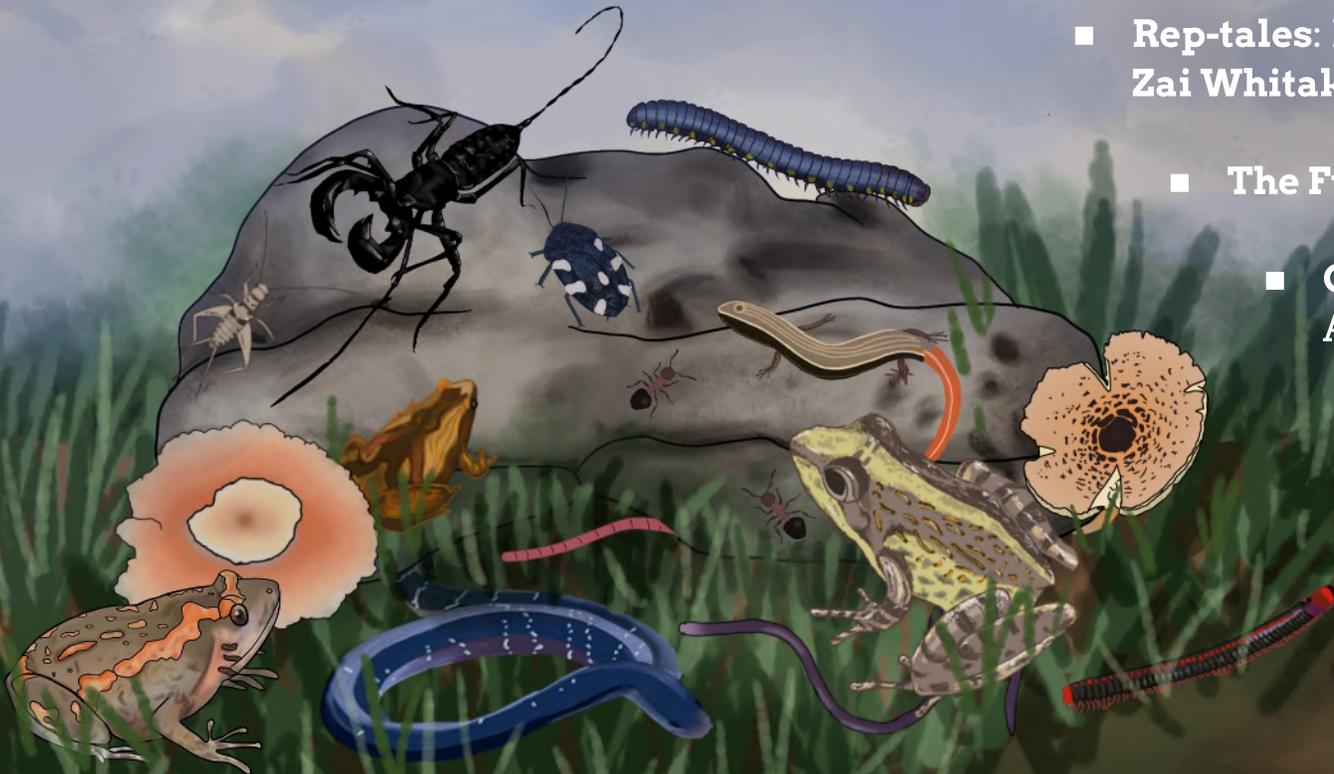


# NATURE TRAIL

Chennai Young  
Naturalists' Network

JAN 2022 | Vol 3, Issue 1

- **Rep-tales: In Conversation with Zai Whitaker**
- **The Fundamentals of Rock-picking**
- **Cloudy With A Chance of Toads-  
A Poem by Rahul Keshav**



# NATURE TRAIL

## Volume 3, 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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**About the Editor:** *An undergraduate student pursuing her B.Sc. in Zoology, Aswathi is up for a walk in the wilderness at any time. Working with coastal and intertidal life, she is also passionate about nature education and working closely with local communities. Along with her love for the shore, she enjoys singing and plays the veena.*

#### **ILLUSTRATION TEAM**

The Illustration Team for this edition, who created the cover page and all the illustrative elements included in this edition, is comprised of:

**Anooja A, Ashwin J Chandran, Balakrishnan Ram, Deepthi A, Prashanth K, Shivani Manivannan and Sridevi P**

Dear Readers,

We are thrilled to present another edition of 'Nature Trail' which hopefully will help you find exciting life right in your backyard! Upturning the usual, I present to you this edition's theme - 'Under the Rocks'- showcasing the wonderful wildlife found within soil, leaf litter and under rocks and logs. From Snakes to Spiders, know-hows to expeditions and encounters, we've explored exciting new grounds this time.

This special edition also marks our first fully illustrated cover page, custom made for the theme by the YNN Illustration Team. It is also a milestone in our journey, featuring contributions from various enthusiastic and talented nature lovers from across the country, outside of the YNN member community.

Hope you stay safe, healthy and wish you an eventful new year!

-- *Aswathi Asokan, Editor-in-Chief*

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

The Chennai Young Naturalists' Network aims to create 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 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.



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*Front Cover-* Illustration depicting various organisms that live in soil and leaf litter - Credits: Illustration Team

*Back Cover-* *Termitomyces microcarpus* - a termite hill fungi - Picture Credits: Mahathi Narayanaswamy



Shore Walk at Broken Bridge Beach

## **Our Recent Events:**

### ***Public Walks and Workshops***

When the situation surrounding the pandemic improved causing lockdown and restrictions to be lifted towards the end of 2021, YNN conducted public walks and workshops aimed at improving people's awareness about local biodiversity. These included a Shore Walk by Anooja A, Aswathi Asokan, Nanditha Ram Satagopan and Rohith Srinivasan at Broken Bridge Beach and a Nature Journaling Workshop at Kotturpuram Urban Forest by a noted nature educator, Yuvan Aves. Nanditha Ram Satagopan and Rohith Srinivasan took the member of public for a Bird Walk at the Pallikaranai Eco Park.

Mahathi Narayanaswamy conducted an online session on birds for the students of the Adyar Theosophical Academy.

*Do reach out to us if you are from a school or college and would like us to conduct a session on wildlife/biodiversity for students.*

### ***Instagram Live Sessions with Experts***

On the occasion of National Wildlife Week, YNN conducted an Instagram Live which saw Aditya Ramakrishnan and Maithree Ramachandran conversing with the nature writer Cara Tejpal about her entry into the field of conservation, her experiences and advice for the aspiring conservationists and naturalists.

*Follow us on Instagram ([@ynnchennai](https://www.instagram.com/ynnchennai)) to be notified about future live sessions.*



Nature Journaling Workshop at KUF by Yuvan Aves



Green Marsh Hawk feeding on an Asian Bloodtail -  
Picture Credits: Nanditha Ram Satagopan

# Recent Observations

Editorial Team

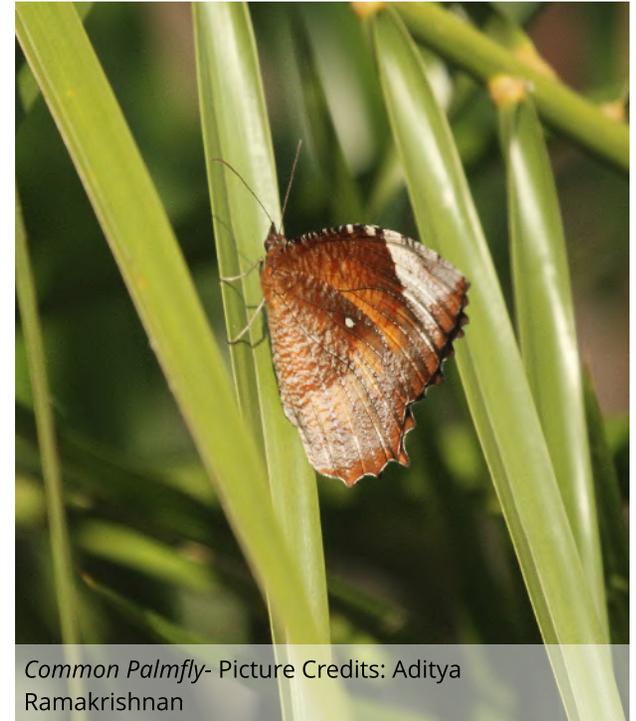
*Members of YNN contribute their wildlife observations to the Chennai Young Naturalists' Network Project on the iNaturalist database.*

*Over the past 4 months, there have been several interesting sightings by our members. Quite a few fascinating butterflies and trends were recorded- a spike in the Common Palmfly numbers, a first record of the Karwar Swift from Chennai in recent years and a record of the Common Lascar (making it the 154th butterfly in Chennai). Several records of the Blue-banded Pierrot were made from across Chennai, a butterfly which is also a fairly recent addition to the list.*

*Apart from the records arising from butterfly documentation, there were also exciting bird observations such as the Korean Flycatcher, Asian Pied Starling and an increasing number of reports of the Eastern Yellow Wagtail.*

*There were some interesting behavioural observations recorded, such as the Green Marsh Hawk feeding on an Asian Bloodtail.*

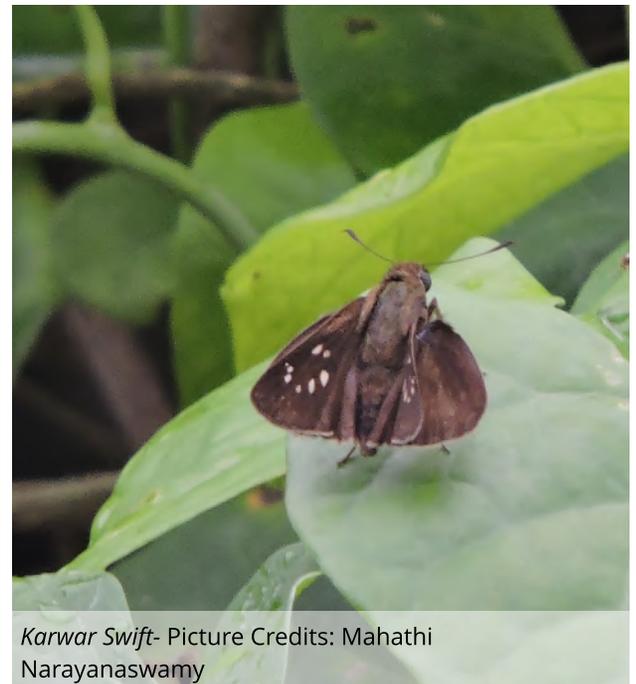
*Check out a few of these observations from the last 4 months, as captured by our members.*



Common Palmfly- Picture Credits: Aditya Ramakrishnan



Blue-banded Pierrot- Picture Credits: Aswathi Asokan



Karwar Swift- Picture Credits: Mahathi Narayanaswamy



*Lacewing eggs*- Picture Credits: Ashraf Shaikh



*White-spotted Supple Skink*- Picture Credits: Samrudh Nandagopal



*Hemiptera nymph*- Picture Credits: Samrudh Nandagopal



*Eumelea sp.*- Picture Credits: Smriti Mahesh



*Star Tortoise*- Picture Credits: Aditya Ramakrishnan

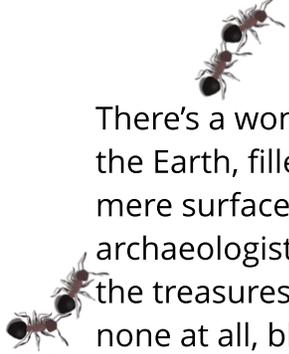
# The Fundamentals of Rock-picking

Ekadh Ranganathan

*An unassuming rock on the side of a road or path could just be hiding a whole world, teeming with an incredible amount of life. In this article, Ekadh Ranganathan unpacks how to best uncover and observe the species hidden under the rocks and stones we might walk by everyday without giving a second glance.*



YNN members exploring the biodiversity under a rock- Picture Credits: Anooja A



There's a wonderful world hidden away beneath the surface of the Earth, filled with an array of creatures rarely seen by us, mere surface-dwellers. For decades, excavators and archaeologists have had exclusive access to this expanse and the treasures it holds. Critters with hundreds of legs, some with none at all, blind creatures and colonial animals are just some of the life-forms that go about their lives tucked away from the naked eye. But for someone with an adventurous spirit and the curiosity to learn more about this concealed world, there are ways to uncover its secrets, and the fundamentals of rock-picking can be your guide through this process.

The main aspect to consider when surveying the forest floor is the demographic of animals you want to observe. Rocks are generally better to find creatures that intentionally hide away to escape predation, such as millipedes, crickets, termite colonies and snails. They can also house arachnids of all sorts as well as centipedes, both of which prey on the false sense of security afforded to the former group of animals. If you're lucky (or unlucky depending on how you look at it), you could even uncover a resting snake. Leaf litter and fallen logs form a complex maze in which ants march perpetually, microhylid frogs attempt to blend in, fungal blooms erupt and the odd cockroach scurries to find shelter. Meanwhile, the layer just beneath the surface is home to the ubiquitous earthworms, nematodes and tonnes of insect larvae living in complete darkness. Looking underneath rocks might be your best bet to uncover both fossorial and shelter-seeking critters, although it can be hard to figure out when and where to start. The 'where' is quite straightforward- an area that carries an abundance of rocks is probably a good place to start. The most productive undergrowth ecosystems would be in areas with thicker than average vegetation, like seasonal forests. In Chennai, areas like

IIT-M, Theosophical Society and Guindy National Park present the best chances for uncovering new fauna. Although there isn't a specific time of year that is necessarily unideal for finding undergrowth species, the monsoon season is when the forest floor truly comes alive. Fossorial snakes are more active, alates arise from their underground abodes, and frog calls can be heard echoing through the night.

Now for the 'how' part. The first thing to consider is the size of rock you want to lift. Larger rocks are more likely homes for snakes and larger critters, while smaller rocks embedded in the soil usually shelter millipedes and whip scorpions. It's also beneficial to select a rock that's within your physical capabilities to lift, as moving around larger rocks in an attempt to lift them could disrupt the wildlife underneath. Now for the 1st golden rule: always pick up the chosen rock from the side that's farthest from you and pull it up towards you, a bit like opening a briefcase full of money to show someone in front of you.



Procession Ant nest under a rock- Picture Credits: Mahathi Narayanaswamy

If you open the briefcase to look for yourself, you might receive a nasty surprise from an animal that's been disturbed, so in the interest of self-preservation, this is the best method. Another useful investment here would be gloves, to reduce the risk of getting bitten. The 2nd golden rule is as follows: after observing the creatures underneath, gently place the rock in the exact position and condition in which it was found. Avoid releasing the rock casually, as it could crush innocent creatures. Sheltering critters are quite sensitive to changes in their environment, so it's a good practice to keep the disturbance of their microhabitat to an absolute minimum.

The tool of choice for investigating the forest floor is the hook-stick. Whether for flipping a small rock or looking under dead leaves, this handy invention allows you to observe creatures from a safe distance. However, one should be careful with its use, as it can severely displace many animals if used without restraint. The stick should be used delicately to have a look under a clump of leaves, not to flush out the creatures by waving it around aimlessly. Another essential item for undergrowth exploration is boots, to prevent bites from any grumpy animals

you may encounter. In any case, always watch your step, since most critters are well camouflaged against their surroundings.

The daytime can reveal a lot of hidden treasures, but as darkness falls, a whole new array of creatures awaken. A night walk is perhaps even better at revealing creatures in the undergrowth that hide once the sun is up. For this purpose, a headlamp/strong torch is vital, but not just for illuminating dingy areas. Since many nocturnal hunters like spiders require excellent night vision to aid in hunting, they have mirror-like membranes in their eyes that reflect light, a phenomenon more commonly known as 'eyeshine', wherein glowing dots stand out amongst the dark leaf litter and can thus be identified as living beings. This effect makes it a lot easier to view nocturnal wildlife that would otherwise be next to impossible to find as they like to conceal themselves in the undergrowth. As such, a strong source of light is an essential piece of equipment to have in your arsenal.

As with any other form of wildlife observation, patience is the most critical attribute for a naturalist. You could pick up 20 rocks and comb through a kilometre of leaf litter and logs without

finding much. Unlike birds or some mammals, fauna on the forest floor don't necessarily want to be found, and thus, can be more elusive. However, the satisfaction of finding a new species under a rock after checking countless others to no avail is unparalleled. Besides, much of the undergrowth is still yet to be fully explored, so you're a lot more likely to find new records of species, which can help add to the repository of knowledge about these animals through citizen science platforms like iNaturalist.

So what are you waiting for? A whole new world of wildlife awaits you. Be careful and vigilant of your surroundings, but most importantly have fun in the process. Happy exploring!

*Ekadh Ranganathan is a 3rd year student at Hong Kong University of Science and Technology.*



*Sri Lankan Bullfrog from under a rock-  
Picture Credits: Anooja A*

# Whip! A Vinegaroon

## Narrative

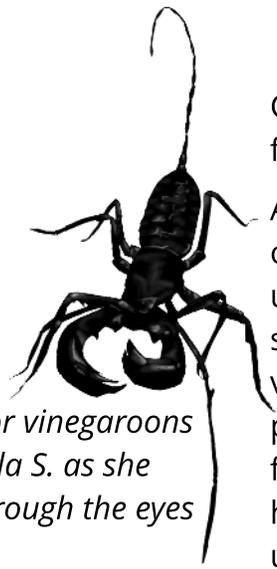
Akhila S.

*While they may look intimidating, whip scorpions or vinegaroons are quite harmless when left unbothered. Join Akhila S. as she explores the lives of these fascinating arachnids through the eyes of the hero of this story, Lucas.*

It has just stopped drizzling in one of the more arid regions of Mhadei Wildlife Sanctuary, Goa. The barely wet grass glows in the twilight. A female *Thelyphonidus* who has been carrying eggs in a sac has just had good news- they are hatching!

Once all the eggs have hatched, Lucas, our protagonist, one among them, catches a ride along with his siblings on their mom's back. They attach themselves there for quite some time, just sucking on her back. This might seem very familiar if you're aware of the life cycle of the scorpion, but Lucas is not one. In fact, Lucas is a 'whip scorpion', also called a 'vinegaroon'. Why 'whip scorpion', though? A cross between a spider and a scorpion, one glance at Lucas proves the point of his nickname. Even though he's just born, he already has a whip-like tail that can shoot concentrated acetic acid or 'vinegar' from its end, hence the name 'vinegaroon'. However, Lucas discharges this offensive liquid only if he is attacked. Lucas and his kind are quite cool-headed and benign, unless you annoy them, in which case, say hello to a vinegarish shower!

Vinegaroons are also known as 'Uropygi', meaning tail rump in



Greek- a reference to the thin, segmented "whip" that extends from the back of their abdomen.

As Lucas grows older over the days, we observe him getting out more frequently at night. Despite being nocturnal, he is unfortunately unaided by the advantage of night-vision. Lucas scrambles to find his prey in the dark, relying solely on vibrations. The foraging procedure is quite elaborate. All four pairs of legs help him with it- the first, like antennae, help him feel his way around and the next three help him walk. With heavy mouthparts called 'pedipalps', shaped like pincers and used mainly for chewing, Lucas eats millipedes, slugs, worms, scorpions, and is very useful in controlling the populations of cockroaches and crickets. He sometimes eats small vertebrates too. All of this food is crushed by specialised teeth he has on the inside of the second segment of his legs.

One primary concern one might have about approaching Lucas is whether he is poisonous or not. The question is very prominent, especially in the heads of those who know that *Thelyphonus*, which was one of the first genus names for the whip scorpion, essentially means 'qui tue' or 'who kills'. The short answer is no, but he definitely can pinch you with his pincers when provoked. He can also spray a mist from the scent gland at the base of his tail if you disturb him, so note to self- "Don't annoy vinegaroons".

Back to Lucas. Fast-forward to about four years later, during which he goes through about four moults and turns into a full-grown adult. Now almost three inches long, he's one of the biggest in the group. He's also nearly black, as is everyone else in his species. And as their lifecycle dictates, Lucas finds love following some courtship rituals, which are quite interesting, to say the least. The multi-stage foreplay lasts almost 15 hours, beginning with them shoving each other around and

grappling. This is followed by a dancing stage where, while face-to-face, Lucas drags his mate round and round. He then uses his pedipalps to push the spermatophore (a mass of sperm) into his mate's body. Fast forward again, this time to just a few months later. Lucas' mate has buried herself in a large burrow that she dug. She'll remain there with no food until about 40 eggs are extruded into a membranous brood sac attached to her genital operculum. As the eggs turn into post embryos, appendages become visible, heralding the arrival of a batch of mini-Lucas.

Answering a frequently asked question about Lucas and his kind, he is an individual of the only observed species of vinegaroons in Goa: the *Labochirus tauricornis*.

In other corners of the subcontinent, one can find upto 19 species dispersed across 6 genera, about 6 of which are found in India. With 83 species of vinegaroons recorded in just Asia, more people are becoming interested in these lesser known arachnids.

On the other side of the planet, Texas is home to the *Mastigoproctus giganteus*, commonly known as - spoiler alert - Lucas. Within this genus itself, there are 15 species, with Lucas' species itself having three subspecies, all of which are found in North America.

The thelyphonids are a very interesting bunch. They are very old in terms of evolution, existing since about 350 million years ago, even before the first dinosaurs roamed the planet. Relatively unchanged since then, they are crucial to our study of species from the Carboniferous era. Even though they might appear dark and foreboding, these well-wishers help us deal with pests. The worst case scenario occurs only if you truly anger them, in which case they employ their vinegar-scented

defence, making you stink all day. Until then, one can continue to coexist with vinegaroons in peace.

*Akhila S. is a 2nd year BS-MS undergraduate student at IISER Thiruvananthapuram.*



# One Man's Litter, A Naturalist's Treasure

Mahathi Narayanaswamy

*While birds, large mammals and isolated rainforests may catch our eye, the soil and leaf litter around us hosts its own unique forms of life. Join Mahathi Narayanaswamy as she unpacks all these species, from colourful little jumping spiders to long lines of ants.*

Like a fair majority of people interested in biodiversity, I began my venture with birds. Over the course of time, with exposure to the work of several others, I began looking at butterflies, dragonflies and moths, among other creatures. It was only recently that I consciously began looking at the soil to try and observe the life forms it sustains and it certainly did not disappoint. Many of us, when thinking of biodiversity, think of romantic habitats and landscapes such as pristine forests, mountains or oceans with limited human presence. However, this is not necessarily the case. There are nooks and corners almost everywhere on this planet that are home to more forms of wildlife than one can imagine. In this article, I will be highlighting the biodiversity that inhabits soil and leaf litter, which is fairly ubiquitous but not well known.

To begin with, I shall talk about spiders as some of these experiences are quite fresh in my mind. Soil and leaf litter often act as homes to several kinds of spiders, and among them, are the jumping spiders. Jumping spiders, belonging to the family Salticidae, occur in several places but tend to frequent windows at home. However, jumping spiders on leaf

litter are particularly fascinating, partly because of how colourful some such as *Chrysilla volupe* and *Stenaelurillus lesserti* are. While these catch my eye, one of my personal favourites is *Phanuelus gladstone*, a spider presently thought to be endemic to Chennai. I have seen it only once from afar and its size continues to astound me. Apart from jumping spiders, the soil is also home to different species of cellar and trapdoor spiders, often seen under rocks. Somehow I always associated cellar spiders with house ceilings, so it was fascinating to watch a cellar spider trying to catch a moth in Eucalyptus leaf litter. Oh, and on that note, several species of moths also take to leaf litter, against which they are camouflaged during the day, to protect themselves from predators. It is astounding how even the most brightly coloured moths look just like yet another dry leaf against this cluttered backdrop. Several butterflies like the Common Evening Brown and various Oakblues and Beaks take to leaf litter for the same.



Orange Oakleaf- Picture Credits: Vikas Madhav Nagarajan



*Procession Ants*- Picture Credits: Nanditha Ram Satagopan



*Thread-waisted Sand Wasp*- Picture Credits: Mahathi Narayanaswamy

Speaking of leaf litter, one of my favourite species to observe are the Procession Ants. When you disturb them, if you listen carefully, you can actually hear them! Ants produce sounds to communicate with each other by rubbing parts of their body together in a phenomenon called stridulation. These sounds, when produced by a large number of ants, become audible to the human ear in addition to causing surrounding material to vibrate. These vibrations are particularly pronounced when Procession Ants move through leaf litter as opposed to soil. So the next time you see a Procession Ant colony moving through leaf litter, don't forget to listen to their speech.

Leaf litter is also home to several other creatures. You have missed out on so much life if you haven't seen millipedes with their several hundred legs scurrying through damp soil for it signifies the onset of monsoon in several parts of the country. Several species of beetles and insects, vinegaroons, the occasional forest scorpion, snails and hammerhead worms, brightly coloured skinks, snakes and frogs- the list never ends! So many creatures find their homes amidst leaf litter and several others even beneath the soil. Ant nests, pupating caterpillars, eggs of sand wasps, beetle larvae, earthworms and Brahminy Blind Snakes never cease to thrill as you explore the world underfoot. Life under a rock sure is underrated! Perhaps once in a while, abandon movies and games and tour the little ecosystems thriving under rocks to learn more about the creatures that call it home.

*Mahathi Narayanaswamy is a 2nd Year Physics student at Azim Premji University, Bangalore.*

# Crawling through the Clutter

Nikitha Iyer

*With their brethren spread across the globe, spiders are going to take over the world! Now that we've gotten your attention, let Nikitha Iyer show you how important spiders are to maintain ecological balance and introduce you to a few of the amazing species that inhabit the leaf litter and rocks around us.*

No matter how repulsed people are at the mere thought of spiders, it's impossible to deny that they are some of the most fascinating creatures on Earth and have a rather unique and unusual lifestyle!

Spiders are one of the most abundant and diverse orders of arthropods, with nearly 50,000 globally known species. This super-predatory group regulates other arthropod populations, potentially saving us from an insect apocalypse. They are some of the most dominant amongst all arthropod predators, and are the only ones present on every continent except Antarctica (who knows now?). Yet, they often remain unnoticed in our daily lives. From terrestrial habitats to mountain peaks, from dark caves to potholes, from tropical rainforests to deserts, and from tree barks to the undersides of rocks, spiders are omnipresent. It is often common on warm summer and autumn days to find teensy spiders crawling as if they dropped from thin air right onto your clothes, or a great hairy monster, crawling from under crevices and rocks, playing peek-a-boo with delicious insects nearby. We are perpetually surrounded

by spiders.

A spider's typical diet consists of flies, mosquitos, cockroaches and other insects that may cause major harm to humans and agricultural crops. They are ancient animals belonging to the class Arachnida under the phylum Arthropoda with a history going back 350 million years. They are some of the most powerful predators and their global population is estimated to consume over 400 million to around 800 million tonnes of prey annually. However, one can certainly say that spiders and other arachnids, despite being an integral part of the ecosystem, receive little attention.



Wolf Spider- Picture Credits: Ashraf Shaikh

The omnipresence of spiders in almost every ecosystem on Earth along with their impressive ability to utilise resources makes them an ideal source of information for conservation management. Intricately woven orb webs can be spotted from a distance, while other spiders like Hersiliids remain perfectly camouflaged against tree barks. Foliage or ground hunters play hide and seek under fallen leaves, bushes and even under rocks.

The dark, semi-moist space underneath a rock sustains its own microhabitat. This space, no matter how small or large, hosts numerous living organisms. It's an abode for a diverse range of invertebrates ranging from tiny ants and huge tarantulas to ground-dwelling spiders like Gnaphosids.

Spiders temporarily stay in burrows under stones, dead logs, or at times below laterite blocks and hunt only in the vicinity. The entrances to their burrows are finely decorated with a thick silk webbing. These spiders, also known as ground hunters, don't spin artistic, architecturally marvellous webs, but neat thin linings enough to trap prey. They include:

- **Trapdoor spiders:** These include the few species of Idiopids that are endemic to India, who make trap doors amidst rocks and stay perfectly camouflaged. Their door opens like a Venus flytrap trying to capture prey. Most females spend their entire lives inside the burrows while males venture out from underneath the covered thick rocks to hunt.
- **Funnel-web spiders:** Spiders like Hexathelids make funnel-like structures, inside which they wait for prey to silently fall on silken traps. Such spiders make webs under rocks and in crevices, as they use the web's outer layer to trap prey while burrowing themselves inside, intact and covert. Most of these spiders are nocturnal

predators, so they ambush their prey on sensing vibrations along their webs.

- **Tarantulas or Hairy Giant spiders** take shelter under stones and boulders. They are generally shy and peaceful spiders, who like to be left undisturbed. They hide under the rocks during the day and at night, hunt and chase down their prey. Depending on their size and how hungry they are, they may even hunt mice and snakes. Since they dislike the cold, they normally remain in their burrows when the temperature drops. They tend to bite only if provoked, but when threatened, most of them raise their front limbs in a defensive posture like Theraphosids. Some, however, release hair that may cause irritation to humans.



*Trapdoor Spider*- Picture Credits: Aniruddha Singhamahapatra

Most tarantulas and ground dwellers live in underground burrows in well-drained soil. If the soil is suitable, the spider digs a deep burrow and lines it with silk webbing; this also helps them keep sand and dirt from trickling in. These enormous spiders are mostly solitary, so there is only one spider per house/web.

Spiders generally don't interfere with humans and mind their own business as solitary predators. The misconception of spiders, particularly tarantulas, being

notoriously harmful is prevalent but they in turn dislike humans and prefer to remain aloof rather than mingle with other species or attack humans. The spiders that reside in the ground or under the rocks are just as important in controlling pests as orb-weavers are.

The quality of human-animal interactions plays an important role in influencing conservation efforts, but unfortunately, despite their significant roles in the ecosystem, some animals are notoriously

unpopular and spiders are certainly one of them.

Thus, despite their importance, their popularity among humans remains shrouded in myth, ignorance, and fear.

*Nikitha Iyer is a postgraduate who did her dissertation thesis from Wildlife Institute of India on phylogenetics & phylogeography of an Indian Spider family.*



Funnel Web Spider- Picture Credits: Yuvan Aves



Tarantula- Picture Credits: Vikas Madhav Nagarajan



# 'Mycorest' - Mycelium Forests

Bhuvi Bommisetty

*Bhuvi Bommisetty is a Class 12 student pursuing Mathematics and Economics in Abacus Montessori School.*



# The Giant African Snail – An Invader Who is neither Slow nor Steady

Kedaravindan Bhaskar

*Seen almost everywhere nowadays, the African Giant Snail is one of the most invasive species in the world. With its ability to multiply rapidly and eat almost anything, this alien could pose a major threat to many native species. Read through, as Kedaravindan Bhaskar describes it, its habits and the threat it poses.*

After the recent rains in Chennai, a peculiar snail is spotted crawling everywhere in the city and its surroundings. Akin in appearance to a creepy-crawly from Borneo or the Amazon, the Giant African Snail has colonised everything from walls to rooftops, places in which it seems incongruous.

The snail is native to East Africa but has travelled to various locations across the world, primarily as an accidental

passenger on cargo ships. Ecosystems to which it is alien or 'invasive' often lack a mechanism to keep its populations in check. The snail, for instance, has few predators in the areas it colonises.

Since moving from East Africa to India, the snail has changed its diet. It has taken well to urban, agricultural, and natural landscapes, having found a source of food in over 50 plants and crops and even other snails (including other Giant African Snails!). They also eat concrete and other calcium-rich construction material which help develop their shells. This hungry snail eats just about anything!

The snails stay underground in periods of low rainfall (when conditions are unfavourable) and use their shell as a refuge in the soil to prevent moisture loss from their bodies. In their original habitat, they would enrich the soil by helping decompose plant matter on the forest floor by feeding on fallen plant litter and excreting nutrition-rich faeces. They have a give-and-take relationship with the soil and other members of the ecosystem that is difficult to express in tangible terms. So to sum up, the snail has a very adaptable diet, lacks a predator and can stay underground when conditions are unideal, making it

incredibly adaptable. They can also lay up to 1000 eggs in one year.

Unless you are living under a rock, you would have noticed the snails everywhere. You might think them pretty but it's an infestation. The snails are proliferating at a worrying pace and could be outcompeting native plant-eaters for food, endangering their survival, and upsetting the web of interaction.



*African Giant Snail*- Picture Credits: Simran Singh



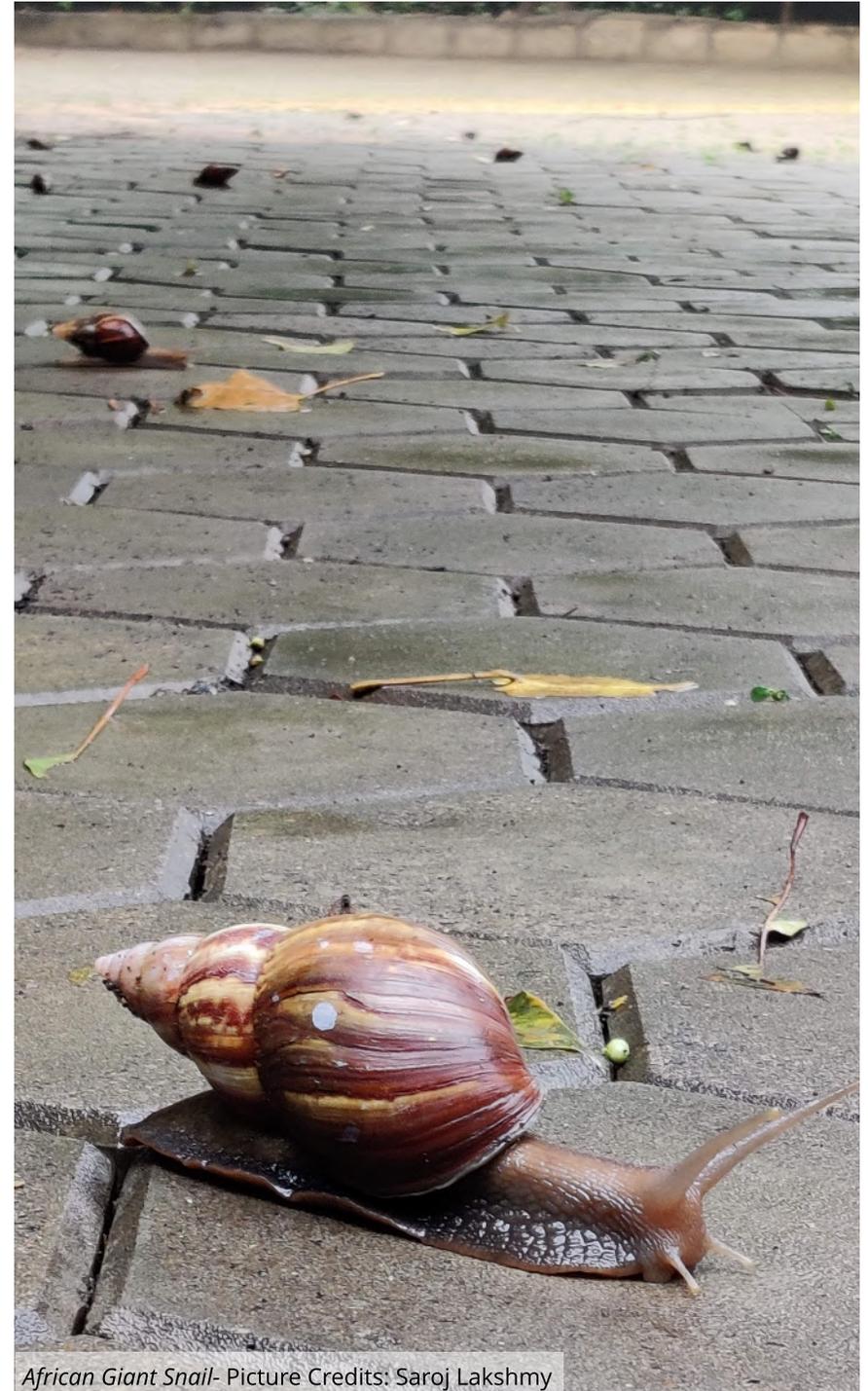
*Cannibalism*- Picture Credits: Aswathi Asokan

A good combination of favourable factors can sometimes be dangerous in ecology. Every landscape is the result of millions of years of (co-)evolution creating an intricate web of interactions. The snail, as well as several other invasives around the world, have been moved by humans, maybe via ships carrying timber or maybe through eggs trapped in the dirt of your shoe after you return from holiday. Sometimes environments can exploit the alien - like a cow in the jungle quickly eaten by a tiger - but sometimes the alien exploits the environment, and the snail does just that.

Invasive species are one of the leading drivers of biodiversity loss along with habitat loss/alteration, pollution, and hunting or poaching. Recently climate change was also added to this list of processes. These factors often combine to worsen and further weaken environmental structures and functions. For instance, the increase in rainfall in Chennai, both in terms of intensity and timing has likely been induced by climate change. Combine this with the snail, which has been introduced by humans and whose growth rapidly increases during rain and the potential for imbalance increases manifold.

The integrity of natural functions is of intangible value to food, water, and climate security, and provides ecosystem functions that we depend on for survival. The ecosystem can be very hard to predict or model. While some invasive species play a positive role in an ecosystem there are several more instances where this is not the case. The Giant African Snail has been named as one of the 100 most destructive invasives in the world but more so due to its impact on agriculture than on the ecosystem. However, weaknesses in natural ecosystems take time to show and an upset in the balance could have dire consequences down the road.

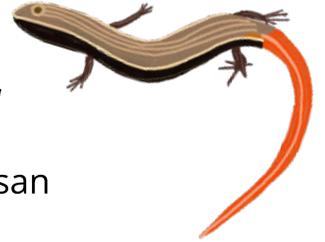
*Kedaravindan Baskar is pursuing a Masters in Environmental Management at the University of Tasmania.*



*African Giant Snail- Picture Credits: Saroj Lakshmy*

# ***Rep-tales - In Conversation with Zai Whitaker***

Interview by Anooja A, Aswathi Asokan, Nanditha Ram Satagopan and Rohith Srinivasan



*In December 2021, members of the Nature Trail Editorial Board, Anooja A, Aswathi Asokan, Nanditha Ram Satagopan and Rohith Srinivasan interviewed Zai Whitaker, Managing Trustee at the Madras Crocodile Bank Trust, at her residence in Chengalpet.*

**Can you tell us a bit about yourself and what you do? What got you into wildlife and conservation? What inspired you to become a writer, educator and wildlife conservationist?**

At the moment, I am working as the Managing Trustee at the Madras Crocodile Bank Trust, an institution I helped start in 1976. My interest in wildlife and its conservation started right from when I was a child. Because I grew up in a family of naturalists, I had relatives both in my nucleus and extended family who were ornithologists or naturalists, and wildlife naturally became an interest for all of us. Initially, the pivotal taxon for me was birds. But when I moved to Chennai and married Rom (Romulus Whitaker), the focus shifted to reptiles - which are quite closely related to birds in any case.

**Could you tell us about Madras Crocodile Bank Trust and the Madras Snake Park? What inspired you and Romulus Whitaker to start MCBT?**

I joined the Madras Snake Park after it had shifted from a village in Tambaram to what was then called the Guindy Deer Park (now Guindy National Park), thanks to a wonderful forest officer who helped Rom acquire the place. My role in the Snake Park revolved around education- something I've always been very interested in. I used to go around with this little spiel about the normal thing for dangerous snakes and getting antivenom. While working there, we decided that something had to be done about the state of crocodiles in the country. The situation was very different back then, with all 3 of India's crocodylian species on the brink of extinction. So we thought it was important to start a crocodile breeding programme. With a large vision and little to no money (which is how most conservation programmes begin), we started the Croc Bank.

**Could you tell us what a day in your life looks like?**

None of you would ever see me start my day because I wake up at around 4:30

AM. Throughout the day, I like to keep myself busy. I have all my Croc Bank work, but I also do a little bird watching and go around the park. I also like to read and write a little every day and am currently working on a book with the Irulas. I am not at all a night owl and prefer to go to bed quite early. I am very lucky that at my age I still have enough to do as I would hate to ever be bored.

**You have worked with indigenous people, the Irula Community. Could you tell us a bit about your work with them and your work with other such communities?**

The Snake Park started because of the Irulas- in fact, Rom came to Chennai because of them. For somebody interested in snakes, working with a community that catches them is truly amazing and Rom loved working closely with them. At the Snake Park, they were the only suppliers of snakes as well as animals such as rats, frogs and fish that were needed to feed them. The Snake Park thus became our first point of contact with them. Even when we moved to the Croc Bank, they supplied the mice and fish we needed to feed our crocodiles.

When the Wild Life Protection Act, 1972

came into force and the snakeskin industry was banned in 1977, the community's livelihood was destroyed almost overnight. Nevertheless, snakes were still needed for their venom which would be used to manufacture antivenom- the only antidote to venomous snakebites. We therefore formed the Irula Cooperative and Irulas now catch snakes for their venom. For a long time, Irulas have been involved in every facet of our work. For example, when I spent 6 weeks in the Andamans for a reptile survey, I was accompanied by an Irula. They're truly an amazing community and are the kind of people we should involve more in conservation and natural history studies than we do currently.

**You are a great writer, we have all read your books from a very young age. When did you begin writing? Which was the first novel you had written and do you have a personal favourite?**

For this answer, I have to go back to my family. My parents were both writers and naturalists and I mean it in the nicest way possible when I say there was no choice- life was all about birds and writing for us. I started writing

stories when I was pretty much a child, something both my parents were very encouraging of. My mother would even send my stories, which were horrible, to various magazines and they would always be returned with a polite little letter. Yet, she encouraged my writing.

So just like conservation and natural history, writing seemed like the natural thing to do. My writing took a turn when I moved to the Snake Park - it became important for me to write about reptiles, especially considering how people thought of reptiles back then, with not many thinking they were worth protecting, preserving or just having around in general. My writing sort of became like a reptile missionary in a way! I wanted to convince people that we need reptiles in the environment, that even if they bite, we have the antivenom needed to cure it.

Somewhere along the way, I began to write fiction based on my experiences at the Croc Bank and I think the first of my fictional stories was probably "Kali and the Rat Snake". We've known Kali since he was a little boy and he still works with us today, and has a little boy of his own. I'd also say that's my favourite of the books I've written,

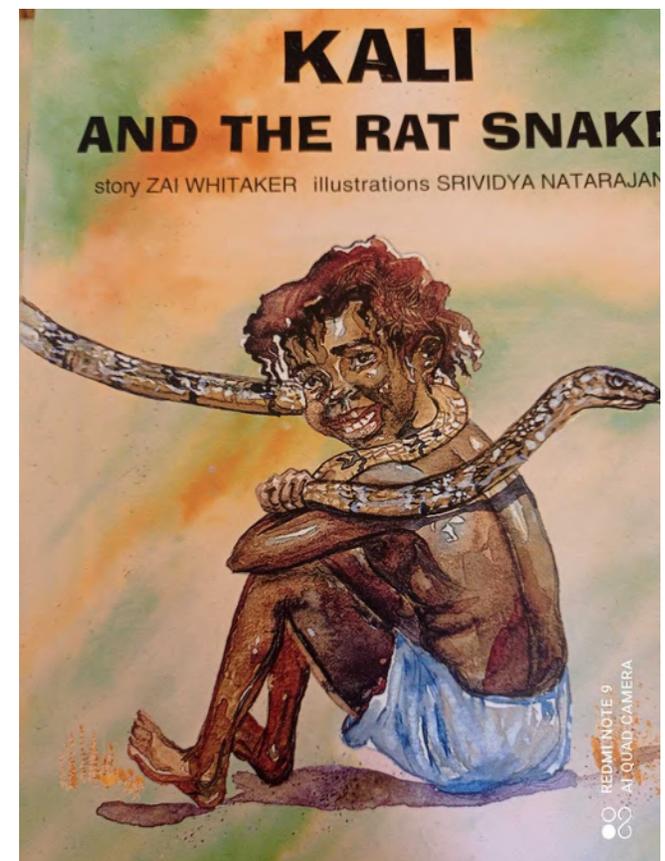
especially because I like him so much and it is about him. I remember the mad adventures he and my boys would embark on, where they used to go snake hunting. Once, they brought back a scorpion in a box- it had babies in the night and we soon found the house covered in baby scorpions!

**Why and how important do you think citizen involvement is to ensure a sustainable future for wildlife?**

I think there is nothing more important than the involvement of citizens in conservation and sustainability. Unless citizens push and get involved, nothing is going to happen. It is nice to see organisations of young people interested in the environment getting involved in activities. I hope it only gets stronger and bigger. It is wonderful to see that Chennai is pretty strong in this field compared to a lot of other cities.

**Most people are scared of reptiles. What are some ways to encourage kids to start liking reptiles?**

The most important thing is that parents shouldn't react to reptiles negatively. Once such a negative impression gets into the child's head, you're done for. Most herpetologists





Saw-scaled Viper- Picture Credits: Aditya Ramakrishnan



Mugger- Picture Credits: Anooja A

have been lucky enough to be encouraged rather than discouraged from pursuing a career in conservation.

**What are some of the conservation, education and outreach projects that MCBT does? There is very little awareness about snakes and how to respond to their presence, and in serious scenarios, their bites. What are some measures that a person can take when they encounter a snake or get bitten by one?**

Our most vigorous and successful programme right from the 1970s till now is the snakebite mitigation program. We go to schools, villages and market places, and also participate in radio shows, TV programmes and such. There are around 60,000 deaths every year in India due to snakebites. Given the fact that we do have antivenom, every one of those deaths is unnecessary and preventable. People are either too far away from a hospital or decide to go to a faith healer or try herbal medicine, which is tragic. Our message from the beginning has been that you can take whatever herbal medicine you want, but only on the way to the hospital. The main focus should be to get the victim to the hospital as soon as possible. People argue that herbal medicines do in fact work, but this is only because 90% of snakebites are not fatal.

We're lucky to have a hardworking team that goes to difficult places to work. Right now, some are in Northeast India making a film about a species found there whose bites are fatal.

**Since Mugger Crocodiles cannot be released into the wild, there is an overcrowding of them at Crocodile Bank. How do you tackle this issue?**

We are actually in the process of talking to a couple of zoos that will hopefully take large numbers of Muggers. Releasing them in the wild is becoming more and more difficult since we humans have invaded most habitats.

**As a woman, did you face any difficulties in the field of wildlife and conservation? Do you have any words of advice for girls who want to get into this field of work? what do you have to say for to all the young naturalists out there?**

I think I was really lucky. During those times, it was such a novelty to see a woman doing fieldwork, that I might even say it was an asset. People might have been asking themselves, "Who's this creature in the Andamans? This Indian girl in jeans?". I can't remember any unpleasant moments, I only remember getting help. People were so astonished that anyone would even go near a snake that that was a helpful thing in itself.

That being said, I do know some friends who faced some anxious moments while they were working in some parts of India. One of them had to disguise herself as a boy by cutting her hair short and wearing a cap, especially while travelling in crowded trains.

Rather than addressing just girls, I want to tell anyone interested in nature to pursue what they want. Especially now, with the COP 26 fiasco, it is extremely important that more young people get involved in the field. The main message is that despite the despair, hopelessness and the feeling of insecurity that might plague how we think about our planet's future, we need to keep being hopeful.

*Aswathi Asokan is an undergraduate student at Stella Maris College pursuing Zoology.*

*Anooja A is currently pursuing a Masters in Conservation Practice at ATREE, Bangalore.*

*Rohith Srinivasan is a 2nd year student pursuing Life Sciences at Ahmedabad University.*

*Nanditha Ram Satagopan is a 4th year Chemical Engineering student at SSN College of Engineering.*



*Interview with Zai Whitaker*



*Interview Team with Zai Whitaker*



## Film Review:

### *Kaliru*

Smriti Mahesh

*Making headlines quite often, human-elephant conflict is one of the biggest issues that confronts conservationists and naturalists in India. Kaliru, a film by Felis Creations' Santhosh Krishnan and Jeswin Kingsly, explores the nuances of this complex issue against the scenic Western Ghats. Get a taste of this beautiful documentary through this film review by Smriti Mahesh.*

A tragic yet hopeful film, 'Kaliru' (meaning 'elephant' in Tamil) highlights the critical issue of human-elephant conflict in India. Opening with scenes of angry residents chasing a trumpeting elephant away from a human settlement, the film innovatively weaves the story of human-elephant conflict in South India using a Tamil puppet show designed for local children.

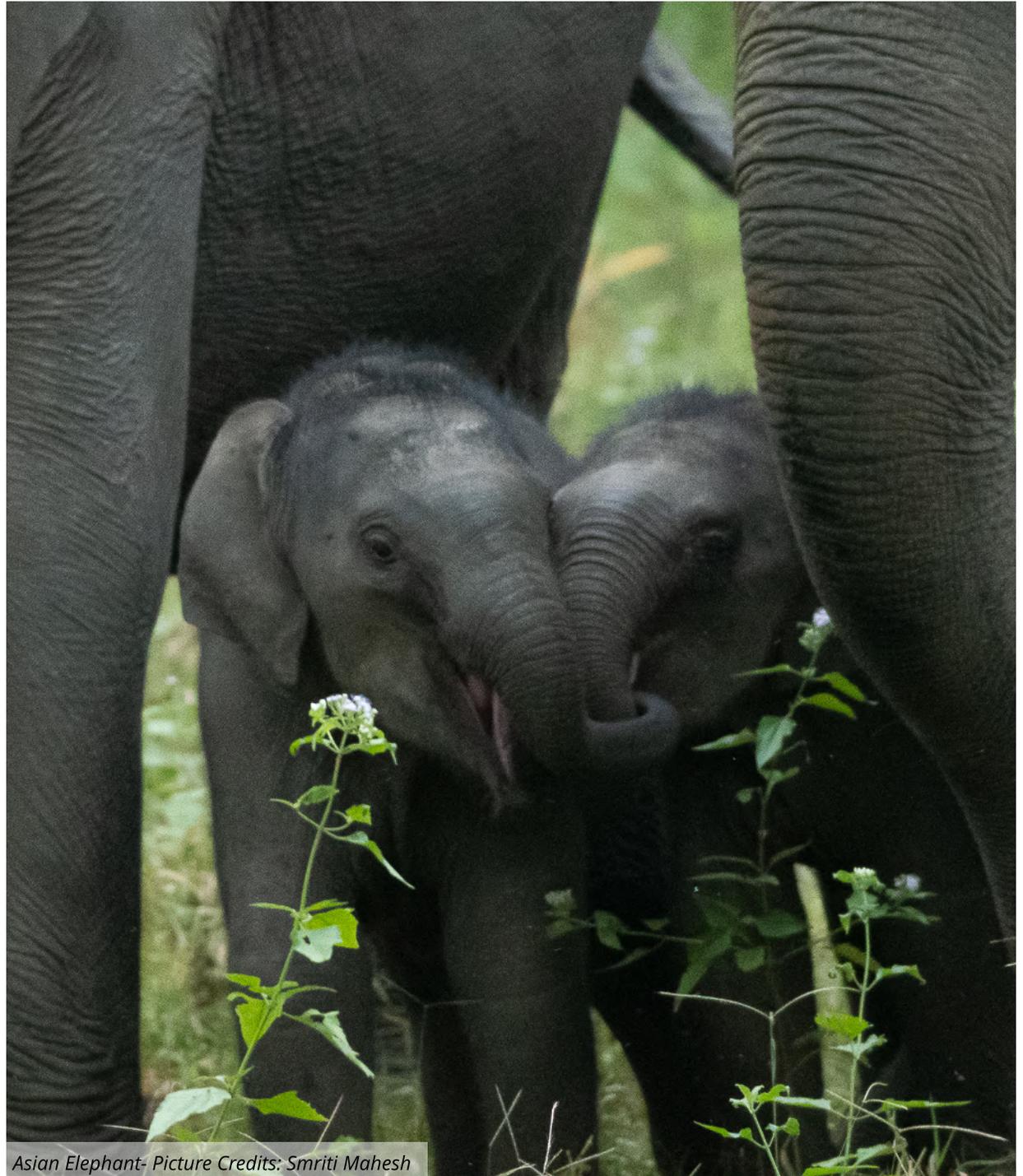
The film portrays the grey nature of this issue, effectively representing both sides- the farmers' as well as the elephants'. It tells the tale of people whose lives have been severely impacted as elephants raid their farms and damage their property, sometimes causing devastating physical injury and death. It depicts people's responses in these situations with gut-wrenching scenes of elephants chased by firecrackers, highlighting the irony of worshipping Lord Ganesha (the elephant god) by day while persecuting elephants by night. The film goes on to explore the

reason behind this conflict, leading the viewer through the world of elephants. It describes their migratory behaviour and their incredible intelligence, using aerial views to show how habitat fragmentation by human intrusion is one of the core reasons for the conflict that exists today.

'Kaliru' explores Valparai as a case study of human-elephant conflict mitigation, depicting the warning system they have in place to keep residents updated on elephant movements in certain areas. It also showcases the problem of sugarcane raiding by elephants at a forest check post at Hasanur, explaining how the elephants have become habituated to the blaring sounds and bright lights that accompany sugarcane trucks.

This 17-minute journey through the frontlines of human-animal conflict concludes with the message that change must begin with the viewers and that everyone must come together to end this problem created by our ancestors. 'Kaliru' is certainly a must-watch for anyone looking for a fair and humane portrayal of human-animal conflict.

*Smriti Mahesh is a 2nd year BS-MS student at IISER Tiruvananthapuram.*



Asian Elephant- Picture Credits: Smriti Mahesh

# Under the Leaves

Garnet Dorothy

Maybe if you look into a leaf litter,  
Perhaps you'll see me there,  
I'm not too hard to spot,  
Black and white and dots, if you care.  
You'll sometimes spot us alone,  
Maybe a serene pair,  
And maybe there's more of us,  
Black and red, we show our flair.  
Hidden in the bushes,  
Bristles as soft as hair,  
Are you wondering if I'm poisonous?  
Touch me if you dare.  
Leave me alone, I'll show you the same courtesy.  
I'm not too hard to spot if you look around.  
What do I do if you get too close?  
If you don't want to find out, back down.

*Garnet Dorothy is a 3rd year Zoology student at Stella Maris College.*

*Illustration by Garnet Dorothy*





*Domino Cockroach*- Picture Credits: Melvin Jason



*Moth Caterpillar*- Picture Credits: Aditya Ramakrishnan



*Indian Red Bug*- Picture Credits: Balakrishnan Ram



*Lychee Stink Bug*- Picture Credits: Aswathi Asokan



## Take Fright

Ivy Manoj

"Take Fright" is a myriapoda millipede illustration depicting a species of arthropods that have just been discovered from lifting a rock, as they quickly curl up and scatter in surprise.

*Ivy Manoj is a Fashion Design undergraduate at the National Institute of Fashion Technology.*

# Cloudy With A Chance of Toads

Rahul Keshav

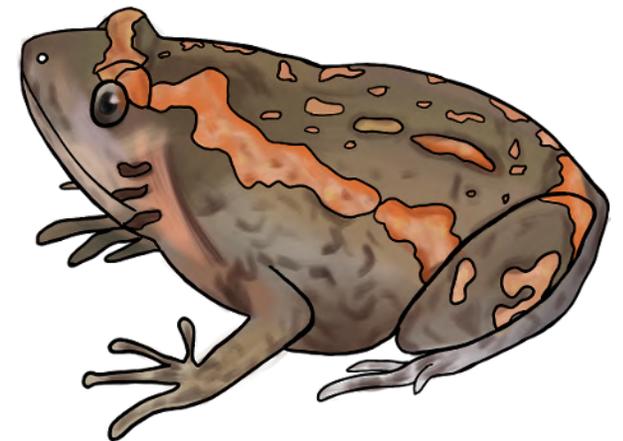
There are people who listen to keys typing for hours  
on their headphones, without a stop.  
It gives them peace, calms the nerves,  
but for me it's plup plup.

The sky shuddered,  
the air so moist,  
touching it tender,  
passing through the nose,  
passing by the buccal,  
and on to the lungs,  
and don't forget that gill  
on the chubby babies in the pond.  
Their tympanum vibrates to the sound of my feet  
and they know I am here and they don't move a foot  
"hey there, little toad o ", heard a little toad,  
then there was a loud burst and  
down came the rain.  
I let him be,  
little toad hopped around and travelled what seemed like  
the  
equivalent of a highway to me.

I remember one afternoon asking my grandpa,  
what do toads see?  
they see everything, he said,  
they can see you wearing your colourful pajama in the night,  
they can see you making faces at them in full sunshine,  
and they are wise and old, nearly as old as fish.

plup plup  
Be careful when you catch 'em,  
they can be slippery,  
they can be rough and tough,  
or gentle but enough,  
to leave you feeling numb,  
know your stuff and be alert.

Plup plup plup I heard one go,  
music to my ears and soup for my soul.  
Can you not hear what I am saying?  
tell me where you are heading?  
"they can't hear you", what did I tell you that day?" said  
grandpa.



Oh, I forgot!  
I must croak like you do,  
at 1500 Hz,  
as you do to woo a lady,  
of your dreams and be with her.  
If you aren't afraid,  
pick one of several thousand,  
more variety than Hot Wheels or Lego,  
but if you are, then let go.  
Under any drain,  
whether there is hail or rain,  
you can find them sleeping like babies wrapped with warm  
soil,  
with heart beats so slow, feeble  
the rhythm of life.  
Hiding in holes in the ground,  
It knows the stakes,  
It's afraid of snakes.  
They come out when there are dark clouds in the sky,  
and we are born with a device to find them out,  
only if you remove your headphones and put down your  
phones,  
we can locate them with our ears and sight.

Streptomyces stuck to his body,  
as I picked him up I smelled the rain,  
its feel fresh in my hand.

My grandpa used to tell me,  
people are embarrassed these days,  
to stop and look at a flower,  
or a cricket on the ground,  
ants eating sugar,  
eagles high up in the sky, floating,  
snails making incredible journeys crossing a road,  
beating all odds, we have a lot to learn still  
"All hearts on the planet beat together", he said.  
The sound of life, inside millions of species, and us.  
We can't do it all alone and  
we need them as much as they need us.  
plup plup plup,  
the toad went,  
as I let it go,  
as I saw it disappear,  
the doppler effect engraving a memory,  
I wish time could turn back time and  
there was a reverse gear on them.  
Plup plup plup,  
the little fella hopped away.

*Rahul Keshav is an aspiring researcher who loves looking at the living things around him.*





Giant Forest Scorpion- Picture Credits: Mahathi Narayanaswamy

## Crossword Hints:

*(Answers in last page)*

1. \_\_\_\_ Blind Snake is India's smallest snake. It is non-venomous.
2. Beetle larvae are known as \_\_\_\_.
3. Its name means 100-footed, but it has between 30-354 legs depending on the species.
4. The part of the scorpion tail that delivers the sting.
5. A diurnal lizard with snake-like movements. It sheds its tail to distract attackers and regrows it over time.
6. Fungi and algae living together in a symbiotic relationship.
7. Sprays acetic acid (vinegar) as a defence, giving it its name. Often mistaken to be a scorpion.

*Chinmaya Manivannan is a 4th grade student at PS Senior Secondary School, Mylapore.*





Dussumier's Litter Skink - Picture Credits: Aditya Ramakrishnan

## Crossword Answers:

1. Brahminy
2. Grubs
3. Centipede
4. Telson
5. Skink
6. Lichen
7. Vinegaroons



Lichen- Picture Credits: Nishanth Aravind



Indian Tiger Centipede- Picture Credits: Harsha Prashanth

