tribal healthcare; Kanchili Mandal; Srikakulam district; Andhra Pradesh; Herbal medicine.

Traditional Herbal Medicinal Knowledge of Tribal People in Alluri Sitharama Raju district of Andhra Pradesh, India

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Abstract

The present study documents the traditional herbal medicinal knowledge of tribal communities inhabiting Addateegala Mandal of Alluri Sitharama Raju district, Andhra Pradesh, located in the Eastern Ghats of India. Ethnobotanical data were collected through extensive field surveys and personal interviews with local healers, elderly tribal members, and knowledgeable informants using standard ethnobotanical methods. A total of 78 medicinal plant species belonging to 72 genera and 44 families were recorded, reflecting the rich plant-based traditional healthcare system of the region. Herbs (35.90%) and trees (34.62%) constituted the dominant life forms. Fabaceae emerged as the most dominant family, followed by Apocynaceae and Lamiaceae. Leaves were the most frequently used plant part (42.31%), and decoction was the predominant mode of preparation (50%). The documented plants were mainly used to treat digestive disorders, fever, diabetes, respiratory ailments, skin diseases, and wound healing, which correspond to the common health issues of tribal populations. The study highlights the strong dependence of tribal communities on forest resources for primary healthcare and underscores the urgent need for systematic documentation, conservation of medicinal plants, and preservation of indigenous knowledge for sustainable utilization and future pharmacological research.

Keywords Indigenous healthcare; Traditional medicine; Tribal knowledge; Medicinal plants; Addateegala mandal ,Alluri Sitharama Raju district; Eastern Ghats; Andhra Pradesh;

Understanding Climate Change Impacts on Biodiversity: Patterns, Processes, and Ecological Consequences

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Abstract:

Climate change has emerged as a major driver of biodiversity loss, altering ecosystems across terrestrial, freshwater, and marine environments. Rising temperatures, shifting precipitation patterns, increased frequency of extreme events, and sea-level rise are reshaping species distributions, population dynamics and ecosystem functioning. Many species are responding through range shifts toward higher latitudes and elevations, changes in phenology such as altered flowering, breeding, and migration timings and physiological stress that reduces survival and reproductive success. Ecosystems with narrow climatic tolerance, including coral reefs, alpine habitats, and tropical forests, are particularly vulnerable to rapid environmental change. Climate change also intensifies existing pressures on biodiversity, including habitat fragmentation, invasive species expansion and the spread of pests and pathogens. These interacting stressors disrupt species interactions, food webs, and ecosystem services essential for human well-being. Understanding the impacts of climate change on biodiversity requires integrative approaches that combine long-term monitoring, ecological modeling, and molecular tools to assess adaptive capacity and vulnerability. Such knowledge is crucial for designing effective conservation and adaptation strategies, including climate-

resilient protected areas, assisted migration and ecosystem-based management. Enhancing the resilience of biodiversity under changing climates is essential not only for species conservation but also for maintaining ecosystem stability and supporting sustainable development in a rapidly warming world.

Keywords: Biodiversity, climate change, ecosystem resilience, species distribution

Integrated Conservation Strategies: Restoration Approaches and the Role of Protected Areas in Sustaining Biodiversity

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Abstract:

Biodiversity loss driven by habitat degradation, climate change and unsustainable resource use has intensified the need for effective conservation strategies worldwide. Conservation and restoration approaches, together with well-managed protected areas, form the foundation for safeguarding ecosystems and maintaining ecological balance. Ecological restoration focuses on recovering degraded habitats through interventions such as reforestation, soil and water conservation, invasive species control and the reintroduction of native species, thereby enhancing ecosystem resilience and functionality. Conservation strategies emphasize both in situ and ex situ measures, integrating scientific knowledge with community participation to ensure long-term sustainability. Protected areas, including national parks, wildlife sanctuaries and biosphere reserves, play a critical role by providing refuges for threatened species, conserving genetic diversity, and supporting essential ecosystem services. However, their effectiveness depends on proper planning, connectivity, adaptive management and governance frameworks that address socio economic realities. Recent approaches highlight landscape-level conservation, restoration of ecological corridors and nature-based solutions to

enhance climate adaptation and mitigation. The integration of restoration initiatives within and around protected areas strengthens conservation outcomes by improving habitat quality and promoting coexistence between human activities and natural systems. Overall, synergistic implementation of restoration, conservation and protected area management is vital for achieving global biodiversity targets and ensuring ecosystem sustainability under changing environmental conditions.

Keywords: Biodiversity conservation, ecological restoration, protected areas, sustainable management

Role of Biodiversity Conservation in Sustainable Economic Growth"

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Abstract

Biodiversity conservation plays a significant role in achieving sustainable economic growth by supporting ecosystem stability and long-term resource availability. Biodiversity, which includes diverse species, ecosystems, and genetic resources, forms an essential component of natural capital that sustains economic activities such as agriculture, fisheries, forestry, tourism, and medicine. This abstract explores the economic importance of biodiversity conservation and its contribution to sustainable development. Healthy ecosystems provide vital ecosystem services, including pollination, soil fertility, water purification, climate regulation, and natural disaster mitigation. These services reduce production costs, enhance economic efficiency, and strengthen resilience against environmental and economic uncertainties. When biodiversity is conserved, economies benefit from stable resource flows and reduced risks associated with ecosystem degradation.

From an economic standpoint, biodiversity conservation encourages sustainable use of natural resources and supports livelihood opportunities, particularly in rural and resource-dependent communities. Conservation-driven

sectors such as ecotourism, sustainable agriculture, and green industries generate employment while maintaining ecological balance. Additionally, incorporating biodiversity values into economic planning improves policy design and promotes responsible investment. The abstract further argues that neglecting biodiversity conservation can lead to long-term economic losses through declining productivity, increased vulnerability to climate change, and rising public expenditure on environmental restoration. Sustainable economic growth therefore requires integrating conservation principles into development strategies rather than treating environmental protection as a constraint. In conclusion, biodiversity conservation acts as a foundation for sustainable economic growth by safeguarding ecosystem services and natural capital. Recognizing biodiversity as an economic asset and aligning conservation efforts with economic policies can ensure balanced growth and environmental sustainability for present and future generations.

Socioeconomic Vulnerabilities and Resilience Strategies of Coastal Fisherfolk: Evidence from Vizianagaram District, Andhra Pradesh, India

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Abstract

Coastal fishing communities form the backbone of regional economies and culture but face persistent social, economic, and environmental challenges. This study examines the fisherfolk of Vizianagaram District, Andhra Pradesh, through a mixed-methods approach using household surveys, interviews, and focus group discussions. Results reveal high illiteracy, unstable incomes, gender disparities, and severe infrastructure deficits, with most households lacking sanitation and living in kutcha housing. Income strongly influenced sanitation access, while migration reduced income stability. Integrating education, gender equity, and infrastructure within sustainable livelihood and

resilience frameworks, the study recommends mobile learning centers, microfinance for women, disaster-resilient housing, and livelihood diversification through aquaculture and ecotourism to strengthen community resilience.

Keywords: Livelihood diversification, Community resilience, Gender disparities, Rural infrastructure. Andhra Pradesh.

Weed Flora Dynamics in Crop Fields of Dr.B.R.Ambedkar Konaseema District, Andhra Pradesh, India

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Abstract

Weeds are a major constraint to agricultural productivity, as they compete with crops for water, nutrients, and space. Among broad-leaved weeds, members of the families Asteraceae and Amaranthaceae are particularly aggressive and highly adaptable. Despite their importance, information on their distribution in Dr.B.R.Ambedkar Konaseema District of Andhra Pradesh remains limited. This study investigated the distribution, frequency, and spread of these two weed families across the major cropping systems of the region. Field surveys were carried out during the Kharif and Rabi seasons using quadrat sampling in rice fields, vegetable crops, and plantation areas. Weed species were identified using standard floristic keys, and their relative frequency and abundance were calculated. The findings revealed that Asteraceae and Amaranthaceae were the most dominant weed families in the study area. Species such as Chromolaena odorata, Xanthium strumarium, Parthenium hysterophorus, and Ageratum conyzoides were commonly found along field margins and fallow lands, while Alternanthera species were widely distributed within cultivated fields, especially under irrigated conditions. Weed distribution and spread were strongly influenced by cropping patterns, soil moisture, and the intensity of field disturbance. Overall, the study highlights the widespread presence and adaptive nature of these weed families in Konaseema District and underscores the need for region-specific weed management strategies.

Role of Bio-chemicals in Maintaining Ecological Balance

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Abstract

Ecological balance is an ecosystem where living organisms interact properly to maintain their balance. Bio-chemicals play an important role in sustaining balance. Bio-chemicals are natural substances that plants, animals, and microorganisms produce hormones, enzymes, secondary metabolites, pheromones, and other organic compounds. Chemicals help plants grow, reproduce, defend, communicate, and provide nutrients. Plants produce alkaloids, terpenoids, and flavonoids while bio-chemicals help herbivores protect themselves. Microorganisms release enzymes that speed up the decomposition process of carbon, nitrogen, and phosphorus cycles and maintain their balance. Animals regulate hormones and pheromones population control, mating behavior, and social interaction. Bio-chemicals maintain food chains and food webs stable. Industrialization, pesticides, and chemical pollution disturb natural bio-chemical balance and cause biodiversity loss. So, bio-chemicals play a vital role in the development of eco-friendly practices and green chemistry to ensure ecological balance and biodiversity conservation.

Key words: Bio-chemicals, role, maintenance, Ecological balance

From Awareness To Action: How Environmental Consciousness Influences Gen Z's Preference For Sustainable Products

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Abstract

Human is an integral part of the mother Earth. But with the technological advancements that intentionally or unintentionally exploit the nature, we are at the verge of being endangered by environmental hazards like

global warming, earthquakes, pollution etc. With the rising number of incidents, humanity is ought to think of eco - friendly measures which change the preferences of a common consumer in the world of business. Subsequently, businesses are adapting the environment friendly practices like using energy-efficient appliances and machinery, transitioning to renewable energy sources like solar, wind, or hydropower, optimizing production processes to reduce energy consumption, minimizing the carbon footprint in production and distribution etc. This paper aims to study how the consumer attitude towards the environment and consumer preferences are reshaping the business landscape among younger generations and also aims to provide some suggestions by studying the perception of the customer. The study also highlights demographic factors, such as education level and income, that further influence eco-conscious purchasing patterns. This paper contributes to the growing body of literature on sustainable consumption by offering insights into how awareness campaigns, policy interventions, and ethical branding can support environmentally responsible consumer behaviour.

Key Words: Energy-efficient, ethical branding, environmentally responsible, unintentionally.

Seed Germination Behaviour Of Cycas Beddomei Dyer: Implications For Conservation And Cultivation

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Abstract

Endemic plants are invariably important in any ecological systems and must be prioritized for conservation efforts which are prone to extinction vigorously because of unstable habitats and habitat specific reasons. Most of the Indian cycads are threatened largely as a result of human activities, Cycas beddomei is one among them endemic to Andhra Pradesh. In this context the present study is intended to propagate the endemic species through seed

germination in a less time period in order to propagate the plants to augment the species in to the natural habitats.

To execute the proposed objective 500 ovules of Cycas beddomei was collected from the forests of Talakona area of Chittoor district, Andhra Pradesh. In the collected seeds 40 were without sarcotesta and the other seeds were segregated into 2 categories 230 seeds each. The first category seeds were soaked in cow dung slurry for 48 hours and then the seeds were dried for 2 days. The same procedure was carried out for 3 times. The sarcotesta was removed manually. All the seeds were dried for more than a month and then stored for embryo maturation.

Seeds without (40) were dried in sunlight in a poly house for 20 days and then treated with 50 ppm GA3 for 12 hours. The soaking process was carried out for 3 times alternatively and the seeds were potted on plastic tub filled with potting mix (1% red soil+1% vegetable manure+1% green manure).

The second category seeds were made in to 5 stages based on their maturity and was separately sown horizontally covered with cow dung slurry which provides environment for the invasion of Termite (belongs to the genus Cryptotermes- the white ants) which plays a vital role in removal of sarcotesta. The act of Termite was quick and effective in the seeds of 4^{th} and 5^{th} stages. Seeds will be treated with various concentrations of GA_3 and KNO_3. Then will be placed on polythene covers filled with potting mix. Gymnosperms, especially the tropical gymnosperms require nominal water as well moderate temperature and good aeration. So, the potting mix should have all these requirements needful to the effective and speedy germination of Cycas. For this potting mix was prepared by adding 1% red soil, 1%vegetable manure, 1% Perlite and 1% coco peat. All the ingredients of the mix are found to have all the needs of cycad seeds for their speedy germination. Sowing of second category seeds on soil beds is under process. Seed Vigour Index (SVI) will be calculated based on the results.

The present paper highlights the methodology followed for speedy and effective germination of seeds of Cycas beddomei.

Ecological Significance of wild thorny plant species in biodiversity conservation: Threats and Management Strategies.

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Abstract:

India is one of the world's most biologically and culturally diverse countries, which constitutes luxuriant wild flora and fauna. In floristic diversity of the country, the wild thorny plant species contributing major role in biodiversity and ecological restoration. The thorny, spiny or prickly plant species providing protection, shelter, food and stability with their defensive mechanism. They help degraded ecosystems, recover and allow diverse plants and animals through their ecological interactions. This wild thorny flora contributes various diversity activities in protection enhancement of plant and animal diversity, providing food web support, secure nesting and breeding sites for the reproduction of some birds and animals, and prevent soil erosion and ecosystem stability.

Key words: Biodiversity, Ecosystem restoration, Thorny plant species, Food web, Breeding sites, Nesting sites.

"Leveraging Artificial Intelligence for Climate-Resilient Mangrove Conservation in the Krishna-Godavari Delta: Implications for SDG-Aligned Coastal Management"

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Abstract:

Mangrove ecosystems of the Krishna-Godavari Delta represent a critical nature-based ecosystem which cornerstone the coastal protection, carbon

sequestration, and biodiversity persistence within a highly dynamic deltaic system. However, these are undergoing rapid structural and functional degradation driven by anthropogenic and industrial pressures, relative sea-level rise, hydro-geomorphological reconfiguration, and climate extremities. In order to improve climate-resilient mangrove protection and implement Sustainable Development Goal (SDG)-aligned coastal management, this study assesses the application of artificial intelligence (AI)-enabled analytical and decision-support frameworks. It includes high-resolution climate constraints, ecosystem status measurements, and multi-temporal remote sensing datasets into sophisticated machine learning. To separate the relative impact of anthropogenic vs climatic factors, supervised learning algorithms and techniques are utilized to forecast future risk trajectories under various climate scenarios. AI-driven models greatly outperform traditional assessment techniques by identifying high-risk and high-opportunity areas for focused conservation, restoration, and adaptive action. This study demonstrates the potential of data-intensive, algorithmic approaches to improve science–policy integration and evidence-based coastal governance by specifically aligning AI-based decision-support outputs with SDGs 13 (Climate Action) and 15 (Life on Land). The suggested paradigm offers a strong methodological approach for integrating artificial intelligence into climate-resilient ecosystem management and sustainable development planning, and it is applicable to climate-sensitive deltaic and coastal systems.

Keywords: Mangrove ecosystems, Climate resilience, Remote sensing, Artificial intelligence, Coastal management, Sustainable Development Goals.

Evaluation of Growth and Phytoaccumulation Potential of Aquatic Plants under Controlled and Contaminated Water Systems

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Abstract:

Aquatic ecosystems are increasingly impacted by heavy metal contamination from industrial effluents and nutrient-rich discharges,

necessitating sustainable remediation strategies. This study evaluated the growth performance and heavy metal phytoaccumulation potential of two aquatic plant species under controlled and contaminated water systems. The experiment was conducted for 45 days using a randomized block design with three water treatments: control water, nutrient-enriched water prepared with single super phosphate and cow-dung water, and industrial effluent water, each maintained in triplicate. Growth parameters, including biomass accumulation, were recorded at regular intervals. At harvest, plant samples were oven-dried and analyzed for Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sr, V, Zn, Ca, K, Mg, and S using ICP-OES at an accredited laboratory. Statistical analysis indicated significant differences in growth and metal accumulation among treatments and between species. Effluent water resulted in significantly higher accumulation of toxic metals, whereas nutrient-enriched water supported improved growth with comparatively lower metal stress. Species-specific variations in phytoaccumulation efficiency were observed, indicating differential tolerance mechanisms. The findings demonstrate that selected aquatic plants can tolerate contaminated conditions and effectively accumulate heavy metals, highlighting their potential application in phytoremediation and environmentally sustainable water quality management strategies in polluted aquatic environments globally.

Keywords: Aquatic plants; Phytoaccumulation; Heavy metals; Effluent water; Nutrient-enriched water; Growth response; ICP-OES; Phytoremediation; Water quality.

A Review on Impact of Climate change on Butterfly Biodiversity of Andhra Pradesh

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Abstract

Climate change significantly threatens butterfly biodiversity in Andhra Pradesh through rising temperatures, erratic rainfall, and habitat loss. These factors disrupt butterfly life cycles, host plant availability, and migration

patterns in the state's diverse ecosystems like the Eastern Ghats. Rising temperatures and declining rainfall reduce host plant growth, leading to lower butterfly reproduction and survival rates, especially for specialists in areas like Seshachalam and Nallamala hills. Habitat destruction from urbanization, deforestation, and monoculture farming exacerbates declines, with once-rich sites like Kambalakonda showing sharp population drops. Recent studies confirm climate change's adverse effects on butterfly populations in Andhra Pradesh, prompting a need for synthesized reviews on species diversity and threats.

. Climate change manifests through rising temperatures (up to 1.5°C since 2000), erratic monsoons, prolonged droughts, and extreme weather, disrupting host plant phenology, larval survival, and adult migration patterns. Habitat fragmentation from urbanization and agriculture compounds these pressures, leading to population declines of 20-40% in vulnerable species like endemics in Seshachalam Biosphere Reserve. This review synthesizes recent evidence (2015-2025) to assess impacts, identify at-risk taxa, and propose conservation strategies for sustaining Andhra Pradesh's lepidopteran heritage amid accelerating global warming.

Andhra Pradesh hosts 273 documented butterfly species across forests, grasslands, and coastal plains, with 190 in Visakhapatnam's Eastern Ghats alone. At least 27 species are protected under India's Wildlife Protection Act, and nine are IUCN-listed, including critically endangered ones like Peal's palm fly. Recent citizen science efforts on platforms like iNaturalist have logged over 8,000 sightings, revealing seven new genera amid ongoing threats. Rising temperatures and habitat loss synergistically threaten endemics like Marbled Map butterfly, mirroring global patterns where climate alters phenology and distributions. Eastern Ghats hotspots amplify vulnerabilities, with plains (e.g., Kadapa) showing steeper drops than hills due to host plant scarcity. Limited longitudinal data hinders predictions, but butterflies' sensitivity enables early interventions. This study suggest that to Restore host plants and hilltop grasslands via afforestation in Seshachalam and Kambalakonda, to Develop eco-corridors and policy integrating butterfly indices into climate action plans and Launch awareness workshops on sustainability to pollinator health.

It was concluded that Climate change imperils Andhra Pradesh's butterfly heritage, with documented declines signaling ecosystem distress. Targeted conservation, habitat protection, monitoring, policy can safeguard diversity, ensuring ecological resilience and supporting regional sustainability efforts and Immediate action preserves these vital pollinators for future generations.

Keywords: Butterfly diversity, climate change, Eastern Ghats, Andhra Pradesh, Lepidoptera conservation, habitat loss.

Diversity and Distribution of Ichthyofauna in Coastal Gujarat: Case Studies of Valsad, Mandvi, and Bhavnagar

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Abstract

The coastal region of Gujarat, India, supports a rich and diverse ichthyofaunal assemblage that plays a crucial role in marine biodiversity conservation and the livelihoods of coastal fishing communities. The present study assesses the diversity and spatial distribution of ichthyofauna along selected coastal zones of Gujarat, with particular reference to Valsad, Mandvi, and Bhavnagar. Primary data were collected through field surveys, landing-site observations, and interactions with local fishermen, complemented by secondary data from published literature. The results reveal notable spatial variation in ichthyofaunal composition, influenced by differences in habitat characteristics, hydrological conditions, and fishing pressure. Valsad exhibited comparatively higher species richness, while Mandvi showed dominance of commercially important marine species. Bhavnagar, located along the Gulf of Khambhat, demonstrated a distinct assemblage shaped by high turbidity and strong tidal regimes. Overall, the study highlights the ecological significance of Gujarat's coastal waters and underscores the need for region-specific management strategies to ensure sustainable fisheries and long-term conservation of ichthyofaunal resources.

Climate-Smart Plant Conservation Strategies in a Changing Climate: Advances, Challenges, and Future Directions

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Abstract

Climate change poses a serious threat to global plant biodiversity by altering species distribution, phenology, and ecosystem functioning. Increasing temperatures, changing precipitation patterns, and extreme climatic events are accelerating plant biodiversity loss and challenging conventional conservation approaches. In response, climate-smart plant conservation has emerged as an adaptive framework that integrates biodiversity conservation with climate change mitigation and adaptation strategies. This review synthesizes recent advances (2022–2026) in climate-smart plant conservation, focusing on in situ and ex situ approaches, climate-resilient restoration, seed banking, climate-smart agriculture, digital tools, and nature-based solutions. The review also discusses key challenges, policy frameworks, and future research priorities, emphasizing the need for integrated, science-based strategies to ensure long-term plant biodiversity conservation under changing climatic conditions.

Keywords: Climate-smart conservation; Plant biodiversity; Climate change adaptation;
Nature-based solutions; Climate-resilient ecosystems; Plant conservation policy

Plant Indicators and their Role in Environmental Monitoring

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Abstract

Plants have long been recognized as valuable indicators of environmental conditions. Their presence, health and behaviour can provide crucial information about the state of the environment. Plant indicators are used

in environmental monitoring to assess the quality of air water and soil as well as to detect and track the presence of pollutants. These are also known as bio-indicators are species or communities of plants that respond to specific environmental conditions. For instance decline in lichen diversity is often associated with increased levels of air pollutants. They can also indicate soil health by responding to changes in soil properties such as PH, nutrient availability and contamination. Aquatic plants and riparian vegetation can indicate water quality by responding to changes in water chemistry, flow and temperatures plant communities can indicate biodiversity levels by reflecting the overall health and complexity of ecosystems. Plant indicators can be less expensive than traditional monitoring methods. These are valuable for long term environmental monitoring. Plant indicators can serve as early warning systems for detecting environmental changes and potential threats to ecosystem health. Plant indicators can be used in conjunction with other monitoring methods to provide a comprehensive assessment of environmental conditions. Remote sensing technology can be used to monitor large scale changes in vegetation patterns, while ground based sampling of plant tissues can provide detailed information about specific pollutants.

A Comprehensive Review on the Protective Role of Phyllanthus niruri Against Heavy Metal Induced Toxicity

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Abstract

Heavy metal toxicity represents a serious global health and environmental challenge due to the persistence and bioaccumulative nature of metals such as cadmium, lead, mercury, and arsenic. Chronic exposure to these metals induces oxidative stress, inflammation, mitochondrial dysfunction, and

genotoxicity, leading to damage of vital organs including the liver, kidneys, brain, and reproductive system. Phyllanthus niruri, a medicinal plant widely used in traditional systems of medicine, has gained considerable scientific attention for its potent protective effects against heavy metal induced toxicity. The plant is rich in bioactive phytochemicals such as lignans, flavonoids, tannins, polyphenols, and alkaloids, which collectively contribute to its antioxidant, anti-inflammatory, metal chelating, and cytoprotective properties. Experimental studies using in vitro and in vivo models demonstrate that P. niruri significantly attenuates heavy metal induced oxidative damage by restoring antioxidant enzyme activities, including superoxide dismutase, catalase, and glutathione peroxidase, while reducing lipid peroxidation and reactive oxygen species generation. Furthermore, treatment with P. niruri has been shown to normalize altered biochemical markers, improve lipid metabolism, and preserve normal histoarchitecture of affected organs, particularly the liver and kidneys. The plant also exhibits potential in modulating inflammatory pathways and enhancing detoxification mechanisms, thereby limiting cellular and tissue injury caused by heavy metals. Overall, the available evidence suggests that Phyllanthus niruri is a promising natural therapeutic agent for mitigating heavy metal toxicity and associated organ damage.

Keywords: Phyllanthus niruri, Heavy metal toxicity, Oxidative stress, Antioxidant enzymes, Hepatoprotection.

Role of Insects in Ecosystem Health and Restoration: A Comprehensive Review

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Abstract

Insects are integral components of terrestrial and aquatic ecosystems, playing a crucial role in maintaining ecosystem health and facilitating ecological restoration. Insects act as primary pollinators, decomposers,

predators, and prey, thereby regulating nutrient cycling, soil formation, energy flow, and trophic interactions. Their activities enhance plant reproduction, improve soil fertility, and maintain ecological balance across diverse ecosystems. Detritivorous and soil-dwelling insects accelerate organic matter decomposition and nutrient mobilization, promoting soil structure and microbial activity essential for vegetation establishment. Pollinating insects support the restoration of plant communities by increasing seed set and genetic diversity, while predatory insects contribute to biological control, reducing the need for chemical interventions. In addition, certain insect species serve as bioindicators of ecosystem health, providing early warnings of environmental stress and habitat degradation. Despite their ecological significance, insect populations are declining globally due to habitat loss, pollution, climate change, invasive species, and intensive agricultural practices. This decline causes serious threats to ecosystem stability and resilience. The review highlights the need for insect inclusive conservation and restoration strategies, such as habitat connectivity, sustainable land use practices, and reduced pesticide dependence. Strengthening policies that recognize insects as vital ecosystem engineers is essential for achieving long term ecosystem health and successful ecological restoration.

Keywords: Insects, Ecosystem health, Ecological restoration, Biodiversity conservation.

Advances in Bacterial and Fungal Bioremediation Strategies for the Removal of Pollutants from Soil and Aquatic Systems

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Abstract

Environmental pollution of soil and aquatic systems by organic and inorganic contaminants has emerged as a critical global challenge, driven primarily by industrialization, urbanization, intensive agriculture, mining, deforestation, and poor waste management. Such pollution severely threatens

ecosystem stability and human health, contributing to a substantial proportion of global mortality. Conventional remediation approaches, including chemical treatments, incineration, and landfilling, are often expensive, energy intensive, and prone to generating secondary pollutants. In this context, bioremediation has gained prominence as a safer, cost effective, and environmentally sustainable alternative. Microorganisms, particularly bacteria and fungi, are widely used in bioremediation strategies for the removal of a broad spectrum of organic pollutants such as hydrocarbons, pesticides, dyes, xenobiotics, and emerging contaminants including per and polyfluoroalkyl substances (PFAS), as well as inorganic pollutants like heavy metals and metalloids from soil and aquatic environments. Bacterial and fungal bioremediation operates through multiple mechanisms, including biodegradation, biosorption, bioaccumulation, biotransformation, enzymatic mineralization, and mycofiltration. The exceptional metabolic versatility of fungi, especially white rot basidiomycetes producing ligninolytic enzymes, along with the complementary roles of bacterial–fungal consortia, enhances remediation efficiency. Recent innovations such as bioaugmentation, immobilized systems, omics based approaches, synthetic biology, and bioelectrochemical technologies are increasingly being applied to improve bioremediation performance.

Key words: Bioremediation, Bacterial and Fungal Bioremediation, Soil and aquatic pollution.

Biodiversity Conservation Under Climate Change: A Quantitative and Systems-Based Approach

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Abstract

Climate change has become a dominant driver of biodiversity loss, operating across ecological, geographical, and temporal scales. Rising global temperatures, altered precipitation patterns, and increased frequency of extreme climatic events are fundamentally reshaping species distributions and ecosystem stability. This paper presents a comprehensive analysis of

biodiversity conservation under climate change using a systems-based and quantitative framework. Integrating ecological theory with mathematical modeling, the study examines population dynamics, ecosystem resilience, and habitat connectivity under climatic stress. The results emphasize the necessity of adaptive, predictive, and network-oriented conservation strategies under changing climatic conditions.

Keywords: Biodiversity; Climate Change; Conservation Biology; Ecosystem Resilience; Mathematical Modeling

The Impact of Climate change on the Biodiversity

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Abstract

The biodiversity we see today is the result of 4.5 billion years of evolution, increasingly influenced by humans. Biodiversity forms the web of life that we depend on for so many things like food, water, medicine, a stable climate, economic growth, among others. But climate change is playing an increasingly important role in the decline of biodiversity. The major impact of climate change on biodiversity is the increase in the frequency of fires, storms or periods of drought. Climate change has altered marine, terrestrial, and freshwater ecosystems around the world. Climate change and biodiversity loss are part of an interlinked major crisis the world is facing today. They need to be concentrate together to the advance sustainable development and secure a viable future on this planet. Preserving biodiversity through conservation is crucial for both climate mitigation and adaptation.This review discuss the importance of biodiversity, the consequences of the climate change and also control measures should be taken for the conservation of biodiversity which can protect the earth from the consequence of climate change.

Keywords: Biodiversity, Climate change, Conservation, Ecosystem, Human health, livelihood, Species.

Applications of Artificial Intelligence in Biodiversity Conservation: Advances in Species Monitoring, Habitat Protection, and Ecosystem Management

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Abstract

Biodiversity loss driven by habitat destruction, climate change, pollution, invasive species, and overexploitation has emerged as one of the most critical global environmental challenges. Effective conservation strategies increasingly rely on timely, accurate, and large-scale ecological data, which are often difficult to obtain using conventional methods. In this context, Artificial Intelligence (AI) has gained prominence as a transformative tool for biodiversity conservation by enabling efficient data collection, analysis, and decision making across diverse ecosystems. Recent advances in the application of AI technologies particularly machine learning, deep learning, and computer vision in species monitoring, habitat protection, and ecosystem management are the effective tools for biodiversity conservation. AI-driven approaches have significantly improved species identification and population monitoring through automated analysis of camera trap images, acoustic recordings, satellite imagery, and environmental DNA data. In habitat protection, AI models support land use change detection, deforestation monitoring, and prediction of habitat fragmentation using remote sensing and geospatial datasets. Furthermore, AI based predictive models facilitate ecosystem management by forecasting species distributions, assessing extinction risks, optimizing conservation planning, and enhancing early warning systems for invasive species and disease outbreaks. The integration of AI with Internet of Things (IoT) devices, drones, and citizen science platforms has further strengthened real time biodiversity assessment and adaptive management strategies. Despite these advancements, challenges remain regarding data quality, algorithmic bias, model

interpretability, scalability, and ethical considerations, particularly in ecologically sensitive and data poor regions. This review also discusses current limitations, emerging trends, and future research directions necessary for the responsible and effective implementation of AI in biodiversity conservation.

Keywords: Artificial Intelligence, Biodiversity Conservation, Species Monitoring, Ecosystem Management.

Conservation of Endemic and Threatened Species: Challenges and Strategies

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Abstract

The rapid loss of biodiversity worldwide driven by habitat destruction, climate change, pollution, and overexploitation has elevated the conservation of endemic and threatened species to a global priority. Endemic species, restricted to specific geographic regions, are uniquely vulnerable to environmental disturbances, while threatened species face elevated risks of extinction across broader ranges. This article reviews the ecological importance of endemic and threatened species, analyzes principal drivers of decline, evaluates conservation strategies, and proposes future directions to enhance biodiversity protection through integrated scientific, policy, and community-based approaches.

Key words: Biodiversity conservation; Endemic species; Threatened species; Habitat loss; Climate change; Conservation strategies; Integrated conservation approaches

Biodiversity conservation and aquaculture are closely linked, and pesticide use can have significant impacts on aquatic ecosystems.

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Abstract

Andhra Pradesh is a leading state in India's aquaculture sector, accounting for 41% of the country's total fish production. The state has implemented various initiatives to promote sustainable aquaculture practices, such as Integrated Multi-Trophic Aquaculture (IMTA) and certification programs like Aquaculture Stewardship Council (ASC).Some conservation initiatives and sustainable practices in AP's aquaculture include:- Integrated Coastal Zone Management (ICZM): A project to conserve coastal ecosystems and promote sustainable use.- Mangrove restoration: Efforts to restore mangrove forests, crucial for biodiversity and coastal protection.- Organic aquaculture: Promoting eco-friendly farming methods, like organic shrimp farming.- Community-led conservation: Local communities managing and conserving aquatic resources.- Best Management Practices (BMPs): Guidelines for responsible aquaculture practices, reducing environmental impacts. Aquaculture in Andhra Pradesh (AP) is a significant economic activity, but it poses environmental concerns. The western delta region, a major aquaculture hub, faces issues like water pollution, soil degradation, and loss of biodiversity due to intensive farming practices. Water Pollution: Aquaculture effluents contain chemicals, antibiotics, and excess nutrients, leading to eutrophication and harming aquatic life. Soil Degradation: Intensive farming practices alter soil chemistry, reducing fertility and affecting adjacent agricultural lands. Biodiversity Loss: Aquaculture expansion encroaches on natural habitats, threatening species like the Great Indian Bustard and mangrove ecosystems.

Conservation Efforts:-1. Sustainable Practices: Initiatives like the Aquaculture Stewardship Council (ASC) promote eco-friendly farming methods.2. Protected Areas: Sanctuaries like Coringa Wildlife Sanctuary and Pulicat Lake Bird Sanctuary conserve biodiversity hotspots.3.Policy Support: Government regulations and projects aim to balance aquaculture growth with

environmental protection. To mitigate these impacts, adopting sustainable aquaculture practices, enforcing regulations, and promoting conservation efforts are Vulnerable

Keywords: IMTA,ASC,ICZM,BMPs,Eutrophication Water Pollution,Soil Degradation, Biodiversity Loss.

Utilization of Artificial Intelligence Tools in Plant Species Identification

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Abstract

The accurate identification of plant species is fundamental to biodiversity conservation, ecological research, agriculture, and ethnobotanical studies. Traditional methods of plant identification, largely based on morphological characters and taxonomic expertise, are often time-consuming and require specialized knowledge. In recent years, Artificial Intelligence (AI) tools have emerged as powerful alternatives and complementary approaches for plant species identification. AI-based systems, particularly those employing machine learning and deep learning algorithms such as convolutional neural networks (CNNs), enable automated recognition of plant species using digital images of leaves, flowers, fruits, bark, and whole plants. These tools can process large datasets, learn complex visual patterns, and achieve high accuracy even in challenging field conditions. The integration of AI with mobile applications, geographic information systems (GIS), and cloud computing has further enhanced real-time identification and data sharing, supporting citizen science and large-scale biodiversity monitoring. Moreover, AI-assisted identification contributes to the rapid documentation of flora, supports conservation planning, and aids in the preservation of traditional botanical knowledge. Despite challenges related to data quality, taxonomic bias, and model interpretability, the utilization of AI tools represents a transformative advancement in plant taxonomy and biodiversity studies, offering efficient, scalable, and accessible solutions for plant species identification.

Keywords: Plant Identfication, AI tools

Mini check list of wood mycoflora from eco-regions of Gujarat, India: a review

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Abstract

Here we provide, for the first time, the check list of micro and macro fungal diversity from timbers of Gujarat state. The survey revealed that the economically important woods present in Gujarat were 14 and locally available common woods were seven. A total of 136 species of lignicolous fungi belonging to Mucoromycota, Zygomycota Ascomyceta and Basidiomyceta fungi were reported from Gujarat, India. These lignicolous fungi were belonging to the families Xylariaceae, Auricularreae, Ganodermataceae, Shizophyllaceae, Stecherinaceae, Hymenochaetaceae, Lachnocladiaceae, Schizoporaceae, Fomitopsidaceae, Polyporaceae. All the lignicolous fungi are new to study area. The family with largest genera is Polyporaceae. The commonly observed lignicolous fungi on woods belongs to Ascomycota and Basidiomycota, were *Schizophyllum commune, Flavodon flavus Ganoderma lucidum Daldinia concentrica Xylaria polymorpha A. niger A. flavus, T. harzianum* and *T. viride*.

Key words: list, wood mycoflora, eco-regions of Gujarat.

Medicinal Plant Heritage of the Eastern Ghats Viskhapatnam : Diversity, Use, and Sustainability- A Study

"*Rich floristic diversity coupled with traditional practices makes the Eastern Ghats an important center for ethnomedicinal studies*."

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Abstract

Traditional medical care is the combination of all knowledge and methods, whether or not they can be explained, that are used to diagnose, prevent, and treat physical, mental, or social imbalances. It is based solely on firsthand experience and observation that has been passed down from generation to generation. India has 47,000 plant species, making it one of the 12 mega diversity hubs in the world. There are between 600 and 700 species that are widely utilized, primarily by rural and tribal communities, and about 200 species that are used both commercially and medicinally. Due to worldwide socioeconomic change and shifting perspectives on life, the plants have severely deteriorated. With the goal to gain knowledge about native medicinal plant species used to cure a variety of illnesses, an ethnomedical survey was conducted in tribal groups in the Eastern Ghats in the Visakhapatnam district. According to the 2011 census, there are 2.14 lakh tribal people living in the study area, including the Jatapus, Kondadoras, Mukadoras, Mannedoras, Yerukulas, Goudus, Gadabas, and Savara. About 336 species of medicinal plants from 269 genera and 99 families are included in this study. Based on known pharmacological properties found in those plants, a survey of the scientific literature indicates that many of the medicinal plants utilized by the tribal people can be scientifically confirmed in their traditional applications. For the purpose to find effective medications, it would be interesting to conduct a

scientific investigation of the plant parts utilized by tribal healers. and pay attention to the native medicinal plants.

Key words: Traditional medicine, pharmacological, socioeconomic, Tribal communities, Native Medicinal plants.

Biodiversity Value and Ecological Importance of Native Medicinal Plants of Machilipatnam Coast

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Abstract

Native medicinal plants along the Machilipatnam coast in Andhra Pradesh, India, embody a vital nexus of biodiversity conservation, ecological stability, and therapeutic potential. This dynamic coastal ecosystem, encompassing mangrove forests in the Krishna-Godavari delta, hosts diverse flora like *Avicennia marina*, *Excoecaria agallocha*, and *Bruguiera gymnorrhiza*, which thrive amid saline tides, nutrient-rich sediments, and seasonal monsoons. These species not only sustain rich phytochemical diversity but also fortify shoreline resilience against erosion and cyclones, underscoring their dual role in ecological integrity and human well-being.

Ecologically, Machilipatnam's mangroves function as keystone habitats, fostering intricate food webs through root systems that trap sediments, support juvenile fish nurseries, and enhance carbon sequestration. They bolster pollinator networks, mycorrhizal symbioses, and nutrient cycling, mitigating salinity stress while promoting faunal diversity—from crustaceans to migratory birds. Overharvesting and aquaculture expansion threaten this balance, yet ethnobotanical surveys reveal traditional uses for ailments like wounds, inflammation, and malaria, with compounds like flavonoids exhibiting antimicrobial and antiplasmodial properties.

This conference paper advocates integrated conservation via community-led restoration, blending indigenous knowledge with GIS mapping and phytochemical profiling. Prioritizing in situ protection of high-value species aligns with SDG 14 and 15, ensuring sustainable yields for modern pharmacology while preserving coastal biodiversity hotspots.

Keywords: Machilipatnam coast, mangrove biodiversity, native medicinal plants, ecological services, Avicennia marina, ethnobotany, coastal conservation, phytochemical diversity, carbon sequestration, sustainable restoration

Thank You

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