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Lantana camara

by Anandha Karthik

...of Aliens, Exotics, Invasives, and Endemics.

While the term endemic is quite clearly understood by most, quite a few of us use the other three loosely interchangeably, which is not quite fair. So, just to put things in perspective, here are the differences:

...**Alien.** Not belonging locally. It may have been brought over by animals or humans, and in the case of the latter, for commercial use, or for beautification, or in some cases, for a good use. Every plant would like to spread its progeny as far from itself as possible....that is the nature of nature....and while this may take millennia naturally, humans and other animals tend to help proliferate plants in new locales very often. There are subsets of alien, namely cultivated, and naturalised.....the first implies that it was brought over for a particular purpose, while the latter signifies a natural process, and may include human intervention. Potato, black-wattle, tomato, celery, leeks, onions, and a whole host of vegetables and flowering plants in “European Gardens” in India belong to the first category. Coconut is probably the best example of a naturalised alien.....floated over seas, carried by the currents and tides, to far-off shores, and took root where it could, to become a local plant.

...**Exotic.** A subset of alien, but not exclusive; exotics are those that have been brought over by humans, and purely for the purpose of beautification or commercial use. A very large number of garden and vegetable plants, and trees in India are European in origin, and survive to this day as exotics. Pears, persimmon, plum, sweet-sop, cherry, apricot, peach, guava, tea.....none of these are natives.

...**Invasive.** An alien, and not always an exotic, that is hardier than endemic species, and will “bulldoze” its way through to grab space and resources at the cost of endemic species. Invasive plants in India include Lantana camara, Water hyacinth (*Eichhornia crassipes*), Prosopis juliflora, Black wattle (*Acacia mearnsii*), Black mimosa, Goat weed, Carrot grass (*Parthenium hysterophorus*), Siam weed (*Chromolaena odorata*), American rope (*Mikania micrantha*), Giant sensitive plant (*Mimosa pigra*), Crofton weed (*Argentina adenophora*), Senna spectabilis and Senna tora, Eucalyptus spp., (gum tree), Mexican sunflower (*Tithonia diversifolia*), *Ageratum conyzoides*, *Ageratum houstonianum*, and many more.

In addition to affecting the local flora, invasives also have a mixed effect on the endemic wildlife.....a lot of them find it difficult to adapt, while it is interesting to note that smaller reptiles, amphibians and passerine birds find it convenient to perch/roost inside the prickly bushes of the Lantana, in preference to endemic species. In a loose sense, ‘invasive’ plants have the resilience to thrive, where endemics may also need more care and can be sensitive.....invasives take over where endemics lack the strength to keep up.....the latter were either naturally weak, or over millennia, have become weaker than the invasive alien. But if we go back in unrecorded time, probably what we call endemic today, was also an alien invasive at one time.

Can we “re-interfere”? In a manner, yes.....in a large number of cases, the invasives were exotics, brought for a particular purpose. Unfortunately, we lack the sensitivity and care that is necessary to prevent aliens from becoming invasives.....carelessly discarded trimmings from garden plants, carelessly discarded seed pods, careless and over-plantation.....

This edition was planned as a special on endemics and invasives. Of course, this is not a complete compilation of either category in the Nilgiris. We hope it helps inculcate a habit of carefully choosing and handling alien-exotics, and nurturing endemics. Never can one plant be better than another, unless we mishandle them.

Ajay Ludra,
Secretary, NNHS

LESSER KNOWN LANTANAS OF THE NILGIRIS

Anita Varghese, PhD

Driving to the Nilgiris from Mysore leaves most people enchanted by the forests and the greenery. If you are one of those who try to identify species through field guides and binoculars on a journey, then you start to differentiate and call out the greenery as native and exotic. One traveller recently remarked “Oh this is an infestation of Lantana” followed by the query “how is the government planning to eradicate this?”. How did words like ‘infestation’ and ‘eradication’ come so easily into the language of nurturing the environment? Weeds, colonisers, invasives, aliens, non-native, toxic etc have become common terms when referring to a plant or an animal that was not seen before but now is extensively visible. One still needs to understand that it is a plant, animal, microbe or fungus before they acquired their labels.

The prolific Lantana (from the Latin ‘lento’ meaning to bend) belongs to the family Verbenaceae (Verbena from the Latin for twigs of plants mostly aromatic that were used in sacred rituals of the Romans) of which there are more than 150 species. The genus Lantana is native to the tropics and has gained much fame because it has spread widely mostly through avid gardeners who were happy to have a plant that flowers regularly with such bright colors. The little raisin-like fruits are quite tasty and have become a treat for birds, bears and young children on their way to school (author’s personal observation from the Nilgiris).

The much maligned *Lantana camara* is the species that has spread across the length and breadth of India which will not be the focus of this article as there is a body of literature available on the species and how it is managed. Here one would like to share about the presence of two species of Lantana in the dry forests of the Nilgiri slopes.

Lantana wightiana Wall. ex Gamble was first published in the Flora of Madras Presidency by J.S. Gamble (1924), the plant is also known by its synonym of *Lantana veronicifolia* and is reported to be found in Pakistan and India.

(<https://powo.science.kew.org>). The plant is also called the Indian White Lantana presumably because of its distinct white coloured flowers (<https://www.flowersofindia.net/>). In the wild they have been observed in mid elevation dry forests of the north eastern slopes of the Nilgiris, along forest paths.

Lantana indica Roxb. was first described in the Flora of India in 1832 by William Roxburgh (<https://powo.science.kew.org>). The native range of this plant is from Afghanistan to Thailand in the dry forest areas. The flowers are mauve to blue in colour. In the Nilgiris they have been observed in the mid-elevation dry



Illustration by Valli Muthuraman

forests of the north eastern slopes of the Nilgiris along roadsides and forest paths.

Both the species discussed above have been observed in the wild in small numbers and low density. They are usually found hidden within larger clusters of several herbs and shrubs. Ecological studies to understand the status of the populations have not been conducted and from personal observations one does get a sense of these species not being too widespread and possibly outcompeted for light and nutrition by other dominant neighboring plants.

Do keep a lookout for these two native Lantana species and if you have some information about it put it in the NNHS WhatsApp group or get in touch with us at contact@nnhs.in.



Sketch by Anandha Karthik



Sketch by Anandha Karthik

The author is an ecologist who is Director at Keystone Foundation, President - NNHS and Chair-Western Ghats Plant Specialist Group

Senna spectabilis

IN THE NILGIRI BIOSPHERE RESERVE

P A Vinayan



<https://india.mongabay.com/2023/11/wayanads-soured-relationship-with-senna/>

Nearly four decades ago, a tree with golden blossoms and a dense green canopy became a popular choice for planting along roadsides and in public spaces within the Nilgiri Biosphere Reserve (NBR), a UNESCO-recognized biodiversity hotspot in the Western Ghats. However, with time, this seemingly attractive tree has revealed its darker side as a severe ecological threat to native biodiversity.

This tree, *Senna spectabilis* (Golden Shower), is a fast-growing invasive species native to tropical America. Introduced to southern India in the

1980s as an ornamental plant, it has since spread aggressively, invading precious wildlife habitats across the NBR, particularly within Protected Areas and adjoining forests, and posing a significant challenge to the region's ecological integrity.

For the first 30 years, the ecological threats posed by *Senna spectabilis* went largely unnoticed. However, after 2010, local communities and experts began to observe its unusually rapid spread into forests, especially open forests that sustain large populations of mammalian herbivores. The gregarious flowering and subsequent mass die-off of bamboo



Sketch by Sartaj Sehgal.

in the NBR region also contributed to the creation of open spaces, providing ideal conditions for *Senna* to establish itself and thrive.

Although *Senna spectabilis* dominates large tracts of forest, it offers minimal ecological value. Native herbivores do not consume its leaves, and even insects avoid feeding on it, rendering the tree virtually useless to wildlife. While local communities occasionally use its poles for constructing huts and fences or as firewood, the softwood burns quickly and generates excessive smoke, making it a less favoured choice. Rarely, *Senna* trees are utilized as support for growing pepper, but overall, their utility remains limited. Recently, the tree has started being used as a raw material for paper and plywood industries.

The tree begins flowering during the monsoon season in the region, and its flowers are easily pollinated in areas like the NBR, where diverse insect species are abundant. Under optimal conditions, a mature tree produces a large number of fruits. In an open area within the Wayanad Wildlife Sanctuary, a single tree has been observed bearing over 1,000 fruits. Each seedpod contains more than 100 seeds, meaning a single tree can produce over 100,000 seeds annually under favourable conditions.

During summer, when food availability in deciduous forests is at its lowest, *Senna spectabilis* fruits mature and fall to the ground. Native mammals like elephants, gaur, deer, and porcupines consume the fallen fruits, and intact seeds are often found in their dung. A single pile of elephant dung can contain thousands of seeds, which sprout and establish in new areas with the onset of the monsoon. As native mammals adapt to eating *Senna* fruits, seed dispersal accelerates, further facilitating the invasive species' rapid spread.

In the last 15 years, *Senna spectabilis* has expanded dramatically, becoming one of the most dangerous invasive plants in the NBR. In the Wayanad Wildlife Sanctuary alone, its spread increased from 15 square kilometers in 2013 to 123 square kilometers by 2022—an eightfold expansion within a decade. Similar rapid spread is being observed in the Bandipur, Nagarole and Mudumalai tiger reserves in the NBR region.

The ecological impact of this invasive tree is profound. Beneath *Senna* canopies, allelopathic effects suppress native vegetation, depleting forage for herbivores and reducing the forest's carrying capacity. The dense monoculture has also eliminated non-timber forest products (NTFPs) and wild edibles crucial to indigenous communities, disrupting livelihoods. Furthermore, reduced wildlife presence in *Senna*-invaded areas has significantly diminished eco-tourism potential, particularly in the Wayanad Wildlife Sanctuary.

As *Senna spectabilis* spreads rapidly across the South Indian states of Kerala, Karnataka, and Tamil Nadu, its effective eradication demands coordinated efforts across these regions. Management of

Senna must be followed by restoration to prevent secondary invasions by species such as *Lantana camara* and *Chromolaena odorata*. Native pioneer species like bamboo, grasses, and fast-growing trees provide promising options for eco-restoration. Involving local communities is crucial, as it not only supports livelihoods but also enhances ecosystem services. Without urgent and sustained action, *Senna spectabilis* risks causing irreversible damage to the ecological and cultural heritage of the NBR.

The author is Founder of FERNS, a natural history society based in Wynad and works with local communities on ecological restoration



Sketch by Sartaj Sehgal.

SPOTLIGHT ON *Cestrum aurantiacum* IN THE NILGIRIS

Harshavardhini Angappan and Vishnu NM



Sketch by Valli Muthuraman

Globally, over 3,500 Invasive Alien Species (IAS) have been documented, with 30% identified as Invasive Alien Plants (IAP) (Roy et al., 2024). These plants are major contributors to biodiversity loss, disrupting ecosystems and the services they provide. In India, a worrying 66% of natural systems are under threat from IAP (Mungi et al., 2023). The Nilgiri Biosphere Reserve (NBR) in the Western Ghats is particularly vulnerable to IAPs, causing significant ecological damage. Factors driving these invasions include human-induced changes, shifts in soil moisture regimes, historical propagation of invasive plants, and altered natural disturbance cycles.

In recent years, *Cestrum aurantiacum*, an exotic woody shrub native to Central and South America, has emerged as a pressing concern in the Nilgiris. Thriving in montane cloud forests, *C. aurantiacum* has found a conducive environment in the Shola forests of the Nilgiris. Initially introduced as an ornamental plant and later used for bio-fencing due to its dense growth, it has now become naturalised and invasive, threatening the native understorey species of the Shola forests (Das et al., 2023).

A Toda elder expressed concern, stating, “In the future, one can see only *Cestrum* in the forests of Nilgiris as it drains the

forests of its water, making the native species eventually die.”

C. aurantiacum is from the Solanaceae family which is the same as brinjal, potato, and tomato. Its berries, dispersed by passerine birds such as the oriental white-eye and red-whiskered bulbul, facilitate its spread. The plant is highly adaptable, tolerating shade, drought, and poor

Scientific name : *Cestrum aurantiacum* Lindl.
Family : Solanaceae
Habit : Shrub
Flowering : May to August



Cestrum aurantiacum in bloom.

Photo courtesy: Harshavardhini Angappan



Landscape in Nilgiris covered with invasive plant species like *Cestrum aurantiacum*, *Solanum mauritanium* and *Ageratina Adenophora*. Photo courtesy: Vishnu NM

soils. Its multiple stumps, toxic leaves, and unpleasant smell deter livestock from browsing on it, contributing to its unchecked growth (Das et al., 2023).

In the Nilgiris, *C. aurantiacum* is increasingly seen invading tree plantations and native forest fragments. Particularly visible along the route from Ooty to Gudalur, it forms dense green screens along roadsides, obscuring views and further spreading its reach.

Despite its invasive nature, awareness about *C. aurantiacum*'s impact remains limited. Urgent research and intervention are needed to understand and mitigate its effects before the damage becomes irreversible. Researchers and conservationists must prioritize studies on this invasive shrub to safeguard the Nilgiris' rich biodiversity.

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The authors are field ecologists with Keystone Foundation who specialise in ecological restoration.

MAPPING THE THREAT: SPATIAL MODELS AND STRATEGIES TO HANDLE INVASIVE SPECIES IN INDIA

P.S. Edward, J. Regupathikannan, A. Samson

India faces intense ecological threats due to invasive species, largely due to the lack of research and forest management across its diverse landscapes. These species, in general, can, intentionally or unintentionally, be introduced to a novel geographic location by various mechanisms which are collectively called introduction pathways. Using these pathways, they further colonize the new non-native range by expanding their distribution over time in different phases. An observed cycle of such expansion is depicted diagrammatically in figure-1. Additionally, an immense anthropogenic stress is also associated with an increase in the population of such invasives in India, thus severely affecting the native species. In India, the introduction and naturalisation of foreign flora began over 450 years ago with Portuguese immigrants. During their time in Goa, they introduced commercially beneficial plants from around the world to the region under their control. Numerous species were unintentionally introduced into the nation and later incorporated into the flora. (Ghate, 1991). Collectively, a total of 173 invasive species are recorded according to the National Biodiversity Authority (Sandilyan et al., 2018). This includes the various flora and fauna that were introduced intentionally and unintentionally into our political boundary. Around 18,000 plants, 1100 arthropods, around 300 freshwater fishes, and 18 marine species are designed as non-native species that hold the potential for becoming invasive in the future (Ali and Pelkey, 2013). In India, approximately 40% of flora present are classified as alien, out of which around 25 % are invasive (Singh, 2005). Owing to its diverse climatic landscapes and soil characteristics, a wide range of invasives can colonize the Indian subcontinent. This herbaceous community dominates the total percentage of invasive species

in India, owing to its ability to survive and thrive against harsh environments, thereby aiding in their range expansion against native flora (Sharma et al., 2005; Shukla and Sinha, 2012). Besides, invasive species might have efficient adaptability attributes such as early germination, autonomous pollination, high fecundity, and effective dispersal mechanisms that complement successful invasion.

Amidst the spread of these invasive species, conservation management in forest settings has become a serious challenge, raising the need for innovative monitoring and mitigation approaches. Spatially structured population models have emerged as promising tools in this regard, offering insights into population dynamics amid landscape alterations.

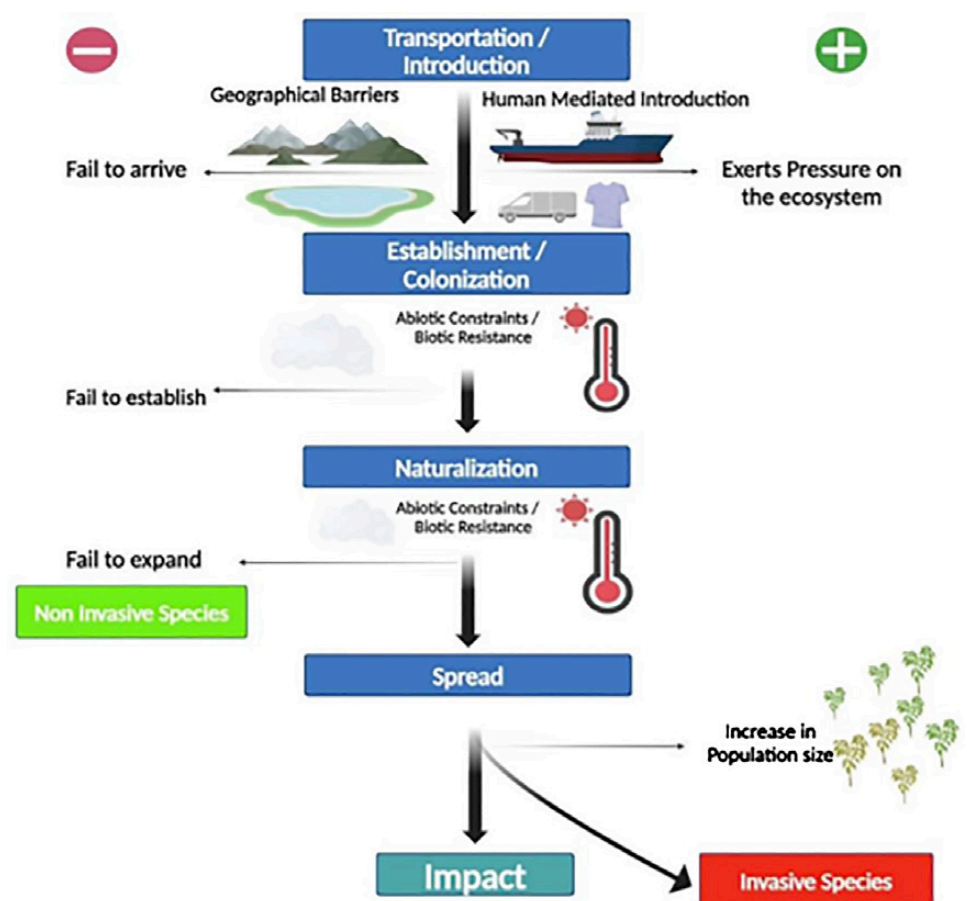


Figure 1. Stages of Invasion, adapted from (Byun et al., 2018)

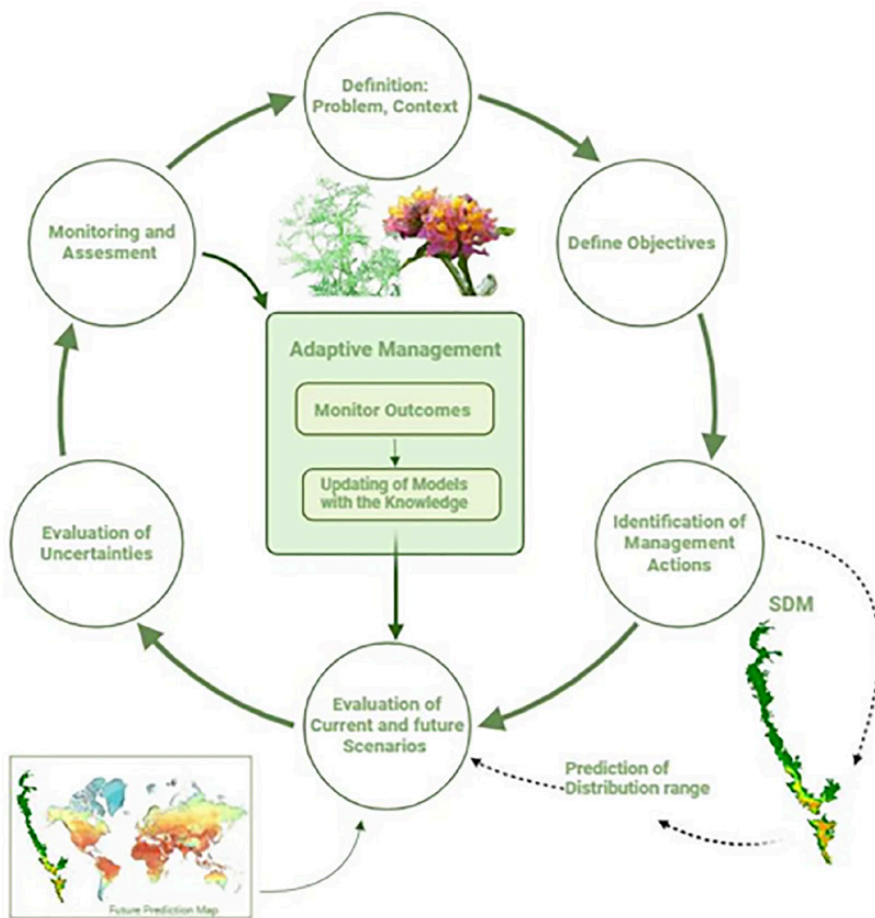


Figure. 2 Spatial Modeling phases in Distribution modeling in Conservation adapted from Garrard et al., (2017)

Through these collaborative approaches (Fig. 2), they can preserve biodiversity and ensure ecosystem stability amidst climate change. While spatial models may not offer a conventional solution, they hold the potential to refine data collection strategies to predict population and distribution scenarios. Statistical modeling used to analyse occurrence data and their interaction with environmental factors has been a successful method for optimising the use of limited data in regional conservation planning. Species-level modeling is most appropriate for specific species of significant conservation concern, such as endangered, threatened, or flagship species. However, this methodology may not be a viable or optimal method for estimating the geographic distribution of biodiversity, especially when dealing with highly varied species in places that have been poorly studied (Ferrier et al., 2002). The modeling outputs are presented as concise executive reports and distribution heat maps. Although visually appealing, these maps can be misleading if model objectives and uncertainties aren't clearly explained. This modeling approach, when incorporated with field testing, can therefore aid in providing reliable and effective

management strategies for the theoretical outputs of the model. Traditional management approaches often fall short in effectively controlling invasive species due to their complex spatial dynamics and rapid spread (Hellmann et al., 2008). Spatial modeling techniques, such as MaxEnt, have emerged as powerful tools for understanding and predicting the distribution of invasive species (Phillips et al., 2006). By analysing spatial data on climate, land cover, and habitat suitability, the model generates distribution maps highlighting areas at risk of invasion by invasive plant species (Elith et al., 2006). Policymakers use this information efficiently in prioritizing areas for management interventions. The graphical representation of high-priority areas, promotion of native flora, and assessment of prospective infestation scenarios highlight the need for proactive management strategies. Furthermore, the invasive species distribution offers valuable guidance for conservation managers and policymakers in regional prioritization and planning, with room for improvement. Furthermore, these predictive models can facilitate adaptive management strategies by incorporating dynamic environmental factors and accounting for uncertainty in model

predictions. This flexibility allows policymakers to adjust management plans in response to changing environmental conditions and emerging threats.

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This is an abstract of a research article prepared by the authors towards their ongoing studies.

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DR TARUN CHHABRA

- Content: Ramneek Singh Pannu

- Compilation: Ajay Ludra

Dr. Tarun Chhabra is a dentist by qualification and profession, an ecologist by passion, and a celebrated ethno-botanist. Born and brought up in Coonoor, he has become a household name amongst one of the oldest inhabitants of the hills of Todamalai^[1], the autochthonous people of the Nilgiris.....the Toda. He even enjoys the epithet of “honorary Toda”, being the only outsider ever to learn their language.

In 1992, Dr. Chhabra and his colleagues set about to preserve the Toda heritage, which was facing increasing pressure - demographic, toxicological, social as well as socio-economic, genetic, cultural, and legal - all challenges that can accumulate in a continually modernising society, coupled with India’s habitat fragmentation. The team established a non-profit trust by the name of Edhkwelynawd Botanical Refuge Centre Trust, EBR for short. The trust is in charge of restoring 24-odd acres of land in the Upper Nilgiris to its erstwhile state. The restoration journey commenced with purchase of a tract of land (mostly tea-farms) through an IUCN-NL grant. This, along with adjacent tracts of private land proposed to be acquired in due course, is being restored to a shola-grass-land-wetland ecotype.

EBR has a plant nursery where saplings, seedlings, and grasses are being raised for in-situ plantation on the acquired tract. EBR has also



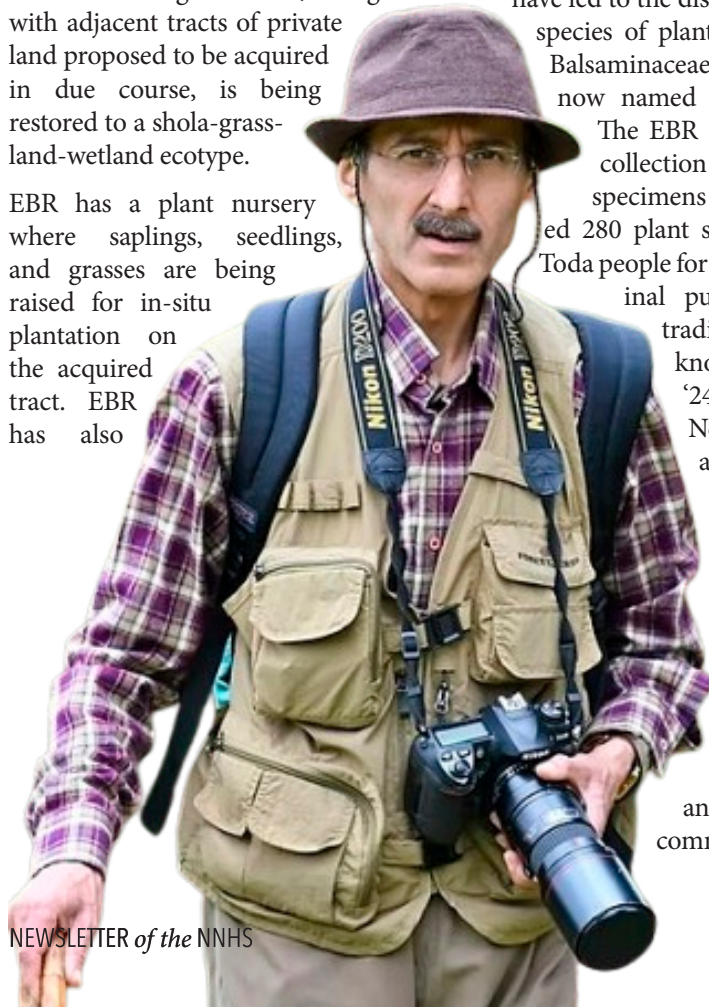
been conducting ecological research and botanical studies, and their efforts have led to the discovery of three new species of plants belonging to the Balsaminaceae family, which are now named after Toda deities.

The EBR Centre maintains a collection of 300 herbarium specimens and has documented 280 plant species used by the Toda people for cultural and medicinal purposes, preserving traditional ecological knowledge. The Jun ‘24 issue of the NNHS Newsletter carried an article on the EBR.

He also founded the Toda Nalavaazhu Sangam (Toda Welfare Society) which works with people of the tribe on projects to conserve the rich and ancient ethos of the community. Following

from his researches on the community, is a monograph titled “The Toda Landscape: Explorations In Cultural Ecology”, compiling exceptionally rich compositions of the Toda community’s cultural and religious life, and the flora and fauna of the Nilgiri hills. The book delves into the rituals, clothing, the sacred geographies of the hills, the material cultures of the community and even the particular importance of the honey bee for the Toda community. The extent of the mythologies, place-names, songs, embroidery designs and poems that are carefully documented in this book is indicative of years of in-depth research. Dr Chhabra describes the sacred practices through which the Toda communities reiterate their social order and their place within the landscape. The is an easy read and adequately explanatory, and includes anecdotes from personal journeys. The book describes migrations

^[1] Todamalai is the name for the hill-plateau of the Nilgiris, home of the Toda peoples in ancient times, as recorded in Malayalam literature, before the name Nilgiris (probably given by an Englishman who was reminded of the “Blue Mountains” back home) was labelled to them.



and pilgrimages, places, plants and animals encountered during the travels. He orients everything across the sacred landscapes. Across these landscapes, past and present, sacred and divine coexist in an order carefully delineated by language, memory and living custom.

His passion for nature, botany in particular, sprung up after leaving medical school. Dr Chhabra's Dental Clinic in Udhamandalam also provide pro

bono treatment to the lesser privileged, and he has the blessings of many a local and tribal elder for his self-less service to the community.

His restoration work is not only limited to the EBR Trust site. He has created a mini endemic forest at his residence that he is very passionate about; the forest hosts a few rare species that are native only to the Nilgiris.

Dr Chhabra's publications include:

The Toda Landscape: Explorations In Cultural Ecology, Orient BlackSwan, 2015

Chapters in Paul Hocking's compilation titled "The Nilgiri Hills".

In 2023, Dr Chhabra hung up his dentist's robe, to lead a life of retirement from profession, and devote his time to the community he loves from the bottom of his heart.

NATURAL HISTORY NOTES

- a compilation of news articles during the last six months (Jul-Dec '24) pertaining to flora, fauna, environment, and ecology, within the Nilgiris.

Collation of articles: N Moinudheen
Compilation: Ajay Ludra

Project Nilgiri Tahr. The Forest Department, in right earnest, took it upon themselves, to radio-collar the meta-populations of the Tahr in Anamalai Tiger Reserve (ATR) and Mukurti National Park (MNP).....the intention being to study habitat usage, movement, and behavioural aspects of the endangered animal. The plan was to radio-collar a total of twelve individuals. The project started well, with three healthy individuals successfully collared; a fourth one was treated for an illness along with being collared. However, the fifth individual, purportedly a healthy animal, died in the process of sedation, leading to a temporary suspension of the task. The officials and conservationists are unanimous that the project should continue, despite the setback, since it is

a long-term measure in the survival of the endangered species, "the benefits far out-weighing the risks". An investigation into the incident revealed that the Tahr had died of liver-disease, and not due to complications arising out of sedation.

Nilgiris opens up to trekking. In a landmark decision, the Govt of Tamil Nadu identified 40 trekking routes in the state, 12 of them lying in the Nilgiris. These have been categorised into easy, medium, and tough, and cater to all categories of enthusiasts. There were, initially, mixed opinions regarding the commercial intent of the project; however, the project has seen good subscription, except during the periods of incessant rains, when the outside-visitor is more keen to stay dry, despite the thrill of walking in the damp forests. It has also been hoped that with this move, unauthorised access into forests for the purpose of entertainment walking or revelry would come down. The Forest Department, however, is yet to increase policing of the forests to curb unauthorised entry.

Nilgiris Aims Towards Carbon-Neutrality. While this is an older thought-process, and discussions started as early as in 2022, there has been a series of brain-storming sessions on making a road-map towards achieving this goal of carbon-neutrality. One of the easier aspects to implement was of the residents opting for public-transport, rather than using personal vehicles, since this is the most convenient method of reducing air-pollution, and emission of carbon-dioxide and other gases.

NEW SPECIES/BEHAVIOURS:

The Nilgiri Tit Butterfly. For the first time, lepidopterists noticed the Nilgiri Tit butterfly (*Hypolycaena nilgirica*) using a large terrestrial orchid (*Eulophia epidendraea*) as a host.....laying its eggs in the full inflorescence. The butterfly is listed in Schedule II of the Wildlife Protection Act. The researchers belong to the Wynter-Blyth Association, and are sanguine that this study will pave the way for further conservation studies of the species.

Discovery of a rare Moth (*Chiretolpis erubescens*). The species, which was "rediscovered" after 132 years, was photographed for the first time by researchers Samson Arockianathan; N. Moinudheen; A. Abhinesh; R. Mahesh; and N. Sadiq Ali. Their record was recently published in the Journal of the Bombay Natural History Society. The team had to comb through illustrations to identify the species. They say that the moth was recorded in a human-dominated landscape in Coonoor. Described as having an orange head and thorax, a streaked tibiae, and hair-like scales on its wings, it was first recorded by British entomologist George Francis Hampton in 1891. The article was published in The Hindu.

New Hepterofauna Species. A study found four potentially new species, two of them geckos, one skink, and a frog, all of them in the MTR buffer zone. The study spanned diverse habitats across altitudes from 300 to 2000 m above sea level,



Photo credit. N Moinudheen

leading to the listing of 36 amphibian and 33 reptile species. Findings include rare species like the Cave Dancing-Frog, Indraneil's Night-Frog, Striped-Coral snake, the King Cobra, and the Nilgiri Burrowing snake. Among the species recorded, 16 of them are in the IUCN threatened list, and three in the near-threatened list.

Poaching. Despite increasing awareness and attempts at policing to reduce poaching, a group of persons was apprehended near Gudalur. Thankfully, vigilant personnel were able to apprehend the gang before they could cause any harm. In another incident, two tigers were purportedly poisoned in Bitherkad forest in Gudalur division, and the culprits were later apprehended.

Raptor Hotspot: Mudumalai. A recent study of the presence of raptors in the Mudumalai Reserve recorded 58 species, and all of them thriving. The study was conducted between 2011-2022, and 31 species were found to be breeding residents, while 27 species are visitors; 16 of these species have high global conservation significance, with three species in the critically endangered list, two in the endangered list, four in the vulnerable list, and six that are near threatened. The researchers noted seven species of vultures, four of them resident species. The researchers hope that the base-line provided by their study would further the ecological assessments and comparative research on the presence of raptors in the area. Conservationists are particularly elated at the success rate of the long-billed vulture (*Gyps indicus*) studied from 2015 to 2021.....the species recorded a 74% increase in the breeding rate. A third study, done on resident vulture species highlights the lack of awareness on vulture conservation in the Mudumalai and Sathyamangalam Tiger reserves (with Sathyamangalam being more severely affected), specifying the villages that are populated inside the tiger-reserves. NSAIDs including Diclofenac are claimed to still continue as the means of treating cattle, resulting in poisoning of vultures through carcasses left behind by predators.

Ooty Lake. The case of Ooty lake desilting dates to 2022, and a short article was carried in our newsletter of Dec 2022. Over more than three decades since the last desilting, build-up of sedimentation



Sharan V

had reduced the storage capacity by an estimated 30%. In addition, sediment and silt comprised waste produced by humanity populating the banks of the feeder channel...the Koddapamund channel. An SADP project, the feeder channel has now been cleared, and gradually, the PWD should be able to complete the desilting project in entirety. The project includes installation of equipment to prevent entry of plastics and other unwanted debris. A fall-out of this project is the hope that incessant rains would now not inundate the low-lying areas downstream of the lake, especially Kandal. There is a parallel movement by citizen-groups, to have the administration work out an alternative means of disposal of waste from the commercial and domestic properties that lie astride the Kodappamund channel, because unless that is addressed, the issue of waste-accumulation in the lake would continue to persist. In a separate article, the NGT has asked for the Ooty Lake to be protected under the Wetland (Conservation and Management) Rules, 2017. This is related to the ongoing tourism development works in the vicinity of the Ooty Lake by the TTDC.....the Wetland Rules 2017 do not allow the use of lands up to 50-m from the high-water mark for non-wetland uses, except for the construction of boat-jetties. The lake, covering approximately 2.25 hectares, is covered under the National Wetland Inventory and Assessment Report, 2011.

Invasive Threat: *Senna tora*. *Senna tora* is a new invasive that has been sighted in Sigur and Moyar, in the buffer zone of the MTR. Already home to listed invasives like *Senna spectabilis* and

Lantana camara, the new threat has been noticed to be cyclic.....emerging every few years. It prefers the open grasslands and the drier parts, unlike *Senna spectabilis*, which prefers rain-swept zones. The threat to the grasslands is presently limited, but spread needs to be checked, and the impact on local/endemic flora and fauna studied in detail. At present, the Forest Department has cleared a 15-hectare zone of this invasive.

The newsletter of the Nilgiri Natural History Society (NNHS) aims to cover the many dimensions of natural history - conservation issues, lay observation, cultural representations and traditional knowledge. The newsletter will carry communications about research in Keystone Foundation in the areas of conservation, environmental governance, culture, livelihoods and enterprise. In keeping with the pan Nilgiri Biosphere Reserve (NBR) nature of the Society, space will be allocated for reporting of events/views from elsewhere within the country and from outside the country. Additionally a section will be devoted to research summaries by students who work in the region of the NBR. Guest editors will be invited for special editions. News items gleaned from printed sources about the NBR will be featured. Separate sections will carry information on NNHS and Bee Museum activities. The species focus will feature species of special conservation status, endemic to the Western Ghats and present in the NBR.

SUBMISSION OF ARTICLE

The NNHS newsletter articles are reviewed by the Chief Editors and a member of the editorial board. Articles are invited for the following section: i. Natural History News from India (400 words); ii. Natural History News from the World (400 words); iii. Research Initiatives in the NBR - student contributions (400 words); iv. Species focus (250 words). Articles should be submitted by email to: contact@nnhs.in

Authors should provide complete information including an email address and phone numbers. Articles need to be submitted in standard word processor formats only. Rich text content and other format are not accepted. Figures and text need to be sent separately with adequate labelling and numbering in context to the articles sent. Pictures in the manuscript also need to be sent in separately in TIFF, JPEG or PNG formats with resolution not less than 250 dpi

Reference style:

Papers in Journals and other periodicals.
Hanely, T.A. and Hanley, K.A. 1982. Food resources partitioning by sympatric ungulates on Great Basin rangeland. *Journal of Range Management* 35: 152-158. Papers in Edited Books, Symposia Proceedings, etc
Cole, D.W. and Rapp, M. 1981. Elemental cycling in forest ecosystems. pp. 341-409. In: D.E. Reichle (ed.) *Dynamic Properties of Forest Ecosystems*. Cambridge University Press, Cambridge.

Books

Lieth, H. and Whittaker, R.H. (eds.). 1976. *Primary Productivity of the Biosphere*. Springer-Verlag, Berlin. Reports, Dissertations, etc
Sollins, P., Reichle, D.E. and Olson, J.S. 1973. *Organic Matter Budget and Model for a Southern Appalachian Liriodendron Forest*. Oak Ridge National Laboratory, Oak Ridge, U.S.A.



EDIBLE FRUITS TREES OF THE MYRTACEAE FAMILY FOUND IN THE NILGIRIS

Dr Shiny Rehel.

The myrtle family (Myrtaceae) has 134 native species in India, which are spread across four genera. The myrtle family is made up of about 130–150 genera and 5,650 species. Some species of Myrtaceae are used for their edible fruits, which can be eaten raw or cooked, or made into jellies, preserves, and beverages. Some of the plants in this family include Eucalyptus, Eugenia, Syzygium, Psidium, Pimenta dioica (All spice plant), Myrtus communis (Common Myrtle), and Melaleuca alternifolia (tea tree).

Features of Myrtaceae plants are:

- woody shrubs or tall trees
- smooth or scaly bark on their trunks
- bark that peels away in strips or flakes
- leaves are aromatic and contain oil glands
- leaves are simple, opposite or spiral, or alternate
- flowers with numerous stamens that are usually longer than the petals

There are 13 species of Myrtaceae reported for the Nilgiris district of Tamil Nadu, India.

Enumerating a few edible fruits species found in the Nilgiris belonging to Myrtaceae family.

Syzygium cuminii (L.) Skeels

Common name: Malabar plum; Tamil name: Naval. An evergreen tree, upto 30m. Glossy dark green with a yellow mid-rib; leaves aromatic when crushed. Flower: creamy-white. Fruit: globose berry, red to dark blue, single seeded.

Distribution: Indian subcontinent, south-east Asia, Australia.

The species is Not Evaluated (NE) in the IUCN Red List

Syzygium montanum Gamble.

Tamil name: Kallunjavaal

An evergreen tree, upto 15m. Leaves gland dotted. Flower: cream white. Fruit:

globose berry, crowned with persistent calyx, single seeded.

Distribution: Karnataka, Kerala and Tamil Nadu.

The species is categorised as Endangered (EN) in the IUCN Red List

Syzygium densiflorum Wall.ex Wt&Arn.

Tamil name: Karunaval

An evergreen tree, upto 20m. Leaves olive green when dry, finely dotted on both sides. Flower: white. Fruit: berry, oblong, dark purple, fleshy, single seeded.

Distribution: Kerala and Tamil Nadu.

The species is categorised as Vulnerable (VU) in the IUCN Red List

Rhodomyrtus tomentosa (Aiton) Hassk.

Common name: Hill gooseberry.

Tamil name: Thavittu Koya

Stout shrub. Leaves 3-ribbed, densely white tomentose below. Flower: white, stamens pink. Fruit: berry, crowned with calyx, seeds many, reniform.

Distribution: Indo-Malaysia and China.

The species is Not Evaluated (NE) in the IUCN Red List