Edition # 4 & #5

January to June 2024

AIWC NEWSLETTER

Fourth & Fifth Quarterly Newsletter

THIRD ANNUAL RESEARCH CONFERENCE

The Third Annual Research Conference on Wildlife Conservation brings esteemed researchers and practitioners together. The event provided a platform for in-depth discussions on contemporary wildlife conservation practices and future strategies.

During the conference, experts highlighted current challenges such as habitat loss, climate change, and poaching, emphasizing the need for innovative and adaptive approaches. Keynote speakers shared insights into successful case studies and emerging technologies that are enhancing conservation efforts. The discussions also explored the integration of community-based initiatives and the importance of interdisciplinary collaboration in achieving long-term conservation goals.

The conference not only facilitated the exchange of knowledge but also paved the way for future research and collaboration. It focused on refining strategies and developing effective solutions to safeguard global biodiversity.

ONE DAY TRAINING PROGRAM @ FISHERIES DEPARTMENT

We are thrilled to share the successful completion of our specialized training program, "Inland Coastal and Marine Biodiversity Conservation: Issues and Challenges," which was tailored for 20 officers from the Fisheries Department. This program was made possible through the generous support of the Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR). It provided valuable insights and practical strategies for addressing critical issues in marine and coastal biodiversity conservation.

AIWC Newsletter

EDITION #4 & #5

January- June 2024 | @Aiwcrteofficial | aiwc_vandalur

Director's Note...

As we forge ahead in our mission at the Advanced Institute for Wildlife Conservation (AIWC), I am excited to present the latest edition of our newsletter, "AIWC" Since our inception in October 2017, we have proudly served as a cornerstone for wildlife research and education under the auspices of the Tamil Nadu Forest Department.
In this edition, we spotlight our recent Annual Research Conference held on February 15 & 16, 2024. This prestigious event showcased pioneering research and fostered valuable discussions on emerging trends in wildlife conservation.

Additionally, we highlight our impactful training programs: a specialized session for the Fisheries Department on biodiversity conservation, a comprehensive course for forensic scientists and enforcement officers, and an engaging awareness program for government school students on wildlife conservation and career opportunities in this field. These initiatives reflect our dedication to building knowledge and fostering a new generation of conservationists.

We are proud of the strides made in advancing conservation knowledge and practice through these endeavors. We trust you will find this edition both enlightening and inspiring as we continue to champion the cause of wildlife conservation and education.

-Thiru. A. Udhayan, I.F.S.

Editorial Members

Ms. S. Senbagapriya , I.F.S.,
Deputy Director (Administration)

Thiru. D. Eswaran
Deputy Director (Technical)

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III- Annual Research Conference

"The wildlife and its habitat cannot speak, so we must and we will." - Theodore Roosevelt

1. Fireflies and Environment

-Mr. Thirumurugan V, Project Coordinator, AIWC

Dark can be silent and may not be everyone's preferred habitat, but a little firefly can illuminate the dark with its lighting luminescence and perfectly glow up the environment. I grew up in rural part of Chennai surrounded by a sacred grove, two lakes, 7-8 small ponds, 40-45 round wells, , and a copious 100 acres of agricultural land in my neighbourhood. Since my childhood (the early 2000s), the two lakes in our vicinity catered to the needs of our people in several ways like a playground during summer, a fishing ground during monsoon, a source of water for domestic use and agriculture, an open swimming pool for the kids and a place of recreation for elders in the evenings. My first acquaintance with fireflies goes back to my childhood days when there were much darker places, fewer street lights with sodium bulbs, and remnant vegetation near my home. Our lakes and barren agricultural land are their prime habitat; we see fireflies slowly moving, emitting light, glittering like gold after sunset in the post-monsoon months of Margazhi and Thai (Dec-Feb) in Chennai. Me and my friends used to collect them, strangle their bellies, and cage them in the Horlicks glass bottle with multiple small holes on the lid. We used to call them hide-and-seek insects; if we touch them, they stop emitting light and hide somewhere in the bushes. We played with those magnificent flies without realizing their ecological significance, eventually leading to their death after few days, instilling remorse in me.

Fireflies are known to be photophobic, soft-bodied, light-emitting nocturnal species demanding a clean and healthy environment (including water, land, atmosphere, and air). They require clear land (soil) to produce eggs and larvae, and a clear sky to attract the females. The life cycle of fireflies shows an intricate relationship with its external environment. Fireflies are unison species, meaning they synchronize their flashing patterns. Rain plays a significant role in their lifecycle, influencing each stage from egg to adult. The emergence of adult, light-emitting fireflies from the larval stage mainly depends on rain. Any shift in rain patterns can affect their emergence, potentially delaying it until the next rainfall.

As a part of the Fireflies ecology project at the Advanced Institute of Wildlife Conservation, Chennai, I had an opportunity to visit the Anamalai Tiger Reserve from April 15 to May 22, 2024. This period is called the season of synchronized firefly movement. I heard about the stories on synchronization of fireflies from a forest officer Mr. M.G. Ganesan and the award-winning photo of synchronized fireflies in Anamalai Tiger Reserve by Mr. Sriram. During the initial phase of the survey, I keenly waited for the rain to come. Every year, after the pre-monsoon rain and mango shower rain between April to May, the larvae of the fireflies emerge into adult fireflies. The adult fireflies live for 14 – 20 days in their life cycle (copulate/mate, lay eggs, and die off). I was fascinated that even the eggs and larva can glow (two yellow lights on the lower side). These nocturnal flies glow like brilliant golden fire minuscules which the locals agree too. These glow worms set flashing lights in the obscure nights while residing beneath the leaves during day time. The firefly larvae are predators that feed extensively on snails, worms, slugs, and other insects. They are usually seen in the water channel and wet areas, crawling slowly with two indicator lights on their back. Our field trackers mockingly call the firefly larva as “ravva” while seeing the animal glow with excitement. We have witnessed a huge firefly larva (4 - 5 cm in length) being hit by a vehicle.

Congregation of fireflies in Anamalai Tiger Reserve

Fireflies resting on the underside of the leaf

Firefly larva is struck by a vehicle

“The Earth is what we all have in common.” —Wendell Berry

According to local Malasars and Muduvans (Tribe communities) beliefs, a large congregation of fireflies predicts a bountiful honey harvest for that year. The current year witnesses smaller congregations of fireflies due to the unusual rain patterns in 2024. With minimal light intensity and pollution, Anamalai Tiger Reserve offers an ambient abode for these unique beetles. On the other hand, Chennai is witnessing rapid urbanization, diminishing the habitats for fireflies. Recently, it has been disheartening to know that children in our area haven't sighted or know about the fireflies and their environment. The exploration of the fireflies and environment is in our situation to protect or witness their extinction in urban landscapes. This calls for urgent conservation attention to protect the existing scattered population of fireflies in Chennai.

2. Report on Nilgiri Tahr Population Estimation Study

-Mr. Pradeep Kumar. N, Project Fellow, AIWC

Introduction:

Our team, Dr. Shameer, Aravind, Thirumurugan, Iyanar, and Deputy Director Ganesan, started a population estimation study of Nilgiri Tahr. The team started from Chennai Central on January 25th 2024, spanning a journey of approximately 9 hours to Coimbatore. During the journey, Deputy Director Ganesan imparted valuable insights on the subject and recounted experiences. On arrival at Coimbatore railway station, accommodation was arranged by the DFO office at the Forest Rest House. The subsequent morning marked our transition from Coimbatore to Valparai, where we reached the Akka Malai Grass Hills Research Station. In the evening, the team gathered to discuss the essential aspects of Nilgiri Tahr estimation.

Field Operations:

The population estimation kicked off with the team dispersing for the fieldwork. On the first day, Dr Shameer, Ravi Kumar, and Ravi (anti-poaching watcher), climbed Tanakkan Malai, covering a challenging 7 kilometre climb. Notably, we encountered a leopard, and observed it standing for over 5 minutes. Transitioning to VR road, we initiated the Nilgiri Tahr estimation, spotting a group of 9 Tahrs on the Koranmalai hills.

Also, a sample group of 16 unclassified individuals was documented. Continuing towards Tanakkan Malai, we observed 12 individuals, comprising 2 males, 1 juvenile, and 6 females at the hill's summit. Further exploration unveiled a significant group of 111 individuals at the edges of Tanakkan Malai. The challenging descent down the cliffs showcased the team's remarkable trekking skills, resulting in the identification of an additional 5 Tahrs on the Tanakkan Malai hills. Finally our team covered an impressive 18 kilometers and finally stayed in Konalar British Hut at the end of the population estimation. This extended effort enriched our understanding of Tahr habitat and ecology and proved a valuable experience in our collective research endeavors.

Conclusion:

The Nilgiri tahr population estimation study, marked by remarkable observations and challenging fieldwork, has significantly contributed to our understanding of Tahr ecology. The collective efforts of the team underscore the importance of such endeavors in advancing our knowledge of wildlife and conservation practices.

"It's surely our responsibility to do everything within our power to create a planet that provides a home not just for us, but for all life on Earth." -Sir David Attenborough

3. Isolation, Speciation, and Survival: Dravidogecko and the Climatic Forces Shaping Reptilian Diversity in the Western Ghats

Dr T T Shameer, Project Scientist

As climate change rapidly escalates, the unique biodiversity of the Western Ghats—a global biodiversity hotspot—is under an immediate and severe threat. Our study on the biogeography of the Dravidogecko, an ancient reptilian genus endemic to the region, presents alarming predictions for its future survival. By modelling the distribution patterns of the Dravidogecko under past, present, and future climate scenarios, the study underscores the urgent need for immediate action to address the fragile nature of its habitat.

The Dravidogecko: An Ancient Relic of the Western Ghats

The Dravidogecko, with its unique greyish-brown marbled body, thick tail, and distinctive granular scales, has adapted to the unique microclimatic conditions of the Western Ghats. Unlike the more common Hemidactylus geckos, this species can be easily identified by its undivided sensors on the toes. The study focused on regions like Coonoor, Kundha, and Kotagiri in the Nilgiri Hills, where we surveyed 58 locations to map the current distribution of this intriguing and elusive gecko, a creature of unique beauty and adaptation.

Fig. The Dravidogecko species observed in the study area. Its banding pattern differs from the reported six species,suggesting the possibility of becoming a new species.

New Species Discovery: nominated to be – *Dravidogecko coonoorenis*

In a significant addition to the biodiversity of the Western Ghats, researchers have identified and nominated a new species named *Dravidogecko coonoorenis*. Discovered during field surveys in the Nilgiri hills, this species underscores the crucial role of the region's unique micro-climatic conditions in promoting speciation, a process that enriches the region's biodiversity.

This discovery is a testament to the importance of our research in understanding and preserving the unique biodiversity of the Western Ghats, highlighting the significant role of the study in the face of climate change.

The identification of *Dravidogecko coonoorenis* was confirmed through DNA analysis, focusing on the mitochondrial COX1 and nuclear RAG1 genes. Its distinct morphological features, including a greyish-brown marbled body and thick cross-barred tail, distinguish the species.

This discovery not only enriches the Western Ghats' known biodiversity but also suggests the potential for uncovering more species within the Dravidogecko genus in underexplored areas of the region

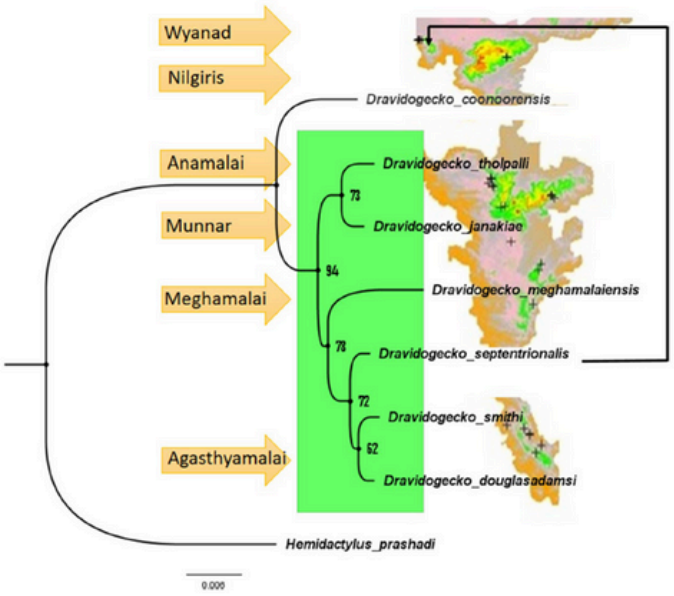


Fig. Phylogenetic analysis of Dravidogecko observed from the Nilgiris. The green colour represents the previously described species of Dravidogecko, and the Nilgiri specimen, which falls outside this cluster, could be an ancient stock with more ancestral similarities. Molecular analysis indicates the specimenis a new species, and we nominate it as *Dravidogecko coonoorensis*

Past and Present: A Shrinking Habitat

The findings reveal that the Dravidogecko had a more extensive range across the Southern Western Ghats during the Pleistocene. However, as the climate warmed post-Pleistocene, the species became geographically isolated, retreating to higher altitudes where cooler conditions prevailed.

"We are not part from nature, we are a part of nature." -Jane Goodall

This geographical isolation led to allopatric speciation, contributing to the remarkable endemism in Western Ghats today.

The study's models predict a grim future. The study used various environmental variables such as altitude, precipitation, and canopy height to forecast the current and future distribution of the Dravidogecko. The models show that under current conditions, the suitable habitat for the Dravidogecko is already patchy, with an estimated area of 21,452 km². This represents a significant reduction from its historical range, which was much more continuous across the region.

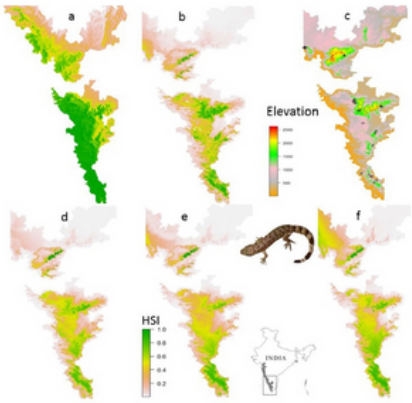


Fig. Habitat suitability model of Dravidogecko. a HSM under Pleistocene Climate, b HSM under current climate, c occurrence points on theelevation map of the WG, d HSM under RCP 4.5, e HSM under RCP 6, f HSM under RCP 8.5

Future Projections: A Dire Outlook

Looking ahead to 2070, the study examines three climate change scenarios based on different levels of greenhouse gas emissions: RCP 4.5, RCP 6.0, and RCP 8.5. Under these scenarios, the suitable habitat for the Dravidogecko is projected to decline drastically—by 46.19% under RCP 4.5, 57.1% under RCP 6.0, and 71.08% under RCP 8.5. The only populations likely to persist are those in the Silent Valley-Mukkurthi-Nilgiri and Agasthyamalai regions. Other meta-populations are at high risk of extinction.

Allopatric Speciation and Biogeographical Implications

The discovery of *Dravidogecko coonoorenis* provides a compelling example of allopatric speciation—a process where new species evolve in geographic isolation from one another. In the Western Ghats, this isolation is primarily driven by the region's complex topography and varied microclimatic conditions. The speciation event for Dravidogecko coonoorenis likely depended on several factors, including habitat isolation, specific ecological conditions, and inter-specific interactions.

Allopatric speciation in the Western Ghats has been well-documented, with many species in this region showing high levels of endemism. The process typically involves the fragmentation of a population into smaller, isolated groups due to geographical barriers or climate changes, which prevent gene flow between them. Over time, these isolated populations undergo genetic divergence, leading to the formation of new species. The *Dravidogecko coonoorenis*, isolated in the Nilgiri hills, illustrates how such geographic and climatic factors contribute to speciation in reptiles.

The changing climate and resultant habitat fragmentation in the Western Ghats play a crucial role in these speciation events. As temperatures and other environmental conditions fluctuate, reptile populations are often forced to adapt by shifting their ranges or becoming isolated in more favourable micro habitats. This leads to the formation of meta-populations that, over time, can diverge into new species, as seen with *Dravidogecko coonoorenis*.

Importance of Understanding Speciation Mechanisms

Understanding the mechanisms of speciation, particularly allopatric speciation, is vital for the conservation of biodiversity. Knowledge of how species like Dravidogecko coonoorenis evolve and adapt to changing environments provides insights into their natural history and ecology, which are crucial for effective conservation strategies. The ongoing challenges of climate change, habitat fragmentation, and invasive species further underscore the importance of preserving the unique ecosystems that foster such biodiversity.

"The diversity of life forms, so numerous we have yet to identify most of them, is the greatest wonder of this planet." -E.O. Wilson

TThe discovery of *Dravidogecko coonoorenis* is a significant addition to the herpetofauna of the Western Ghats and highlights the dynamic processes of speciation driven by geographical and climatic factors. As research continues, more species within the Dravidogecko genus may be discovered, offering further opportunities to understand the complex interplay between environment, isolation, and evolution in this biodiversity hotspot.

Reference

Shameer, T.T., Nittu, G., Mohan, G. et al. Consequences of climate change in allopatric speciation and endemism: modeling the biogeography of Dravidogecko. Model. Earth Syst. Environ. 8, 3059–3072 (2022). https://doi.org/10.1007/s40808-021-01284-4

4. "Vanishing landscapes: The Disappearing Charm of Rural Chennai"

-Mr. Thirumurugan V, Project Coordinator, AIWC

Chennai, renowned for its historical landmarks and the longest beach in Asia, is also home to a network of lakes, ponds, and water tanks that many might overlook. My childhood memories are filled with experiences around two lakes—Madambakkam and Agaramthen—as well as numerous ponds, wells, and agricultural lands in our neighborhood. These water bodies not only provided recreational spaces but were vital for domestic and agricultural use.

Biodiversity and Ecosystems

The wetlands around Chennai once thrived with diverse flora, including Borassus flabellifer, Azadirachta indica, and Morinda tinctoria. Birds like Egrets, Ibis, and Painted Storks frequented the lakes, while mammals such as the Indian grey mongoose and various snake species added to the rich biodiversity. This vibrant ecosystem was a source of life and joy for many.

Urbanization and Its Impact

Over the years, however, rapid urbanization has drastically altered this landscape. The lakes that once served as playgrounds and fishing grounds have diminished due to encroachment and pollution. The remaining lake faces challenges from invasive species like Water Hyacinth, and the natural flow of water from high-ground to low-lying areas has been disrupted.
Chennai's water management system has suffered from the expansion of concrete developments. The conversion of agricultural lands and water bodies into land plots has shrunk water channels, leading to increased flooding and environmental degradation. The loss of lakes and water paths impacts not only the local climate but also exacerbates issues like flooding, as seen during the Michaung cyclone in December 2023.

The Critical Need for Conservation

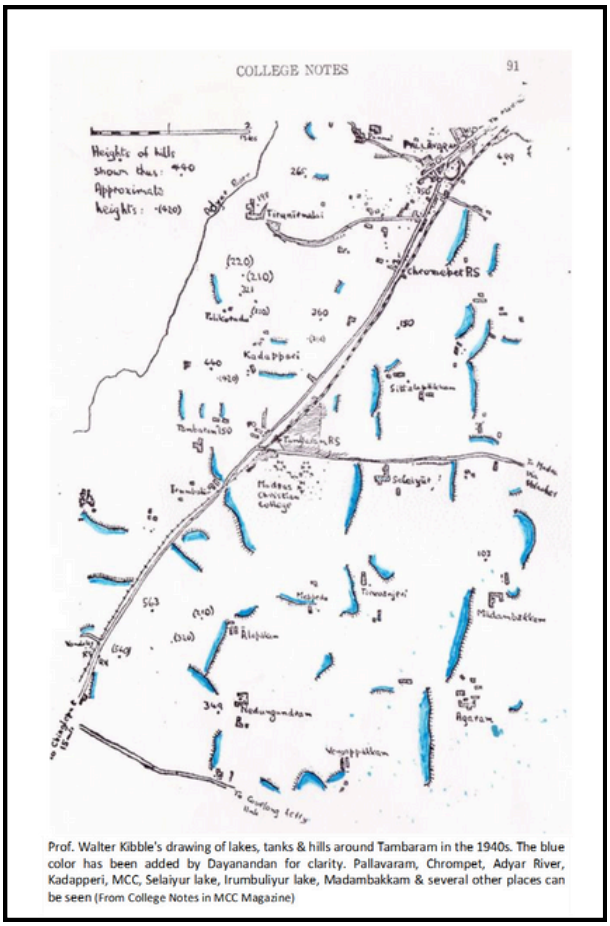
Water paths, or "water memory," are essential for the movement of water across the city's terrain, moving from higher to lower elevations and eventually reaching the Bay of Bengal. Any obstruction or reduction in these paths can lead to waterlogging and flooding, impacting lives and livelihoods. The recent transformation of rural landscapes into concrete urban spaces without adequate planning has led to an increase in floods and environmental degradation.

Moving Forward

As urban development continues, it is crucial to balance growth with conservation. Protecting and rejuvenating our lakes, agricultural lands, and water paths is vital for ensuring a sustainable future. We must prioritize water management and conservation to avoid a day-zero water scarcity scenario and mitigate the adverse effects of climate change.
Everyone, including policymakers, developers, and residents, shares responsibility for safeguarding our water resources. By focusing on sustainable development and conservation, we can ensure the well-being of our city and its inhabitants for generations to come.

"Look deep into nature, and then you will understand everything better." - Albert Einstein

Vanishing landscapes: The Disappearing Charm of Rural Chennai - Images



Prof. Walter Kibble's drawing of lakes, tanks & hills around Tambaram in the 1940s. The blue color has been added by Dayanandan for clarity. Pallavaram, Chrompet, Adyar River, Kadapperi, MCC, Selaiyur lake, Irumbuliyur lake, Madambakkam & several other places can be seen (From College Notes in MCC Magazine)

Cyclone Michaung (December 2023) impact on people livelihood (Image courtesy: The Mint)

Water crisis in Bengaluru (Image courtesy – Indian Express)

"The real wealth of the Nation lies in the resources of the earth - soil, water, forests, minerals, and wildlife." - Rachel Carson.

5. Advancing Wildlife Protection Through Innovative Mobile Application

-Mr. Pradeep Kumar.N, PF & Mr. R. Saravanakumar RA, AIWC

Our project, titled "Development of a Bilingual Mobile Application for Identifying Terrestrial and Marine Fauna as an Aiding Tool for Prevention and Control of Wildlife Crimes in Tamil Nadu," is designed to revolutionize wildlife conservation efforts by enhancing our ability to identify and protect both terrestrial and marine species across the region.

The primary goal of our project is to create an innovative mobile application that will play a crucial role in preventing and controlling wildlife crimes. This application aims to provide a reliable and comprehensive tool for wildlife identification, which is essential for effective protection measures. To ensure that our application is accurate and comprehensive, we are meticulously compiling data on scheduled wildlife Trade animals, focusing on their physical characteristics and Morphological Identification.

Recent Field Study and Data Collection

As a key component of our project, our research team will be conducting a field study at the Arignar Anna Zoological Park in Vandalur. We are scheduled to visit the park on 13.08.2024 (Thursday) and 14.08.2024 (Wednesday). This fieldwork is crucial for collecting high-quality photographic data's (Pugmarks, Foot Mark, Scat, Pellets), which will significantly contribute to the development of our application.

Wild life Documentation

On the first day, our team will focus on capturing images of various carnivores, including tigers, sloth bears, leopards, foxes, hyenas, wild dogs, and wolves. We will also photograph pug marks and scat to provide detailed evidence of these animals' presence and behavior. This comprehensive approach will help us build a robust database for accurate species identification.

The second day will involve capturing images of tigers and leopards once again, alongside photographing animals such as grey heron, night herons, flamingos, pelicans, snakes, lizards, tortoises. This will ensure that our application includes a diverse range of wildlife, enhancing its utility for users in various scenarios.

Image Credit: R.Saravanakumar, A.Pradeep Kumar, Sasipriyan.P

Images from field visit for Mobile Application- GoMBR

"The Earth is what we all have in common." —Wendell Berry

6. A Tale of Polymer

-S.Sakthinarenderan (DNA-LAB) JRF, AIWC,Vandalur

What would the world be like without plastics? A remarkable substance that is resilient and long-lasting enough to find use in a wide range of sectors, from pharmaceuticals to food packaging to automobiles. These materials are inexpensive to generate and also relatively simple to make. Let's look into a tale of such plastic called polystyrene.

Hello everyone, this is Sty-rene. I am really thankful to mankind for setting me free from latex of Storax balsam tree that could be found in Asia and Central America. I was bored to stay at one particular tree for very long years, wherein a German professor named Casper Neuman isolated my ancestor from bansal tree and named them "Storax". In 1839, Johann Eduard Simon was the German chemist who accidentally heated my ancestor in a glass setup that collects evaporated vapours (distillation). Then we felt very sticky, strong and very elastic. We got a new name as 'Polymers' and we were put to use in food packing industry, electrical insulating wires, laboratory ware. I was praised and adored by mankind for until I reached every nook and corner of this planet. Firstly, mankind was very keen about producing me in large scale by adding me into a strong bonded chain by pressurized heating process (polymerisation). But nowadays they are calling me as pollutant that causes harm to the organisms and the environment.

I was moulded to variety of products with perfection. And after single use, I was thrown away into garbage. From there I landed up in landfills and sometimes nearby river. Finally, I settled at one place for long days by the action of UV rays of the sun, wave abrasion activity in river and ocean. I further broke down into very tiny particles of size less than 5mm. Now, they call me as microplastics and they are trying to destroy me completely. 'Unity is strength' is a famous proverb in English literature. Since our individual units (monomers) are very united with each other in chains, we are very hard to break (non -biodegradable). I don't know why humans are suddenly turning against me because I was already present here in different form, they moulded me, used me and finally blaming me as toxic to the environment. As a very tiny particle I could reach to many places, which the macroplastic couldn't reach. Moreover, I was eaten up by tiny creature (zooplanktons, phytoplankton, ciliates, protists), further it was eaten up by secondary consumers (small fishes) and tertiary consumers (large fishes). Sometimes, I get stuck into the blood stream of fish and thereby reaching into internal organs. Finally, I have also travelled to human's intestine through edible fishes. Now, they have found me in blood stream, reproductive organ of humans also.

These days, people produce me in the form of micro beads in various sizes to evaluate the harm I do to different marine species, including fish, crab, seabirds, etc. I routinely undergo tests in the lab where different species are exposed to me and their mortality is examined. These animals that are ingesting me are under a lot of stress, which causes them to act differently than animals that aren't taken. Even though I am very useful to them, I have abundantly dispersed to all possible biospheres on this planet in three forms namely: Macroplastic, Mesoplastic, Microplastic, Nanoplastic. I'm wondering how they're going to entirely digest me into non-toxic components or get me back into latex. My issue is that the compounds put on me to increase my agility prevent me from degrading on my own (plasticizers).

My new avatar as micro beads tagged with green fluorescence had a new purpose. Eventually it was used to trace the pathways through which I was transferred from one trophic organism (lower) to another (higher). A researcher in white coat named Sakthi was adding me into freshwater medium and properly distributed us with high vibrations producing machine (Ultrasonicator). Beyond that step, young fishes of European Sea Bass (Lates calcarifer) were introduced into tanks. After exposure for 24 and 48 hours, they seem to behave normal compared to other lower organisms. However, I slowly got moved through the gills and mouth of the fish eventually leading to gut, intestine. Few of my friends came out through faecal

"We don't own the planet Earth, we belong to it. And we must share it with our wildlife." -Steve Irwin

matter but few of us got stuck inside the tissues of muscle, gill, and liver. No fishes were died during our incubation with them (acute exposure).In addition to direct exposure, he also placed us inside tiny oval cells and cultured them with us for 24 and 48 hours. We infiltrated cells, causing harm to their structural integrity. Some cells eventually died, while others were able to use their repair mechanisms to survive. He also tested natural extracted polymer (biopolymer - Polyhydroxybutyrate) from a bacteria isolated from paddy field. They were made to encapsulate in order to acquire spherical shape. To our surprise though the biopolymer belongs to similar material, they are called as bioplastic. They were given some privilege these days and were praised for being a sustainable alternative for synthetic plastics. The biopolymer thus produced were subjected to the same testing environment in order to assess the toxicity induced by them was comparable for my own effects. Therefore, it was discovered that even the biopolymer that was extracted and produced spontaneously, gets accumulated and caused certain alterations in the tissues. Additionally, biopolymers caused cell death after acute exposure, gives researchers insights into the toxicity of bioplastics. So, even these green synthesized materials can also become toxic.

Further, he is also exposing us to zooplanktons to check how they are responding after ingesting us. He tracked down us using our fluorescence emission throughout our way into from zooplankton to shrimp larvae and further to fish larvae. He was very keen to look into gut and the faecal matter in order to check how many particles were being ingested and assimilated in one organism. Moreover, transferring from one trophic level to other trophic level whether it keeps on adding on to next trophic level or excreted out after digestion.

Though I have the ability to reach different medium and organism easily. Mankind assumes that I may harm them with my chemical ingredients. But the truth is they only developed me to be strong but now they are going against me. No matter where I live, I am also a part of this Mother Earth. If I am posing threat to everyone, I would like to go back to my ancestor state. So that everything turns to be in harmony.

7. Protected Marine Animals of Tamil Nadu

-Mr. R. Saravanakumar, Research Assistant, AIWC

India is one of the mega biodiversity countries in terrestrial and marine ecosystems. The coastal zone in India assumes importance because of the high productivity of its ecosystems, concentration of population, and exploitation of renewable and non-renewable natural resources. India's long coastline of about 7,500 km, including that of its island territories, comprises 60 coastal districts. The coastline of Tamil Nadu has a length of about 1,076 km, which constitutes about 15% of the total coastal length of India and stretches along the Bay of Bengal, the Indian Ocean, and the Arabian Sea. 14 districts share the coastline namely Thiruvallur, Chennai, Chengalpattu, Villupuram, Cuddalore, Mayildathurai, Nagapattinam, Tiruvarur, Thanjavur, Pudukottai, Ramanathapuram, Thoothukudi, Tirunelveli and Kanyakumari. According to the Indian Wildlife Protection Act 1972 largely present in marine animals are mainly important for marine conservation. The conservation aspect focused on one of conservation implemented by acts and rules. The majority of marine protected animals are its comes in schedules I and II. The majority of Phylum cnidaria as well as coral species are highly in the WPA Act.

The Gulf of Mannar Biosphere Reserve is one of the richest Marine Faunal biodiversity in Tamil Nadu. Located along the southeastern coast of India, it is one of the world's most significant marine biodiversity reserves. Stretching from Rameswaram in Tamil Nadu to Kanyakumari, it spans 10,500 square kilometers and includes 21 islands surrounded by coral reefs. The coastal stretch of the Gulf of Mannar Coral reefs interacts with the most precious dynamic ecosystem of Marine flora and fauna. They are the protectors of the coastlines of the maritime States. The diversity of protected marine fauna in the Gulf of Mannar is highly recommended as one of the ecological balances of the coastal environment. Some Cnidaria species have unique roles in creating marine environments. More species of sea anemones, sea pens, sea fans, hard corals (Scleractinians) Tube dwelling anemones, false corals, holothurians, molluscs, dugongs, whales, sea snakes,

"We never know the worth of water till the well is dry." -Thomas Fuller

turtles, sharks, ray fishes, guber fish, sea horses and pipe fishes, are highly distributed in Gulf of Mannar Biosphere Reserve and highly distributed in hard and soft corals in this coastal stretch.

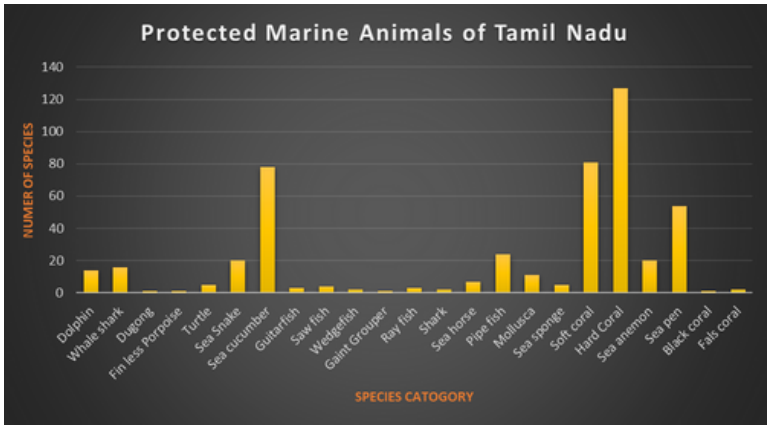


Fig. Number of species in protected marine animals of Tamil Nadu

8. Bird feathers tell secrets; a peek into Feather Forensics

-Ms. Niveditha RK, JRF, AIWC

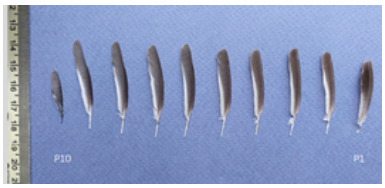
Bird feathers play a vital role in bird anatomy. They are crucial part of a bird's body that has different form and functions. The very first thing we notice in a bird is its colour; the plumage. Different types of feathers together form the plumage of a bird.

One could discover plenty of information about a bird species from its feathers like moulting, breeding, injuries, sex, etc. Feathers can be a valuable piece of evidence when examining a crime scene, identifying species that are unique to a certain area, or solving bird strikes with aircrafts or other vehicles.

Owing to their captivating beauty, birds are targeted by the illicit pet trade. Wild birds are easily identified by their plumage, but occasionally, traders color the feathers of birds and pass them off as different species in an effort to mislead buyers and avoid being caught. Bengal finches/ Society finches and the White-rumped munias almost look same in their appearance but the Bengal finches are hybrids and domesticated species whereas White-rumped Munias are wild species. They could be differentiated from the wild species with presence of irregular white patches at the wings, tail and other parts of the body. But in the case of Black-headed Munia, the scenario is different. These birds are caught easily from wild and traders dye them with different colours to make them look like exotic species. Therefore, this could only be addressed with adequate knowledge of feathers and finding the species may be aided by understanding morphology of feathers, particularly the flight feathers, like wing feathers and tail feathers that forms major part of visible plumage.

Bengal Finch/Society Finch

White-rumped Munia



White-rumped Munia wing feathers & tail feathers (Source: AIWC)

Black-headed Munias Perumbakkam Marsh.

Black-headed Munias dyed with colours (Source: Deccan Herald, Bengaluru)

"Look deep into nature, and then you will understand everything better."-Albert Einstein

On the other hand, birds are utilized in black magic and are hunted for food. The village outskirts and water bodies are frequently used for hunting gregarious migratory birds like ducks and waders. In this instance, the feathers and outer skin are discarded and only the flesh is used. Discarded feathers serve as a valuable clue to find whether the species is domestic or wild.

Another way to find out whether a certain bird species is present is to look for feathers from that habitat. The presence of shy species and birds that are camouflaged and difficult for humans to see could be identified from the fallen feathers. In this regard I would like to relate a personal experience.

Along with a friend, I was birding at the Perumbakkam Marsh. We documented few species during birding. Suddenly, my friend saw a feather floating on the water close to the reeds. We retrieved the feather and examined it. It had a really clear pattern and was quite lovely. It had bars and dots, and raptors immediately came to mind. I was so curious to find which bird it belonged to. I was just recalling all the owls and other raptors and about their patterns. We continued birding watching the pipits and munias. As we began to make our way back, again we saw a tuft of feathers that was stuck on the grass. We gathered them with care onto a piece of paper and folded it. I brought the feathers to the laboratory and began a thorough inspection.

At AIWC's morphometry lab were we have a collection of bird feathers from various wild species, which we collected as a part of "Feather Atlas" project. I compared the feather to see whether it matches with Indian Scops Owl from the collection. Sadly it did not match. I had a doubt with Eurasian Kestrel as they have similar pattern, but failed in matching this feather with any of the kestrel feathers. As the feather was from the marsh land, I thought to narrow down my search towards some water birds with same feather pattern. Finally after surfing various references, I found that the single feather is a secondary feather that belonged to a male Painted Snipe
Rostratula benghalensis.

Secondary feather of Painted Snipe
Rostratula benghalensis

The tuft of feathers resembled the patterns of some quail species Upon examining the patterns of every ground-dwelling galliformes, I discovered that it was from the Gray Francolin ***Ortygornis pondicerianus***.

Under body feathers of Gray Francolin
Ortygornis pondicerianus

For this reason, a thorough understanding of feather morphology is crucial to crime scene investigation. Under the Feather Atlas project, we are therefore in the process of gathering as many common, endemic, and extensively traded species as possible throughout Tamil Nadu to create a wonderful database for the bird feathers..

References:

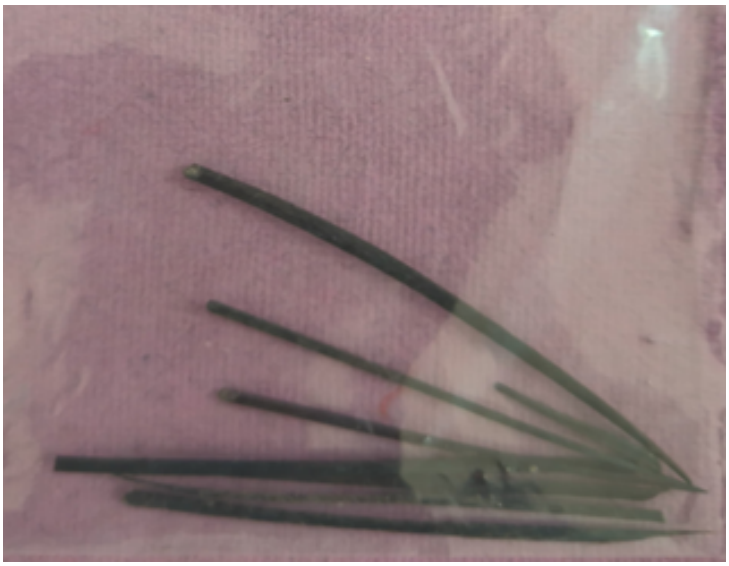
1.Hardey, J. (2006). Raptors: a field guide to survey and monitoring. The Stationery Office.
2. https://www.featherbase.info/en/home

"Birds can survive without humans but a human can't survive without birds " – Salim Ali

9. Forensic Analysis reveals suspected "Elephant Tail Hair" as Cattle Hair in Wildlife Trade Investigation

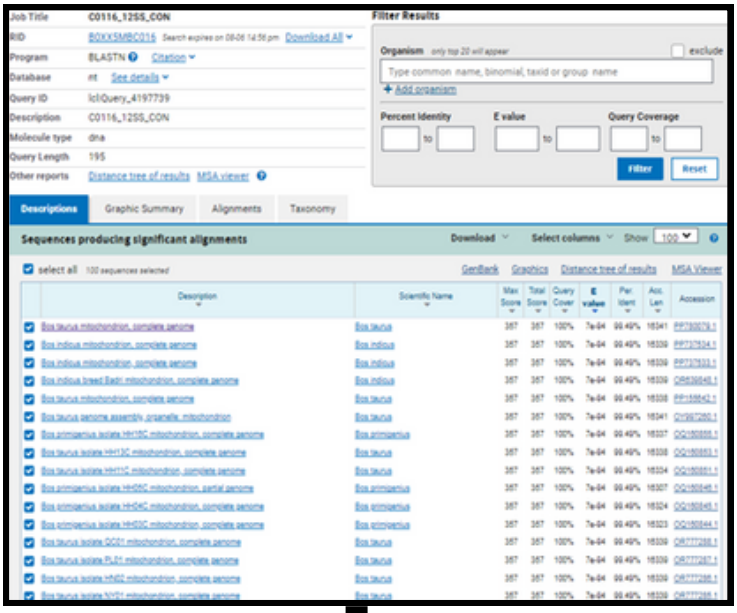
-Ms. R. Uma Maheswari (DNA-LAB) JRF, AIWC,Vandalur

As part of our ongoing efforts to combat illegal wildlife trade, our forensic team recently received a case for species identification analysis on a sample purported to be elephant tail hair. The results of this analysis were surprising: the hair, claimed to be from an elephant, was conclusively identified as originating from domestic cattle. The fraudulent trade of wildlife products, whether fake or real, contributes to the threat of the species and disruption of the ecosystem.



(Sample received)

sample in question was submitted to our lab for Wildlife forensic analysis. Given the severe conservation concerns surrounding elephants, it is critical to verify such claims to prevent illegal exploitation. The sample underwent rigorous morphological examination and DNA testing, and the morphological examination proved that it was not an elephant hair. DNA analysis confirmed that the hair did not belong to an elephant but rather to a domestic cow.



Conservation Implications:

This case highlights a troubling trend: the circulation of counterfeit wildlife products in markets that cater to cultural and luxury demands. The sale of fake items not only deceives consumers but also fuels the ongoing illegal trade, which remains a significant threat to endangered species like elephants.

"Wildlife is something which man cannot construct. Once it is gone, it is gone forever." -Joy Adamson

7. Photo Gallery: Glimpse of Training Programs & visit organized at AIWC

55 students of Forest College, Mettupalayam, TNAU Visited the Advanced Institute for Wildlife Conservation (Research, Training & Education), Vandalur on January 05, 2024.

Two-day Training Program on Advanced approaches and techniques in wildlife research to 25 biologists from Various Division on January 8 & 9, 2024.

The Head of Forest Force (HoFF) visited the AIWC (R, T & E) on January 19, 2024, and recognized our commitment to wildlife conservation, sustainable practices, and environmental excellence.

65 Preventive Officers from NACIN, Chennai Visited the Advanced Institute for Wildlife Conservation (Research, Training & Education), Vandalur on January 22, 2024

Photo Gallery: Glimpse of Training Programs / Visit organized at AIWC

The AIWC initiative enhanced knowledge and inspired over 100 students from GHSS Otteri and GHSS Urpakkam in Chengalpattu on January 24, 2024. This initiative focused on wildlife conservation activities, career opportunities in the field, and the important role AIWC plays in conservation efforts.

The AIWC initiative raised awareness over 500 students from GHSS Mampakkam, GHSS Old Perungkalaththoor, GHSS Pergankaranai, and GGHSS Nandhivaram about wildlife conservation and career opportunities on January 30th, 31st, and February 2nd, 2024.

Our Project Coordinator, Mr. Thirumurugan, delivered an insightful talk on the "Mangroves of Andaman and Nicobar Islands," emphasizing their crucial role in the island ecosystem to AIWC in-house faculties on February 02, 2024, World Wetland Day.

17 Examining Officers from NACIN, Chennai, visited the Advanced Institute for Wildlife Conservation (Research, Training & Education), Vandalur on February 08, 2024

Photo Gallery: Glimpse of Training Programs/ Visit organized at AIWC

One-day training program on "Inland, Coastal, and Marine Biodiversity Conservation – Issues and Challenges.", for 22 officer trainees from the Fisheries Department, Tamil Nadu, held on February 12, 2024.

Book release event during Third Annual Research Conference held at AIWC, Vandalur on February 15 & 16, 2024.

Successful completion of Third Annual Research Conference held at AIWC, Vandalur on February 15 & 16, 2024.

In celebration of World Sparrow Day, AIWC has installed terracotta shelters and water feeder pots on trees within our premises, providing a safe haven for sparrows on March 20, 2024

42 NSS students from SSN College of Engineering visited AIWC Vandalur. They gained valuable insights into biodiversity and the role of AIWC in wildlife conservation. on May 02, 2024

Dr. G. Umapathy, Chief Scientist at CSIR-CCMB, delivered an enlightening talk on biotechnological tools in biodiversity conservation at AIWC Vandalur. The discussion explored innovative strategies for safeguarding our planet's diverse ecosystems on June 28, 2024

One-day training program on "High Resolution Melting analysis for Deer species identification and other advanced wildlife forensic techniques.", for 30 Officers from the Forensic Department, Tamil Nadu, held on March 15, 2024.

8. Poster Corner

January Events

January 10: Save the Eagles Day

February Events

February 02 : World Wetlands Day

March Events

March 21 : International Day of Forests

March 22: World Water Day

April Events

April 22 : World Earth Day

April 27: World Veterinary Day

May Events

May 03 : International Leopard Day

May 11: World Migratory Bird Day

May 17: Endangered Species Day

May 20: World Bee Day

Poster: Save the Eagles Day

Poster: World Wetlands Day

Poster:International Day of Forests

Poster: World Water Day

Poster: World Earth Day

Poster: World Veterinary Day

Poster: Endangered Species Day

Poster: International Leopard Day

Poster: World Bee Day

Poster: World Migratory Bird Day

May Events

May 22 : International Day for Biodiversity

May 23 : World Turtle Day

May 25 : World Fish Migration Day

May 28: World Dugong Day

May 29; World Otter Day

June Events

June 01 : World Reef Awareness Day

June 05 : World Environment Day

June 08 : World Ocean Day

Poster: World Day to Combat Desertification and Drought

Other Posters

Poster: Tribute to Dr. AJT Johnsingh, Wildlife Scientist

Poster: IUCN Red List Assessment of Ecosystem, listed Mangroves of Tamil Nadu as Critically Endangered

Poster Corner

Poster: International Day for Biodiversity

Poster: World Turtle Day

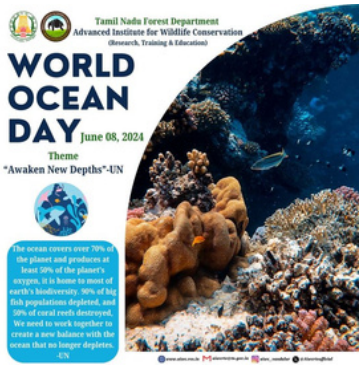
Poster: World Fish Migration Day

Poster: World Dugong Day

Poster: World Otter Day

Poster: World Reef Awareness Day

Poster: World Environment Day



Poster: World Ocean Day

Editing, Design & Layout
Sasipriyan.P, JRF,
Centre for Conservation Education

Contact us

The Principal Chief Conservator of Forests & Director,
Advanced Institute for Wildlife Conservation (R, T & E),
Tamil Nadu Forest Department,
Vandalur, Chennai - 600 048.

www.aiwc.res.in *aiwcrte@tn.gov.in* *aiwc_vandalur* *@Aiwcrteofficial*