

The background of the entire page is a photograph of a lush green environment. In the foreground, two snakes are visible. One is a large, light-colored snake with a yellowish-brown body and a dark head, standing upright. The other is a smaller, greyish-green snake, also standing upright. They are surrounded by dense green foliage and small pink flowers. The title 'NATURE TRAIL' is overlaid on the top left in large, white, bold letters.

# NATURE TRAIL

**Chennai Young  
Naturalists' Network**

*JAN' 2021 | Vol.2 Issue.1*

## Highlights

- ▶ The **Shola forests** of Tamil Nadu
- ▶ **Interview:** Sneha Dharwadkar
- ▶ **Irulas:** The Snake Tribe of Chengalpet

# NATURE TRAIL

## Volume 2, Issue 1

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**Our Mission-** To reach a broad spectrum of readers and ignite curiosity and scientific thinking towards the natural world, while also promoting young naturalists to develop a variety of skill sets.



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*Ekadh Ranganathan is a 2nd year undergraduate student studying Biological Sciences at the Hong Kong University of Science and Technology. He aims to pursue a career in wildlife biology in the future and apart from nature, he loves creative writing and playing table tennis.*

Dear Readers,

As the new year begins to unfold, I trust that this issue finds you all safe and joyful, presumably in anticipation for a more fruitful year ahead for us all. As always, in this edition of Nature Trail, we have aimed to cover a myriad of topics relating to the biodiversity around us, with a slight focus on a particular group of overlooked yet abundant critters, namely, reptiles and amphibians! We've included a few articles covering snakes, agamids and other under-represented taxa in hopes of increasing awareness about their importance in culture and ecosystems. We have also incorporated a few suggestions received from the previous edition to enhance the reading experience, which we hope you all enjoy.

All things considered, I hope that this edition helps you learn about and subsequently advocate for the conservation of the natural world as we head into a year of new opportunities and challenges for wildlife as a whole.

*--Ekadh Ranganathan, Content Editor*

### **About the Chennai Young Naturalists' Network**

The Chennai Young Naturalists' Network aims to provide a platform for young naturalists to interact with peers interested in wildlife and to explore various applications of a variety of skills. The hope is to help them grow not only in aspects connected to observation in the field but also to give them the opportunity to explore various career options. Meanwhile, we also aim to conduct outreach and educational events to help increase awareness and improve participation of the public in citizen science and other nature-related activities.



Front Cover -

Indian Rat Snake (*Ptyas mucosa*): Mahathi Narayanaswamy

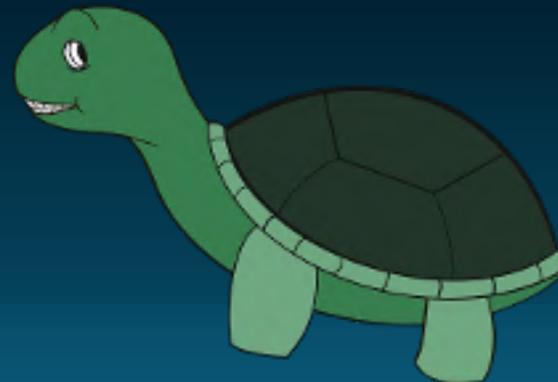
Back Cover -

Kashmir Rock Agama (*Laudakia tuberculata*): Adit Jeyan

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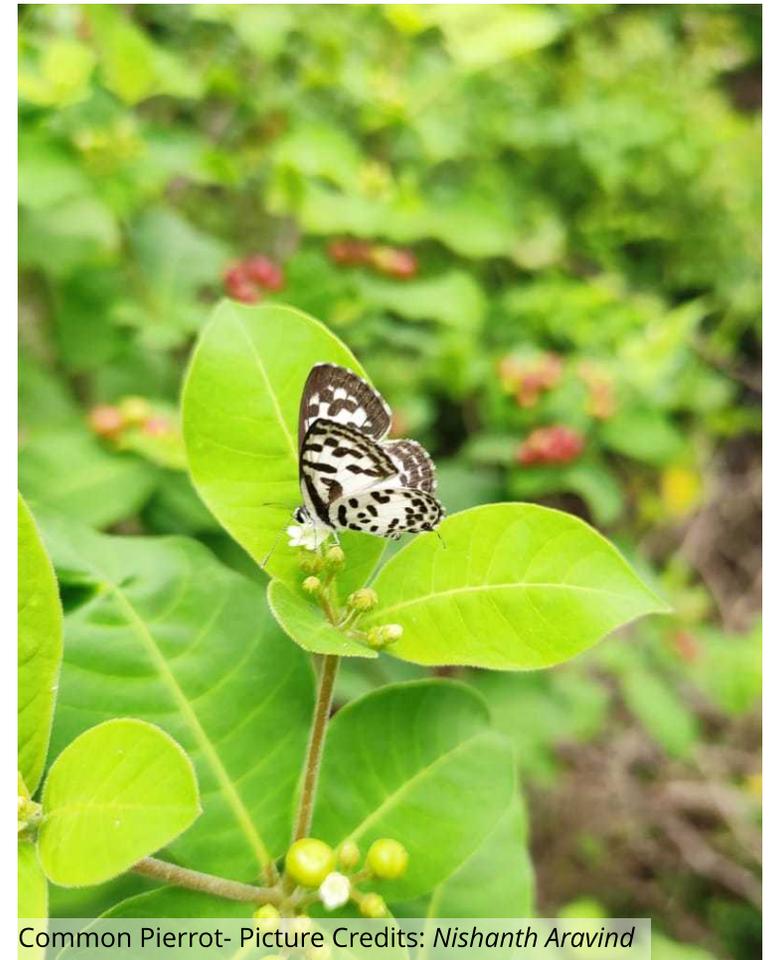
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*Eutropis bibronii*- Picture Credits: Nanditha Ram



Common Pierrot- Picture Credits: Nishanth Aravind

## Observations from the Previous Quarter,

The Editorial Team

*With bird migration having set in and monsoon rains having just passed, the previous quarter has been quite eventful despite COVID-19. Several interesting observations were documented by our members, including the Grey-tailed Tattler passaging through during December end and several observations of Saturniid Moths across the city. Here are some of our observations.*



Yellow-browed Bulbul -  
Picture Credits: Mahima Nair



Elbow Crab- Picture Credits: M Yuvan

## Observational Notes, Saroj Lakshmy. U

Many of our eight legged friends, the spiders, are sure to be found under every roof. These arachnids are highly fascinating and help us in innumerable ways, yet they are feared by many city-dwellers. In this edition, we bring to you the observations made by Saroj Lakshmy U. hoping to dispel the air of trepidation surrounding these marvellous creatures.

It was past nightfall when I spotted a spider hanging from a slab in the corner of my bathroom. I noticed that it was a Daddy Long Legs, a member of the family *Pholcidae*. As its name suggests, it had thin, long legs approximately 6 to 7 times longer than its translucent body which was approximately 7 mm in length. Daddy Long Legs are nocturnal predators- I found this one hanging upside down with its legs extended to catch its prey but when the lights were turned on in my bathroom, it quickly retracted its legs and pulled itself underneath the slab where there was no light. It hid there until the lights were switched off and I found it under the slab even during the day. When I read about Daddy Long Legs, I learnt that they are found on every continent except Antarctica. As they are found in undisturbed parts of buildings such as in ceiling corners, attics and cellars, they are also called 'Cellar spiders'. They usually feed on other spiders or their eggs, using their legs to hold on to prey, then wrapping their prey up in a silk-like material and finally, delivering a venomous bite. They are usually passive around humans. There is a misconception that their bites can harm us but their fangs are too short and brittle to pierce our skin.

The other spider I observed was *Plexippus paykulli*, spotted below a tube light in my room. It was an 8-9 mm long spider belonging to the family *Salticidae* (Jumping spiders). I was easily able to identify it as a male since these spiders show sexual dimorphism; the males usually have a black carapace with a central white stripe running down their bodies and two other white stripes along either side of their bodies, while females have a brownish-grey carapace with a tan stripe along their bodies. It uses light from bulbs or any other light source as bait

to prey on insects attracted to the light. It usually feeds on flies, bugs, butterflies, moths, grasshoppers, crickets and dragonflies, but most frequently, on mosquitoes. Considering my place is swarming with mosquitoes, it's no wonder I found this spider. They can even kill prey twice their size by injecting venom through their fangs to immobilize them. The spider I saw didn't even flinch when I moved close to it, so I concluded that it was highly accustomed to humans. It was extremely stealthy, being able to stay still for very long and could move without causing much commotion. It had eight eyes and thick legs to support it when it jumped.





People usually get scared of spiders, but while observing them closely, I realised that they are rather beautiful creatures- some have big, cute eyes while others have amazingly long legs. Each spider is special in its own way. Since they consume mosquitoes and other pests which can cause diseases like malaria and dengue, they also help us tremendously. So, instead of fearing them, we should appreciate their beauty and the help they offer us.

*All photos attached in the article were taken by Saroj Lakshmy and she holds the copyright to them.*

*Saroj Lakshmy U. is a 2nd year student at Stella Maris College.*

# Sri Lankan Bullfrog,

Supraja Narasimhan

*The Sri Lankan Bullfrog is an anuran belonging to the family Microhylidae. The members of this family are commonly called "narrow-mouthed frogs". Sri Lankan bullfrogs are nocturnal, fossorial and insectivorous amphibians.*

## HABITAT:

Sri Lankan Bullfrogs inhabit a wide range of habitats including wetlands, river deltas, forests, agricultural land and metropolitan areas.

## DISTRIBUTION:

They are distributed across South Asia in Bangladesh, India, Sri Lanka and Nepal. In Sri Lanka, they are found in wet and dry zones of elevation up to 500 m above sea level.

## DIET:

The Sri Lankan Bullfrog is an insectivorous Microhylid species. They feed on a wide variety of insects including termites and greater flies.

## MORPHOLOGICAL DESCRIPTION:

The Sri Lankan Bullfrog is a medium-sized Microhylid with a balloon-like abdomen, wrinkled skin and granular projections on its body. The body of the frog is greyish-black in colour with bright red or orange coloured patches on the back. During the breeding season, males develop dark patches on their throats. Females are slightly larger in size than males.



Sri Lankan Bullfrog - Picture Credits: Mahathi Marayanaswamy

## REPRODUCTION AND DEVELOPMENT:

Breeding occurs in the monsoon season and the fertilization process takes place in stagnant and temporary freshwater pools. Males attract females using vocal communication (loud calls). The male scrambles onto the back of the female and after a successful courtship, the female lays a single layer of eggs in the pool.

The eggs hatch after a few days and tiny black tadpoles emerge which then develop in the stagnant water pools. After successful metamorphosis, the adults move out of the pools.

**Sri Lankan Bullfrog**  
(*Uperodon taprobanicus*)

## TAXONOMY

**Kingdom:** Animalia  
**Phylum:** Chordata  
**Class:** Amphibia  
**Order:** Anura  
**Family:** Microhylidae  
**Genus:** Uperodon

## THREATS:

Despite being listed as "Least Concern" in the IUCN Red List, these Microhylids face serious threats from environmentally degrading anthropogenic activities. Surface run-off from pesticide-laden agricultural lands is one of the major threats to these frogs. Another major threat is the loss of their terrestrial habitat due to urbanization.

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Supraja Narasimhan is a teacher and content creator.



Picture Credits: Mahathi Narayanaswamy

# Common Blind Snake,

Kavya G. V.

*Common blind snakes are known as "flowerpot snakes", which refers to their dispersion throughout the world hidden in the friable soil of flowerpots. It is thought that the voluminous pots used in commercial agriculture along with its parthenogenetic reproduction contributed to this Asian native's successful invasion of pantropical and certain adjacent temperate areas.*

## REGION:

The Common blind snake is native to several parts of Africa and Asia. They have also been introduced to many parts of the world including Australia, the Americas and Oceania in order to control the spread of termites in these countries and also as a result of the trade of potted plants whose soil these snakes can be found in.

## HABITAT:

They occur in urban and agricultural areas. These snakes are entirely fossorial, as in, they live underground for most of their lives. They are found in ant and termite nests and are also found under logs, moist leaves, stones and humus in wet forests, dry jungles and abandoned buildings. Their distribution and survival are entirely dependent on soil humidity and temperature. One can encounter *I. braminus* while digging soil and turning logs or rocks over or after heavy rainfall which could force them to the surface.



Common Blind Snake-  
Picture Credits: Mahathi Narayanaswamy

## DESCRIPTION:

Adults measure 2-6 inches in length making them the smallest known snake species. The head and tail are nearly indistinguishable, with the only major difference being the small eyes that may be visible upon taking a closer look. While looking at them from afar, one may think these snakes are earthworms but on closer examination you will notice that the body is covered with translucent scales unlike the segmented bodies of earthworms and other annelids. These scales also cover the small eyes of the snake, leaving them nearly blind- they are capable of registering only light intensity.

## Common Blind Snake

*(Indotyphlops braminus)*

**Length:** 5-15 cm

## TAXONOMY

**Kingdom:** Animalia

**Phylum:** Chordata

**Class:** Reptilia

**Order:** Squamata

**Sub-order:** Serpentes

**Family:** Typhlopidae

**Genus:** Indotyphlops

The body comprises fourteen rows of dorsal scales along its length. This species can appear charcoal grey, silver-grey, light yellow-beige or purplish.

Juveniles show darker colouration and all the external characters from close view. After moulting they turn light-blue or bluish-white and this form is often mistaken to be albinism.

#### **DIET:**

Their diet consists of the larvae, eggs and pupae of ants and termites.

#### **BEHAVIOUR:**

They are extremely sensitive to high temperatures and light, and will quickly seek the cover of soil or leaf litter to avoid the sun while above ground. Thus, they are generally nocturnal.

#### **INTERACTION WITH HUMANS:**

In addition to being predominantly fossorial, Common blind snakes are non-venomous and thus pose no threat to humans. They are also considered important indicators of the moisture levels and quality of soil. However, some local communities believe that these snakes sometimes enter the human body through the ear mistaking it for a hole in the ground- a belief that is backed up with no evidence.

#### **REPRODUCTION:**

They reproduce asexually by means of parthenogenesis and all specimens collected so far have been female. They lay eggs or may bear live young. Up to eight offspring are produced- all-female and genetically identical. Their reproduction has helped them travel to various points across the globe and become quintessential colonizers.

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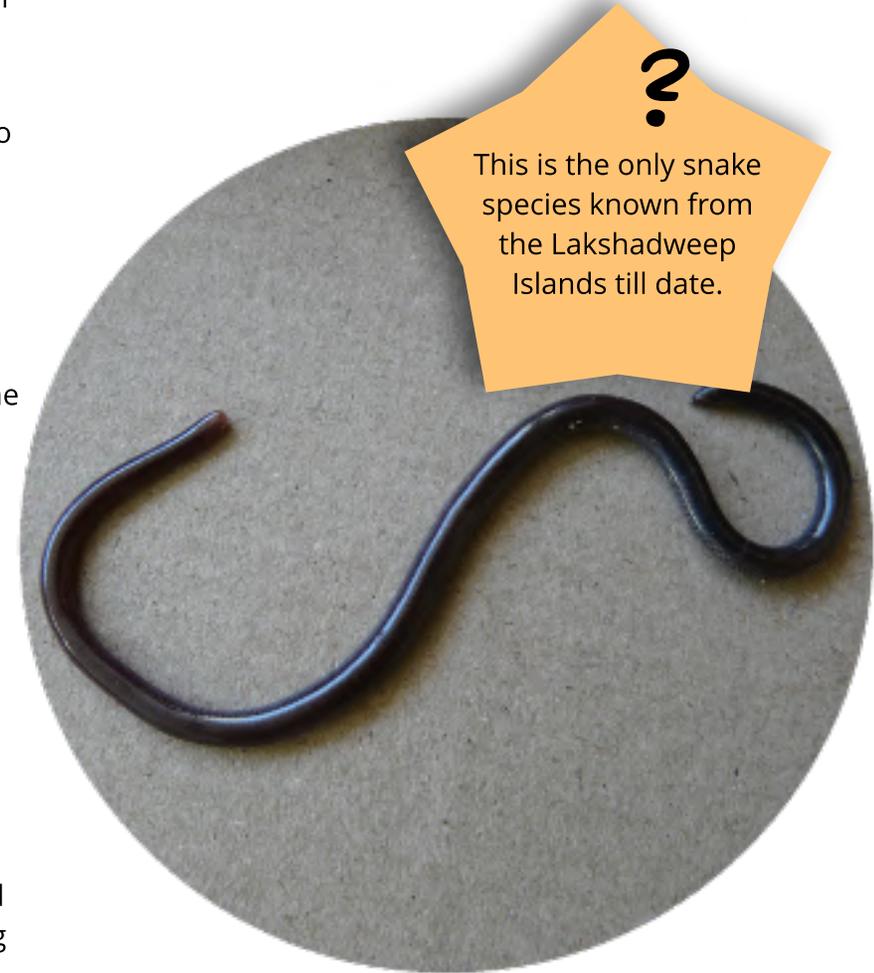
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This is the only snake species known from the Lakshadweep Islands till date.

Picture Credits: *Vikas Madhav Nagarajan*

*Kavya G. V. Is a 2nd year student at SRM Easwari Engineering College.*

# Indian Grey Mongoose,

Melvin Jaison

*One of India's most widely distributed mammals, the Indian grey mongoose is well known and is a common figure in several myths and traditions like the Panchatantra and in modern books such as Rikki-Tikki-Tavi by Rudyard Kipling. Being this well known, they have several local names such as Keeree (Tamil, Kannada, Malayalam), Newala (Hindi), Neula (Odia), Norio (Gujarati) and Mangisa (Telugu).*

## HABITAT & DISTRIBUTION:

There are 5 subspecies of Indian Grey Mongoose that are found throughout India in open scrub forests, cultivated land, rocky patches, grasslands, dry forests and forest edges up to an elevation of 2100 m. They do not occur in the higher slopes of the Himalayas.

## DESCRIPTION:

Indian Grey Mongooses have tawny grey fur which is heavily grizzled and coarse, with each individual hair possessing 10 alternating dark and light bands. The length of the body is 68-90 cm, from head to tail, and the animal weighs around 1.4 kg. They have small legs with five digits on each foot which are darker than the rest of their bodies. The forefeet are hairy and have claws, whereas the hindfeet are naked up till the heel. Their tails are as long as the head and body put together, the tip of the tail being pale yellow or white but never black. The ruddiness of their coat varies between subspecies. The males are typically larger than the females.



Indian Grey Mongoose- Picture Credits: Sidharth Srinivasan

## BEHAVIOUR:

Though they can be seen at any time of the day, they are especially active early in the morning and in the evening, hunting for reptiles. A primarily omnivorous species, they are opportunistic hunters. They tackle snakes using swift movements, which help them evade the snake's strikes. Subsequently, they wait for the snake to get tired before biting and breaking its cranium. They also eat scorpions and arachnids without removing their stingers and fangs. The vegetarian portion of their diet consists of berries, nuts, roots and tubers. To escape the mid-day sun, they sleep in holes of hollow trees or the ground.

## Indian Grey Mongoose

*(Herpestes edwardsii)*

**Length:** 68-90 cm

## TAXONOMY

**Kingdom:** Animalia

**Phylum:** Chordata

**Class:** Mammalia

**Order:** Carnivora

**Family:** Herpestidae

**Genus:** Herpestes

## REPRODUCTION:

Males have specialised anal sacs with which they spray urine on tall objects during the mating season (March, August and October). Pairs exhibit playful behaviour before copulation with a few mock attacks. Copulation occurs 2-3 times before they part ways. Females give birth to 2 or 3 litters every year with 2 to 4 young in each, with the gestation period lasting 60 days. Though these creatures are generally solitary in nature, females with young provide food for and nurse their offspring until they are old enough to fend for themselves.

## ENVIRONMENTAL AND ECONOMICAL ROLE:

Mongoose keep snake populations in check and help maintain ecosystems. They also prey on rats thereby reducing the number of pests in agricultural fields. They are preyed upon by larger carnivores.

## THREATS:

Major threats to this species include illegal trafficking for use in the exotic pet trade and poaching for its fur, a product used in manufacturing paintbrushes. It is protected under Schedule II of the Wildlife Protection Act, 1972 and is listed as "Least Concern" by the IUCN.

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Melvin Jaison is a student at Chengalpattu Medical College.



Picture Credits: Mahathi Narayanaswamy



Picture Credits: Rohith Srinivasan



# The Shola Forests of Tamil Nadu,

Balakrishnan Ram

*When you travel to the higher elevations of the Western Ghats, an interesting mosaic of temperate grasslands and tropical evergreen forests appears. Occurring higher than 1500 meters above sea level, a typical Shola-grassland complex consists of vast, expansive grasslands speckled with thick, isolated patches of stunted woodland in valleys.*

*Two hypotheses attempt to explain the origins of Shola landscapes. However, both do not have conclusive evidence yet. One theory states that climatic conditions such as frost played a key role in their creation, while another argues that the Sholas were formed due to agricultural practices involving seasonal burning of vegetation.*

*The ecosystem harbours many endemic plants and animals and is also the origin of many rivers in the Western Ghats. Despite its colossal ecological significance, Shola forests have not been taken care of in the past owing to the capacious monoculture of Cinchona and Eucalyptus. Even today, they face the threat of human encroachment.*

*Sholas are distributed throughout the southern portion of the Western Ghats in Tamil Nadu, Kerala, and Karnataka along with isolated patches in the southernmost portion of the Eastern Ghats. In this article, we will look at a few locations in Tamil Nadu where the Sholas are prevalent along with the myriad forms of life that call them home.*

## Nilgiri Hills:

The Nilgiris district is home to 368 species of bird, 300 of which can be found in the Masinagudi range of the Mudumalai National Park. Mukurthi National Park, which was sanctioned to protect the endangered Nilgiri Tahr, and Sathyamangalam Tiger Reserve are two other protected areas that are part of the Nilgiri hills on the Tamil Nadu side.

▶ **Mudumalai National Park:**

- The Park is about 45 km away from Ooty and is home to 291 species of birds, including the endemic and Shola-preferring Nilgiri Thrush, Nilgiri Sholakili, and Nilgiri Laughingthrush. One is likely to come across several hill birds such as the Crimson-backed Sunbird, Asian Fairy Bluebird, Nilgiri Wood Pigeon and the near-threatened Black-and-Orange Flycatcher. Besides its rich avian diversity, the park also houses the Nilgiri Langur and Lion-tailed Macaque, while Malabar Giant Squirrels are a common sight. Stable populations of carnivores such as Dhole, Golden Jackal and Bengal Tiger exist in the park.

▶ **Mukurthi National Park:**

- In Tamil Nadu, Mukurthi is one of the last strongholds of the endangered Nilgiri Tahr, the state animal of Tamil Nadu which is the region's keystone species. It has a healthy distribution

here as well as in the neighbouring Eravikulam National Park in Munnar. Other mammals include Mouse Deer, Sambar, Barking Deer, Leopard and Dhole. You are also likely to find the Nilgiri Shieldtail, Gunther's Vine Snake and Horseshoe Pit Viper here. The park is famous for its *Impatiens* plants, many of which are endemic to the South-western Ghats. Rhododendron trees with their bright-red flowers can be seen throughout the park. Prior permission from the Forest Department is required for one to visit as commercial tourism is prohibited within the reserve. Since there are no motorable roads, the park needs to be explored on foot. Mukurthi Peak and Mukurthi Lake are popular trekking spots.

▶ **Sathyamangalam Tiger Reserve:**

- Shola cover in Sathyamangalam is restricted to a few patches found in the hilltops at altitudes above 700 m. The reserve acts as a link between the Western and Eastern Ghats and is home to around thirty Bengal Tigers. Gaur, Elephant, Chital and Blackbuck are other mammals that have been frequently spotted in the region. A small nesting population of the critically endangered Indian Vulture resides within the reserve. The reserve is about 60 km from Erode.

Besides these protected areas, the Longwood Shola and Banagudi shola forests located in Kotagiri are often visited by nature enthusiasts from all over the world. These spots are rich in birdlife, hosting resident bird species like the Crested Goshawk and Brown Wood-Owl which can be spotted here along with rare winter migrants such as the Kashmir Flycatcher.



Gaur- Picture Credits: *Ekadh Ranganathan*



Nilgiri Sholakili- Picture Credits: *Melvin Jaison*



Crested Treeswift- Picture Credits: *Melvin Jaison*



Puff-throated Babbler- Picture Credits: *Smriti Mahesh*



Malabar Parakeet- Picture Credits: *Smriti Mahesh*

## Anamalai Hills:

Sprawling across the hill stations of Pollachi and Valparai in Coimbatore district, this ecoregion is under constant threat from ever-expanding tea estates. Both hill stations have multiple stay options that are well maintained and see regular tourist influx.

Top Slip is a great spot for birds with around 258 recorded species till date. You will see the Grey-footed Green Pigeon, Great Hornbill and both kinds of Malabar Hornbills, Bronzed Drongo, Orange Minivet and White-cheeked Barbets in good numbers here. On the Karian Shola side, a major part of the UNESCO declared World Heritage Site, you are likely to see the Crested Treeswift, Malabar Trogon, Changeable Hawk-eagle and Flame-throated Bulbul. The Nilgiri Pipit is frequently sighted in Valparai while Lion-tailed Macaques and Malabar Giant Squirrels can be seen near human settlements across the hill station.

If lucky, you might come across the elusive and endangered King Cobra and other reptiles such as Beddome's Keelback, Indian Rock Python and the Travancore Tortoise.

## Palani Hills:

Kodaikanal lies in the southern centre of the hill range and is hence an ideal place to stay at when visiting these hills. The Palani Laughingthrush is endemic to the region and is sometimes sighted in mixed flocks with babblers and bulbuls. The Indian Scimitar Babbler can often be heard throughout the hills. Grey-headed Canary-Flycatcher, Indian

Blackbird, Gray Wagtail, Jungle Myna and Indian White-eye are common avian denizens.

There are several waterfalls in Palani, some of which attract various forms of life- the Bear Shola Falls and Silver Cascade Falls are good places to find Mountain Imperial Pigeons, White-bellied Sholakili and Black-naped Monarch.

An hour-long drive from Kodaikanal will take you to Berijam Lake where you are likely to come across Alpine Swifts flying over the expansive grass cover and Velvet-fronted Nuthatch, Indian Yellow Tit and Puff-throated Babbler among the trees. The roads surrounding the artificial Kodai Lake are home to many butterflies including Black Prince, Paris Peacock, Red-disc Bushbrown, Palani Fritillary and Branded Royal. The Upper Lake View Road, otherwise called Bombay Shola is yet another great patch to find Sholakili, Square-tailed Bulbul and Black-and-orange Flycatcher along with several migrant species of warbler.

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*Balakrishnan Ram is an avid birder who currently works at Freshworks.*



Malabar Trogon-  
Picture Credits: Sidharth Srinivasan



Saiva nodata-  
Picture Credits: Vikas Madhav Nagarajan





## Irulas: The Snake Tribe of Chengalpet,

Ekadh Ranganathan

Picture Credits: *M. Yuvan*

*On a lazy evening in Keerapakkam village of Chengalpet, a snake catcher recalls how the reputed vaidyar (local healer) 'Nagamma', saved his life when he was bitten by a cobra. She gave him a dose of medicinal herbs and after a few hours' rest, he left on his own two feet, alive and unscathed. Miraculous recitals of such events are commonplace in the Irula tribe that Nagamma is a part of.*

**T**he Irulas are an indigenous people of parts of Tamil Nadu, mainly inhabiting the Nilgiri ranges while also living in settlements in a section of the Chengalpet district near Chennai. The term 'Irula' means 'finding a path through dark forests', a fitting description considering the tribe's incredibly harmonious relationship with the natural world. Although their diet consists of termite alates in the pre-monsoon season and their ability to chase down rodents is staggering in its own right, the skill that has garnered them worldwide recognition is their ability to hunt and capture snakes, in many instances using only crowbars or their bare hands.

For the Irula tribe, a snake capture is never associated with a food source as snakes are revered under the deity 'Kanniamma', who is traditionally linked to the cobra. However, for a sizable portion of the 20th century and especially during the 1950s and 60s, the Irulas sold snakeskin for export to the Western world as reptile skin was fashionable in clothing at the time. In 1972, the Wildlife Protection Act effectively banned all such

activity, and the Irulas lost their main source of income. Moreover, protected reserves had begun to drive Irulas out of their native settlements, while fragmentation and shrinking forests also drastically reduced their range. On the brink of disappearance, they were given a fresh start.

Romulus Whitaker, a herpetologist studying the unsettling increase in snakebite incidences in India, found that countless lives could be saved using antivenom from some of the most venomous Indian snakes, including the cobra, Russell's viper, Saw-scaled viper and krait. Inadequate distribution and production of these serums were elevating tensions between humans and snakes. Whitaker, therefore, decided to employ the Irulas by creating the Irula Snake Catchers' Industrial Cooperative Society (ISCICS), an organisation working from Chengalpet under the aegis of the Forest Department, for the capture of venomous snakes. The community is remunerated for the supply of snakes and the extraction of venom used in the production of life-saving serums distributed to hospitals across the country. In fact, as of 2018, the organisation was the largest producer of snake venom in the country, all thanks to a single indigenous tribe helping advance the modern field of medicine and saving countless lives.

Catching and collecting venom from serpents is a dangerous occupation, but even so, the members of the cooperative have adopted the process as a part of their lifestyle, catching, on average, up to 3 healthy adult

snakes per day. These individuals are subsequently bagged and transported to the extraction centre, where each snake is made to inject venom into a flask by sinking its fangs into a layer of clingfilm. Snakes tend to be adversely affected when kept in captivity for a prolonged time. So after a few extractions, the snake is released back into the forests in the vicinity of the Irula settlements. A report conducted on the health of snakes that were released showed that out of 100 kraits released with fluorescent paint marks, all individuals except one thrived after they were set free.

It is often said that the Irulas can map a snake's trajectory based on even the most



Picture Credits: Aditya Ramakrishnan

minute scrapes of dirt and this snake-tracking prowess quickly spread and caught the attention of foreign organisations, who were intrigued by their rare skill. Recently, the Florida government hired two Irulas for the capture of the highly invasive Burmese python from the Everglades in Key Largo. The team successfully captured 27 of the large reptiles in just a month of work, a testament to the great skill they possess.

There's a common fallacy that just about all snake catchers in the community are men and this could not be farther from the truth. Of the 370 licensed members of the cooperative, 122 are women. Talented snake catchers like Parvati, who has caught over 100 of the venomous reptiles in a year, make up a crucial percentage of the organisation; yet they are overlooked in many instances due to social stigma.

The Irula Tribal Women's Welfare Society (ITWWS) set up by Zai Whitaker sought to change the patriarchal perception of the Irula community. Apart from the many women associated with snake catching, the organisation empowers and employs women to pass down their vast experience with forest resources and traditional medicine, to explore the natural remedies used by vaidyars like Nagamma. The ITWWS campus in Chengalpet houses a nursery complete with shrubs that constitute herbal treatments for osteoporosis, diabetes and a myriad of other ailments. It has also been documented that the remedies offered by the local healers have decelerated and even stagnated the effects of snake

venom in humans, although these require further testing.

In an increasingly urban world, traditional ideals of a harmonious relationship with nature are being lost at a rapid rate, along with the wealth of information about the resources the natural world has to offer. Thus, the initiatives put forth to leverage the intrinsic talents of the Irulas serve as an excellent example of the great benefits of prioritising and propagating indigenous knowledge in the modern world.

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*Ekadh Ranganathan is a 2nd year student at Hong Kong University of Science and Technology.*



Picture Credits: M. Yuvan



Picture Credits: Ekadh Ranganathan



*Sitana marudhamneydhal*-  
Photo sourced from Gnaneswar Chandrasekharuni

## Paper Abstract: Fan-throated Lizards,

Aswathi Asokan

**Title:** Systematics and phylogeny of *Sitana* (*Reptilia: Agamidae*) of Peninsular India, with the description of one new genus and five new species.

**Author:** Deepak, V., Giri, V. B., Asif, M., Dutta, S. K., Vyas, R., Zambre, A. M., Bhosale, H., & Praveen Karanth, K.

*Published in Contributions to Zoology, 85(1), 67–111 in 2006*

**DOI:**

[doi.org/10.1163/18759866-08501004](https://doi.org/10.1163/18759866-08501004)

*'A country as diverse as India couldn't have just 2 species of Fan-throated lizards.'*

*This article encapsulates the study on the lizards of genus *Sitana*, which was thought to have only one genus. The study resulted in the description of one new genus and five new species.*

### **Target Taxon:** Fan-throated Lizards

(Genus *Sitana*, Family *Agamidae*)

**Summary:** Lizards of genus *Sitana* described by Cuvier, 1829, are widespread ground-dwelling lizards found in the Indian subcontinent. A sampling of Fan-throated Lizards was done in Peninsular India by the team over 81 locations across 160,000 km<sup>2</sup> in order to understand their diversity better. The genus *Sitana* that previously included all the species of the animal, based on general similarities in morphology and dewlap, has now been revised with the introduction of a new genus, "Sarada", in which two new

species have been described. Additionally, three new species have been described under the genus *Sitana*.

**How the study was done:** Museum specimens were examined to help the demarcation of species by identifying characteristics for diagnosis of morpho-species. The states of Tamil Nadu, Karnataka, Maharashtra, Gujarat and Rajasthan were surveyed and specimens were collected by hand.

A total of 231 specimens of Fan-throated lizards were studied of which 56 were museum specimens.

Morphometric characters, meristic characters, hemipenis morphology and osteology from both sexes were used in the study. Tissue samples were collected for molecular sampling from which genomic DNA was extracted. Molecular data were analysed using maximum likelihood and Bayesian methods.

### **Results:**

Based on the detailed examination of morphological characters, one new genus *Sarada* and five new species of Fan-throated lizards were described. The new species are

*Sarada darwini*, *Sarada superba*, *Sitana visiri*, *Sitana laticeps* and *Sitana spinaecephalus*. After phylogenetic analysis, three major clades; Clade 1- *Sarada deccanensis* clade, Clade 2- *Sitana spinaecephalus* clade and Clade 3- *Sitana ponticeriana* clade were recovered. *Sitana* and *Sarada* have overall similar skeletal structure, except for an extra phalange on the fourth toe of manus and one reduced trunk vertebra in genus *Sarada*. *Sarada* is differentiated from *Sitana* by the presence of enlarged scales in *Sitana* on the body and thigh. *Sarada deccanensis* and *Sarada superba* are differentiated from *Sarada darwini* in having a relatively longer snout-vent length. *Sitana spinaecephalus* has characteristic enlarged spine-like scales on the back of its head, differentiating it from the other species in *Sitana*. *Sitana spinaecephalus* and *Sitana laticeps* have only a blue line on the throat extending in the dewlap, making them different from the other *Sitana* species. The various species can be differentiated with the help of

three major pointers, the presence of dewlap margins, extent to which dewlap extends along the trunk and number of lobes in the hemipenis. Serrated dewlap margins are found in *Sitana ponticeriana*, *Sitana visiri*, *Sitana bahiri* and *Sitana devakai* and absent in all others. Dewlap extends posteriorly along the trunk in *Sitana laticeps*, *Sitana bahiri*, *Sitana devakai*, *Sitana ponticeriana*, *Sitana spinaecephalus* and *Sitana visiri*, up to 29%, 29%, 33%, 37%, 45% and 56% respectively. *Sitana devakai*, *Sitana bahiri* and *Sitana ponticeriana* have a ventral scale count of 100-108, 87-89 and 64-76 respectively. *Sarada superba*, *S. ponticeriana*, *S. spinaecephalus* have a bilobed hemipenis while *Sarada darwini*, *S. laticeps* and *S. visiri* have a single lobed hemipenis. (Please do refer to the photo in the paper to understand the differences better).

#### **Discussion:**

Based on current distribution patterns, some topographic features such as hills and rivers may be responsible for acting as

barriers for gene flow. The river Godavari in the case of *Sitana spinaecephalus* and *Sitana laticeps*, and the rivers Krishna, Bhima and Godavari with the Mahadeo mountain range for *Sarada deccanensis* and *Sarada darwini*. *Sarada superba* appears to inhabit only high elevation plateaus in Maharashtra and were not found below elevations of 1000 m. Proof of past terrestrial connection was made with the presence of species closely related to *Sitana bahiri* from Sri Lanka found in Rameshwaram and another location in Tamil Nadu.

Deepak, V., Giri, V. B., Asif, M., Dutta, S. K., Vyas, R., Zambre, A. M., Bhosale, H., & Praveen Karanth, K. (2016). *Systematics and phylogeny of Sitana (Reptilia: Agamidae) of Peninsular India, with the description of one new genus and five new species. Contributions to Zoology, 85(1), 67-111.*

<https://doi.org/10.1163/18759866-08501004>

*Aswathi Asokan is a 2nd year student at Stella Maris College.*

## **GLOSSARY**

*To help you understand some of the technical words and terms in the article, Anooja A. has defined some of them.*

- 1. Bayesian method:** a statistical tool to keep updating the probability of a hypothesis as more evidence keeps coming up
- 2. Clade:** a group of different species of organism that comprises of all the descendants of a common ancestor
- 3. Dewlap:** a flap of loose skin that hangs from below the neck of animals
- 4. Gene flow:** the movement of genetic material from one population of the same species to another
- 5. Hemipenis:** one of the paired intromittent copulatory organs in lizards and snakes
- 6. Manus:** the last segment of a forelimb, typically referring to the hand and wrist
- 7. Meristic:** the number of organs and anatomical segments in the body of animals or plants
- 8. Morphometric:** analysing physical characters like size and shape
- 9. Osteology:** the study of morphology, structure and functions of bones
- 10. Phalange:** plural form of the word "phalanx". Refers to the fingers and toes of a vertebrate except for the thumb and the big toe
- 11. Ventral scale count:** the scales present on the underside of reptiles from the neck region to the anal region

# Of Scales & Shells- Interview with Sneha Dharwadkar,

Anooja A. and Aswathi Asokan



*Sneha Dharwadkar with a Caecilian*

## What brought you to this field?

While growing up, I was unaware of wildlife-related fields of work and I aspired to become a psychiatrist; but, when I completed school, my grades were insufficient for my desired course. This was when I heard of B.Sc. Environmental Science and on applying, I topped the entrance exam for it. After that, there was no looking back - I joined. While pursuing my graduation, I volunteered with several organisations to gain hands-on experience. The city I grew up in, Baroda, is home to several crocodiles, turtles and snakes which I helped rescue. Crocodiles ignited my interest in herpetology. I developed a fascination for reptiles and amphibians, which together are called herpetofauna. I was then intrigued about doing a Masters degree in herpetology. However, unfortunately, there is no MSc herpetology course in India as a result I went on to do an MSc in Wildlife Biology. I chose to specialise in herpetology and focus on amphibians and terrestrial reptiles found in the southern Western Ghats.

## Can you tell us what your research work encapsulates?

Currently, a significant chunk of my work involves studying freshwater turtles and tortoises but I used to work on herpetofauna in general. Initially, I mainly used to write popular articles on amphibian-related conservation education. For the past two years, I've been working on research papers on freshwater tortoises and turtles, which are expected to come out soon. My current project involves studying softshell turtles in Maharashtra while focussing on the endemic Leith's softshell turtle (*Nilssonina leithii*) and how people perceive the presence of turtles in their backyards. Unfortunately due to COVID-19 I've not been able to do any fieldwork. However, I hope that from January 2021 I will be able to resume my fieldwork.

The other major project I'm working on is the FTI citizen science project on the India Biodiversity Portal, where we curate records of the 29 species of freshwater turtles and tortoises

submitted on the India Biodiversity Portal. The portal is quite easy to use. We have updated all the available information on our Indian species on the portal and one just needs to click on the photo of the species they want to check to find information on it.

I am also working on a few manuscripts and popular articles. One on "Women in Herpetology in India" and another on the "Herpetofauna of the northern Western Ghats."

**What are some ecological sites you enjoy working in? Are there any locations that you would recommend visiting for herping?**

My favourite ecosystem to work in is evergreen forests, and as such the southern Western ghats is my favourite place to be. However, I'm not dead-set on exploring only a particular ecosystem type. Diverse ecosystems have diverse herpetofauna. Deserts like the Rann of Kutch and the Thar desert in Rajasthan have good herpetofauna diversity. Even agricultural fields can be a good place for 'herping', that is, going out looking for herps. These are often underrated ecosystems because many people don't think much can be found in them.

If you want to see turtles, the Northeast is the best, especially Kaziranga where you can see many different species of turtles in the Brahmaputra. Another good spot for freshwater turtles is the Chambal river. Bonus here is, you may also get to see the Critically Endangered Gharial and Ganges dolphin! For frogs and toads, the forests of Munnar and Agumbe are very diverse.

However, most importantly, also keep an eye out for the animals in and around your house. Many people realised how diverse their backyards were during the lockdown when they were shut in their homes with no scope of travelling in the wilderness. You don't appreciate the animals around your house until you take regular walks because every walk will surprise you.



*Leiths Softshell Turtle*



## **What inspired you to start 'Freshwater Turtles and Tortoises of India' (FTTI)?**

During many rescues and raids conducted on illegal pet shops, I used to see many Indian star tortoises being kept in deplorable conditions. Often, there were several freshwater turtles as well. Although initially interested only in the tortoises, I later realised how poorly understood this entire group of turtles and tortoises was. There were barely any studies and even the field guide on these animals was out of print and hard to find. People often mistook the native Indian species for exotic ones and the rampant trade went on. In turtles and tortoises, there is much to study and hoping to bridge this knowledge gap, my colleague Ms. Anuja Mital and I started FTTI (Freshwater Turtles and Tortoises of India), a citizen science project dedicated to documenting turtles and tortoises using observations uploaded by people on the India Biodiversity Portal, in 2016.

## **What are the difficulties you face as a female herpetologist in India?**

The problems I face are akin to those that women generally face. Sometimes, people do not take me seriously and even question my authority simply because of my gender. For instance, participants of seminars prefer asking a man with no experience about questions regarding turtles and tortoises instead of me, who works with them.

Fieldwork in herpetology is often conducted at night owing to our subjects being nocturnal and hence people often assume that women won't be able to conduct field studies. There is also the issue of safety in the field and sometimes even in workspaces.

Such situations are often difficult to navigate as you want to protect yourself while not offending anyone as it might have future implications. Many women stay quiet because of this and continue to face harassment.

Some of the field stations and field centres I stayed at during my fieldwork in Uttar Pradesh lacked toilets. This situation was very unhealthy and I faced a lot of health

repercussions.

Instead of ensuring that their employees are safe, some organisations tend to think that women need too many facilities and avoid hiring them, even though having a proper toilet is a basic necessity, even for a man.

Some 10 years ago when I was new in the wildlife job market, I often saw many job opportunities that were circulated with "male" being an eligibility requirement. Thankfully, this has reduced and people are now talking about such issues and calling out such incidents. Field biologists often spend many months in the field and it's unfair to expect them to live in subpar conditions. When we hire people, we ensure that basic necessities like decent accommodation, clean drinking water and access to electricity are present. Just because we are field biologists, we shouldn't be expected to accept inadequate facilities.

## **What are some research gaps you have come across while studying amphibians and turtles?**

Herpetology in India is still a

growing field. There is much to study, right from the ecology and distribution of the newly described species, to their natural history and behaviour. In the past decade, there have been many new discoveries of frogs. Along with the description of new species, adequate attention needs to be paid to understanding their ecologies. There is very little work on India's freshwater turtles. The distribution of several turtle species are highly understudied. If you look at the FTTI portal, we are getting a lot of new records from new geographical locations where we didn't know turtles existed, or some behaviour that is backed up only by anecdotal evidence. I think that freshwater turtles, in particular, have a lot of scope for research. If you start working with freshwater turtles, then most of the behavioural observations you'll come across will be new, like how J. Vijaya started observing freshwater turtles and tortoises of India and helped build a lot of knowledge. So I feel that the research gaps we need to fill for these organisms include updating our understanding of their distribution, the different species,

their populations across different river systems, their natural history and behaviour and applying all this knowledge to conservation. A lot of these species are threatened and endangered due to illegal trade and habitat loss, so there is a lot to do for freshwater turtles and tortoises.

**You have mentioned in an article (<https://jlrexplore.com/explore/focus/freshwater-turtles-and-tortoises-of-karnataka>) that tortoises and turtles face the threat of illegal trading and extinction. Could you discuss this further?**

Illegal trade in wildlife is a huge problem, made worse by the fact that people aren't aware that turtles and tortoises aren't meant to be kept as pets. Pet-sellers aren't very honest too. They often pass off Indian species as Malaysian or Singaporean species and they often sell hatchlings, which are quite small, telling customers that they won't grow. We at FTTI keep posting material on Indian species on our social media pages. We also share information on problems faced due to irresponsible pet ownership and diseases captive turtles can contract among others which help us further our goals of outreach. As more and more people join us, we hope the information reaches far and wide. Wildlife trade is demand-driven. The more people buy, the more comes into the market to be sold. We hope that we are able to educate people to not buy illegal pets, care for an exotic and legal pet and in general, get them acquainted with our turtle fauna and spread awareness about these issues.

**Are there skills and tools that you recommend young naturalists pick up or learn to use?**

Being able to take care of yourself is a paramount prerequisite. This includes basic cooking (for any gender), cleaning up and such. Carrying a first aid kit and knowing how to use it, possessing basic map-reading skills and knowing how to navigate using a magnetic compass are, according to me, necessary skills while working in the field.

Apart from this, it helps if one is familiar with basic software like Microsoft Word, Excel, etc. Knowing how to use binoculars is also important. An extremely essential skill one must possess is planning. Plan your fieldwork out well in advance before going to the field.

One piece of advice that I wish I had got in my early days is about how to manage finances. I feel it's extremely important for a young person to plan out their finances well. Learn how to file taxes. Even if you do not fall under the tax bracket, you still need to file nil returns. Save money from whatever amount you earn. This is a crucial skill that no one talks about but is an extremely important part of life.

**Do you have any suggestions on how young naturalists can contribute to outreach? In what ways do you spread awareness?**

Contribute to citizen science portals - not just for turtles or tortoises - for anything. Try to document whatever you can - plants, butterflies, insects, mammals, even stray dogs

in protected areas or stray dogs eating any wild animals. Contribute these findings to citizen science portals. There are several options today, such as the India Biodiversity Portal ([indiabiodiversity.org](http://indiabiodiversity.org)) and iNaturalist (<https://www.inaturalist.org/>). A lot of young naturalists use social media and post pictures related to wildlife with invoking captions, and many of these individuals have large



*Sneha with Star Tortoises*



followings, which helps information reach a wider audience. If you are posting a picture of, say a turtle, then write something about it that a common person would like to read, like an interesting fact or a peculiar observation. Some of us may not be good at writing, but of course, you can always take help from others. Young people are not hesitant to collaborate and I feel they don't shy away from uncomfortable conversations, something I find amazing. I follow a lot of young naturalists on social media and I feel that they engage in polite discussion but don't back down from their positions. This is one of the ways that you, as a young naturalist, can engage anybody who is reading this. Volunteering with organisations for causes that you believe in is great too. Sometimes, it may not always be possible physically, time-wise or even financially, so it's okay if you are not able to or if you are just working online, don't beat yourself up about it. Talk to people, write to individuals who inspire you and would respond if you had questions. Don't hesitate to ask doubts, because they help you grow and learn.

**What are your views on internships and volunteering opportunities for students, especially in the context of women? Does FTTI provide such opportunities?**

I try to take interns and volunteers when I can afford them, especially young women - both Anuja and I feel very strongly about this. As women, we have faced problems and opportunities for us have been limited and so we want to extend the kind of support we wished we had in the past to upcoming women biologists. We conduct a lot of capacity building initiatives for women in conservation in general, but mostly in herpetology. If we conduct a workshop, we ensure that there are a good number of women attending the workshop and if they are facing issues, we try our best to help them out.

I hope we keep getting funds to be able to afford interns. As soon as our fieldwork starts again, I believe we may have opportunities opening up. Apart from FTTI, many organisations are always on the lookout for interns and volunteers. You could subscribe to the YETI mailing list, through

which you can learn about what is going on and about volunteering opportunities. For women especially, talk and reach out to other women in the field, before taking any opportunity you get. Most of the times there are people listed on the websites of these organisations, so reach out to them and ask them how their experience has been.

I have always felt that our profession is unfair. We are not asking for extremely high paying jobs, but we should get enough money to sustain our basic needs. It is unfair to conduct unpaid internships and nowadays, organisations which do so are being called out. Nothing comes free, and everybody, including interns, should be paid for their services. However, if you are willing and can afford to take up an unpaid job where your living and food cost is covered, go for it. However, weigh the pros and cons of both paid and unpaid opportunities before you do so.



*A Mugger crocodile at Katarniaghat*



*Green Keelback, Juvenile*



*Three Striped Roofed Turtle*

**What advice do you have for children and women who want to take up nature-related jobs when society often stresses the importance of having a “safe earning” job and a “settled” life?**

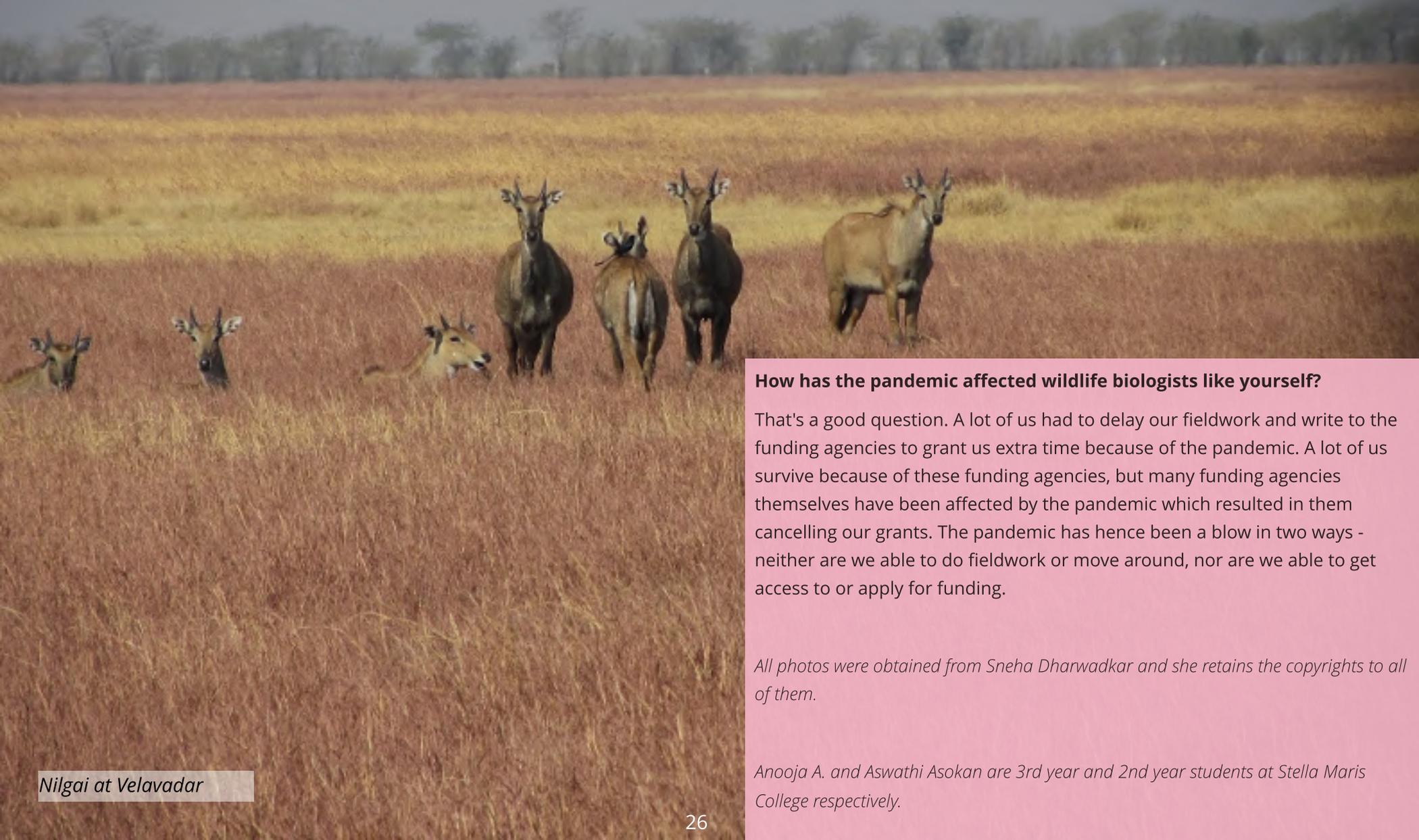
This is quite a tricky question because everybody's background is very different and one can't generalise. I have been fortunate enough to never have been pressured into 'settling down'. This is a luxury most women don't enjoy.

My advice would be to follow your heart, but often this may not always be possible so do not despair. The best part of conservation is that it is multidisciplinary. You will be able to contribute to conservation no matter what field you choose to work in. You could design outreach material, innovate or design new systems or equipment, publish articles and so much more depending on the skills you possess. You need not necessarily have a masters degree in wildlife biology, ecology or zoology to work in this field. If you take up

a job not related to wildlife due to whatever reason, don't worry, you can still contribute to wildlife conservation in some way or the other.

**As a co-founder of FTTI, do you have any advice for those who want to start nature-related projects or businesses?**

For anybody who wants to start anything, having clarity as to why you are starting up and having a plan for your start-up are crucial and so are short term and long term goals. These are a must as they help you proceed in an organised fashion. This was the advice I got when we started FTTI and I feel that it has helped me a lot. As an entrepreneur, I feel one should be meticulous and very organised, especially if it's a small start-up or initiative. Prioritize what is important. Organisational skills and having people aligned with your values and ethics are also very important. Anuja and I communicate well. Before taking up new projects we discuss things and take a call together.



*Nilgai at Velavadar*

**How has the pandemic affected wildlife biologists like yourself?**

That's a good question. A lot of us had to delay our fieldwork and write to the funding agencies to grant us extra time because of the pandemic. A lot of us survive because of these funding agencies, but many funding agencies themselves have been affected by the pandemic which resulted in them cancelling our grants. The pandemic has hence been a blow in two ways - neither are we able to do fieldwork or move around, nor are we able to get access to or apply for funding.

*All photos were obtained from Sneha Dharwadkar and she retains the copyrights to all of them.*

*Anooja A. and Aswathi Asokan are 3rd year and 2nd year students at Stella Maris College respectively.*

# Ashoka Trust for Research in Ecology & the Environment (ATREE), Nanditha Ram

## ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND ENVIRONMENT (ATREE)

**Location-** Bengaluru, Karnataka

**Established in-** 1996

**Courses they offer-**

PhDs in various interdisciplinary courses

**Website-** [www.atree.org](http://www.atree.org)



Photo sourced from Anurag Singh

### What is ATREE?

ATREE is a non-profit organisation located in Bengaluru which endeavours to conserve and protect India's natural biodiversity in an interdisciplinary manner. The research institution, founded in 1996, aims at efficient policy-making and implementation on a national and global level to better facilitate socially just and sustainable development strategies for future generations. The organisation believes in the proper formation and application of scientifically sensible policies along with the active participation of representatives of stakeholder communities and individuals to tackle pertinent environmental issues.

The academy hosts PhD scholars, researchers, fellows and grantees who are engaged in conservation and related research work around the globe.

## **Centres and Associations:**

The Academy for Conservation Science and Sustainability Studies that comes under ATREE was set-up in 2008 and offers several interdisciplinary PhD courses for students from diverse backgrounds like economics, sociology and wildlife sciences. Various international organisations give grants and awards to talented scholars from ATREE for exceptional contributions in their respective fields. The annual TN Khoshoo Memorial Award which was instituted in honour of Dr Triloki Nath Khoshoo, the renowned Indian environmental scientist, recognises people who have contributed immensely to the fields of conservation, environment or development. In addition to this, the Academy organises certificate courses, workshops and talks by notable guest speakers from different backgrounds throughout the year, providing a platform for the exchange of ideas and learning through interaction.

The Academy has established Community Conservation Centres

(CCCs) that function on a community-based approach to conservation. These centres work based on the exchange of valuable information between local communities, which provide native knowledge and observations from the concerned region, which are used by researchers to come up with suitable scientific solutions. The CCCs have been crucial in ensuring policy implementation and conducting activities for local communities, especially for children via awareness campaigns, outreach and education.

There are two centres for Research at ATREE- the Centre for Biodiversity and Conservation and the Centre for Environment and Development. The Centre for Biodiversity and Conservation is broadly divided into three departments- "Ecosystem Services & Human Well-being", "Landscape, Conservation & Livelihoods" and "Biodiversity Assessment & Conservation Planning". They have several ongoing projects across India, with a primary focus on zoonotic diseases, taxonomical

documentation and distribution, human-animal interactions and impact assessments. On the other hand, the Centre for Environment and Development focuses on "Water, Land & Society", "Forests & Governance" and "Climate Change Mitigation & Development". The centre works on public and community-centric projects, striving to ensure efficient policy making and implementation that aids in tackling climate change and its effects on humans.

### **How to get in?**

ATREE offers many internship opportunities in research, outreach and education for individuals from various fields. Interns interested in research usually stay at field sites and the CCCs mentioned above. Anyone proficient in English with a degree, good communication and writing skills, ability to collect and organize data and a dedicated interest in the subject may apply. Applicants need to submit a resume, letter of purpose, reference letter and research permits (if applicable) along with their application form.

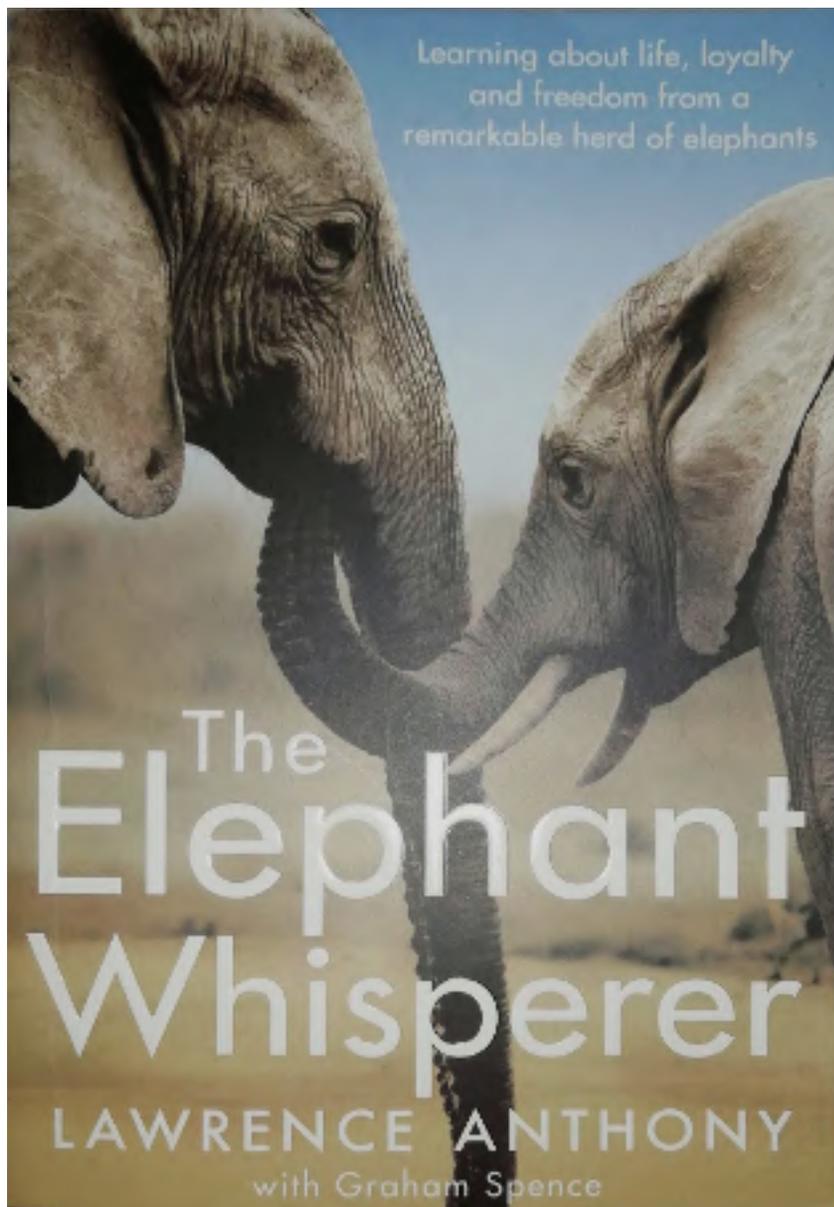
Candidates with previous field experience are usually preferred.

In partnership with Manipal Academy of Higher Education (MAHE), Karnataka, ATREE's PhD programme employs an integrated and interdisciplinary approach to conservation of biodiversity and sustainable development. Having a background in natural or social sciences and displaying academic excellence in the same are the only two prerequisites for a candidate seeking admission. The institute accepts students every alternate year and on gaining admission, students are given monthly stipends and mentored by experienced ATREE faculty. The admission process consists of an entrance exam, from which one may be exempted if one has already qualified in an accepted common examination. Persons who tick the boxes of all the mentioned criteria are called for an interview for the final round of the application process.

*Nanditha Ram is a 3rd year student at SSN College of Engineering*

# Book Review: The Elephant Whisperer

Smriti Mahesh



## The Elephant Whisperer

**Author-** Lawrence Anthony

*Lawrence Anthony, a conservationist and author, penned 3 soul-stirring books during his life describing his various experiences with conservation. A man who understood and practised the fine balance between the emotional and scientific aspects of conservation, he established The Earth Organisation in 2003. Lawrence was posthumously awarded an honorary Doctor of Science degree by the University of KwaZulu-Natal in 2012.*

**Release-** April 2009

**Genre-** Non-fiction, Nature

**Pages-** 368

## Summary:

The Elephant Whisperer is a novel describing the author's experiences with a herd of rogue elephants as he finds himself facing what is effectively a Hobson's choice - adopt the herd into his private game reserve, Thula Thula, or let them be shot.

The book is centred around Lawrence's relationship with the herd and its development over time as the elephants transform from hostile beasts intent on breaking out of their new home, into gentle giants that live in harmony with the humans around them.

Woven into the sequence of events leading to the herd's settlement and growth at Thula Thula are several anecdotes that give the reader a humorous, yet moving insight into the running of a 5,000-acre reserve. From putting out devastating forest fires to establishing relationships with local communities, from learning to accept the passing of dear friends to understanding the language of the bush, this book captures the true essence of a life lived in and for the wild.



Picture Credits: *Melvin Jaison*

### **Evaluation of Content:**

The book is written in a highly evocative manner, catching the reader in an onslaught of mixed emotions. Peppered with a variety of little tales from the wild, some described with a touch of dry humour and some that bring tears to one's eyes, *The Elephant Whisperer* never fails to instil in the reader a deep emotional and spiritual connection to the African wilderness and its inhabitants. The author's understanding of the African bush and its conservation shines through every word in the book as he consistently emphasises the need to differentiate between the wonders of forming a bond with wild animals and the dangers that accompany it.

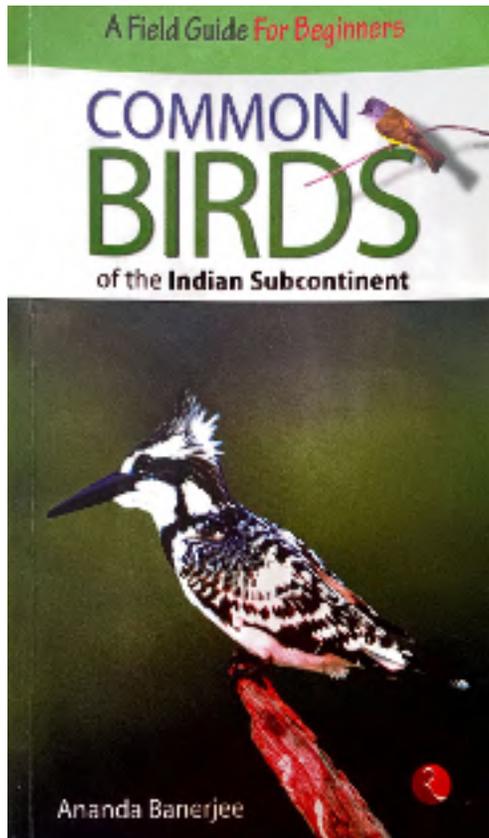
### **Opinions and Recommendation:**

Lawrence Anthony dedicated over 14 years of his life to the Thula Thula game reserve and the myriad of wild beings it's home to. He risked his life to save a herd of dangerous animals from a terrible fate, forging such a strong bond with them that they instinctively arrived at his doorstep to pay their respects on his demise.

This near tangible connection he built with the wild makes *The Elephant Whisperer* a powerful book, due in part to Lawrence's vivid writing style as he weaves an incredible tale of a world far removed from the bustling city life most of us are accustomed to. His consistent emphasis on the elephants' remarkably high levels of emotional and rational intelligence gently nudged me to realise that there is far more to this world than just us humans. The mind-boggling ability of these creatures to communicate across distances and species serves as a much-needed reminder that it would do us well to connect with the other denizens of this planet as well.

A book that truly altered the way I view relationships, be it with other species or even with our own kind, I would whole-heartedly recommend it not only to people already smitten by the wild but also to readers of all age groups looking for a deeply personal, mesmerising and thought-provoking read.

*Smriti Mahesh is a 1st year student at IISER Thiruvananthapuram*



# Book Review: Common Birds of the Indian Subcontinent, Twisha Mullappa

*From busy urbanscapes to dense jungles, from low-lying wetlands to colossal mountain ranges, our diverse nation is home to over 1,200 species of birds. Yet many people struggle to identify the birds they spot- even those they see on a daily basis. In this article, Twisha Mullappa, an eight year old birder, reviews a handy field guide on some of the common birds of the Indian subcontinent, a book that is sure to assist all birdwatchers, novices and professionals alike, on their quest to explore the avian world.*

## Summary:

This book is a field guide for beginner birdwatchers by Ananda Banerjee. It has descriptions and photographs of more than 200 bird species found in the Indian subcontinent.

## Evaluation of Content:

I like the way the author describes each bird, writing about features like the shape of the birds' bills, the colour of their eyes, wings and so on, to help users identify the birds they spot. He also mentions where the birds are best sighted, for example in wetlands, lakes, forests, cliffs or hill stations. I also like the 'Bird Trivia' provided in some of the pages. It mentions interesting facts about birds, and there is an index at the back that allows you to quickly find the page describing the bird you want to know about. Some

## Common Birds of the Indian Subcontinent: A Field Guide

**Author-** Ananda Banerjee

*Ananda Banerjee is a renowned conservationist and wildlife photographer. He has a strong affinity for black-and-white photography and capturing close-up images of shy animals. Currently, he is the editor for Special Projects at Outlook Media Group, where he facilitated the launch of 'Planet Outlook', a media platform that raises environmental awareness. He regularly writes on wildlife and conservation for Mint magazine.*

**Release-** 2008

**Genre-** Nature, Science

**Pages-** 116

## Opinions and Recommendation:

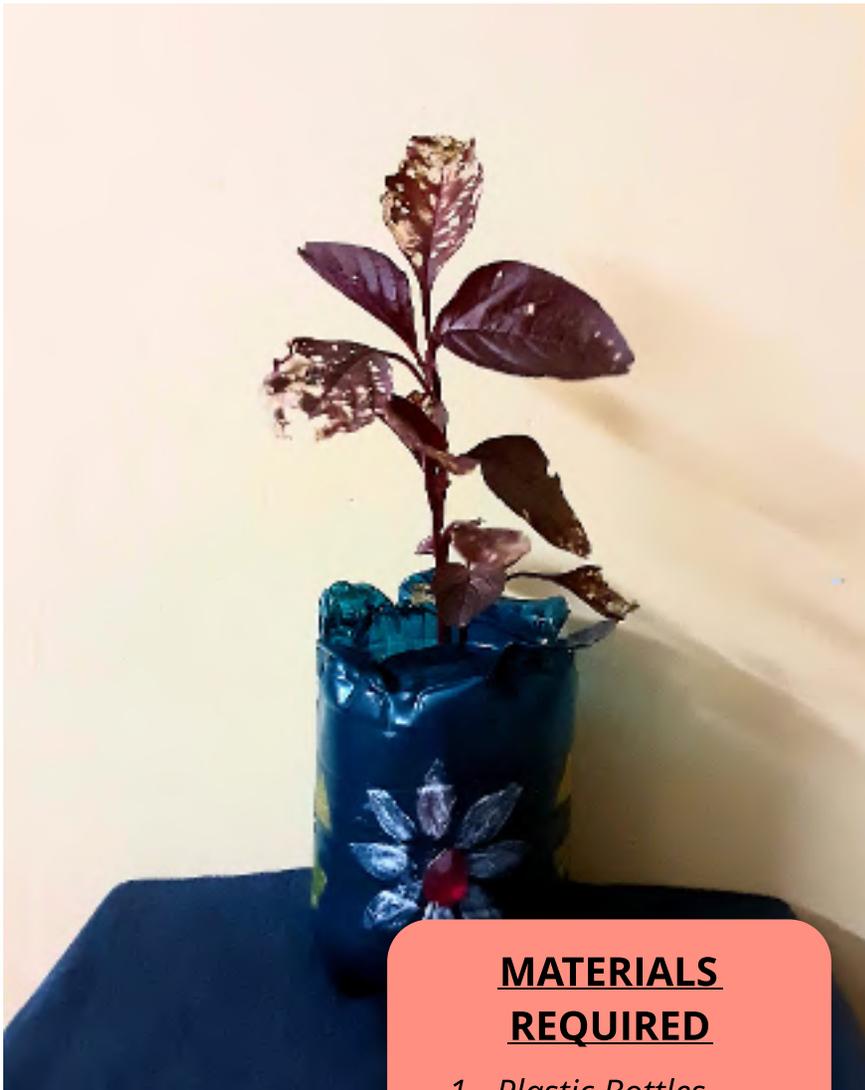
This field guide was gifted to me on my birthday by a birdwatcher. Initially, I used this book to identify the birds that I spotted from my balcony. Then I started taking this book with me when I went on birding trails. If you want to start birdwatching and learning more about common birds around you, this is a good book to begin with.

*Twisha Mullappa is an 8 year old birder from Chennai*

## Hands-on Activity: DIY Plastic Bottle Pots, Claudia Pinheiro



*In continuation with the last issue, we would like to showcase another simple activity to reuse waste plastic. This activity will not only help in reducing plastic pollution but will also bring a natural look into your homes! Hanging gardens have always been an attractive setup in households, and their hassle-free maintenance along with their eye-catching appearance make sure that you never forget to water them.*



### **MATERIALS REQUIRED**

1. *Plastic Bottles*
2. *Scissors/ knife*
3. *Decorative materials  
of your choice*

### **Steps:**

1. Take a clean and dry plastic bottle of any size and cut it horizontally in the middle to get two halves. A heated knife could be used to cut through it easily.
2. A few small holes must be made on the bottom of the container to ensure drainage of excess water. Two equidistant holes could be made on the top side of the container for tying a thread, if you need a hanging pot.
3. Acrylic paint/spray paint can be used to paint the pot and additional decorations can be added using any materials of your choice including glitter or stickers.
4. After the final decorations are made, one can visit a local nursery to pick a plant that suits the location of where it is to be planted, in terms of light availability and space allocated.
5. Once the plant is chosen, remove the sapling and the surrounding soil from the container provided by the nursery and place it securely in the middle of the recycled pot, ensuring that the soil covers the entire circumference of its container.
6. The pot is now ready to be placed on a platform or hung from walls or the ceiling.

There is a chance that insects might be attracted to your garden. Since it is a hanging garden, insects that fly might be expected, with the occasional colony of ants. If your setup is inside your house and if you are afraid of attracting insects at home, you could plant species like Mexican mint (*Coleus amboinicus*) that are known to not attract too many insects, provide a fresh aroma to the house and can be used in cooking!

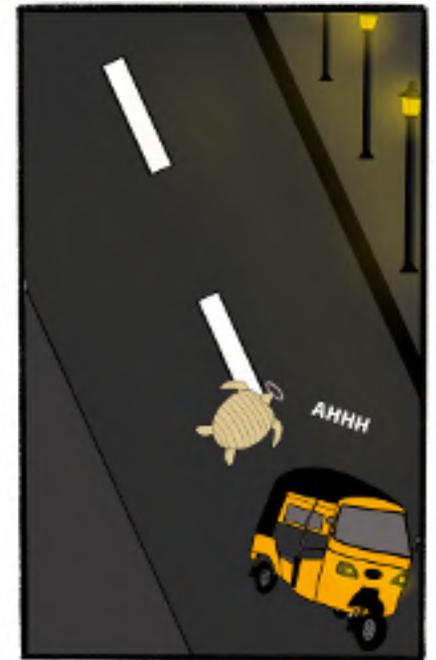
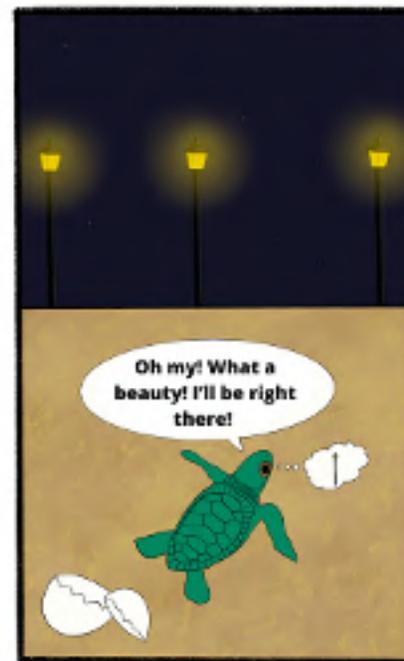
*All photos are taken by Claudia Pinheiro and she retains the copyright to them.*

*Claudia Pinheiro is a 3rd year student at Stella Maris College*

## Comic Strip, Anooja A. (below) and Deepthi A. (right)

Deepthi A. has shown the effects of anthropogenic activities on nature through her comic strip. Turtles hatch near the sea shore. The hatchlings naturally move towards the sea as moonlight reflects off the sea at night, making it a bright source of light for them to follow. Here however, the unnaturally bright city lights disorient them and they die of dehydration, trampling and predation.

Anooja A. brings to us a light-hearted comic that talks about bird migration. Arctic Terns undertake the world's longest bird migration every year, crossing a number of countries and seas while travelling from the Arctic Circle to the Antarctic Circle. The pandemic might restrict our movements but we can still enjoy these birds' expeditions from our homes.



Anooja A. and Deepthi A. are 3rd year students at Stella Maris College

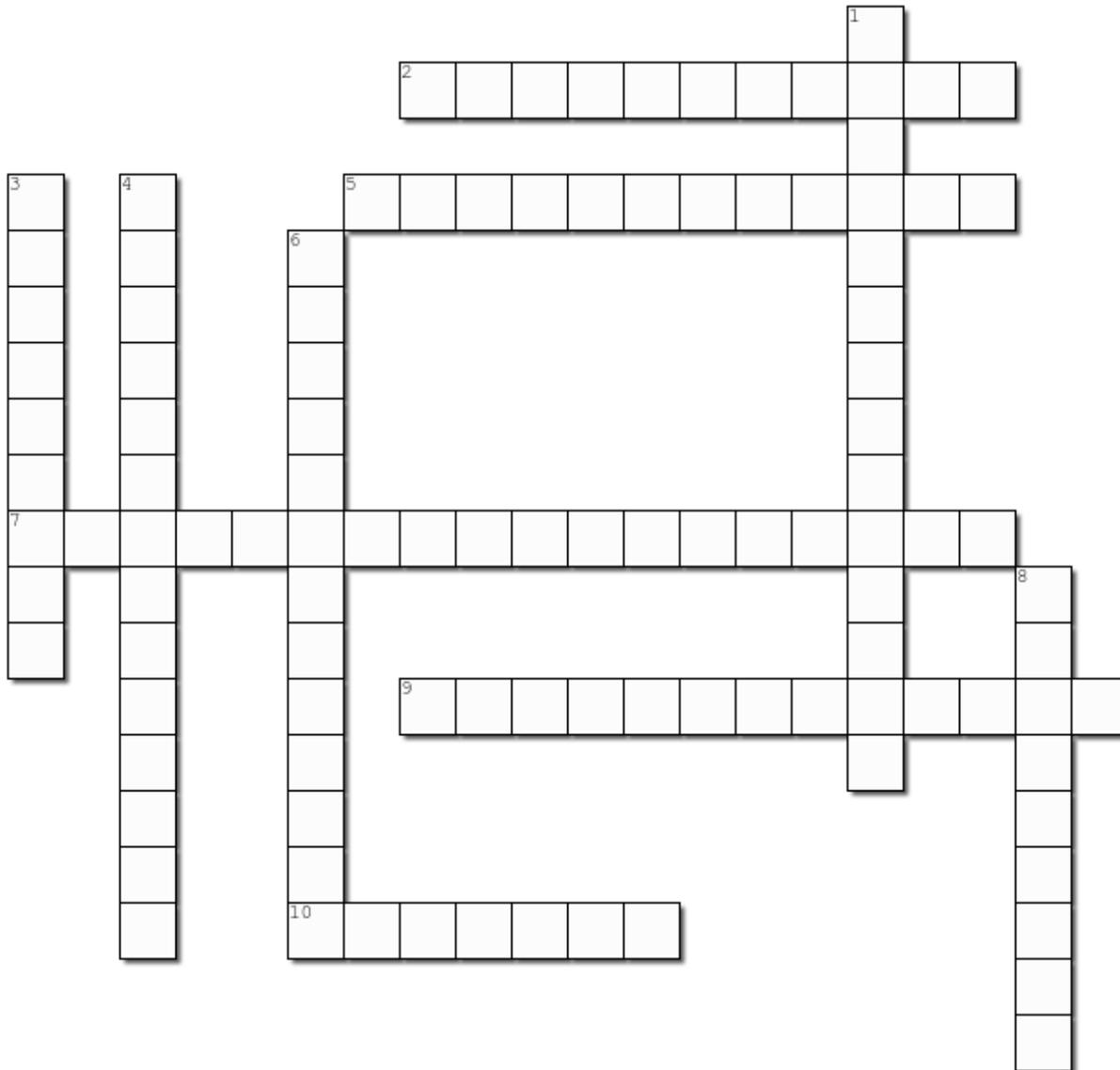


**I Spy,** Aditya Ramakrishnan

Try to spot the creature in this picture!

This picture was taken by *Aditya Ramakrishnan*  
in Kerala.

*Aditya Ramakrishnan* is a 1st year student at Shiv  
Nadar University.



## Crossword, Nikitha Vasu

### Across

2. The turtle species which holds the record for longest reptile migration
5. The toads belonging to the family Alytidae are commonly called \_\_\_\_\_.
7. The crocodile species which has the strongest bite force of any animal
9. Largest lizard in India
10. The only surviving member of the Order Sphenodontia

### Down

1. \_\_\_\_\_ frog is greenish-brown and is endemic to the Western Ghats. Its name refers to its type locality, a town in Tamil Nadu.
3. The most common sea snake in India
4. The smallest snake among the big four venomous snakes of India
6. The only tailed amphibian seen in India
8. Scientific name of the Spiny-tailed lizard

*Nikitha Vasu is a 3rd year student at Stella Maris College.*

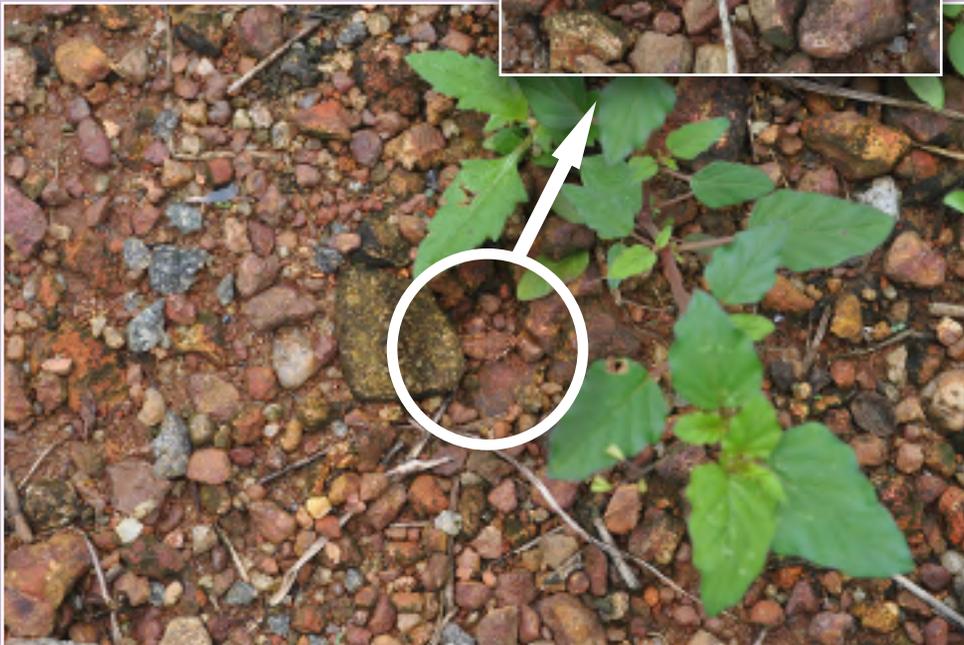
# Answers

## Crossword: Bird Migration

(Hyphens and spaces not included in crossword)

1. Kalakad gliding
2. Leatherback
3. Hook nosed
4. Saw scaled viper
5. Midwife toads
6. Himalayan newt
7. Saltwater crocodile
8. Uromastyx
9. Bengal Monitor
10. Tuatara

## I Spy



Saw-scaled Viper- Picture Credits: Aditya Ramakrishnan

