CITIZEN SCIENTISTS' SYMPOSIUM
ON CONSERVATION AND ECOLOGY

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LET'S PROTECT NATURE

YOUNG ZOOLOGISTS' ASSOCIATION SRI LANKA
ESTD 1972



EMPOWERING CITIZENS FOR
BIODIVERSITY CONSERVATION

ABSTRACTS

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4TH CITIZEN SCIENTISTS' SYMPOSIUM ON CONSERVATION AND ECOLOGY

2024

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4TH CITIZEN SCIENTISTS' SYMPOSIUM ON CONSERVATION AND ECOLOGY

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Preface

Fourth Citizen Scientists' Symposium on Conservation and Ecology 2024

Theme: Empowering Citizens for Biodiversity Conservation

In the ever-evolving landscape of biodiversity conservation, the Young Zoologists' Association of Sri Lanka proudly presented the Third Citizen Scientists' Symposium on Conservation and Ecology, held on December 02, 2023, at Genesis Dilmah Centre for a sustainable future, Colombo 10. This year's symposium centered around the theme, "Empowering Citizens for Biodiversity Conservation," bringing together passionate individuals committed to fostering collaboration and addressing pressing ecological challenges.

This proceeding compiles peer-reviewed abstracts, reflecting the symposium's dedication to uniting citizen scientists, researchers, and conservationists in sharing knowledge and amplifying their crucial role in biodiver-sity conservation. The symposium explored key thematic areas, including Biodiversity and Nature, Marine and Coastal Management, Ex-situ Conservation, Urban Wildlife, Invasive Species, and Ecotourism. The central theme served as a guiding beacon throughout the symposium, emphasizing the empowerment of individuals and communities in conservation efforts.

The Fourth Citizen Scientists' Symposium represents a significant stride in promoting citizen engagement, advancing conservation education, and deepening the collective understanding of ecological stewardship. Through exchanging ideas, research findings, and experiences, we aim to inspire a sense of shared responsi-bility among all stakeholders dedicated to preserving our invaluable natural heritage for future generations.

Message from Patron

It is with great pleasure that I extend my warm greetings to all participants of this year's Citizen Scientists Symposium organized by the Young Zoologists' Association of Sri Lanka (YZA). The theme for this year, "Empowering Citizens for Biodiversity Conservation," could not be more timely and relevant as we collectively face the numerous challenges to biodiversity across the globe. By empowering citizens, we encourage active participation, fostering a deeper connection with the environment and mobilizing collective efforts towards preserving the rich and diverse ecosystems of Sri Lanka and beyond.

This symposium is truly a unique gathering, bringing together a dynamic mix of researchers, scientists, conservationists, and citizen scientists. It serves as a platform for valuable knowledge exchange, where innovative ideas and experiences are shared, and collaborative efforts in biodiversity conservation are cultivated. Through such events, we are able to create lasting networks and partnerships that fuel impactful research and conservation action.

As the Department of National Zoological Gardens, we recognize our responsibility in promoting biodiversity conservation, and we are committed to supporting efforts in line with the goals of YZA. In the future, we will take maximum effort to further encourage and facilitate biodiversity conservation, collaborating with organizations like YZA, and implementing programs that resonate with both national requirements and the aspirations of the next generation of conservationists. Our efforts will focus on public awareness, capacity building, and fostering active community participation in wildlife and habitat preservation.

I would like to take this opportunity to acknowledge the Young Zoologists' Association of Sri Lanka for its continued dedication to fostering the next generation of conservationists, scientists, and environmental leaders. The work you do is invaluable in driving forward the agenda for biodiversity conservation, and your contributions are essential to our collective success.

To all the participants, I encourage you to engage with the discussions and exchanges that will take place during this symposium. Your insights and passion for the natural world have the potential to inspire change and shape the future of conservation. Together, we can continue to build a sustainable future, where biodiversity is preserved and protected for generations to come.

I wish you all a successful and fruitful symposium.

Warm regards,

Dr. R. C. Rajapakshe
Director General
Department of National Zoological Gardens, Sri Lanka

Message from the President of the Young Zoologists' Association of Sri Lanka

The Young Zoologists' Association of Sri Lanka, dedicated to imparting knowledge about the environment and wildlife to the youth of Sri Lanka under the theme of Conservation Through Education, welcomes you to the 4th Citizen Scientists Symposium on Conservation and Ecology.

As we gather under the theme "Empowering Citizens for Biodiversity Conservation," it is an honor to address you as the president of an organization committed to inspiring individuals to actively contribute to the conservation movement. This symposium is a testament to the belief that conservation is not the responsibility of experts alone but a collective effort that involves people from all walks of life.

The Young Zoologists' Association has been a non-profit, voluntary environmental organization contributing to various aspects of environmental conservation for many years. Through initiatives like this symposium, we strive to bridge the gap between scientific research and community-driven action, making conservation inclu-sive and accessible for all.

This platform provides an opportunity for citizen scientists to showcase their research, share their observations, and exchange innovative ideas. By encouraging collaboration and fostering a spirit of inquiry, we aim to advance scientific understanding while nurturing a deeper connection between communities and the natural world around them.

Your participation in this symposium underscores the power of collective action. It is heartening to witness the impact each of you has made through your dedication and commitment to conservation. Together, let us continue to shape a sustainable future for all life on Earth.

Thank you for your invaluable contributions, and let us work together to empower citizens and drive positive change for biodiversity conservation.

Mr. Shositha Liyanage

President, Young Zoologists' Association of Sri Lanka - 2024

Fourth Citizen Science Symposium

Citizen science is a powerful approach that transcends traditional boundaries. It is widely applied across diverse scientific domains, from life sciences and health sciences to ecological sciences, engineering, and social sciences. What makes citizen science unique is its ability to engage large numbers of enthusiastic, non-professional participants who contribute to advancing scientific research.

In countries such as the UK and Japan, citizen scientists play a vital role in tackling ecological chal-lenges such as spatial and macro-ecology, the management of threatened and invasive species, and biodiversity monitoring. By incorporating activities such as bird ringing and behavioral observations within home gardens, these nations inspire their citizens to become active contributors to science.

In Sri Lanka, however, such initiatives have yet to gain momentum for which the Citizen Scientists' Symposium presents a golden opportunity. Sri Lankans possess an innate affection for biodiversity an affinity that can be effectively harnessed to bridge this gap. But for this to happen, we must understand the deeper essence of citizen science.

Citizen Science: A Journey of Discovery

At its core, citizen science is an inclusive approach. It embodies the idea that anyone regardless of age, gender, or educational background can become a scientist. And the journey to becoming a citizen scientist is surprisingly similar to that of professional scientists. It begins with meticulous observations, recording them accurately, and progressing toward designing experiments, collecting and interpreting data, and implementing findings.

Yet, in many citizen science initiatives, this lifecycle often stops midway. While participants excel in data collection, critical stages such as experimental design, analysis, and implementation are less emphasized. To truly empower citizens, we must embrace the full lifecycle of citizen science, ensuring that it progresses from design to implementation, evaluation, and robust data management.

The Role of Questions in Scientific Inquiry

The foundation of this lifecycle lies in the quality of questions asked. Scientific inquiry, whether undertaken by professionals or citizen scientists, depends on the ability to ask questions. But not all questions lead to meaningful discoveries. The right question must not only be based on meticulous observations but also framed in a way that unlocks answers with broad implications.

Asking the right question is a skill a process that thrives on free thinking and creativity. It requires a deep understanding of the observations at hand and the curiosity to explore their underlying patterns. It is this practice of inquiry that transforms a citizen scientist from a data collector to a true contributor to science.

Realizing the Potential of Citizen Science in Sri Lanka

Sri Lanka stands at a pivotal moment. With its rich biodiversity and an inherent cultural connection to nature, the potential for citizen science is immense. Imagine harnessing the curiosity of communities to monitor endemic species, address human-wildlife conflicts, or combat invasive plants. Imagine fostering a culture where every citizen feels empowered to ask questions about the natural world and find ways to answer them.

However, to realize this vision, we must move beyond mere data collection. We need to engage citizen scientists in all stages of the scientific process, providing them with the tools and knowledge to design, analyze, and implement solutions. Only then can citizen science in Sri Lanka contribute to biodiversity conservation on a transformative scale.

A Call to Action

As we reflect on the theme of this symposium, I urge each of you to consider:

- How can we create opportunities for Sri Lankan citizens to engage fully in the scientific process?
- What steps can we take to foster a culture of questioning and curiosity?
- And how can we ensure that the questions raised today lead to actionable solutions tomorrow?

The future of biodiversity conservation depends not only on the actions we take but also on the questions we ask. By empowering citizens to ask the right questions at the right time, we unlock the potential for a more connected, informed, and proactive society.

Let us embrace this opportunity to transform citizen science into a powerful force for biodiversity conservation. Together, we can ensure that Sri Lanka becomes a beacon of inspiration for citizen scientists around the world.

Thank you, and may your questions lead to meaningful discoveries and impactful actions.

Nihal Dayawansa
Co-Chair, B. Sc. (Hon.) (Colombo) Ph. D. (Aberdeen), FI Biol., C. Biol
Professor in Zoology
Chartered Biologist

Keynote Address

It is a great honor, privilege, and pleasure to be tasked with providing the Keynote Address to the Fourth Citizen Scientists' Symposium organized by the Young Zoologists' Association of Sri Lanka (YZA).

Citizen science, put, is public participation in scientific research and the aim of it is to increase sci-entific knowledge base. In other words, it is an endeavor that actively involves those who are outside the mainstream scientific pursuits to engage in different types of observations and research. Hence, citizen scientists, or those who engage in citizen science work, contribute to the relevant scientific fields and to society in general by enhancing the available knowledge and understanding of different sciences.

The term "Citizen Science" was invented by British sociologist Alan Irwin in 1995 and the Oxford English Dictionary included "Citizen Science" in the list of new words in 2014. The definition provided is: "The collection and analysis of data relating to the relevant world by members of the general public, typically as part of a collaboration project with professional scientists.

On the one hand, this particular definition is restrictive, while on the other hand, it relegates citizen science to a subsidiary role of mainstream science by the term "typically as a part of a collaborative project with professional scientists." Thus, this definition imparts the notion that citizen science cannot stand on its own and, hence, should collaborate with professional scientists.

The stark truth that confronts us is much further from this notion. For one, "Citizen Science" has existed in the world well before this concept got its present name and has evolved over the centuries. The second is that many professional scientists have relied on citizen sciences for designing and carrying out their research activities, thereby accepting and acknowledging the key role of citizen sciences.

More importantly, for us in Sri Lanka, citizen science observations have been a part of our indigenous knowledge base for centuries and have evolved and developed through the passage of time. Thus, we have a strong base on different fields and spreads from Astronomy to Zoology. Hence, in the context of Sri Lanka, we can place citizen science as an "independent branch of science" which can be can be helped by mainstream science as well as something capable of helping and nourishing mainstream sciences.

It is this backdrop that the Citizen Scientists' Symposium organized by the YZA plays a crucial role in bringing citizen science to focus and attention in Sri Lanka. These symposiums of the YZA are the first and still the only symposium that are totally devoted to showcasing research carried out by citizen scientists. It not only provides an important forum to publish and discuss research, but also an excellent opportunity for both citizen scientists and those who intend to do research in future to meet each other, know each other, collaborate and reinforce their research activities in the future. The citizen scientists also have to meet and know professional scientists and to learn from them too.

Therefore, it is evident that the Citizen Scientists' Symposium of the YZA fulfils many more important functions in addition for being a forum to introduce their work.

I wish the Fourth Citizen Scientists' Symposium the best and success and also take this as to wish an occasion and hope that the YZA will be able to meet more success and further expand the citizen science horizons of in Sri Lanka in the foreseeable future.

Dr. Jagath Gunawardana
Co-Chair, Fourth Citizen Scientists Symposium
Hon. Senior Instructor
Young Zoologists' Association of Sri Lanka.

Message from Chief Guest

Citizen science is a collaborative approach to scientific research involving the public in collecting, analyzing, and interpreting data. It allows non-professional scientists often referred to as "citizen scientists" to contribute to scientific projects, often in partnership with professional researchers or institutions. This practice harnesses the skills, observations, and enthusiasm of volunteers with a vested interest in environmental, health, astronomical, or other scientific issues. Citizen science plays a crucial role in biodiversity conservation for several reasons that cover diverse applications. Citizen science is applied across multiple fields, including ecology, astronomy, climate science, public health, and social sciences. A few examples include monitoring bird populations, tracking climate change impacts, or gathering data on local air quality with technology utilization. With technological advancements, citizen science often utilizes mobile apps, websites, and social media platforms to facilitate data collection and sharing, making participation more accessible and engaging. Projects can involve various forms of data collection, including field observations (e.g., wildlife monitoring, environmental sampling (e.g., water quality testing), or contributions to online databases (e.g., noting sightings of species). Citizen science often involves collaboration between scientists, research organizations, and the public. Scientists design the project, while citizens contribute by gathering data, offering insights, or providing local knowledge. Citizen science enables people from various backgrounds and skill levels to engage in scientific research. This participation can range from simple data collection, such as observing and reporting local wildlife, to more complex tasks like analyzing data or pinning down the trends. Citizen science initiatives can empower communities by actively involving them in research that affects their local environments, enhancing their capacity for steward-ship, and influencing conservation or policy decisions. A few examples of citizen science projects include: the eBird project, where birdwatchers can report their bird observations, contributing to a large dataset used by researchers to track bird populations and migra-tion patterns; the Zooniverse, a platform that hosts a variety of projects where volunteers can assist with data analysis, such as recording historical documents and the BeeWatch, a program that invites citizens to observe and report on bee populations, contributing to studies on pollination and biodiversity.

Thus, citizen science not only contributes to significant scientific advances but also fosters public interest in science, enhances the understanding of environmental issues, and encourages active participation in the stewardship of natural resources.

Prof. Kalinga Padmalal
Wildlife Biologist and Senior Environmental Consultant
Former Senior Lecturer, Open University of Sri Lanka

CITIZEN SCIENTISTS' SYMPOSIUM ON CONSERVATION AND ECOLOGY

Abstracts

Assessment of ecological impacts of Mini Hydro Power Projects, A case study from Kalawana, Sri Lanka

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Environmental impact assessments on Mini Hydro Power Projects (MHPPs) carried out in Sri Lanka are often criticized, mainly due to the negative impacts on the ecosystem after the commencement of the projects. The evaluation procedure of MHPPs should be improved, based on scientific observations. The present study was carried out at the Koskulana MHPP (600 kW) located in Kalawana, to identify the variation in biodiversity and physical parameters of the impacted area of the river, assess the effectiveness of the adopted mitigatory measures, provide scientific evidence to revise the Central Environmental Authority's evaluation criteria for MHPPs, and suggest a rehabilitation module for the MHPP. Four plots in the project area were selected for data collection, including the ponding area above the weir, the diverted area, and the area below the tailrace. The study was conducted from February 2020 to April 2023. A biodiversity survey was carried out in each plot. Flow rates, depths across the river width, and canopy cover were measured. Tabular data and graphical illustrations were used for the analysis. Altogether, 285 species (35 birds, 19 butterflies, four mammals, six reptiles, eight odonates, 10 fishes, 14 amphibians, and 189 flora species) were recorded in the study area including 82 nationally threatened species. However, there were only 188 species, including nine threatened in the Initial Environmental Examination (IEE) report submitted in 2013 by the project proponent. This highlights the disadvantage of relying solely on the IEE report during the evaluation. Significant changes in niche partitioning of fish were observed due to alterations in water flow. *Devario malabaricus*, which prefers fast-flowing conditions, was not recorded after the second visit in the second plot. The abundance of *Aponogeton rigidifolius* increased in the ponding area as the water became stagnant. *Malaxis* sp., located on the left bank of plot 02, could not be found after the first visit. Several large trees along the river fell down during the study period. Other than those, noticeable changes to the area's biodiversity were not observed. Reductions in environmental-flow and blockages of the opening, eroded locations along the channel path, and lodged construction materials in the river bed were observed. Multiple suggestions were made based on the findings to improve the preparation of Terms of Reference (ToR)/IEE reports, evaluation, and monitoring processes. The dataset collected through the study can serve as a baseline for restoration efforts if the project is ever dismantled.

Keywords: Biodiversity; ecological impacts; IEE; Kalawana; mini hydro power projects

Acknowledgments: Central Environmental Authority, Mr. Dulan Ranga Vidanapathirana, Dr. Himesh Dilruwan Jayasinghe

Avifaunal diversity and conservation in forest patches along Mirahawatta-Diyatalawa road, Bandarawela, Sri Lanka

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Sri Lanka, an island rich in biodiversity, is home to a remarkable variety of avifauna, making it a critical region for bird conservation. Due to ongoing deforestation and habitat loss, the remaining forest patches serve as vital refuges for diverse flora and fauna, often harboring species that cannot thrive in other environments. Additionally, they act as ecological corridors, allowing species to migrate and adapt to changing conditions, which is vital for resilience against climate change and habitat fragmentation. This study investigates the avifaunal diversity in selected forest patches in Bandarawela, Uva Province, to assess their ecological importance and conservation value. Five remnant forest patches within a 2 km stretch of the Mirahawatta-Diyatalawa road were selected for the study. Field surveys were conducted over five days in May 2024. Data collection was done by visual encounter survey using the point count method, covering an area with a radius of 25 m per forest patch, involving binoculars and direct observations, observing each forest patch for 10 minutes between 6.00 am and 9.00 am. Standard guidebooks were used to identify and verify the observations. Findings revealed noteworthy avian diversity within the selected forest patches. A total of 45 species representing seven orders and 27 families, including 12 endemic species were reported. Among the documented species, seven species (*Culicicapa ceylonensis, Merops leschenaulti, Picus chlorolophus, Pomatorhinus melanurus, Psittacula calthropae, Psittacula cyanocephala,* and *Surniculus lugubris*) were nationally near threatened and two species (*Geokichla spiloptera,* and *Hierococcyx varius*) were nationally vulnerable according to The National Red List 2021. Species richness for forest patches 1 to 5 was 27, 26, 26, 30 and 31, respectively. The Shannon-Weiner diversity index values of forest patches 1 to 5 are 2.958, 2.977, 3.033, 3.072, and 3.160, and species evenness values are 0.898, 0.914, 0.931, 0.903, and 0.920, respectively. Species richness and Shannon-Weiner diversity index values are comparatively higher in forest patches 4 and 5. The detection of 12 endemics, alongside nine species of conservation con-cern underscores the importance of these habitats for regional biodiversity. To safeguard these vital ecosystems, we recommend implementing conservation actions like legal protection, habitat preservation, and community engagement in forest management, restoration, and expansion. Long-term monitoring of bird populations and continued research will be essential to assess the effectiveness of these strategies and support the persistence of these threatened species.

Keywords: Avifaunal diversity; Bandarawela; conservation; forest patches; threatened species

New record of the Critically Endangered *Cyclogomphus gynostylus* from Malwatu Ba-sin, dry zone, Sri Lanka

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The odonate fauna of Sri Lanka includes many common oriental species. *Chlorocyphidae* (four species), *Euphaeidae* (one species), *Protoneuridae* (six species), *Platystictidae* (18 species), *Corduliidae* (two species), and *Gomphidae* (all except for three species). Among these, some endemic species are taxonomically isolated, including *Cyclogomphus gynostylus* Fraser,1926, commonly known as the Transvestite Clubtail. Despite its significance, a comprehensive study on the ecology and conservation status of *Cyclogomphus gynostylus* within this cascade has yet to be undertaken. This observation reports a new sighting of the Critically Endangered dragonfly *Cyclogomphus gynostylus* from the "Vayava Ulpatha" lake, "Malwatu" Basin, located in the dry zone (7°58'20"N 80°40'56 "E), Sri Lanka. The sighting occurred on September 25, 2024, in a lowland tank bank, characterized by grassy riparian zones and scattered vegetation. A male specimen was observed resting on vegetation. Photographs were taken using a DSLR camera for morphological analysis and field identification was carried out using standard field guides and taxonomic keys. The key morphological features included a black body with distinct yellow markings on the thorax with two prominent yellow triangular markings, yellow dorsal bands on the abdominal segments, and pale green eyes. A ventral expansion was observed in the abdomen starting from segment seven. Clear wings were observed with pterostigma were dark brown with pale ends. This sighting contributes to the knowledge of the species' current range and highlights the conservation significance of the "Malwatu" Basin, which faces ecological threats due to habitat degradation, habitat modification and pollution. Conservation efforts are urgently needed to protect this species and its habitat.

Keywords: Critically endangered dragonfly; *Cyclogomphus gynostylus*; Malwatu basin; Transvestite clubtail

Acknowledgments:The authors would like to thank the Mr. S.D.A. Gunathilake and A.L Peris from International Union for Conservation of Nature, (IUCN), Sri Lanka Country office, Pelawatta, Battaramulla, (WP), Sri Lanka for reading the article and making several useful suggestions.

Species richness of butterflies in selected landscapes of Galle District, Sri Lanka

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Butterflies are essential indicators of biodiversity dynamics and conservation status due to their sensitivity to environmental changes. This study assessed butterfly species richness and abundance across urban, suburban, and remote areas in Galle District, Sri Lanka. It also evaluated the impact of habitat characteristics and anthropogenic activities on butterfly populations, focusing on the interplay between land use practices and biodiversity. With urbanization and habitat fragmentation increasingly threatening species survival, understanding these dynamics is vital for conservation efforts. The research objectives included comparing butterfly diversity among the three geographic locations and identifying environmental factors influencing their abundance, habitat preferences, and diversity. This study was conducted over seven months from July 2023 to January 2024. The study involved systematic butterfly counts in 12 sites, representing urban, suburban, and remote environments. Observations employed a 15-minute butterfly count method, covering five plots per site, further classified into open and shady microhabitats using visual estimation. Monthly surveys were conducted during morning and evening hours to capture activity patterns. Data were analyzed using ANOVA, paired t-tests, and correlation analyses to evaluate butterfly abundance, diversity, and the effects of habitat characteristics. A total of 2,763 butterflies were recorded, with 47.24 % in remote, 27.68 % in suburban, and 25.08 % in urban areas. *Eurema hecabe* was the most common species, with a mean density of 0.75 butterflies per plot. Species richness, calculated using the Shannon-Wiener diversity index, showed no significant differences among urban, suburban, and remote areas (ANOVA, Tukey's method, $p > 0.05$). Butterfly abundance differed significantly between urban and remote areas (ANOVA, $p < 0.05$) and correlated positively with host plant availability (Spearman's correlation, $p < 0.05$). Open habitats supported significantly higher butterfly abundance than shady areas, with remote sites hosting rare species. The findings underscore the importance of undisturbed habitats for butterfly conservation, particularly in remote areas where rare species thrive. Urbanization and intensive land-use practices negatively affect butterfly populations, reducing species richness and abundance. Suburban areas, with intermediate biodiversity levels, present opportunities for conservation through improved habitat management. Conservation strategies should focus on sustainable land management to promote butterfly diversity in urban and suburban areas, integrating ecological principles into urban planning. Enhancing host plant availability, preserving open habitats, and minimizing habitat disturbances within urban green spaces can significantly mitigate the adverse effects of urbanization. Awareness programs targeting urban and suburban communities are crucial for fostering appreciation and support for butterfly conservation, enabling coexistence between development and biodiversity preservation.

Keywords: Biodiversity; butterfly species richness; conservation; habitat characteristics; urbanization

Acknowledgments: I extend my gratitude to Mr. Rajika Gamage and Mr. Prasad Tharanga of Dilmah Conservation for their insights on Lepidoptera and to Mr. Anuradha Ediriweera for his assistance with butterfly and floral identification. Special thanks to all property owners for granting permission for research and to my parents for their unwavering encouragement.

Butterfly diversity in Mandaramnuwara along the different land use patterns

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Mandaramnuwara, a village at the foothills of the Eastern slopes of the Piduruthalagala Mountain Range, boasts a unique and diverse faunal composition due to its varied habitat types. This area was previously dominated by tea plantations and forests but now, at present, is increasingly occupied by residential areas, vegetable cultivation, and other agricultural purposes further depleting the unprotected forest areas. Butterflies, being sensitive bioindicators, provide valuable insights into ecosystem health. This study aims to evaluate butterfly diversity in the Mandaramnuwara area and assess the impact of land use changes on butterfly biodiversity to recommend conservation measures. The study areas ranged from 900 m to 1600 m above sea level and a 12 km transect was established to encompass all available habitat types, with 33 sampling spots distributed along this transect. Sampling was conducted during daylight hours (08.00 am to 5.30 pm) over 15 months, from October 2022 to December 2023, with observations made for three days each month. Butterflies within a 10 m radius of each sampling spot were visually identified using updated field guides. Butterflies that are observed in between two spots were added to an opportunistic list. A total of 63 butterfly species, belonging to five families, were recorded; 10 % species from Papilionidae, 17 % from Pieridae, 38 % from Nymphalidae, 25 % from Lycaenidae, and 10 % from Hesperiidae while nine species being endemic. Among the recorded species, 32 % were classified as threatened, including two critically endangered, seven endangered, and eleven vulnerable species. Habitat preference analysis revealed that 29 % of the recorded species prefer forest, grassland, and home garden habitats were most prevalent. 21 % preferred forest habitats and 3 % were exclusive to grassland and combined forest and grassland habitats. The recent, unplanned changes in land use, particularly for agriculture and land clearance to establish residential areas, pose significant risks to ecosystem balance. The habitat loss that occurs due to land use alterations poses a significant threat to the butterfly fauna in the area due to various factors. These include the clearance of host plants and nectar plants, the overgrowth of invasive plants that dominate native flora, and the use of herbicides and pesticides in agricultural lands which negatively impact all stages of the butterfly lifecycle.

Keywords: Butterflies; diversity; Kabaragalla; Lepidoptera; Mandaramnuwara

Strategies for enhancing mangrove rehabilitation and conservation efforts in Sri Lanka: Future research perspectives

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Mangroves are among the world's most productive ecosystems, essential for ecological and socio-economic role. In Sri Lanka, mangroves occupy a limited area and are distributed along lagoons, estuaries, and river mouths, particularly in narrow intertidal zones. Despite their limited extent, they exhibit high species diversity due to the country's diverse climatic and geomorphological conditions. They provide essential ecosystem services, including shoreline protection, water purification, carbon sequestration, nutrient cycling, and serving as nurseries for fauna and flora. Additionally, they support local communities by offering resources such as food, medicine, and timber. However, mangrove ecosystems face rapid degradation caused by habitat destruction, overexploitation, pollution, climate change, and invasive species. The 2004 Tsunami severely damaged mangroves, and many subsequent restoration efforts failed due to an inadequate understanding of ecological processes, insufficient research on mangrove genetics and physiology, and the involvement of untrained personnel. To address these challenges, this study conducted a review of published literature from 2010 to 2023, sourced from Google Scholar and ResearchGate, focusing on Sri Lankan mangroves using keywords such as "mangrove conservation," "mangrove rehabilitation," "mangrove ecosystem services", "threats for mangroves," and "mangrove genetic diversity." This study aims to identify effective strategies to safeguard mangrove ecosystems and explore key scientific research aspects essential for their conservation and rehabilitation. A total of 47 publications were identified, of which 18 relevant publications specific to Sri Lankan mangroves were analyzed to evaluate threats, restoration efforts, and future research directions. The evaluation identified habitat destruction as the major threat, primarily due to aquaculture expansion, urbanization, and unsustainable harvesting alongside pollution, invasive species, and climate change impact. While the Sri Lankan government has taken steps such as designating conservation forests and drafting restoration guidelines, significant gaps remain in protecting endangered species, raising public awareness, and conducting consistent monitoring. Future conservation and rehabilitation efforts should prioritize research on mangrove genetics and physiology to identify resilient species and genotypes, integrate climate change impact assessments into management strategies, and employ innovative tools such as remote sensing and GIS for monitoring and planning. These approaches will enhance restoration success and ecosystem resilience. Collaborative efforts involving local communities, scientists, and policymakers are vital for implementing sustainable management practices. Furthermore, public education and benefit-sharing mechanisms should be established to engage local communities in conservation efforts actively. Comprehensive strategies, including adaptive restoration techniques, multidisciplinary research, and awareness campaigns, are necessary to address current challenges and threats. Effective mangrove management demands continuous monitoring, proper replanting activities, and expert involvement to ensure the long-term health of restored plantations. This review emphasizes the importance of integrating evidence-based research and inclusive strategies to secure mangroves' ecological and socio-economic benefits.

Keywords: Endangered species; genotypes; habitat destruction; remote sensing; restoration

Avian diversity and behavioral adaptations in an urbanized wetland: A preliminary study of Walpola Lake, Angoda, Sri Lanka

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Rapid urbanization impacts wetland ecosystems, affecting biodiversity and species behavior. Walpola Lake, near Lake Crest Residencies in Angoda, was redeveloped under the Urban Regeneration Program, in 2018, introducing a 500 unit housing complex, walking path, and routine maintenance. While these changes altered the wetland ecology, their impact on wildlife, particularly birds, remains unexamined. This study evaluates avian diversity and behavior around Walpola Lake, focusing on ur-banization's impact on species richness, abundance, and adaptations. From September to November 2024, weekly evening surveys using visual encounter surveys (VES) and bird call identification were conducted from vantage points along the lake and walking path. Evening observations were chosen as they coincide with peak human activities, enabling the study of critical interactions between hu-mans and birds. Species diversity, richness, and evenness were analyzed using R software. A total of 61 bird species were recorded, indicating moderately high biodiversity (H'=3.45). No single species dominated, suggesting a well-structured community (D=0.05). The community's effective diversity equated to 31 equally abundant species, highlighting uneven population distribution (ENS=31.51). Behavioral observations revealed avian resilience and adaptability to urbanization. Red-wattled lap-wings (*Vanellus indicus*) nested in vehicle parks, likely benefiting from reduced predation risks in hu-man-dominated spaces. Rose-ringed Parakeets (*Psittacula krameri*), Red-vented bulbuls (*Pycnonotus cafer*), and Spotted doves (*Spilopelia chinensis*) regularly fed on urban food resources from the housing complex, while migratory Cattle Egrets (*Bubulcus ibis*) foraged at garbage dumping site, aiding in housefly control. However, such dependency on anthropogenic resources poses threats, including reduced natural foraging skills, vulnerability to food fluctuations, and health risks from unsuitable diets. Habitat fragmentation and alterations reduce breeding grounds for sensitive species, favoring urban tolerant species while disrupting ecological specialists and community dynamics. Walpola Lake continues to sustain a diverse avian community, although the anthropogenic impact has threatened its ecological integrity, hence, conservation strategies suggest green space preservation, reduced distur-bances, and sustainable waste management. This study contributes to understanding urban biodiversity in Sri Lanka and advocates for biodiversity conscious urban planning to ensure wildlife and human coexistence in urbanizing areas.

Keywords: Avian diversity; bird behavior; wetland ecosystems; urbanization; urban wildlife

Exploring the odonate diversity in the Diyasaru urban wetland park, Colombo, Sri Lanka

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Colombo was declared as a wetland city in 2018 during the 13th conference of the Parties to the Ramsar Convention on Wetlands, making Colombo the only wetland city in South Asia. Colombo Ramsar City consists of several wetlands that are interconnected to each other within the Colombo district including several popular urban wetlands that are shaped and managed by human intervention by bending the natural ecosystem to support the wetland biodiversity while catering to educational, recreational, and conservation needs. Sri Lankan odonate fauna comprised 132 species with 59 of them being endemic to the country. The present study was carried out in the Diyasaru urban wetland park located in the water-rich area on the edge of Diyawanna Lake aiming to study the odonate diversity within the Diyasaru wetland park. The study was carried out for five months from May 2024 to September 2024. All the data collections were carried out during the length available period as morning and evening data collection sessions (07.30 am – 5.00 pm). The line transect method was employed for the data collection covering the whole park area. Dragonflies and damselflies were identified and recorded from 10 m to either side of the transect with nine sampling spots in it. A total of 28 species were recorded during the study period with Painted Waxtail (*Ceriagrion cerinorubellum*) and Marsh Dancer (*Onychargia atrocyana*) being locally vulnerable and another five being locally near threat-ened. Variegated Flutterer (*Rhyothemis variegata*) was the most common species recorded in both morning and evening sampling sessions followed respectively by Sombre Lieutenant (*Brachydiplax sobrina*), Pied Parasol (*Neurothemis tullia*) and Yellow Waxtail (*Ceriagrion coromandelianum*). During the study period, breeding incidents of 13 species were recorded including the breeding incidents of Painted Waxtail. Both dragonflies and damselflies were most abundant during the morning session. Due to the availability of breeding habitats, appropriate perching sites, high abundance of food, and other favorable characteristics to thrive in the area, Diyasaru wetland park harbors a good odonate diversity. The Shannon-Wiener index value of 2.1298 indicates moderate species diversity within the park with even species distribution, and a high Simpson's index value of (0.83389) within the park further assures that no single species dominates the habitat emphasizing the importance of urban wetlands in biodiversity conservation.

Keywords: Colombo; conservation; diversity; odonates; wetlands

The role of animal intelligence in ecological processes and its applications to ecosystem management - A Review

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Animal intelligence comprises a diverse range of mental processes and cognitive abilities that enable different species to adapt and succeed in their environments, which include adaptations to their circumstances problem solving, communication, social behavior and tool usage, and survival strategies. This review offers innovative perspectives on the incorporation of cognitive behaviors into ecological and conservational frameworks, highlighting significant deficiencies in existing management techniques. The purpose of this review is to (a) address the limited empirical evidence linking animal intelligence with ecological processes and (b) integrate the cognitive behaviors of wildlife into ecosystem management strategies. A systematic literature review was conducted using Google Scholar with specific keywords like 'animal intelligence', 'conservation strategies', 'ecological processes and management'. A total of 53 peer-reviewed articles were screened of which data from 40 effective articles were identified as relevant. Inclusion criteria focused on research published between 2000-2024 in English, emphasizing clear methodologies. Selected studies addressed 'cognitive behaviors', 'impact on ecological processes', 'animal intelligence in ecosystem resilience', and 'integration into manage-ment strategies' by covering diverse ecosystems. The review identified diverse cognitive behaviors contributing to ecological processes like energy flow, nutrient cycling, and biodiversity maintenance. Elephants navigate vast landscapes, spreading seeds and aiding forest regeneration. However, similar findings may be less applicable to fragmented ecosystems where elephant populations are limited. Peafowl (*Pavo cristatus*), Toque macaques (*Macaca sinica*) use complex vocal communications to warn predators, impacting predator-prey dynamics. Leopards (*Panthera pardus*), particularly among mother-offspring or siblings employ cooperative hunting strategies that regulate prey population. Similarly, bees' (*Apis spp:*) population efficiency illustrates their vital ecological significance, yet empirical data show that habitat fragmentation interrupts foraging paths and diminishes population effectiveness. These findings underscore the importance of habitat connectivity in conservation measures for sustaining these behaviors. Despite evidence of animal intelligence influencing the nitrogen cycle and biodiversity, its integration into ecosystem management remains a constraint. Habitat mod-ifiers like earthworms (*Lumbricus terrestris*) are essential for soil structure and fertility, though their conservation is frequently neglected. Integrating cognitive behaviors into actionable conservation and management techniques like wildlife corridors and pollinator-friendly environments, can enhance biodiversity preservation and ecological benefits. Despite these efforts, substantial knowledge gaps persist. Future research should concentrate on underrepresented taxa, particularly aquatic animals to provide a more complete knowledge of cognitive behaviours across habitats. Further, interdisciplinary studies integrating behavioral ecology with cutting-edge technology like artificial intelligence and real-time monitoring may improve the accuracy of conservation measures. Additionally, further research is needed on how cognitive behaviors impact ecosystem services in long-term climate change scenarios. Through these initiatives, the incorporation into a sustainable ecosystem will be improved.

Keywords: Animal intelligence; biodiversity; conservation strategies; ecological processes; ecosystem management

Bringing people to plants: Flora of Sri Lanka digital platform

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The lack of scientifically accurate information that is easily accessible on Sri Lanka's diverse and threatened flora to the general public was the impetus for establishing the "Flora of Sri Lanka" on-line platform (https://www.floraofsrilanka.com/) in 2020. This user-friendly, multilingual scientific database is a collaborative effort dedicated to identifying and sharing information about Sri Lanka's flora. The platform features 3,100 species including both native and non-native, across 265 families, with over 17,000 photographs contributed by more than 350 contributors. The information on approx-imately 49 % of the native flowering plants and 56 % of the endemic flowering plants of Sri Lanka are available on this website. It provides up-to-date scientific names, common names in Sinhala, Tamil, and English, as well as details about the plants' habits, origin, national conservation status, legal status, similar species, references, and links to global data. Several associated social media platforms are utilized to collect data from citizens regarding species distribution, vernacular names, and potential threats. In 2024, the platform recorded more than 108,000 visits, serving approximately 77,900 unique users. The platform has become a key contributor to national conservation initiatives; supporting environmental education, tree-planting campaigns, resource donations, and gathering information for the next Red Data List evaluation. Plans to enhance this platform include developing a mobile app, incorporating QR codes, expanding the photo repository, and creating plant identification keys. Challenges include securing funding, addressing financial limitations, and training taxonomists to strengthen the team. This platform will serve as a great effective tool to increase accessibility and awareness of Sri Lanka's flora, support conservation efforts, and contribute to global botanical research, ensuring the country's plant life remains a significant part of the world's natural heritage.

Keywords: Conservation; Flora of Sri Lanka; plant identification keys; scientific database; social media sites

A preliminary survey of the avian diversity within the Open University premises, Nawala and notes on migratory species

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With the ever-increasing urban developments, green spaces in urban areas are crucial in providing safe habitats for birds and other urban-dwelling wildlife. Through casual observations, it was seen that the Open University of Sri Lanka (OUSL) premises in Nawala, Colombo, harbor a rich diversity of avifauna. As a part of a biodiversity assessment of the OUSL premises, a preliminary survey of its avifauna was conducted during October and November 2024. Five different habitat types- grassland, woodland, home garden, canal, and riparian were identified and a transect was laid covering all those habitat types. Data collection was done between 6.30 am - 9.30 am and 3.00 pm - 6.00 pm on eight ran-domly selected survey days. No night sampling was conducted. Only the birds perching on trees or on the ground or soaring above the sampling sites were considered and fly-overs were not counted. A total of 778 observations of 44 species belonging to 11 orders and 31 families were recorded. Com-mon crow (*Corvus splendens*) was the overall most abundant species (62.8 ± 35.48). Highest mean abundance was recorded from 'grassland' habitat (68.88 ±1.15). Apart from the "canal" habitats, other habitats showed higher abundance of species during the morning survey sessions. Six migratory species were observed within the premises during the time of study. The most highlighting feature we observed was that all of these species were localized to a specific habitat of their own. Forest wagtail (*Dendronanthus indicus*) was only observed in the woodland; Common sandpiper (*Actitis hypoleucos*) and Black Winged Stilt (*Himantopus himantopus*) were only observed in the canal and Barn Swallow (*Hirundo rustica*), Brown Shrike (*Lanius cristatus*) and Blue Tailed Bee-eater (*Merops philippinus*) were only observed in the riparian habitat during the whole study period. Also some of the resident species exhibited such affinities towards certain habitats; Brown Headed Barbet (*Psilo-pogon zeylanicus*) and the two endemics, Crimson-fronted Barbet (*Psilopogon rubricapillus*) and Red-backed Flameback (*Dinopium psarodes*) were repeatedly observed only from the woodland and home garden habitats. The findings showcase that different habitats situated within highly urbanized areas can still serve as crucial refuges for diverse avifauna, including migratory species. The distinct habitat preferences observed among species underscore their unique ecological roles and the importance of preserving the variety of habitats within such urban environments. It is not only important for the survival of urban wildlife but also for sustaining the ecological balance in rapidly developing urban landscapes. Such efforts ensure that urban areas continue to provide safe havens for wildlife while fostering coexistence between nature and urban growth.

Keywords: Avifauna; biodiversity; habitats; migratory; urban

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Diversity and the distribution of the spider genus *Utivarachna* in Sri Lanka: Discovery of five new species

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The genus *Utivarachna* Kishida, 1940, represented by 31 species globally distributed across Southeast Asia. Its presence and distribution in Sri Lanka are limited to a single species, *Utivarachna accentuata* Simon, 1896, which may be attributed to the limited research conducted on the genus on the island. Thus, this study aims to enhance our understanding of the biodiversity and taxonomy of *Utivarachna* spiders in underexplored regions by identifying and describing species of *Utivarachna* in Sri Lanka, based on their morphology. Fieldwork was conducted in 11 localities across five districts in Sri Lanka: Nuwara Eliya, Kandy, Rathnapura, Matale, and Puttalam, representing diverse habitats. All ground-dwelling spiders were collected from litter by sieving and hand collection. The collected specimens were preserved in 70 % ethanol, identified, and photographed using Olympus SZX7, and Leica M205C microscopes using standard methodology. A total of 18 males and 15 females were identified. Five new species of *Utivarachna* were recognized based on differences in genital morphology and were validated by comparing these features with previously described species. They were provisionally named *Utivarachna* sp. A, *Utivarachna* sp. B, *Utivarachna* sp. C, *Utivarachna* sp. D, and *Utivarachna* sp. E. The newly identified species were distinct by the arrangement of the dorsal lobe and dorsal spine of the retrolateral tibial apophysis and the highly recurved posterior eye row from the existing species. *Utivarachna* sp. A and *Utivarachna* sp. C recorded from Nuwara Eliya District, whereas *Utivarachna* sp. B and *Utivarachna* sp. D were recorded from Deanston and Riverston of the Knuckles mountain range, respectively. *Utivarachna* sp. E was reported from the Loolecondera estate of Kandy District. The discovery of five new species of *Utivarachna* from Sri Lanka, belonging to the *Kinabaluensis* species group, significantly enhances our understanding of the biogeography of this group, which is currently known to span across South and Southeast Asia, including regions of India, China, Taiwan, and Thailand. The discovery of these new species highlights the ecological importance of Sri Lanka's unique habitats and underscores the need for their conservation. All five *Utivarachna* species are novel discoveries and will be formally described in an upcoming publication.

Keywords: Araneae; biodiversity; morphology; taxonomy; trachelids

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Preliminary observations on birds and odonates at a selected area in Kotte wetlands, Colombo

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The Kotte wetland complex, located in the administrative capital of Sri Jayawardenepura Kotte, Sri Lanka, is a vital ecological and hydrological system. These wetlands are rich in biodiversity, providing habitats for numerous plant and animal species. This study aims to assess the species richness of birds and odonates in a highly urbanized part of the Kotte wetland complex. 1 km transect covering the canal and the swampy part at Denzil Kobbekaduwa Road, Battaramulla was selected for the study. The observations were conducted from September 2023 to November 2024 spanning 10 days. Field visits were carried out between 8.00 am to 11.00 am in the morning and 2.00 pm to 5.00 pm in the evening. Species were recorded using the direct visual encounter method with the aid of binoculars. Standard guides were used to identify observed birds and odonates. Conservation status of odonates were determined according to The National Red List 2012 of Sri Lanka and conservation status of birds were determined according to The National Red List 2021 . A total of 46 bird species belonging to 28 families from 12 orders were observed including one endemic (*Dinopium psarodes*) and one nationally Near Threatened species (*Phalacrocorax carbo*). Seven damselfly species from two families and 19 dragonfly species from three families were observed including one Vulnerable species (*Anax immaculifrons*) and five nationally Near Threatened species (*Diplacodes nebulosa, Lathrecista asiatica, Orthetrum luzonicum, Orthetrum pruinosum,* and *Rhodothemis rufa*). These findings highlight the critical role of scattered small wetland areas are important for expanding the population and distribution of species beyond protected ecosystems. The presence of threatened species also highlights the ecological significance of these urban wetlands as an important habitat for the conservation of threatened wildlife. Protecting these wetlands is essential to maintaining regional biodiversity, particularly in the face of urban expansion and habitat fragmentation. Ensuring their protection requires integrating these wetlands into broader conservation frameworks through sustainable land-use planning, maintaining environmental health, and promoting community engagement. Continued biodiversity monitoring in the wetlands is crucial for understanding ecosystem dynamics and implementing effective species and habitat conservation strategies.

Keywords: Conservation; Kotte wetland complex; wetland protection; urban wetlands

Survey of butterfly diversity in a small agricultural estate in Akkaraipattu, Ampara District, Sri Lanka

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Agricultural lands are easily accessible for citizen science and important refuges for biodiversity. A survey of butterflies was carried out in Mannankulam Estate in Akkaraipattu, a 12.5 ha coconut and paddy plantation over three years from 2021- 2024. The study suggested that plant species and other factors contribute to butterfly diversity in Mannankulam Estate. The plantation has organic certification and diverse habitats including semi-natural vegetation along the coconut plantation edges and along the property boundary on the Sinnakalappu Lagoon. Flowering herbaceous ground cover and shrubs were maintained as nectar gardens along the plantation edges. Weekly field visits were followed and a visual encounter survey method was done. Adult butterflies observed were documented as well as larval host plants and nectar plants were noted. A total of 36 Butterfly species were observed from five families. Family Nymphalidae recorded the greatest number of butterfly species (15), followed by Pieridae (nine species), followed by Lycaenidae (five species), followed by Papilionidae (four species), and Hesperiidae (three species). Two butterfly species recorded are categorized as threatened under the National Red List 2012 of Sri Lanka. Those are *Pelopidas agna agna* (Near Threatened) and *Azanus ubaldus* (Critically Endangered). A total of 25 nectar plant species from 11 families were identified to support 34 butterfly species. Among these nectar plants, 19 are indigenous, while six are alien species.. Most of the nectar plant species were recorded from the family Fabaceae (seven species) and most of the butterfly species were noted while feeding on *Tridax procumbens* flowers (19 species). 46 larval host plant species were identified at the estate for recorded 29 Butterfly species based on field observation and standard field guides. The high butterfly diversity can be attributed to the availability of nectar sources and larval host plants with natural ground cover of herbaceous and shrub species, and the absence of pesticides and weedicides. Based on the findings of this study, the estate plans to introduce butterfly larval host plants and nectar plants which were absent at the estate for the recorded butterfly species at first step. This study also highlights the need for more collective action through citizen science on private agricultural lands to conserve mobile and migratory species such as butterflies.

Keywords: Agricultural land; larval host plants; nectar gardens**;** paddy fields; threatened species

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Environmental influences on foraging behaviors and social coordination in red weaver ants (*Oecophylla smaragdina*)

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Weaver ants (*Oecophylla smaragdina*) are known for their advanced social organization and cooperative foraging strategies, making them a valuable model for behavioral ecology studies. This research investigates how environmental factors, including temperature, humidity, food type, distance, and angle, influence foraging behaviors, with a focus on understanding the ants' adaptability, unity, and social coordination. Observations were conducted on a mango tree colony, using protein (chicken meat) and sugar (honey) food sources placed at distances of 5–100 cm and varying angles from the colony. Experiments with distance, angle, and food source type were conducted over four days, with observations starting at 8.00 am and recorded over 10-minute intervals. Weather data, including temperature and humidity, was recorded using the AccuWeather: Weather Radar App over two days with eight time intervals from 7.00 am to 6.00 pm, and behavior was documented through scan and focal sampling methods, noting ant counts, response times, and recruitment behaviors. Findings revealed that warmer and drier conditions significantly boosted foraging activity, with ants exhibiting a strong preference for protein over sugar, likely due to its importance for colony growth and brood development. Foraging efficiency was higher at shorter distances, with ants exhibiting coordinated, cooperative behavior in food transportation. Conversely, angle variations had minimal impact on foraging effectiveness, suggesting that *O. smaragdina* relies primarily on pheromone trails rather than directional cues to locate food sources. These results underscore the species' ecological adaptability, highlighting how environmental conditions shape social cooperation, resource management, and survival strategies within the colony. The findings have significant implications for conservation, offering insights into the resilience of *O. smaragdina* to environmental changes and how such adaptive behaviors can inform strategies for preserving species in changing ecosystems.

Keywords: Environmental factors; ecological adaptability; foraging behavior; *Oecophylla smaragdina*; social coordination

First record of *Xenocerus rectilineatus* from Sri Lanka on the iNaturalist platform

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Longhorn beetles (Cerambycidae) play a very significant role in the ecological functions of woody habitats and have received little attention in Sri Lanka. Among them, *Xenocerus rectilineatus* with its elongate body coloration, dark in ground color with cream or yellow longitudinal markings on the elytra, provides perfect camouflage among the tree barks. The present observation reports the first-ever documented record of *X. rectilineatus* from Sri Lanka and evaluates the role of citizen science platforms like iNaturalist in biodiversity documentation. The observation was made during a field survey in Minneriya National Park, comprising dry mixed evergreen forest habitats, on 01st of November, 2024, at 10.30 am under clear weather conditions. Photographs were taken with a Canon DSLR camera, and its behavior and other ecological data were recorded. Photographs were uploaded to the iNaturalist for identification. A single adult specimen was observed on a tree trunk in a shaded mi-crohabitat. The habitat featured dense canopy cover. The long antennae longer than the length of the body and specialized arboreal legs are features that assure this is indeed *X. rectilineatus*. The current record expands the species distribution range, which was previously known from India and Thailand. This species from Sri Lanka assumes either an overlooked native or the recent disjunct pattern in response to natural processes or anthropogenic factors. Specific behavior like feeding and mating was not observed, but the presence of the species on tree bark agrees with its ecological preferences. This record is a testament to the role that citizen science platforms play in enhancing biodiversity records and baseline data for poorly documented taxa. The results also reiterate the importance of expert validation in ensuring data reliability within citizen science projects. However, the record based on photographic data alone limits the extent of the taxonomic analysis. Further research is needed re-garding the distribution, behaviour, habitat preferences, and ecological role of *X. rectilineatus* in Sri Lanka. The present study underlines the potentiality of citizen science platforms such as iNaturalist for supplementing conventional biodiversity surveys in contributing toward conservation biology.

Keywords: Citizen science; iNaturalist; Longhorn Beetle; Sri Lanka; *Xenocerus rectilineatus*

Assessing the status of marine debris at Keeri Beach, Mannar, Sri Lanka, using the Clean Coast Index (CCI)

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Marine litter is a globally increasing environmental issue, contributing to the degradation of coastal aesthetic quality. Mannar is one of the five districts of Sri Lanka's Northern Province. Its western side boasts the golden sandy Keeri beach. This beach is used for fishing, local tourism, and recreational activities. Clean Coast Index (CCI) serves as a tool for evaluating the actual cleanliness of the coast, categorizing beaches as very clean (0-2), clean (2-5), moderately clean (5-10), dirty (10-20) and very dirty (>20). The main objective of this study is to assess marine debris, quantify and categorize the types present on the beach, eventually assess beach cleanliness using the CCI, and compare the results for fishing and non-fishing sites. Data were collected on fishing and non-fishing sites using the throwing quadrat method (100 m x 10 m x 8 quadrat = 8000 m^2) along designated transects which were identified using random plot sampling. The mean debris quantities were analyzed using a paired t-test in Minitab to evaluate the significant differences. A total of 736 macro debris (classified into single-use and multi-use plastic waste) were identified from both sites. Among them, 109 (~20 %) and 627 (~80 %) macro debris were collected, respectively, from the fishing and non-fishing sites. The paired t-test revealed a mean difference of -122.7 *(p-value = 0.02, with a 95 % confidence interval),* statistically indicating that the non-fishing site holds the maximum macro debris. The study showed the classification of the non-fishing sites as dirty (12.54) and fishing sites as clean (2.18), according to CCI. The structured questionnaire survey was conducted among available local fishermen in the community using the convenience sampling method. This included the Likert scale, multiple choice, and open-ended questions covering sections of demographic information, marine debris status, fishery status, and tourism activity. The results revealed concerns about marine debris and its sources and impacts. Based on the responses, tourism activity was identified as a major contributor (50 %) to high debris accumulation on the beach, while no significant effects on fishery resources were observed. The main sources of marine macro debris have been imputed from improper waste disposal and fishing activities. The finding underscores the need for targeted cleanup and management interventions, such as implementing proper waste disposal systems, conducting an awareness campaign, and educational workshops for the community, particularly in non-fishing areas, to mitigate the environmental impacts.

Keywords: Clean Coast Index (CCI); environmental impacts; fishing site; marine debris; non-fishing site

Preliminary study on community insights and participation dynamics in Thalangama Wetland, Colombo

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The Thalangama Wetlands, recognized as an Environmental Protection Area, are among Colombo District's most picturesque urban landscapes. Comprising Thalangama Lake, Averihena Tank, paddy fields, swamp forest patches, marshlands, and home gardens, this unique ecosystem delivers a broad spectrum of ecological, social, economic, and cultural services to the local community and beyond. This preliminary study aimed to examine community perspectives and participation in the conservation and management of the Thalangama Wetlands, addressing the following factors: key ecosystem services valued by the community, extent of community engagement in management efforts, and stakeholder perception in conservation challenges and opportunities. Data were collected from May to August 2024 through field surveys, stakeholder interviews, and structured online and physical questionnaires involving 33 respondents, including local and international participants. The data were analyzed using basic descriptive statistics to interpret community insights and participation dynamics. Key findings underscored the wetlands' critical ecosystem services, including flood mitigation, irrigation support, biodiversity conservation, and recreational and educational benefits. Birdwatching and relaxation were identified as the primary activities for visitors. The community demonstrated significant ecological knowledge, including identifying various flora, fauna, and invasive species. Additionally, the wetland supports local livelihoods through small businesses reliant on its resources, providing economic benefits to the community. However, the study also identified pressing environmental challenges threatening the wetland's sustainability. These include invasive plant species (*Annona glabra*, *Salvinia* spp., *Eichornia crassipes*), exotic fish species, water pollution, improper waste disposal, excessive landfilling and reclamation of paddy fields, inadequate stakeholder communication, limited community engagement, and visitor misuse. Within the limited generalizability of the sample, these insights provide a foundation for understanding community roles in conservation. To address these challenges, immediate actions such as invasive species control, pollution mitigation, and better waste management are critical. Strengthened stakeholder coordination, enhanced community engagement, and long-term monitoring with periodic assessments are essential for ensuring sustainable management and preserving the multifaceted contributions of the Thalangama Wetlands.

Keywords: Community participation; ecosystem services; Thalangama wetland; threats to wetland

Occupancy modeling of meso-mammals in the recreational area of Kumana National Park using camera trapping

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Protected Areas (PAs) play a vital role in the conservation of wildlife. Understanding the influence of various habitat factors on the occupancy of meso-mammals can help improve the habitat quality of the PAs for their needs. To address this, we conducted a camera trap survey in the recreational area of Kumana National Park (KNP), Sri Lanka, from May 2023 to January 2024, to analyze how meso-mammal occupancy changes with different environmental factors. Camera traps were installed adjacent to the recreational road within predefined 4 km^2 plots. For occupancy modeling, we collected several habitat variables under three categories at each camera trap station: vegetation, physical features, and prey, predator, and food abundance covariates. These covariates include ground vegetation cover, canopy height, Euclidean distance to the nearest water body, and predator and prey abundance. The presence and absence of each species were recorded using camera trap data, with the study period divided into 15-day intervals. Occupancy modeling was conducted using PRESENCE software. We selected the highest-ranked occupancy models to determine how different covariates affected species occupancy and to identify preferred habitats based on average occupancy probabilities. During the study, we recorded 13 meso-mammal species within the study area. They are Rusty-spotted cat, Fishing cat, Golden jackal, Golden palm civet, Common palm civet, Ring-tailed civet, Brown mongoose, Ruddy mongoose, Strip-necked mongoose, Indian pangolin, Sri Lankan spotted chevrotain, Indian crested porcupine and Black-napped hare. The average occupancy probability ranged from 0.92 (Ring-tailed civet) to 0.30 (Indian pangolin). Moderate occupancy probabilities were observed for the Golden palm civet (0.65) and Sri Lankan spotted chevrotain (0.69). The Golden jackal had a lower average occupancy probability of 0.37. The Common palm civet, Indian pangolin, and Black-napped hare had the highest occupancy probabilities in dry mixed evergreen forests of KNP at 0.91, 0.43, and 0.87, respectively. Species such as the Golden palm civet and Indian crested porcupine showed the highest occupancy probabilities in dry riverine forests. At the same time, Golden jackals exhibited a high occupancy probability of 0.79 in tropical thorn forests. When assessing habitat factors, litter cover positively influenced the Common palm civet and Ring-tailed civet occupancy. Canopy height and cover positively impacted the occupancy of the Golden palm civet. Additionally, Euclidean distance to recreational roads and the presence of other meso-mammals positively affected the occupancy of Golden Jackals. The findings of this study provide valuable insights for improving habitat conditions within Kumana National Park. Enhancing these habitats would support the conservation of these species and boost tourist attraction, thereby contributing to more effective conservation efforts.

Keywords: Camera trapping; meso-mammals; National Park; PRESENCE

Perceptions, awareness, and conservation challenges of urban wildlife in Jaffna Peninsula, Sri Lanka

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Sri Lanka is a developing country and is also labeled as one of the 36 biodiversity hotspots in the World. The post-civil war scenario accelerated development in the Northern Province, which leads to the vital question of biodiversity conservation. Studying urban wildlife in the Jaffna Peninsula is essential since no predominant natural forests or protected areas exist. Understanding and conserving the prevailing urban wildlife is vital to maintaining ecosystem services within the study area. The primary data were collected using structured questionnaires (128), and the secondary statistical data were collected from the Jaffna Divisional Secretariat. This study assessed home gardens, vegetation types, and urban wildlife awareness, observations, interactions, attitudes toward urban wildlife, and trends related to urban wildlife. The survey was ensured with a gender balance (~50 % each), revealing that 60 % of respondents owned home gardens (54 % from the 2023 statistical data book). It has been observed using the study that, of the 60 %, within the last five years, 44 % of respondents newly established their home garden, featuring fruiting trees (30 %), flowering plants (29 %), vegetable plants (22 %), and herbal plants (15 %). Regardless of the space, whether it is a backyard or a front yard (~50 %), the respondents were happy to utilize the space for a garden landscape. 65 % of respondents were familiar with urban wildlife terms, and 60 % knew what urban wildlife was. Respondents observed various wild fauna daily (57 %), such as mammals (mongooses, bats), birds (owls), reptiles, amphibians, and pollinators (bees, butterflies, moths). The respondents (79 %) mentioned that observing urban wildlife is therapeutic, and almost all felt connected with nature. Respondents (76 %) were aware of the benefits of wildlife, like biodiversity conservation (27 %), pollination (24 %), natural pest control (17 %), aesthetic value (17 %), and improved mental health (15 %), as well as potential problems like snake bites and Ferrel behavior (29 %), crop damage (24 %), and disease spread (20 %). The study discovered that urban wildlife populations have decreased (51 %) due to habitat fragmentation (31 %), construction (29 %), road development (17 %), parapet walls (14 %), and waste generation (9 %). Notably, the respondents mentioned a population reduction in the Greater coucal *(Centropus sinensis)* and butterflies. Of the respondents, 80 % accepted that urban wildlife needs to be conserved by declaring biosphere reserves or green space within the study area. It could be concluded that the Jaffna community's perception of urban wildlife is a reasonable opinion, and the respondents' awareness of urban wildlife is high. It is vital to sustain this since the Jaffna Peninsula is forecasted to be a hub for accelerated development in the Northern Province.

Keywords: Ecosystems; home garden; Jaffna; perception; urban wildlife

Perception of the local community towards the establishment of Delft as a National Park and its impact on tourism

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National Parks (NP) are protected areas in Sri Lanka and are administered by the Department of Wildlife Conservation (DWC). Part of Delft Island (36.92 % of the total area~1,800 ha), called "Vellai," situated at the center part of the island, was declared as a NP in 2015. A two-day questionnaire survey was conducted in Delft to assess public perception towards the newly established NP and their interest in tourism activities. Based on the list provided by the Divisional Secretariat inventory, a total of 29 questionnaires (~80 %) were collected among 37 locals who own land in *"Vellai"* and presently reside in another area of the village. The study revealed a complex historical, cultural, and economic relationship shaping the community's relationship with the NP. While most locals (55.17 %) were unaware of the official establishment, they recognized the DWC boundary marker. Almost all respondents indicated that the part declared as the NP is inevitable for their daily activities, such as fishery, seasonal agriculture, and religious activities. Even though this NP is limitedly accessible, it has high tourism potential, and there is a growing interest in it as a potential economic driver. Currently, 37.9 % of their family members work in the tourism field in Delft, and they believe that 74.55 % will find employment in the tourism industry in the near future; 62.10 % have positive impacts on the tourism while ~80 % believed tourism did not affect their cost of living, and 90 % indicated there are no tourism economic leakages to outsiders. The study discovered that 83.30 % of respondents conciliate with tourists, and the rest do not interact with tourists. Most respondents (~100 %) indicated that Delft's iconic wild horses *(Equus caballus)* face challenges due to the accumulation of the horse population within the NP, like inbreeding depression, disease spread, and resource unavailability, particularly water and fodder. Moreover, they indicated that this could be the reason for their decreased height. The research revealed that 80 % of the respondents observed no human-wildlife conflict. It can be concluded that declaring Delft a sanctuary rather than a NP could improve its status for residents and wildlife. The biggest obstacle to establishing ecotourism is the economic instability among the locals. However, if the locals identify the potential to execute small-scale ecotourism, they can overcome this.

Keywords: Community perception; Delft; National Park; tourism potential; wild horse *(Equus caballus)*

Faunal diversity assessment in Kubichchankulama tank: promoting urban wildlife in Anuradhapura

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Wetlands are crucial ecosystems that support diverse fauna, including aquatic and terrestrial species. However, human activities increasingly threaten these habitats. This study investigated the faunal diversity of an urban lake under significant anthropogenic pressures. The research focused on different taxa, providing valuable insights into the lake's biodiversity and ecological health. The survey was conducted across four sites with varying levels of human pressure measured by the number of people, stalls, noises, and pollution levels. Data collection occurred along a 1 km transect in both morning and evening sessions. Species identification was facilitated using guides on amphibians, reptiles, birds, butterflies, and dragonflies. Diversity indices were employed for analysis using Microsoft Excel. Water quality parameters were measured at each site and air quality was obtained from secondary data. The study recorded 108 species and 14679 individuals comprising 42 bird species, 33 butterflies, 13 dragonflies, eight damselflies, six reptiles, four mammals, two amphibians, and 11 fish species. Species distribution varied across sites (A to D) with total species counts of 65 (1627±64.19), 66 (1625±45.08), 80 (10514±415.94), and 50 (909±26.45) respectively. Overall, the Kubichchankulama Tank's diversity was H′ = 2.19, with taxa-specific diversity of each taxon: birds H′ = 2.26, butterflies H′ = 2.98, dragonflies H′ = 0.48, damselflies H′= 0.96, reptiles H′= 1.35, mammals H′ = 0.96, amphibians H′ = 0.82. The most dominant species recorded in the lake include *Nycticorax nycticorax* and *Phalacrocorax niger* among birds, *Brachythemis contaminata* and *Ictinogomphus rapax* among dragonflies, *Euchrysops cnejus* and *Leptosia nina* among butterflies, *Ceriagrion coromandelianum* and *Ischnura senegalensis* among damselflies, *Calotes calotes* and *Calotes versicolor* among reptiles, and *Funambulus palmarum* among mammals. *Psuedagrion rubriceps ceylonicum* was endemic while *Phalacrocorax fuscicollis* and *Ardea cinerea* were native to Sri Lanka, one winter visitor (*Merops apiaster*) and also an endangered species *Nycticorax nycticorax* was recorded. Water quality varied significantly across sites; pH:(8.760, 8.743, 8.834, 9.040); Biochemical Oxygen Demand (BOD): (1.73, 1.20, 9.00, 9.64), conductivity: (661µS, 661µS, 628µS, 629µS). The average air quality of the tank was 14.30 AQI^{+} US; particulate matter 2.5 - 2.92µg/m^3 according to Iqair.com, 2023. Site C exhibited the highest diversity due to favorable natural habitats and minimal anthropogenic interference, despite high BOD from bird droppings. In contrast, Site D had the lowest diversity, attributed to intense human activity and degraded wa-ter quality. Kubichchankulama Lake supports urban wildlife, ecological education, and sustainable tourism. Community workshops can raise awareness about its ecological value and proper waste disposal. Seasonal limitations may exclude transient and migratory species, nocturnal species could be under-recorded, and inadequate data on pollution types could challenge effective conservation.

Keywords: Anthropogenic pressure; educational potential; habitat quality; pollution level; urban wildlife

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Assessing the distribution and ecological impact of *Areca triandra* in Sri Lanka through citizen science

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Areca triandra, an ornamental palm, was introduced to the Royal Botanic Gardens Peradeniya in the late 1800s and is colonizing the Sri Lankan wet zone. This palm reproduces vegetatively through its clustering habit and is also a prolific producer of fruits (100 - 400 per cluster) dispersed by birds and bats. Originally from Southeast Asia, it is considered one of the 28 globally invasive palms. Recently we carried out an evaluation of this species through an invasive species protocol which shows that it poses a "Moderate Threat" in the wet zone. The aim of this study is to assess the distribution of the invasive palm *Areca triandra* in Sri Lanka using citizen science and social media tools, supplementing methods such as literature and herbarium reviews A survey was conducted from November 2021 to October 2023, through Facebook pages - 'Flora of Sri Lanka (සිරිලක තුරුලතා හඳුනාගැනීමට අත්වැලක්)' and 'Medicinal plant identification (ඔසු පැළ හඳුනා ගනිමු)' which have a large following of plant enthusiasts. A detailed description and photos of *A. triandra* were posted on these social media sites with a request to share photos, habitat types, and locations where *A. triandra* was detected. A total of 130 participants provided observations and these social media responses were invaluable re-connaissance information of the range of *A. triandra* and confirmed that the species was restricted to the wet zone with one intermediate zone location in Kurunegala. The locations observed were 40 % in home gardens and boundary fences, 30 % on roadsides and abandoned lands, 19 % in forest edges, 7 % in suburban areas, and 4 % in rubber plantation edges. These locations were later confirmed with field visits and mapped using ArcGIS software. The limitation of this tool was that observations were primarily from non-forest habitats visible to the public. Therefore, additional data was gathered through conventional sampling from forested areas to complete the invasive assessment. Utilizing online social media platforms was important for data collecting, sharing scientific knowledge, and engaging local communities in managing and controlling this invasive species. Future research should include quantitative data, such as density measurements or spatial analysis of *Areca triandra* populations in various habitats.

Keywords: *Areca triandra*; citizen science survey; naturalized; ornamental palm; wet zone

Impact of *Austroeupatorium inulifolium* invasion on native plant diversity and composition in Welimada area, Sri Lanka

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Invasive species like *Austroeupatorium inulifolium* threaten native plant diversity by altering species composition and, ecosystem dynamics. This study investigates the impact of *Austroeupatorium inulifolium* invasion on native plant communities in the Welimada area. The study attempts to investigate the effect of this invasive species and its impact on local flora by evaluating species diversity and abundance across various infestation levels. Three invasion levels; high, medium, and low were defined based on *Austroeupatorium inulifolium* coverage of 0.68–0.76, 0.48–0.52, and 0.20–0.36 individuals per m², respectively. Species composition, abundance, and diversity indices (Shannon-Wiener and Simpson's) were analyzed using ten randomly distributed quadrats (5 m × 5 m) per invasion level, employing the random scatter quadrat sampling method. In high-invaded quadrats, ten taxa and 82 individuals were recorded, compared to 17 taxa and 95 individuals in medium-invaded quadrats and 23 taxa with 253 individuals in low-invaded quadrats. The dominance index exhibited a declining trend with increasing diversity, measured at 0.4358 in high-invaded quadrats, 0.1218 in medium-in-vaded quadrats, and 0.07176 in low-invaded quadrats, indicating greater diversity of native plants and lower dominance of *Austroeupatorium inulifolium* in less-invaded quadrats. Simpson's 1-D index showed a decrease in diversity from 0.5642 in Plot 1 to 0.9282 in Plot 3, and the Shannon-Wiener index increased from 1.236 to 2.842 across the quadrats, further confirming higher species diversi-ty in areas with lower invasion. Evenness (H/S) also increased from 0.344 in highly infested areas to 0.7456 in low-invaded areas, suggesting a more equitable distribution of species in less-invaded areas. Statistical analysis ANOVA revealed significant differences in species composition across infestation levels ($p < 0.05$). These findings underscore the ecological impact of *Austroeupatorium inulifolium*, highlighting its role in reducing native plant diversity and dominance. The results emphasize the need for conservation efforts focused on limiting the spread of invasive species to preserve native plant communities.

Keywords: Biodiversity indices, conservation, invasive species, plant diversity, species composition.

Evaluating the impact of invasive species on native biodiversity in the Madampa lake ecosystem: A case study

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The Madampa Lake sanctuary is a coastal, brackish water lagoon located in (80° 03' 11.52"E - 80° 05' 21.12" E, and 6° 14' 32.64" N - 6° 13' 1.92" N) Ambalangoda Divisional Secretariat in Sri Lanka. The lake is surrounded by mangroves. The introduction and spread of invasive species have raised serious concerns about the health and stability of this ecosystem. This study utilizes a multi-metric approach that incorporates ecological, social, and economic dimensions of socio-ecological resilience which allows for a nuanced understanding of how invasive species influence various aspects of the ecosystem and local community. The study further employed a comprehensive literature review spanning from 2007 to 2024 on Lake Madampa and invasive species identification frameworks.12 field surveys from June to November 2024 were done to assess the species diversity, population densities, and the ecological health of the lake. Visual inspection of high spatial resolution images was used as a straightforward approach for detecting invasive species. A structured questionnaire was distributed to 133 individuals aged 15-60 years considering several variables such as the demographic background, occupation, and interaction with the sanctuary to gather local perceptions about biodiversity and invasive species impacts. Only 41 individuals were educated about the concept of invasive species while 108 individuals had experienced the rapid growth of alien species. The study revealed that Madampa Lake was affected by Alligator apple (*Annona glabra*) competing aggressively with native flora, leading to reduced biodiversity in terrestrial habitats surrounding the lake, Water Hyacinth (*Eichhornia crassipes*) and Giant Salvinia (*Salvinia molesta*) had rapid growth forming dense mats on the water's surface, which could choke waterways, reduce oxygen levels and block sunlight essential for native aquatic life leading to changes in water quality and nutrient dynamics, Guinea Grass (*Panicum maximum*) was observed outcompete native grasses and alter local ecosystems. Results show that these threats have posed significant risks to its biodiversity and the livelihoods of local communities that rely on fishing and agriculture. Furthermore, the rapid growth of the black devil snail (*Faunus ater*) the exotic species (an opportunistic feeder on fish eggs) was identified, and further research and validation were needed to assess its invasiveness. The study concludes that Madampa Lake underscores the urgent need for proactive management strategies and implementation of effective biodiversity conservation solutions to ensure that it remains a thriving sanctuary for wildlife and a cherished resource for the communities that depend on it.

Keywords: Biodiversity; conservation; invasive species; Madampa lake; socio ecological resilience

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Harnessing artificial intelligence for early detection and monitoring of invasive alien species in aquatic ecosystems: A review in the Sri Lankan context

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Management of Invasive Alien Species (IAS) in aquatic ecosystems is hindered by complexities in implementing control and reactive strategies; allowing species to establish in the environment. The emergence of AI (Artificial Intelligence) technologies has spurred interest in their potential for early detection and monitoring of IAS. Therefore, we aimed to evaluate AI tools' potential and current application for early detection and management of IAS in Sri Lanka's aquatic ecosystems. This review employed a comprehensive literature search on Google Scholar, using specific keywords related to "AI tools", "early detection", and "invasive species". Studies published between 2010 and 2024 were selected, focusing on AI applications in the detection and management of IAS in aquatic ecosystems. A total of 50 peer-reviewed articles were screened and selected studies were analyzed based on methodology, AI tools used, and the outcomes related to early detection, monitoring, and management of IAS. The analysis also considered the advantages and limitations of these tools in the Sri Lankan context. Thirty articles were deemed relevant and findings from impactful journals were considered. Emerging AI technologies, including Machine Learning, have revolutionized fields by processing vast data, identifying patterns, and making predictions with speed and accuracy beyond human capabilities. Studies showed the use of environment DNA, DNA barcoding, Acoustic barriers, Acoustic traps, and Underwater Remotely Operated Vehicles (ROVs) for the early detection and monitoring of IAS in aquatic systems. Convolutional Neural Networks (CNN), remote sensing technologies (e.g., satellite imagery and drone-based surveys), AI-driven predictive models (e.g., Long Short-Term Memory networks), geospatial models, automated monitoring systems, Unmanned Aerial Systems (UAS) for image acquisition, camera traps, eco-acoustics, genetic manipulation, smartphone apps, and stable isotopes can also be utilized. These are based on genetic detection, acoustic, chemical, visual, and light-based technologies and enhance the effectiveness of early detection, and rapid responses and maximize resource allocation by; prioritizing zones, minimizing risk spending, reducing manpower and transportation costs, saving time, and enabling immediate real-time actions to prevent problem escalation. While AI tools show promise for early detection and management of IAS globally, Sri Lanka lags in their applications in aquatic ecosystems. Adopting these tools could significantly improve the nation's efforts in biodiversity conservation. However, it is limited by several challenges, including data scarcity, algorithmic biases, and ethical considerations. Moreover, the current lack of infrastructure and resources hinders the adoption of these tools in aquatic ecosystems. Addressing these challenges is critical for effective implementation. Existing literature reveals that quantitative and predictive models have been applied, but primarily for terrestrial ecosystems. Therefore, it is crucial to prioritize the adoption of effective AI tools to enhance biodiversity conservation.

Keywords: Aquatic ecosystems; artificial intelligent tools; biodiversity; conservation; invasive alien Species

The possible first record of the assassin bug subfamily Epiroderinae from Sri Lanka?

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Assassin bugs who belong to Family Reduviidae play an important part in ecosystems as predators of a wide range of arthropods, including pests of agricultural importance. The present observation highlights the first verified record of the Assassin bug subfamily Epiroderinae from Sri Lanka through the iNaturalist platform, a cryptic group with limited documentation globally. The observation of this bug was made in a home garden from Pamunuwa, Maharagama, a suburbanite of the commercial capital Colombo, Sri Lanka. It was recorded on 31st October 2024, at 5.56 pm (+05.30). The insect was observed on a wall, with its head downwards. The specimen was uploaded to the social science platform iNaturalist the following day and identified by an expert on the family in this region. Thus, as there are no prior official records, as confirmed by the expert, this is this country's first verified record of this subfamily even though this subfamily already has some verified records from some other countries in South Asia, including India. Assassin bugs in this subfamily are small to medium-sized, with slender bodies and cryptic coloration that help them blend into their environments, with habitats such as leaf litter and ground cover. These bugs are cryptic in both their overall appearance and behavior. Other identification features that aid distinguish them from other subfamilies already recorded from Sri Lanka include elongate-conical or tapering heads with distinctly projecting eyes, the absence of raptorial forelegs, forelegs with a distinct armature, flattened abdomen, and the presence of distinct carinae or tubercular projection in the pronotum structure, while the anterior lobe is narrower. This discovery underscores the importance of citizen science, and especially raising awareness of using citizen science platforms such as ''iNaturalist'' in documenting wildlife, especially such cryptic and overlooked groups, that support collecting data on local and regional biodiversity. Recorded observations from such non-experts, identified by experts on those groups can help increase the knowledge of the regional distributions of these groups, while also being a potential aid to future taxonomic studies. Also, conducting further studies on these groups would help us identify species that could potentially be beneficial to us, such as in combating agricultural pests. Further research is needed to explore the ecological role and species diversity of this subfamily in Sri Lanka and the region.

Keywords: Citizen science; family Reduviidae; iNaturalist; subfamily Epiroderinae; urban biodiversity

Innovative integration of biodiversity conservation and tea tourism: A case study of Pedro tea estate, Nuwara Eliya, Sri Lanka.

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Tea plantations often intersect with natural ecosystems, making them crucial zones for balancing agriculture, tourism, and biodiversity. However, these areas face challenges such as habitat fragmentation, biodiversity loss, and inadequate conservation efforts due to the dominance of monoculture farming practices. This study investigates how insstegrating biodiversity conservation into tea tourism landscapes can mitigate these issues, focusing on ecotourism's potential to enhance conservation efforts. The research aims to propose practical frameworks for engaging local communities and tourists in conservation initiatives and the study will align with UN Sustainable Development Goals, by addressing habitat fragmentation and promoting sustainable practices in tea landscapes. The study employed a combination of field surveys, biodiversity assessments, and stakeholder interviews. Over 120 species of flora and fauna were cataloged during field surveys and wildlife corridors, tourist hotspots, and natural attractions within the tea estate were documented to assess connectivity. Stakeholder engagement involved interviews with 10 plantation managers and ecotourism operators to evaluate current practices and challenges, as well as surveys with 50 tourists to measure awareness of biodiversity conservation. Additionally, 10 residents were consulted to explore their roles in conservation and ecotourism initiatives. The data were analyzed for ecological patterns, stakeholder perspectives, and the feasibility of integrating ecotourism with biodiversity conservation. The findings revealed that Pedro tea estate hosts a range of endemic and migratory species, with biodiversity hotspots located in areas adjacent to natural forests. Ecotourism activities, such as guided tea plantation walks and educational tea tours, showed the potential to raise awareness and generate funding for conservation. However, challenges were identified, including resistance from tea estate authorities, limited participation from local communities in conservation efforts, financial viability concerns, market demand uncertainties, and policy barriers such as land-use conflicts and insufficient government incentives. This study concludes that integrating biodiversity conservation into tea tourism landscapes is a viable strategy for ecological preservation and sustainable development. Proposed frameworks include community-based conservation programs and ecotourism initiatives to educate tourists on ecological preservation. The analysis also addresses challenges and provides actionable solutions to foster coexistence between agriculture, tourism, and biodiversity, and implementing these measures can enhance the ecological value of tea estates while fostering sustainable livelihoods for local communities. Pedro tea estate exemplifies how tea tourism can be leveraged for biodiversity conservation, offering scalable insights for other tea-growing regions in Sri Lanka and beyond.

Keywords: Biodiversity conservation; community engagement; ecotourism; sustainable development; tea tourism

Behavioural dynamics of Asian elephants during the great gathering on wildlife tourism: A case study of Minneriya National Park

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Wildlife tourism is a growing niche market contributing to the country's economic value. The Minneriya National Park plays an important role in wildlife tourism in Sri Lanka and it hosts the world's largest gathering of Asian elephants. The gathering happens in the dry period each year, over 300 wild elephants gather on the bend of Minneriya reservoir. The study aimed to identify factors impacting wild elephant behaviour during the Great Elephant Gathering and to investigate the ecological, social, and economic consequences, with a focus on sustainable conversation practices. A qualitative mode of inquiry was followed as a case study approach to conduct the study. Primary data were collected from three park administration respondents, three safari operators, three villagers, and five environmentalists who work and study at Minneriya by using semi-structured telephone call interviews. The collected data was analysed using the thematic analysis method. Mainly, the decline in the number of elephants visiting the Minneriya was identified as the primary change. The results have shown that both natural and human causes influence and that unplanned water projects with poor water management have impacted less elephant visitation. Also, elephant migration pattern changes have caused human-elephant conflicts, loss of bio-genetic diversity, and reduced tourism income. The long-term sustainability of the Great Elephant Gathering requires better land-use and water-management strategies. This could be achieved by developing policies aimed at sustainability and involving key stakeholders in conservation. Furthermore, responsible wildlife tourism that respects elephant behaviour and supports local communities will be vital in the long term to ensure that the tourism value of the Minneriya National Park is maintained while its natural heritage is protected. Future research should focus on assessing the broader impacts of tourism and human activities on wildlife behaviour across Sri Lanka's protected areas.

Keywords: Behavioural changes; ecotourism; elephant migration; great elephant gathering; Minneriya National Park

The ex-situ population census of elephants that are privately possessed from 2018 to 2024

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Apart from the census statistics presented in this paper, Sri Lanka has documented nine captive elephant surveys. After 16 years, a census of privately owned captive elephants was conducted in 2018. This census doesn't include elephants from orphanages or zoos. The census information was updated for 2019, 2020, 2021, 2022, 2023, and 2024. The information of those elephants was acquired during visiting festivals in which captive elephants participated. Additionally, by contacting elephant owners, veterinary surgeons, and elephant enthusiasts, more information on the whereabouts of captive elephants was gathered. In 2018 there were a total of 117 elephants, with 77 males, 40 females, 19 tuskers, and 77 owners. For the year 2024, there were a total of 100 elephants, with 68 males, 32 females, 16 tuskers, and 69 owners. The highest numbers were recorded in the districts of Colombo (18), followed by Kandy (17), Gampaha (14), Kegalle (13), and Ratnapura (nine). Below-average values were from districts of Kurunegala (seven), Badulla (six), Kalutara (five), Matara (five), Monaragala (five), Hambantota (one), and Polonnaruwa (one). Out of 16 tuskers, about seven are from foreign countries, and their subspecies is *Elephas maximus indicus*. This includes tuskers from India (two), Myanmar (four), and Thailand (one). However, for more than two decades, only Myanmar has donated elephants to Sri Lanka. Only two privately owned captive-born elephants were recorded: Pooja, born in 1986 to Lakshmi and Kandula, and Bandara, born in 1992 to Kumari and Vijaya. This shows that though the Pinnawala Elephant Orphanage had been a successful elephant breeding center in Asia, the breeding of privately owned captive elephants is very retarded. Also, the majority of captive elephants are found in the wet zone of the country, while the wild population is predominantly in the dry zone. Compared with past censuses, it is clear that those mentioned above-average districts had a high prevalence even fifty-four years ago. A reason for the high number of males is that many males were given away by the Pinnawala Elephant Orphanage to temples. Two types of elephant rearing are known as extensive (jungle-orientated) and intensive (urban or temple-orientated). This shows Sri Lanka's elephants are kept 'intensively rearing'. Previous research on ex-situ elephants shows that intensively kept elephants are susceptible to health problems, poor reproduction, and poor welfare. So, it is essential to improve the welfare of the elephants using a modern scientific method.

Keywords: Captive breeding; captive elephants census; ex-situ elephants; Sri Lankan elephants; tuskers

Community perception on the ex-situ conservation in Sri Lanka

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Sri Lanka is celebrated for its rich biodiversity, featuring high levels of endemism and diverse ecosystems. However, this biodiversity is under severe threat due to habitat destruction, climate change, and expanding human population. In response to these challenges, effective conservation strategies are essential, with ex-situ conservation defined as the conservation of species outside their natural environments. This study aims to explore local community perceptions of ex-situ conservation practices in Sri Lanka, focusing on their awareness of the purposes and local ex-situ sites. The research questions examine the extent of knowledge local communities possess regarding the purposes of ex-situ conservation and awareness of existing local ex-situ sites. The objectives of the study include evaluating levels of awareness concerning ex-situ conservation purposes and identifying recognition of local ex-situ conservation sites. A quantitative survey methodology was employed to collect primary data. The survey, which consisted of nine questions arranged into three sections; demographic information, awareness of ex-situ conservation purposes, and familiarity with local ex-situ conservation sites. The questionnaire was distributed online, allowing responses in both English and Sinhala for greater accessibility. A total of 129 participants from various districts in Sri Lanka formed the sample size, ensuring diverse representation. Descriptive statistics were used to analyze the data, assessing the frequency and percentage of correct responses related to conservation purposes and site recognition. The results indicated that 86.8 % of participants recognized biodiversity conservation as a primary purpose of ex-situ efforts; however, understanding of other purposes was significantly lower. Participants demonstrated awareness of well-known local ex-situ conservation sites related to fauna, with over 70 % accurately identifying facilities such as Dehiwala Zoo, Pinnawala Zoo, Pinnawala Elephant Orphanage, Ridiyagama Safari Park, Udawalawe Elephant Transit Home, Sea Turtle Hatcheries and Aquaculture Development Centers. Despite this, over 50 % mistakenly categorized National Parks, Bird Sanctuaries, Hikkaduwa Coral Reef, and Trincomalee Coral Island as ex-situ sites. Recognition of Botanical Gardens was strong, with over 70 % acknowledging these sites, except for Mirijjawila Dry Zone Botanic Gardens, Herbal Gardens, and Arboreta. Only the Gannoruwa Plant Genetic Resources Center, representing gene banks, was acknowledged by 75.2 % of respondents, while other gene banks were less recognized. Overall, the findings highlight significant knowledge gaps within local communities regarding ex-situ conservation sites and their purposes. It is concluded that improving community awareness is vital for fostering engagement and support for biodiversity efforts in Sri Lanka. To address this issue, it is recommended that educational outreach initiatives be implemented to create a more informed public, thereby empowering local communities to take an active role in conservation practices. Specifically, targeted initiatives such as educational workshops, community participation projects, and collaborations with local organizations should be prioritized to ensure widespread understanding and support for conservation initiatives.

Keywords: Community perception; ex-situ conservation; Sri Lanka

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First detection of rabies virus in Golden Jackal (*Canis aureus*): A case study from Haldwani forest division, Uttarakhand, India

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Rabies remains a significant public health concern, particularly in regions where wildlife closely interacts with human populations. This study aims to document the first rabies virus (RABV) detection in a Golden Jackal (*Canis aureus*) from the Haldwani Forest Division, Uttarakhand, India. A thorough investigation was conducted following reports of unusual behavior and aggression, including incidents of a Golden Jackal biting multiple people near the Chhakata range in Haldwani. A deceased golden jackal exhibiting clinical signs (neurological signs, including tremors and difficulty in coordi-nation, aggressive behavior towards humans and domestic animals, profuse drooling, and difficulty swallowing) consistent with rabies was found. Post-mortem examinations and laboratory analysis, including reverse transcription polymerase chain reaction (RT-PCR), Rapid Fast Technology of Analysis (FTA), and d-Fluorescent Antibody Test (d-FAT) confirmed the presence of RABV. These findings underscore the public health risks posed by RABV in wildlife and emphasize the need for enhanced monitoring, awareness, and domestic animal vaccination to mitigate transmission. This first record of RABV in golden jackals in Uttarakhand emphasizes the necessity for a one health approach to address wildlife diseases and their implications for animal and human health.

Keywords: One health approach; spillover; teraiarc landscape; wildlife disease surveillance; zoonotic spillover

Acknowledgments: We sincerely thank DFO-Haldwani Forest Division for granting access to the study area and supporting fieldwork. We also extend gratitude to IVRI Bareilly for their vital assis-tance in confirming the presence of rabies virus (RABV) in the samples. Special thanks to the front-line forest staff for their dedicated efforts during field surveys and data collection.

First record of an unidentified *Italochrysa* species in Sri Lanka: Implications for taxonomy and citizen science

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Taxonomic identification of insect species can be challenging, particularly for species within lesser studied genera with limited taxonomic resources. This study presents the first recorded observation of an *Italochrysa* species in Sri Lanka and explores the associated taxonomic ambiguities on citizen science platforms. It aims to document this observation, highlight the limitations of taxonomic resources for understudied genera, and emphasize the critical role of citizen science platforms like iNaturalist in biodiversity documentation and taxonomic research. The insect was observed in a hotel near the Minneriya National Park on 08th of September 2024 around 10.40 pm. The specimen was photographed using a Canon Kiss x3 DSLR camera with a 55-250 mm f4.5 lens and it was uploaded to the iNaturalist platform. The genus-level identification was done using the iNaturalist community, taxonomic keys, and expert contributions. The genus *Italochrysa* is characterized by a narrow, elongated body with red and yellow colours, transparent wings, and elaborate venation that includes red colouration at the tips. Species-level identification was not possible due to limitations in taxonomic keys and available studies. This may represent the first recorded occurrence of the genus *Italochrysa* in Sri Lanka, and the taxonomy of this species remains uncertain. This observation highlights the challenges associated with species identification on citizen science platforms due to the reliance on photographic data and limited taxonomic expertise. This finding underscores the necessity for enhanced taxonomic resources, including updated regional databases, comprehensive identification keys, and increased involvement of taxonomic experts. Practical recommendations include organizing regional taxonomic workshops, fostering international collaborations, and developing genus-specific identification guides to address existing challenges in insect taxonomy. These efforts are essential for effective biodiversity conservation and the advancement of taxonomic research.

Keywords: Citizen science; iNaturalist; *Italochrysa*; Minneriya National Park; Sri Lanka

The implication of the terms "Equitable" and "Fairness" in biodiversity policies: Navigating conflicts under the theme of generic resources

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The main scope of this analysis is to make the reader understand the complicity that arises from the terms which include "Equitable" and "Fairness" within biodiversity policies in Sri Lanka. Access and Benefit-Sharing (ABS) and Convention on Biological Diversity (CBD) framework, often lack clarity in defining what constitutes equitable and fair sharing and fail to provide clarity as to how the benefit sharing can be done or how it is been measured equally and fairly, leading to disputes among stakeholders and in result, such actions have been subject to heated debate and discussion. This study demonstrates a comprehensive analysis of the CBD along with the National Policy on Biodiversity of Sri Lanka and ABS. The author identifies the significant gaps that hinder effective benefit sharing in Sri Lanka, while compelling with the biodiversity policies in both national and international approaches. To support this argument, relevant Indian case laws and legislative frameworks were incorporated, reflecting on how similar challenges have been faced in India. The understanding of equity and fairness are broader perspectives in legal frameworks, yet their interpretations can lead to significant conflicts, and incomplete, ambiguous, or misleading provisions relating to benefit-sharing activities. One of the biggest threats to society is the misleading terms create a threat to biodiversity and the genetic resources are continuously offered benefit sharing on behalf of the industries who take advantage of a high profit from such resources, potentially disadvantaging local communities who contribute substantially to genetic resources. What is required is an urgent need to either remove the terms as a whole from the biodiversity policy or propose precise definitions for the two terms by consulting with government entities, lawmakers, and policy initiatives by taking into consideration the need and benefit for our community at large. The ultimate goal of the policymakers should be to benefit the community as a whole by interpreting efficient and coherent terms in order to avoid conflicts that may occur in the future.

Keywords: access to benefit sharing; convention of biological diversity; equitable; local community

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Assessing Human-Elephant Conflict (HEC) along Peraru River, Mullaitivu, Sri Lanka.

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Human-elephant conflict (HEC) is a major socioeconomic and conservation issue in Sri Lanka. Sri Lanka is the place where the highest Asian elephant density is observed, and almost 60% of the human population shares its habitat with the elephant. The proximity to natural vegetation and denseless population around the river allows only to collect through the convenience sampling method of thirty structured questionnaire surveys among rural residents of the Peraru River region, from Muththayankattu Tank to Nanthi Kadal Lagoon, Mullaitivu District. Collected data were analyzed through Minitab and the results indicated that 89.8 % of respondents engaged in farming and gardening, and almost all had lived in the area for over 10 years. Paddy, coconut, and vegetable *(Manihot esculenta, Cucurbita)* cultivation dominates in this region. The questionnaire revealed that in the Peraru region, elephants are observed daily (96.6 %), primarily at night (75.9 %), causing extreme damage to paddy (87.0 %), vegetables (10.2 %), and coconut trees (34.0 %), respectively. This study assessed the key causes of HEC in the study area using a 5-point Likert scale, which showed both elephant attraction towards local farming practices and improper management practices to deter elephants as the same percentage (15.82 %), followed by water scarcity (14.77 %), settlements in elephant roaming paths (14.18 %), and expanding agricultural land and human settlement (13.71 %), respectively. Due to the HEC, this year, it was reported that the death of an individual elephant (Septicemia) and a human (during elephant deter) was recorded on two separate occasions in the study area. Usage of bright lights (46 %), firecrackers (39 %), loud noises (32 %), Improved Explosive Devices (IED) (28 %), and private electric fences (21 %) are some of the elephants deter methods used by the residents of the Peraru region. Also, one respondent indicated that using seasonal bio-fence (chili fence) successfully prevented the elephant. About 90 % of respondents believe electric fences around forests are a permanent solution for the HEC. Also, 60 % of respondents are confident that elephants are captured and translocated from other parts of the country due to the unavailability of fodder, and they believe this was done purposefully. Further, the interviews exposed that existing government regulations and improper deterrent practices, like false fencing methods, also increase HEC in the study area. Improving the awareness could lead to further co-living of elephants and humans in the Peraru region, Mullativu, Sri Lanka. Moreover, the study finds and recommends that collaboration between government authorities and the community is lacking in establishing and maintaining suitable elephant deterrent electric fences, which should be accompanied by consistent maintenance and monitoring by the community to mitigate HEC sustainably in the future.

Keywords: Bio-fence; co-iving; HEC causes; human-elephant conflict; Peraru

Understanding the pathological impact of pesticides on wildlife in Sri Lanka- A review

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Pesticides, while intended to enhance crop yields and pest controls, have raised serious environmental and public health concerns, particularly regarding their effects on biodiversity and local wildlife. Many species, including birds, amphibians, aquatic species, and mammals, are exposed to pesticides through direct ingestion environmental contamination, or bioaccumulation. Scholarly literature available on pathological impact is scattered and doesn't contain sufficient empirical evidence, in terms of wildlife management. The purpose of this review is (a) to explore the pathological impact of pesticides on wildlife, focusing on species-specific disruptions caused by various pesticide types, and (b) to evaluate the conservation implications of pesticide exposure on wildlife in Sri Lanka. A thorough literature review was conducted using Google Scholar. Inclusion criteria included research published in English between 2000-2024 that focused on keywords such as 'pathological examinations', 'biodiversity conservation', and 'pesticide toxicity' by various types of pesticides like organophosphates, carbamates, and neonicotinoids. 58 peer-reviewed articles were screened and the data of 44 effective articles were synthesized based on species affected, types of pesticide, and observed pathological outcomes with a focus on impacts relevant to conservation. The review discovered that the pathological impact of these chemicals occurs through a variety of mechanisms that disrupt normal physiological processes. It entails not only acute and chronic health problems but also ecological repercussions. Exposure to the neonicotinoid was linked with endocrine functions in wildlife, causing adverse effects such as reproductive anomalies, reduced fertility, skewed sex ratios, and development deformities in amphibians (*Rana temporaria*). Organophosphates seriously interfere with the nervous system, which inhibits 50 % of brain tissues by acting as neurotoxins and altering behavioral patterns like foraging time in birds like *Phalacrocorax niger*. Particularly, carbamates can cause direct toxicity and mortality in threatened fish (*Heteropneustes fossilis*), and endangered fish (*Mystus ankutta*). Chronic exposure to low levels of pesticides can result in bioaccumulation within wildlife that may not cause immediate fatalities but can lead to sub-lethal effects, especially in birds (*Himantopus himantopus*) which compromise immune functions. As species-specific responses, amphibians are especially susceptible to pesticides due to their skin, allowing greater absorption of harmful chemicals compared to mammals and birds. The pathological impact of pesticides on wildlife emphasizes an urgent need for habitat protection strategies like pesticide-free buffer zones, promoting integrated pest management, biodiversity-friendly agricultural practices like organic farming, and stricter conservation-focused policy reforms. The observed pathologies directly threaten the survival of exposed populations, ultimately risking biodiversity loss. Implication of those strategies is mandatory to protect species and reserve ecological functions within affected habitats.

Keywords: Biodiversity; conservation; pathology; pesticides; wildlife

Assessment and management plan for solid waste disposal practices at the National Zoological Garden, Dehiwala

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The National Zoological Garden, Dehiwala, is a leading tourist attraction and research center, a hub for biodiversity conservation and public education. Therefore, sustainable waste management practices are focused on reducing waste, reusing materials, recycling, and upcycling. This helps protect the environment, save natural resources, and protect the health of humans and animals. Also, these are essential for maintaining the environmental quality and visitor experience at the National Zoological Garden, Dehiwala. The garden attracts a diverse range of visitors daily and is necessary to contribute to sustainable waste generation. Therefore, this study aims to assess current waste management practices and propose a comprehensive plan to improve waste reduction, collection, and disposal methods to achieve sustainability goals. A comprehensive questionnaire survey comprising closed and open-ended questions was conducted, utilizing primary and secondary data sources. Data were gathered from 149 participants and systematically recorded. The responses were analyzed using descriptive statistics, ANOVA, Chi-square tests, and Multiple Response Analysis in IBM SPSS software. The analysis explored the influence of demographic factors on visitor behaviors, levels of awareness, and satisfaction with the waste management facilities at the National Zoological Garden, Dehiwala. The results indicate that approximately 62.4 % of respondents are female and 64.6 % are aware of separate waste disposal bins. However, 87.2 % of participants reported not noticing recycling bins, while only 12.8 % observed them. Satisfaction with cleanliness was mixed, with 39.6 % satisfied but 43 % neutral. Furthermore, an ANOVA test showed significant differences ($p=0.041$) in attitudes across demographic groups regarding waste practices. Multiple response analysis found that visitors bring and use items such as food and snacks (86.7 %) and plastic bottles (70.6 %) to the Zoological Garden. However, the environmental, health, and ecological impacts of solid waste were recognized by 96.0 %, 91.9 %, and 83.9 % of participants, respectively. These findings conclude the need for enhanced labeling, accessibility, and public education on waste management practices to improve more sustainable visitor behaviors and improved waste management practices. Therefore, the study proposed to develop the biogas sector using food waste and other biodegradable waste as compost waste. Furthermore, it was suggested to collect all solid waste separately properly label the garbage bins, and return products such as plastic to the relevant companies.

Keywords: Environmental practices; recycling; sustainable; upcycling; waste management

Impact of land use and land cover changes on flood risk: A case study of Pinga Oya catchment, Sri Lanka

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Rapid loss of green space is leading to frequent floods in the Pinga Oya (PO) tributary. The catchment covers 109.2 km^2 and connects to the Upper Mahaweli River Basin at Katugastota. The inundation was observed in the Akurana and Ambatenna areas along the Kandy-Jaffna (A9) main road. Unauthorized constructions on river corridors, clearing of vegetation cover, and sewage discharge are major anthropogenic threats in this watershed. In recent years, PO has experienced several flash floods even at 50 - 60 mm rainfall threshold levels. Six flood events were recorded from October to December in 2023. This study aims to assess the role of vegetation cover changes in flood risk from 2014 to 2023 and explore mitigation strategies for sustainable watershed management. The catchment area was delineated using DEM (Digital Elevation Model) and divided into six sub-catchments. The spatial and temporal variations of vegetation cover were analyzed using Landsat 8 OLI/ TIRS images following Support Vector Machine (SVM) classification in ArcGIS version 10.5. Past flood dates were collected from the Disaster Management Center and secondary sources such as newspapers, social media, and journal articles. According to the results, forest cover declined by 17.1 % (18.67 km^2) while the urban area has gradually increased by 19.6 % (21.40 km^2) for the entire catchment area. Home gardens showed only a 2.5 % (2.72 km^2) reduction with slight fluctuations. Pinga Oya sub-catchment showed the high-est increment of urban land use, at 25.5 %. The urban land use of the Kurugoda Oya sub-catchment increased from 10.2 % to 31.9 % which had the major flood-prone area in Akurana and its periphery with notable change from 2017. Wahagalla Oya and Kurugoda Oya sub-catchments indicated the highest forest cover decline by 24.1 % and 21.1 %, both connected at Dunuwila junction where the flood level rose to nine feet from road level. The rapid increase of impervious surfaces such as buildings, retaining walls, and bridges on river banks reduces infiltration capacity and increases surface runoff and soil erosion. The reduction of water retention areas such as paddy lands, forest patches, and home gardens led to increasing flood risk and siltation effect in low-lying areas of the PO catchment. Effective law enforcement and local community participation are crucial to regulating urban expansion and implementing nature-based mechanisms for flood control in this watershed.

Keywords: Akurana; flash floods; Pinga Oya; remote sensing; vegetation cover

An assessment of knowledge on common snakes, snakebite prevention, and first aid among adults of the Ragama MOH area

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Snakes, as keystone species, play a vital role in maintaining ecosystem equilibrium while significantly influencing human-nature interactions and sociocultural dynamics. Poor public knowledge of snakes, snakebites, and first-aid have contributed to an increment in disease burden and unnecessary killing of snakes. The World Health Organization identifies snakebites as a 'neglected tropical disease'. Thus, we aimed to evaluate the knowledge on common snakes and snakebites among the adults of the Ragama MOH area. A descriptive cross-sectional study was conducted, using cluster sampling with a sample population of 637 residents (mean = 41.31 years, SD = 15.59). Demographic and study-specific data were collected through an interviewer-administered questionnaire which was developed with existent scientific literature and clinical guidelines; validated by experts on the topic and a pilot test; delivered in Sinhala and Tamil by investigators who were native speakers and trained together for consistency. Colour calibrated plates were used for species identification. Data collection was conducted in January 2023 after acquiring ethical approval. Informed consent was obtained from participants. A unified score was calculated for each participant considering the responses in four domains: the ability to identify species, their venom status, bite prevention measures, and first aid. Those who achieved an overall mark of 50 % or above were attributed as having 'good knowledge'. Statistically significant associations were identified using the Chi-square test ($\alpha = 0.05$). Statistical analysis was conducted using SPSS software (version 22). Of the participants, 59.18 % (± 0.49 %) had a 'good knowledge' overall, while 98.11 % (± 0.01 %) identified *Naja naja*, 56.67 % (± 0.02 %) identified *Daboia russelii*, 44.11 % (± 0.02 %) identified *Hypnale* spp., 36.26 % (± 0.02 %) identified *Bungaurus ceylonicus* and 28.41 % (± 0.02 %) identified *Bungarus caeruleus*. Of the participants, 20.9 % (± 0.7 %), 22.4 % (± 0.8 %), 96.8 % (± 0.6 %), and 67.9 % (± 0.7 %) obtained 50 % or above marks respectively on the four domains mentioned above. Statistically significant associations were recognized with sex, where males had better knowledge ($p = 1.7 \times 10^{-5}$, $\varphi = 0.17$); education on snakes ($p = 4.02 \times 10^{-7}$, $\varphi = 0.21$); occupation, where unskilled labourers, agricultural and fishery workers had good knowledge ($p = 2.0 \times 10^{-3}$, $V = 0.21$). Although the overall mark was satisfactory, a significant knowledge gap was observed in identifying even the highly venomous species and their venom status. This deficiency presents an opportunity for community level interventions, such as workshops, coexistence programs, and educational groups. These initiatives could help reduce the negative impacts of snakebites on public health, the economy, and biodiversity while simultaneously improving biodiversity conservation and public health outcomes.

Keywords: First aid; Ragama; snakebites; snakes; venomous

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