

# ZOO'S PRINT

Communicating Science for Conservation

Magazine of Zoo Outreach Organization

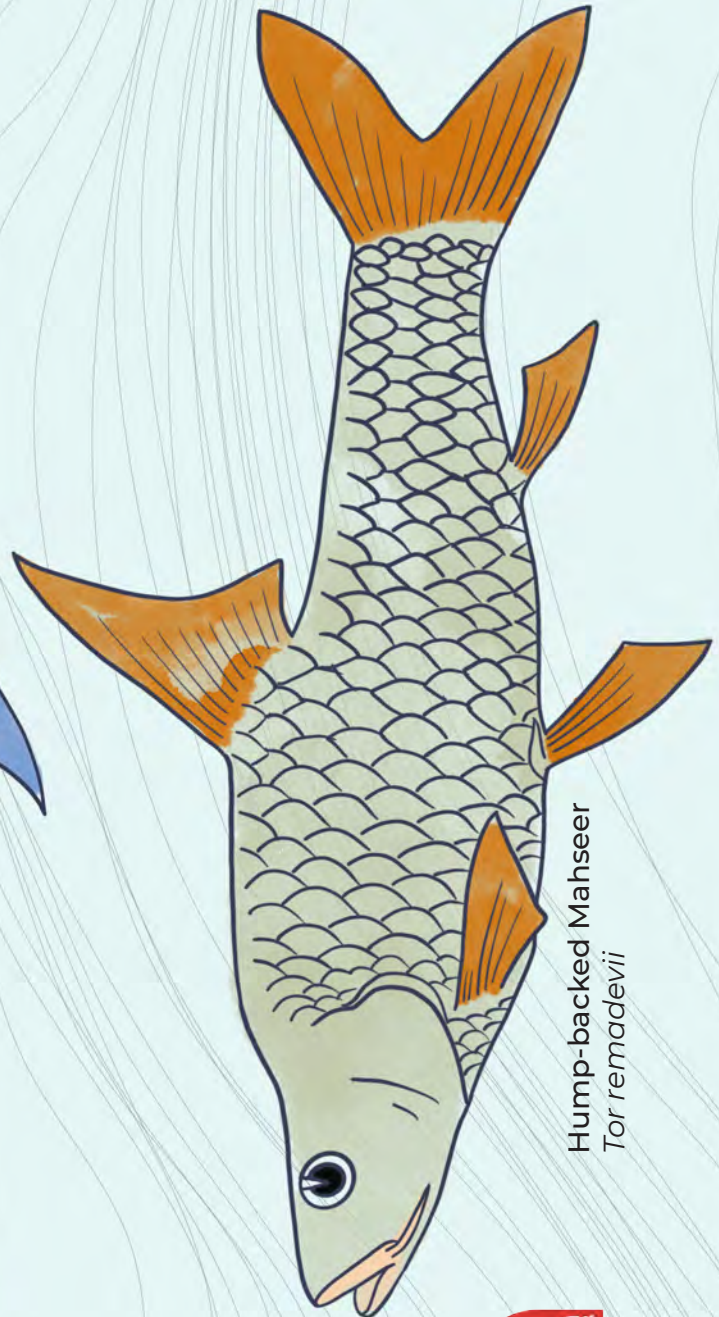
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Deccan / Blue-finned Mahseer  
Tor khudree



Hump-backed Mahseer  
Tor remadevii





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# Learning the 'Organic' way

The Ram Hattikudur  
Advanced Training in  
Conservation (RHATC)  
Fellows went on a field trip  
to Hunsur and Coorg

The RHATC course by Zoo Outreach  
Organization aims to bridge the gap for graduates  
and young professionals between academic learning  
and on-the-ground needs by providing real-time  
training in different aspects of conservation.

<https://rhatc.zooreach.org>





## Our first stop - Gerry Martin and Chandini Chhabra's Liana Trust, in Hunsur.

The Liana Trust is on a farm nestled adjacent to the Devi Kere Lake in the outskirts of Hunsur. The accommodation buildings on site are creative, yet very practical and blend right into the farm. Gerry and his team at Liana Trust study snake behaviour, snake ecology, and research on snake venom. They also conduct education workshops on snakebite mitigation and human-snake interactions. From being accustomed to having posters on the wall, all of a sudden,

our new normal was to have Russel Vipers and scorpions in vivariums around us.

The first discussion with **Gerry** was supposed to be a casual chat, but it ended up being very thought provoking. Some of the poignant topics that he brought up made us question the current practices in conservation. Here are a few topics he discussed with us:

- In the education for mitigation of snake human interaction we often measure the effort we put into educating the public,





but rarely do we measure the impact it has had on them.

- Scientific research shows translocating a snake does not help with conservation. The chance of survival of snakes that are translocated is very low. So, snakes are not being rescued, rather they are being removed.
- All the veterinary courses in India are only for domestic animals, so the domestic vets train for wildlife directly on field
  - *Could you imagine if you were your doctor's guinea pig? Would you allow your doctor to experiment on you?*
  - *In the modern world when there are courses introduced on new topics such as Data Analytics it's quite shocking that a profession like veterinary sciences for wild animals, a profession that has existed for ages, has no specific course or specialization.*
- A question Gerry asked that was startling and had us thinking was "What is really wild in today's world?"

Gerry also explained snake behaviour and demystified some myths based on research. He mentioned that a snake's first instinct is not to attack humans, given the chance, they would rather flee than attack humans. Their venom is precious to them because the primary function of their venom is to immobilize prey and kill it. So, their first option is not to waste their venom, they use it as their last resort. This aspect of snake behaviour was an eye opener to many.

The fellows also got to try their hand at the radio telemetry to track a Russell's Viper on the farm. To make the experience even more

sensory, Gerry also gave us access to his treasure trove of various snake's skin, fangs, unhatched crocodile eggs, ostrich and emu eggs. From the expressions of wonder on each fellow's face you could tell that getting to touch such specimens makes a huge difference in the learning process.

Some of the key takeaways regarding conservation from Gerry were:

- Conservation cannot be based on ethics, as it is subjective. It should be based on science.
- The three important questions to ask before getting into conservation are:
  - Why do you want to do it?
  - How do you want to do it?
  - What do you want to do?
- Always question your approach to see what you are doing wrong. It's common to think we are doing the right thing, but questioning our approach will make us see the flaws and make it better.

Besides the other conservation work that Gerry and his team do, they take in abandoned exotic pets. By giving these exotic animals a home, it prevents these non-native species from interacting with native species in the wild.

**Fun fact about reptiles:** Did you know that the gender of some reptiles could depend on the temperature the eggs are incubated at?

### **Insights from Chandini Chhabra:**

Chandini is an educator who creates inspiring learning experiences for children in the fields of science, math and ecology. Her way of



teaching is very innovative and is in tune with the way the current generation of children learn. She also educates other educators. Some of the key takeaways and learning from our conversation with Chandini were:

- Don't make education self-centered, make it for everyone's learning experience.
- It's only human to avoid knowing if your work has actually had an impact, but as an educator it is important to measure your impact to know if you are making progress.
- When you have to choose between a long-term engagement or one time engagement, go for the long-term engagement. You'll have a better chance to make an impact in a long-term project and also have the ability to measure your impact as opposed to a one time project which will probably only be enough to sow the seed.
- Educating educators such as school teachers and equipping them with the right tools to teach will help create a bigger impact in the long-term. After all, by doing it yourself there is only so much you can do and only so much time you have. But if you empower educators, it's like creating an infinite chain reaction.

During our time at the Liana Trust we also had the chance to interact with Romulus Whitaker and Janaki Lenin. Stay tuned to know more about interaction with them as it will be covered in another Zoo's Print article.

### **For the second leg of the trip, we headed to the Rainforest Retreat in Madikeri.**

Rainforest Retreat is an eco-lodge situated within the Mojo Plantation, a certified organic

farm in Madikeri. Mojo Plantation was founded by Drs. Sujata and Anurag Goel in 1994. Sujata has a PhD from the Botany Department of Delhi University and Anurag has completed his studies (PhD in Molecular Biology) in Toronto, Canada. Their daughter Maya has also played an integral part in helping set up and establish the plantation. A few steps into the property and you will realize that you are in a rare gem of a place. The Rainforest Retreat has tall, towering native trees and one has to cross over a few streams on wooden bridges to get to the cozy cottages. Sounds like a fairy tale, right?

### **Day 1 at Rainforest Retreat:**

We reached Rainforest Retreat just in time for a scrumptious lunch. After lunch we couldn't help but head straight to the stream at the property for a dip. Without exaggeration, the stream looked just like the ones you'd find on a Windows screensaver.

Later that evening we went for the Sterling walk. It was a short walk, but it had some steep climbs. There were spectacular views along the way and at the highest point we had gotten to see undisturbed panoramic views of the Western Ghats with the native shola forest-grasslands far into the distance. Just after the sunset, we were able to see Saturn and Jupiter against the evening sky with our naked eyes.

During the trip the weather was mostly cloudy and there was an occasional drizzle or bursts of rain during the other times. Fortunately, that night the skies cleared for some time and we were able to stargaze. Obuli Chandran, a science and astronomy



accompanied us on our trip. He showed us the Andromeda galaxy, Pleiades, Hyades Cluster through his astronomy binoculars. The weather that night was not favourable for him to set up his telescope, but read along to know and see some more about our astronomy viewings in Coorg.

### **Day 2 at Rainforest Retreat:**

The following day we had gone for the Ridge walk. The Ridge walk is adjacent to Mojo Plantation. We saw some of the post effects of the landslides that took place in 2018 after a record high rainfall. We learned about how the landslide areas were stabilized by planting bamboo, hibiscus, banana, and vetiver. This restored patch of vegetation will help prevent further soil erosion.

After the Ridge walk, we returned to the Rainforest Retreat for Lunch. During lunch we had the chance to interact with the neighbouring estate owners, Abishek and Anna. Our interaction with them will be covered in another Zoo's Print Article. After lunch, some of us helped with peeling cinnamon bark and the others helped plant sweet potatoes in their veggie garden. Getting our hands dirty while planting sweet potatoes triggered the inner child in us and we broke into an impromptu mud fight. We headed to the stream to wash up after the mud fight, but the friendly fight continued and more people joined in and it sure was 'more the merrier'. Later that evening, Anurag showed us some photos and videos of some regular visitors to the plantation. These





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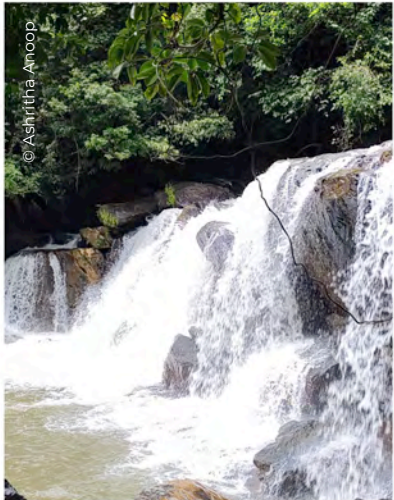
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include the Barking Deer, porcupines, Small Indian Civet, Brown Palm Civet, Nilgiri Marten, Plum-headed Parakeet, Grey Mongoose, White-bellied Woodpecker, Malabar Grey Hornbill, and the Malabar Gliding Frog.

After Anurag's presentation, we went for a nocturnal walk with him to check out the nightlife scene in the wild for ourselves. The croaks and calls of the creatures around us were intense against the stark quietness of the place. For some of us, it was our first experience to go into the wild at night. So, we were tip-toeing taking each step, very carefully, and flashing our torches side to side frantically when the walk began. As we began to see the frogs, cicadas, spiders, and snails were so absorbed by it our franticness eased that we began to let loose and just be in the moment. We also spotted snakes including a *Boiga beddomei* (Beddome's Cat Snake), *Boiga thackeray* (Thackeray's Cat Snake), an unidentified *Boiga* species, and *Fowlea piscator* (Checkered Keelback).

### **Day 3 at Rainforest Retreat:**

Sujata took us for a plantation tour and showed us a wide variety of trees and crops. We saw food crops such as cardamom, pepper, vanilla, wild pepper, kokum, and of course, coffee. At Mojo Plantation they have retained the natural landscape of the land, with many native trees and they grow the crops in between the existing landscape.

Having the experience of running a certified organic farm for many years, Sujata explained to us how they have dealt with pests the organic way. As two biologists, Sujata and Anurag have used their scientific

thinking approach and merged it with traditional practices to come up with their own recipes for pest repellents and manure. The decisions regarding the plantation at Mojo since its establishment 27 years ago has been thought out for the long term with sustainability as the key driving factor.

### **The biodiversity identified at Rainforest Retreat during the 3 days:**

We identified 15 species of amphibians, eight species of snakes (including road kills), 58 species of butterflies, eight species of spiders, five species of dragonflies, three species of snails, and 18 species of birds.

### **Other highlights from Rainforest Retreat:**

The food at Rainforest Retreat needs a special mention. It was delicious, hearty, healthy, and nourishing. Most of the ingredients used are organic and you can tell that it makes a world of a difference.

Another highlight of Rainforest Retreat is the staff, who are warm, friendly, and extremely knowledgeable about the plantation, biodiversity, and about the landscape around them. A special shout out to Ravi and Muthu for sharing their knowledge of the biodiversity and of the land with us during the Sterling walk and Ridge walk. We left the Rainforest Retreat with some wise and beautiful words from Sujata. She said "If you spend time listening to the land, life itself will sustain you."

**For the last part of the trip, we headed to one of the RHATC Fellow – Ashritha's coffee estate near Shanivarsanthe in northern Coorg.**

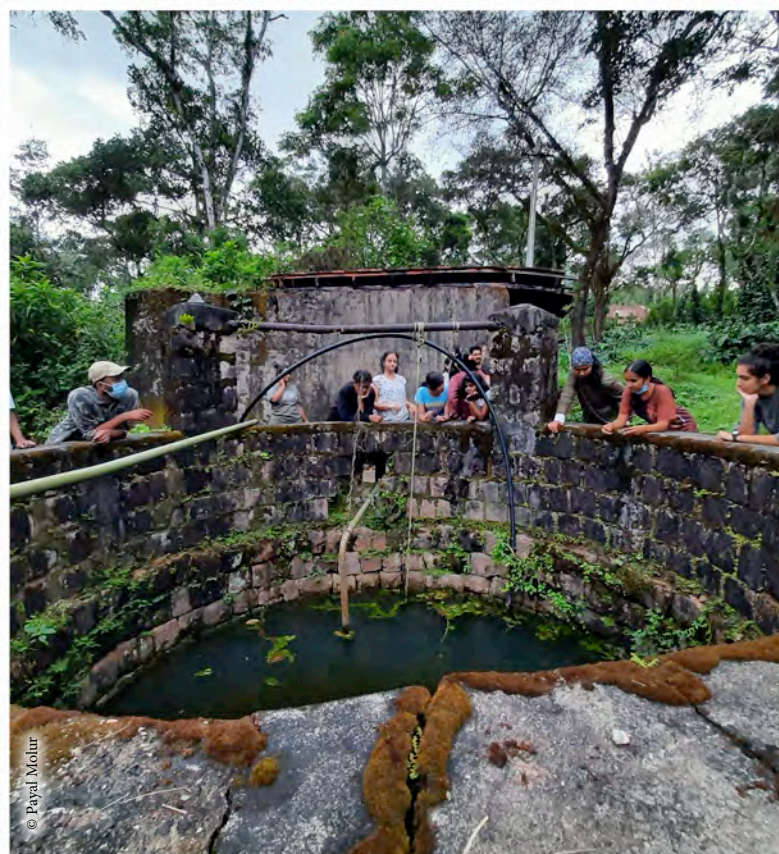




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© Supriya Samanta





The estate is called **Yedehally Estate**. We were warmly greeted by her family and they prepared some delicious traditional food for us. The coffee at her home was one of the best coffees I've ever had, of course, it came from her estate and was as fresh as it possibly could be.

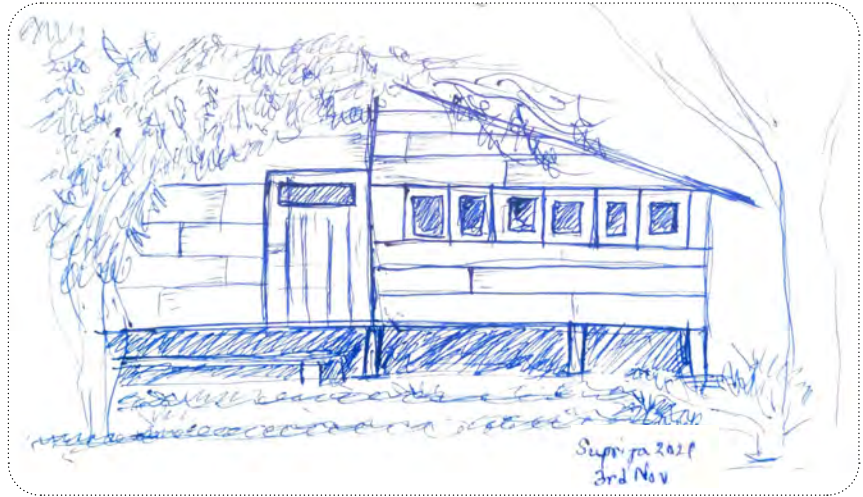
Ashritha took us around the plantation for a walk and showed us how the coffee bean is extracted from the coffee fruit. Besides being surrounded by Robusta and Arabica coffee plants we got to see some of the native trees such as the native tall Mango Tree, Soap Nut Tree, ficus, Malabar Ironwood, and many more. We saw some turtles swim around in the pond. She also mentioned there is a bird checklist with more than 110 birds in the estate which she has noted from the past eight years. We also spotted some birds, including the Malabar Grey Hornbill, Malabar Barbet, Malabar Parakeet, Malabar Whistling Thrush, Plum-headed Parakeet, Puff-throated Babbler, Racket-tailed Drongo, Flameback, Verditer Flycatcher, White-browed Wagtail,

Laughing Dove, Red-whiskered Bulbul, Mottled Wood Owl, Black Drongo, White-cheeked Barbet, House Crow, Cattle Egret, and warbler species.

Later that evening, the skies were clear and we had the chance to stargaze again. Obuli set up his telescope and we got to see Saturn, Jupiter and its 4 moons, Andromeda galaxy Cygnus, Cassiopeia, Andromeda, Perseus, Auriga, Taurus, and Orion (See back cover picture). The following day we went to the Bisile Ghat view point. The expanse of greenery with waterfalls and streams was breathtaking. The view was so good that it got the entire lot to shut up for a while (a rather rare moment) and got many of us sketching.

After the Bisile Ghat viewpoint we went to Mookanamane Falls. While some were skipping stones, some others tried and failed miserably. The time at the falls was a combination of fun, frolic and oddly even solitude, well we do have some very deep thinkers.





**Liana Trust dormitory**



**The road to Malabar Grey Hornbill's at Yedehalli**

**The cozy cottage at Rainforest Retreat**

Overall, the trip was a very educational one with tons of laughter and fun along the way. We got to have some mind-blowing experiences with the places we saw and people we met. If learning was so interactive and fun, no student would dread a Monday!



**Vardhini Suresh, Shweta Madgulkar, Ashritha Anoop, Aakanksha Komanduri, Usha Ravindra, Dhanush Shetty, Arpan Joshi, Nilesh Murmu, Supriya Samanta & Trisa Bhattacharjee**  
 RHATC Fellows, 2021–22, Zoo Outreach Organization, Coimbatore, Tamil Nadu, India.



# Gowri Shankar and the King

We all assembled in our classroom eager to finally hear from Gowri Shankar on his adventurous journey of more than two decades in conserving the vulnerable, endemic, apex predator species of India, the king cobra.

Gowri treated us with the reminiscence of his first ever participation in a professional workshop on amphibians which was organised by the Zoo Outreach Organisation. The transpired knowledge, wisdom he says, has been instrumental to him in various ways, be it about organising the workshops or the ways of life.

Gowri was part of the Radio telemetry of king cobra research by ARRS(Agumbe Rainforest Research Station). The extensive studies on King cobras were all from the ones living in the wild. To name a few, the nesting & mating behaviour, habitat & dietary preferences, and the geographical distribution of all various species across the world. Another very fascinating aspect of his research work was about the home range of the King cobra. His study showed how translocated individuals move much more and haphazardly than



© Gowri Shankar



those that are released into their original site, providing evidence against moving of snakes as a means to mitigate human-snake interaction. Also, it was fascinating to know that the King cobra is the only species of snake in the whole world that build nests which are 75–90 cm tall from the ground and are so well built that not even a single raindrop can permeate even though Agumbe receives 7,000+ mm of average annual rainfall.

While he shares the methods he used to track the King cobra's movements in the wild and their corresponding challenges, he attributes the privilege of acquiring data with relative ease due to the immense cooperation and reverence the local community had for the snake. He compares for instance on how a researcher in Thailand had radio tagged more King cobras (found in their region) but could fetch only a little data as the locals would end up killing or eating the snakes, whereas, similar challenges are not encountered in Agumbe as a result, Gowri could collect lots of data from radio tagging only five of them. To add to this, the locals went as far as waiting for an entire day for the snake catcher to arrive at their place to ensure an injured/ displaced King cobra was rescued and released back in its wild home. Considering how snakes are feared commonly, the evidence of coexistence was a pleasant and welcoming surprise.

It was a moment of thrill, suspense, and deep gratitude for us when Gowri shared his moment of life & death situation when bitten by the King cobra. He says he survived because the King injected very less venom and mainly being calm throughout helped him a great deal. He remained hospitalised for three days while the bitten hand remained swollen for a month. Despite this, he rushed to another King cobra rescue right on the day of his discharge. He says, "Well, they





are one of the most sensitive, intelligent creatures on Earth and are only defending themselves when cornered. If at all there has been a bite case so far, it's only because of our wrong way of interference or mishandling them". Considering how he has rescued and released nearly 350 King cobras and monitored over 50 King cobra nests, one cannot help but fathom the gravity of his words.

Well, for a man coming from a non-wildlife background, to build such regard for nature and wildlife, make us understand their ecological importance, to help break our irrational perceptions, and educate us, the local communities, the local schools, and the visitors with various workshops and outreach programs is commendable.

The richness with which Gowri spoke about this fascinating life, the King cobra, his past research works and recent findings, it's invigorating to know that there is so much more that needs to be explored and to study on these beautiful limbless animals. We look forward to his next



research on Malabar Pit Vipers. We are certain that Gowri Shankar's work inspires more and more young minds to conserve wildlife which is an important chunk of our lives.

Around the end of Gowri's talk, the classroom burst into a plethora of discussions, sharing pictures, videos of reptiles around, browsing up a few articles on King cobra, sharing personal experiences and so on of bustling activities. All in all, Gowri's talk left us all exhilarated, sensitised, and lots of wonder-ponder worms in our heads started to move around, in analysing our journey in conserving the wildlife.

## About Gowri Shankar

P. Gowri Shankar has spent over two decades researching king cobras as a wildlife scientist, now affiliated as a PhD scholar with the North Orissa University, Odisha, Indian Institute of Science, Bangalore. A number of wildlife documentaries have featured him, like Secrets of the King cobra, King cobra and I, Wild India, Wildest India, Cobra King etc. The Swedish Herpetological Society awarded him Herpetologist of the Year in 2015. He is also a TED Fellow. He is an educator of wildlife and conservation and the co-founder of Kalinga Foundation, an NGO and Kalinga Centre for Rainforest Ecology (KCRE) in Agumbe, Karnataka.



**Usha Ravindra**

RHATC Fellow, 2021–22, Zoo Outreach Organization,  
Coimbatore, Tamil Nadu, India.

© Gowri Shankar



# Welcoming the Grey Wagtail



Selva Ganesh talked about how his journey began with a forest officer taking him to compete in a drawing competition inside a forest in 2012. The first bird he saw through the binoculars was a Green Bee-eater and a Great Hornbill. His curiosity about birds motivated him to save money and buy 'The book of Indian Birds' by Sálím Ali. He now teaches English at Cinchona, a village near Valparai. After owning Salim Ali's field guide, he started documenting the birds in his backyard to the best of his knowledge. He recalls that he initially mistook a Large-billed crow for a raven. Later, he met P. Jegannathan from Nature Conservation Foundation, who corrected the checklists which he had prepared so far, as he shares this, he recalls

that Jegannathan also suggested him to get a 'Birds of the Indian Subcontinent' by Richard Grimmett, Carol Inskipp, & Tim Inskipp, for updated references. Jegannathan also taught him how to use the eBird mobile application and he suggested that Selva should document birds on the eBird. Following this Selva Ganesh created an ebird group called [Cinchona GPS](#), where his students and the public among whom he had sparked interest in birding contribute to the group's checklist.

He and his peers also have an Instagram handle '[Young birders of Valparai](#)'. He and his students so far have documented 133 species of birds among which 23 are migrants and 11 are endemic to the Western Ghats.



His initiative of welcoming the migratory bird, the Gray Wagtail *Motacilla cinerea*, which comes all the way from the Himalaya to keep the Valparai ecosystem healthy, with public posters, distribution of sweets has created awareness among the local people to conserve the bird species and its habitat.

This initiative of Selva Ganesh has also been made into an animated [video](#) by [Mongabay India](#). Along with birds they also have recently started to document trees on ‘[season watch](#)’ and insects on [iNaturalist](#). He remembers continuous support given by NCF, Cre-a publication for his outreach works.

Selva did talk about his continuous contribution to GBBC (Great Backyard Bird Count), [Endemic Bird Day](#) (Global Big Day), [Pongal Bird Count](#), and the [Kerala Bird Atlas](#) project. He said he enjoys taking up the monthly eBirding challenges announced by Bird Count India. He added participating in these kinds of bird surveys as well as interacting with fellow birders have given him an opportunity to improve his knowledge of birds.



Selvaganesh is also part of the Coimbatore Bird Atlas which is similar to the popular Kerala Bird Atlas. He said his main role is to manage people who monitor birds and to enter the birds into a checklist or cross verify the lists. He explained to us how the city was divided into equal grids, subgrids. He adds each main grid cell would have three subgrids that were randomly selected. These subgrids are visited by citizens to list the birds observed and document on ebird which also tracks their path.

More information about the methodology can be found on the [Bird Count India](#) website.

This data is used to develop species richness maps. He then showed us through the early bird website, State of Indian Birds.

He was declared the eBirder of the month in December 2011.

His talk was indeed inspiring!



**Dhanush Shetty**  
RHATC Fellow, 2021–22, Zoo Outreach Organization,  
Coimbatore, Tamil Nadu, India.



# The Mahseer's redemption! Can we save India's freshwater megafauna from hybridization?

Freshwater fishes are one of the most threatened vertebrate groups. Generally when we think of a fish, we first think about its food value rather than its role, and the adversities faced by it in the ecosystems. Although India harbours the greatest number of endemic freshwater fishes in Asia, many are at the brink of extinction.

Mahseer, the most iconic of India's freshwater fauna belongs to the family Cyprinidae which are large-bodied fishes with thick scales, powerful jaws, and protrusible, sometimes very fleshy, lips adapted for taking food from the bottom. The taxonomy of mahseers are complicated due to the morphological variations they exhibit. They are widely found in freshwater rivers and lakes of India,

with a distribution range extending from the Himalayan foothills, Indus, Brahmaputra, and Ganga basins, to southern river basins like Tambraparini, Balamore, Cauvery, Periyar, and Chalakudy with most species believed to ascend into rapid streams with rocky bottoms for breeding. They are omnivorous like other types of carps, can eat algae, crustaceans, insects, frogs, and other fish, along with some fruits that fall from overhanging trees. The mahseer species fetch high market prices and hence they are potential candidate species for aquaculture.

Amongst the three known genus of Mahseer such as *Tor*, *Naziritor*, and *Neolissochilus*, the famous *Tor* has eight known species that occur in India.





**Table 1. Conservation status of currently valid mahseer (*Tor* spp.), based on the IUCN Red List of Threatened Species.**

	Valid Species Name	Common Name	IUCN Current Status
1	<i>Tor barake</i>	Barak Mahseer	Near Threatened
2	<i>Tor khudree</i>	Deccan / Blue-finned Mahseer	Least Concern
3	<i>Tor kulkarnii</i>	Dwarf Mahseer	Data Deficient
4	<i>Tor malabaricus</i>	Malabar Mahseer	Endangered
5	<i>Tor mosal</i>	Copper Mahseer	Data Deficient
6	<i>Tor putitora</i>	Golden Mahseer	Endangered
7	<i>Tor remadevii</i>	Hump-backed Mahseer	Critically Endangered
8	<i>Tor tor</i>	Red Fin Mahseer	Data Deficient

### Freshwater fishes and their religious role in India

Since the Vedic period, freshwater fishes have been considered sacred in many parts of India. Even though freshwater fishes were a staple part of the diet of the Indus valley civilization, the mahseer was not consumed due to its high cultural value. Species of mahseer are also mentioned in Hindu religious scriptures, symbols, motifs, sculptures, and in ancient literature. It is believed the fish 'Matsya' is an incarnation of the lord Vishnu. The sculptures of lord Vishnu as 'Matsya' are present in many temples throughout India. Local people in Walan kond where river Savitri flow in the northern part of Western Ghats worship mahseer as goddess Parvathi.

The mahseer is also found in the 'temple sanctuaries' or 'temple pools', which are community-protected areas and looked after by local authorities, an example of effective 'in situ' conservation action. The devotees worship the mahseer as god. The famous Sringeri temple in Western Ghats region of Karnataka protects mahseers of the genera *Neolissochilus* and *Tor*.

The religious beliefs play an important role in the protection of the largest fish and acts as a key element in conservation. The endangered Golden Mahseer *Tor putitora* is present in many tributaries of the river Ganges. Sacred sites along the river and its tributaries act as safe haven for this charismatic species and help in their protection from anthropogenic pressure. Research suggests that sacred spaces harbor species of scientific importance in significant abundance and in many cases these are the last remaining traces of the original habitat and species.







### Threats to freshwater fishes

Freshwater systems are of the least studied ecosystems despite being one of the most sensitive and vulnerable. Since fishes are looked upon more for their commercial value rather than their ecological value, they are one of the taxa which are most prone to extinction. Climate change, habitat loss, overexploitation, lack of research data, construction of hydropower dams, catchment fragmentation, invasive species, illegal fishing, pollution, and other anthropogenic threats are the main factors affecting the survival of mahseer in India.

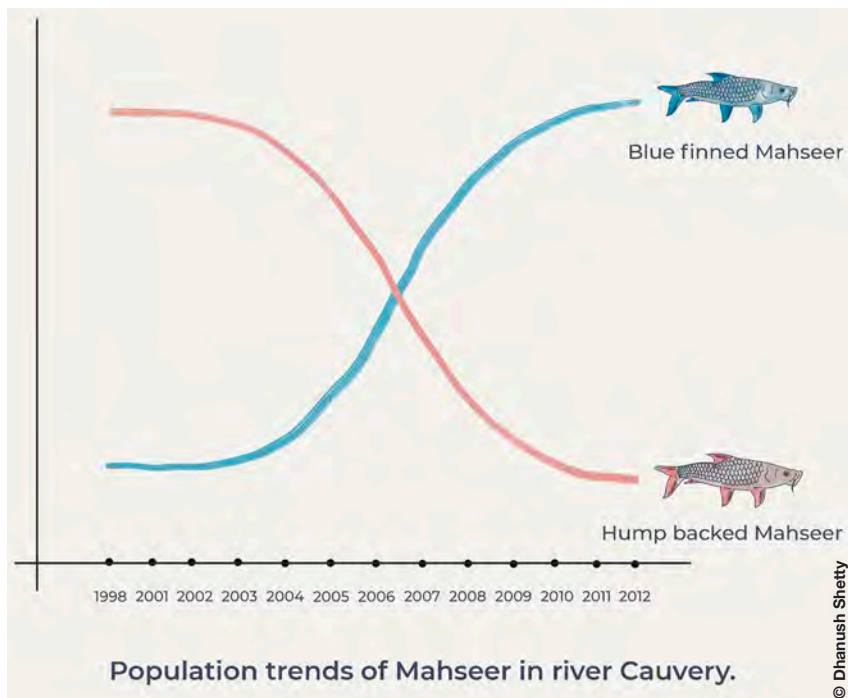
Along with these existing dangers, mahseer are also now threatened by hybridization wherein different species were artificially bred and later released in natural systems. The hybrid species compete with naturally occurring mahseer species. The hybrids not only threaten the existence of native mahseers but can cause the entire ecosystem to collapse.

### The tiger of the water is now ‘critically endangered’.

The Hump-backed Mahseer which was recently named as *Tor remadevii* is now ‘Critically Endangered’ as per the IUCN (International Union for Conservation of Nature) Red List. The need for immediate conservation action has to be the priority, else we might lose one of the top freshwater megafauna forever.

This tiger of freshwaters that was once widespread (but endemic to) throughout the river Cauvery catchment in southern India and its major tributaries is currently extremely restricted to small pockets in five or six major tributaries. There was a collapse in recruitment in the main river population during the mid-2000s. Based on its alarming reduction in population size and persistent threats, *Tor remadevii* is now recognised as the most imperilled of all *Tor* spp. and the only mahseer species to be assessed as Critically Endangered. Some efforts are





being initiated by NGOs to conserve a few local populations in the Cauvery river basin.

All mahseer captured in the Cauvery before 1993 were hump-backed; since then, a blue-fin phenotype appeared in catches and subsequently dominated them. Such results triggered further studies indicating that the Hump-backed Mahseer was the endemic *Tor remadevii* and that the blue-fin was the invasive *Tor khudree*, introduced in 1976 and then stocked periodically from hatcheries.

Records of angling data from 1998 to 2012 showed

that mahseer catch rates had increased in this period. Surprisingly, two distinct phenotypes were caught. The positive role of catch-and-release angling in providing information on data-poor species was highlighted in a paper by Adrian Pinder and colleagues in the journal Aquatic Conservation (AQC).

*Tor khudree* which was not to be found in the natural population is possibly the result of hybridization between two species from the breeding stock that was subsequently introduced in 1976 in the river Cauvery. Regular artificial stocking of the hybrid *Tor khudree* has led to decrease in the

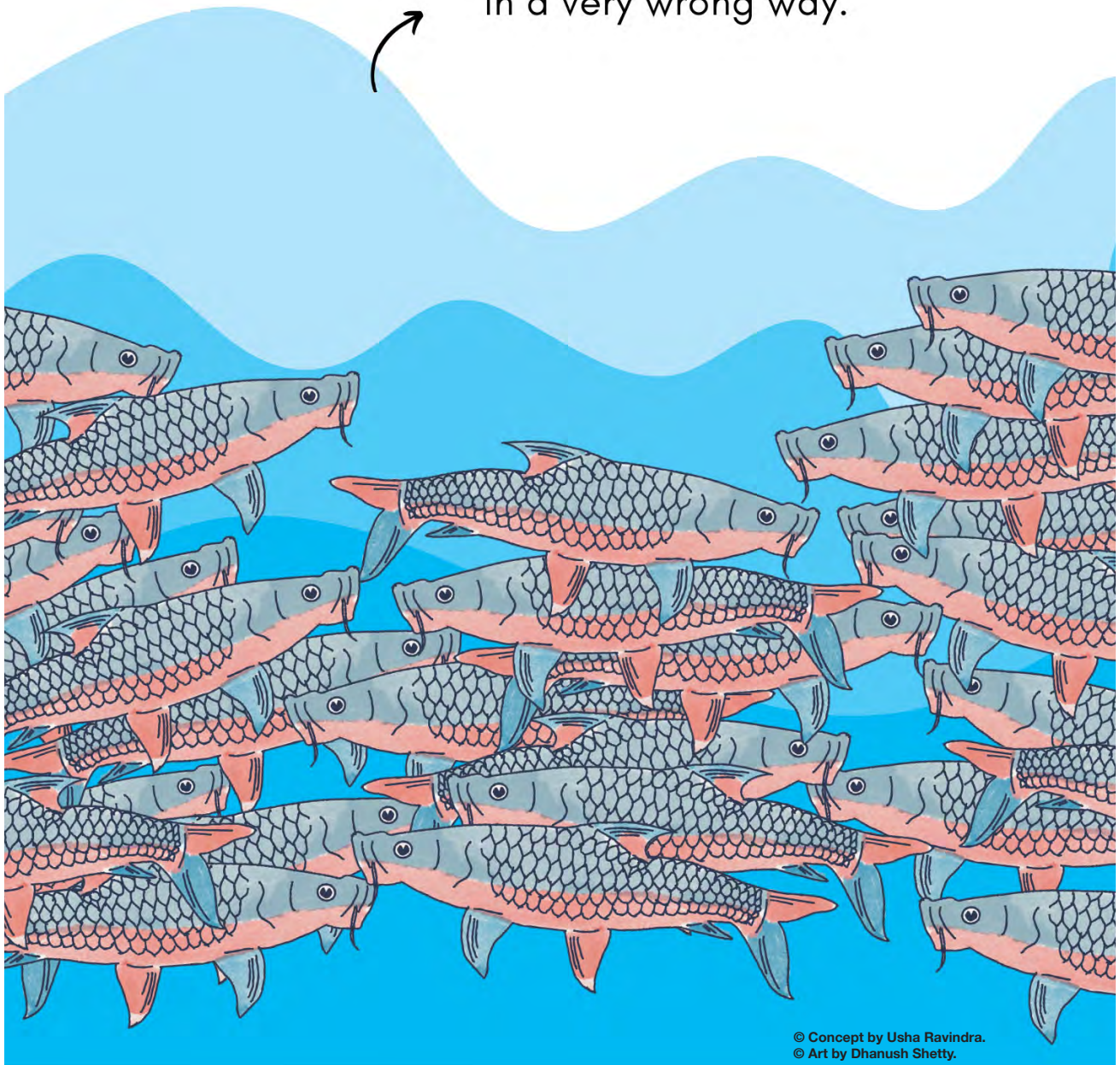
native species population of *Tor remadevii* which is now Critically Endangered.

Recreational angling which is still a debatable topic in conservation community, has played a vital role in protecting the fish of the Cauvery Wildlife Sanctuary from illegal fishing using indiscriminate and highly destructive methods such as dynamite and poisons, which had impacted all aquatic fauna until the closure of the Cauvery fishery in 2012. Anecdotal evidence suggests that illegal fishing is now high within this 27 km section of river, that is now known to be one of the remaining habitats of the Hump-backed Mahseer since the closure of the fishery. However, recreational anglers have collected quality data to monitor mahseer populations.

The contribution of long term data collected by anglers has helped in assessing the critical status of the Hump-backed Mahseer, with a high risk of this species going extinct before being afforded a valid scientific name. To maximise conservation benefits, one must also



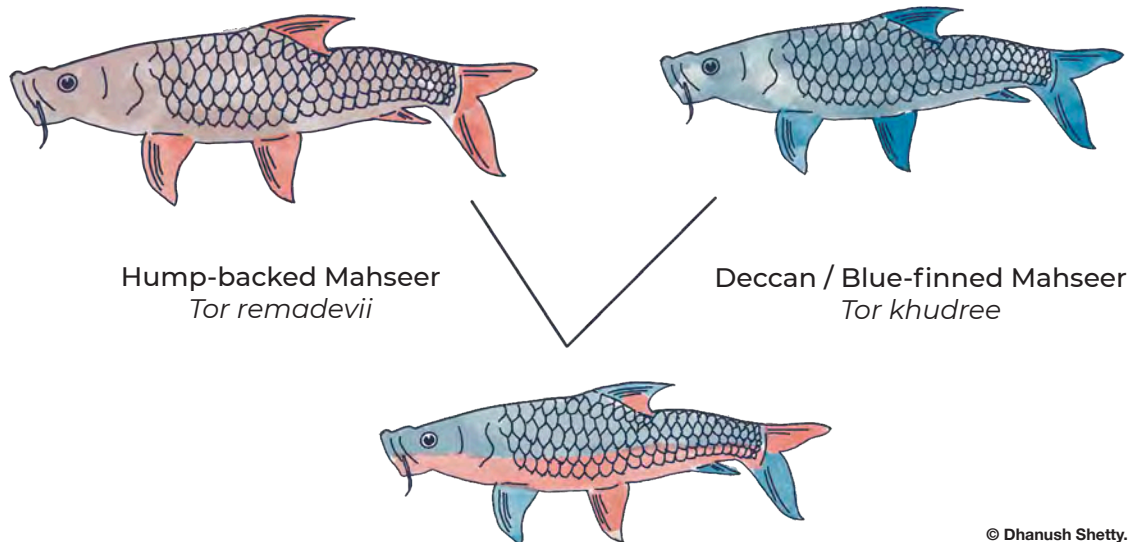
You fishes look very anomalous biologically, &  
are expanding a lot faster.  
I know I am famous for anomalous expansion\*.  
But you are taking up after me,  
in a very wrong way.



\*Anomalous Expansion of water:

Commonly, substances contract as it gets colder, however, water expands as temperature falls to  $0^{\circ}\text{C}$  from  $4^{\circ}\text{C}$  .





© Dhanush Shetty.

consider and evaluate site specific holistic threats versus resources to mitigate these threats.

### Hybridization and its adverse effects

Hybridization in biology is simply defined as interbreeding of two unrelated species to create a hybrid that may be used for commercial use. Hybridization also occurs naturally that may lead to the transfer of adaptive alleles from one species to another. Introgressive hybridization is the spread of genes of one species into the gene complex of another as a result of hybridization between numerically dissimilar populations in which extensive backcrossing prevents formation of a single stable population.

Hybridization is one of the most simple, inexpensive, and potential tools of aquaculture which are more common in fishes than any other vertebrate groups. Hybridization with introduced species might not previously have been identified as a threat to freshwater fish species due to the lack of research. However, it is clear that introduction of fishes from breeding stock

which is a result of human assisted movement can result in introgressive hybridization which is a major threat to native species. So fishes from one region should not be released outside its natural range. More studies need to be done to confirm the vulnerability of a native fish species to hybridization with an introduced species using aquaria trials. However, we can predict that it is not good to release them in the wild based on the principles of conservation biology. There has been a documented case of an Australian fish facing extinction solely due to hybridization. Hybridization may also happen in situations when there is widespread fish stocking, river diversions, and potential aquarium escapes that have occurred in a few places, but remain largely undocumented.

But hybridization not only disrupts natural food chains but also threatens long term survival of other freshwater species that are consumed. We need to think whether we need short term benefits that put the future generations at risk or long term benefits that are sustainable.



Many native fish have been introduced outside their natural range. Studies have shown that the introduction of 'native' fish species outside their natural range poses a higher risk of hybridization than previously thought.

We now know from the studies that range-restricted species are at the risk of extinction, which is further increased by introgressive hybridization if they are closely related to a widespread, dispersal-oriented species. Without community-based education programmes, the extinction of other fish

species due to hybridization and replacement from competition with introduced species will be inevitable. There needs to be a management plan and a rapid response system to deal with recently established introduced populations of fish species in order to prevent future extinctions due to hybridization.

**Ashritha Anoop, Shweta Madgulkar, Dhanush Shetty, Usha Ravindra, Nilesh Murmu, Trisa Bhattacharjee, Supriya Samanta, Aakanksha Komanduri, Vardhini Suresh & Arpan Joshi**  
RHATC Fellows, 2021–22, Zoo Outreach Organization, Coimbatore, Tamil Nadu, India.





## Eastern Indian Leopard Gecko from the plateau region of West Bengal, India



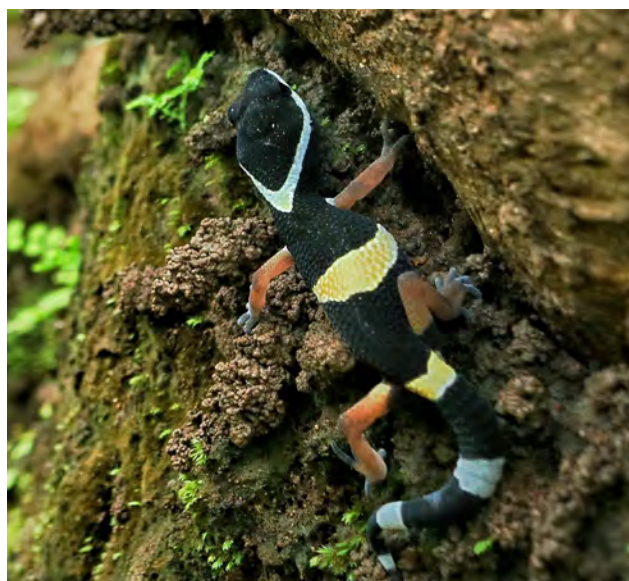
A juvenile *Eublepharis hardwickii* on leaf litter in mixed vegetation forest floor in Ajodhya Hills, West Bengal. © Supriya Samanta.

The Eastern Indian Leopard Gecko *Eublepharis hardwickii* Gray, 1827 is a nocturnal reptile belonging to the family Eublepharidae. It is a forest dwelling insectivorous species usually found on the leaf litter or crevices of rocks and stones (Ahmed et al. 2021). It has a reddish-brown to dark brown body with cream-coloured markings. The first U-shaped marking is extended to the snout from the nape. Second one is in the middle of the body and there are four to five markings in the tail (Smith 1935). It has a distinct black spot on the thigh (Prakash et al. 2014).

A juvenile Eastern Indian Leopard Gecko was opportunistically sighted once in the Belpahari, Jhargram district, West Bengal on 17 June 2017. Only one adult individual was there on leaf litter inside a sal plantation beside the road. Other two sightings were in Ajodhya Hills, Purulia district, West Bengal on 10 November 2020 and 21 July 2021. Both those instances, the juveniles were found on the leaf litter under mixed vegetation. Photographs were taken with Canon 750D camera with 18-55 lens.

It was described by Gray in 1827 on the basis of specimens from Chittagong, Bangladesh





**Juvenile *Eublepharis hardwickii* in its natural habitat in Ajodhya Hills. © Supriya Samanta.**

(Smith 1935). But no record can be found after that from Bangladesh. There is only one record from West Bengal. That is from Aushgram, Burdwan district (Chandra et al. 1997). Other records are from Barajamda and Hazaribagh of Jharkhand, Khurda, Jaypore, Similipal Biosphere Reserve and Tikarpada of Odisha, Simhachalam and RV Nagar of Andhra Pradesh & Gariyaband of Chhattisgarh (Singh 1984; Dutta et al. 2009; Mirza et al. 2014; Prakash et al 2014; Ahmed et al. 2021).

## References

**Ahmed, M., K. Basak, P. Sarkar, M. Suraj & K.C. Bebart (2021).** *Snakes and Other Reptiles of Chhattisgarh A Field Guide*. Chhattisgarh State Biodiversity Board, Raipur, Chhattisgarh.

**Chandra, G., S.N. Chatterjee, C. Datta, M. Majumdar & A. Nath (1997).** Occurrence of the fat tailed gecko, *Eublepharis hardwickii* Grey (Sauria: Gekkonidae) with remarks on the variation in certain taxonomic characteristics. *Journal of the Bombay Natural History Society* 94: 165–166.

**Dutta, S.K., M.V. Nair, P.P. Mohapatra & A.K. Mohapatra (2009).** *Amphibians and Reptiles of Similipal Biosphere Reserve*. Regional Plant Resource Centre, Bhubaneswar, Odisha.

**Mirza, Z.A., R.V. Sanap, D. Raju, A. Gawai & P. Ghadekar (2014).** A new species of lizard of the genus *Eublepharis* (Squamata: Eublepharidae) from India. *Phyllomedusa: Journal of Herpetology* 13(2): 75–90. <https://doi.org/10.11606/issn.2316-9079.v13i2p75-90>

**Prakash, P., M. Raziuddin & A.K. Mishra (2014).** Record of East Indian Leopard Gecko *Eublepharis hardwickii* Gray, 1827 (Squamata: Sauria: Eublepharidae) from Hazaribag, Jharkhand, India. *Reptile Rap* 16: 24–26.

**Singh, L.A.K. (1984).** *Eublepharis hardwickii* (Reptilia, Gekkonidae). The Kalakuta observed at Tikerpada, Orissa. *Journal of the Bombay Natural History Society* 81(3): 708–709.

**Smith, M.A. (1935).** *The fauna of British India, including Ceylon and Burma, Reptilia and Amphibia-Sauria*. Taylor and Francis, London, 2: xiii+440 pp.

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**Supriya Samanta<sup>1</sup>, Avik Dutta<sup>2</sup>, Bajrang Kumar<sup>3</sup> & Kirty Kumar<sup>4</sup>**

<sup>1</sup>Department of Zoology, Sidho-Kanho-Birsha University, Purulia, West Bengal 723104, India.

<sup>2</sup>Belpahari, Jhargram, West Bengal 721501, India.

<sup>1-4</sup> Green Plateau, Hatirampur, Bankura, West Bengal 722121, India.

Email: <sup>1</sup>supriyasamanta1234@gmail.com (corresponding author)

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## First report of hypomelanism in Northern Palm Squirrel from Gujarat, India



**Hypomelanistic squirrel exploring the ground. © Kirnalee Patel.**

The visual appearance in mammals serves varied functions, chief among which is self-defence (Cott 1940; Nordlund et al. 1998). In mammals, melanin present in melanophores of the epidermis is responsible for imparting colour to their hairs and eyes (Nordlund et al. 1998). The changes in these epidermal melanophores are known to change morphologic colour, which includes either an increase or a decrease in the pigments. Eumelanin and Pheomelanin, the two types of melanin responsible for producing diverse coat colour range from black-brown to sandy red or yellow, respectively (Solano 2014). However, some mutations give rise to

conditions wherein these pigments are affected and result in abnormal colouration (Nordlund et al. 1998).

These occurrences of colour aberrations, reported in 55 Indian mammalian species, have been accordingly termed as albinism, leucism, piebaldism, hypomelanism, melanism, and blue-eyed white morphs (Mahabal et al. 2019).

Colour aberrations such as albinism and leucism, which are responsible for the abnormal appearance of an individual, have been reported in Northern Palm





Squirrel *Funambulus pennantii* from India (Agrawal & Chakraborty 1979; Chaturvedi & Ghose 1984; Sharma 2004; Mahabal et al. 2005; Mehra et al. 2007; Sayyed & Mahabal 2016; Kamalakannan et al. 2019). However, another such genetic mutation in mammals known as hypomelanism, referred alternatively as flavism, erythrism, tawny, silvering, and rufism; is also known to occur (Lucati & López-Baucells 2016).

It is a type of hypopigmentation resulting due to reduced pigment granules as a consequence of mutation in a gene responsible for synthesis of melanin. Though this mutation leads to a paler phenotypic appearance such as a creamy, brown, golden, yellow, or reddish coat of an individual, the eye colour of the affected individual remains unchanged (Lucati & López-Baucells 2016; Mahabal et al. 2019). For paler appearing forms, the term 'dilution' has been described by van Grouw (2006, 2013), which is also associated with a lower number of pigment granules in birds. Here, we report a case of hypomelanism in Northern Palm Squirrel from Vadodara City, Gujarat, India.

The Five-striped or Northern Palm Squirrel, a small rodent of the family Sciuridae, is commonly found in northern India in various habitats. Being a diurnal, semi-arboreal, bold, and inquisitive species, it is incredibly adaptable and a commensal with man (Molur et al. 2005; Johnsingh & Manjrekar 2015).

On 15 August 2018 at 0720 h, a different looking Northern Palm Squirrel was noted

at Sayaji Garden, a public park in Vadodara City (22.315°N, 73.188°E). It appeared golden, and had pinkish snout, ears and feet, although its eyes were normal black. Its five pale white stripes were set against the golden-orange fur. As seen in other *F. pennantii*, in this individual also out of the three median stripes, the mid-dorsal central stripe was longer than the two lateral stripes and extended up to the tail.

However, the other two supplementary stripes were not marked from the ventral surface. The upper head region up to the snout and the dorsal region of the forelimb appeared creamy orange in colour. Though the tail appeared lighter, it was almost white towards the tip and ventral side while it appeared creamy orange in the mid-region.

The individual was identified as a female as evident from the absence of scrotal sacs and distinctively visible mammary glands observed during the breeding phase. As the individual appeared golden-orange with normal eye colour, the colour aberration was inferred to be hypomelanistic.

Mahabal et al. (2019) has given a comprehensive compilation of all types of colour aberrations in various Indian mammalian species. This interpretation reveals cases of hypomelanism in 44 mammalian species, but has not yet been reported in palm squirrels. Hence, the present report is the first photographic record of hypomelanism in Northern Palm Squirrel from India.





## References

- Agrawal, V.C. & S. Chakraborty (1979).** Catalogue of mammals in the Zoological Survey of India, Rodentia-Part 1, Sciuridae. *Records of Zoological Survey of India* 74(4): 333–481.
- Chaturvedi, Y. & A.K. Ghose (1984).** A case of albinism in the Five-striped Palm Squirrel *Funambulus pennanti* Wroughton. *Bulletin of Zoological Survey of India* 6(1–3): 321–322.
- Cott, H.B. (1940).** *Adaptive Coloration in Animals*. Methuen, London.
- Johnsingh, A.J.T. & N. Manjrekar (2015).** *Mammals of South Asia*, Volume 2. Universities Press (India) Private Limited, Telangana.
- Kamalakannan, M., K. Chandra & C. Venkatraman (2019).** A leucistic Northern Palm Squirrel from Dehradun, India. *Small Mammal Mail* #424 in: *Zoo's Print* 34(11): 29–31.
- Lucati, F. & A. López-Baucells (2016).** Chromatic disorders in bats: a review of pigmentation anomalies and the misuse of terms to describe them. *Mammal Review* 47(2): 112–123.
- Mahabal, A., R.M. Sharma & M.S. Pradhan (2005).** A case of total albinism in the Five-striped Palm Squirrel *Funambulus pennanti* Wroughton in Sindhudurg District, Maharashtra State. *Journal of the Bombay Natural History Society* 102(1): 98–99.
- Mahabal, A., R.M. Sharma, R.N. Patil & S. Jadhav (2019).** Colour aberration in Indian mammals: a review from 1886 to 2017. *Journal of Threatened Taxa* 11(6): 13690–13719.  
<https://doi.org/10.11609/jott.3843.11.6.13690-13719>
- Mehra, S.P., J.S. Kharwar & N.S. Kharwar (2007).** Second record of albino Five-striped Palm Squirrel *Funambulus pennanti* Wroughton from Udaipur, Rajasthan. *Journal of the Bombay Natural History Society* 104(3): 344–345.
- Molur, S., C. Srinivasulu, B. Srinivasulu, S. Walker, P.O. Nameer & L. Ravikumar (2005).** Status of south Asian non-volant small mammals: conservation assessment and management plan (CAMP) workshop report. Zoo Outreach Organization/CBSG-South Asia, Coimbatore, India, 618 pp.
- Nordlund, J.J., R.E. Boissy, V.J. Hearing, R.A. King, W.S. Oetting & J.P. Ortonne (Eds.) (1998).** *The Pigmentary System: Physiology and Pathophysiology*. Oxford University Press, New York.
- Sayyed, A. & A. Mahabal (2016).** First record of leucism in Five-striped Palm Squirrel *Funambulus pennanti* (Rodentia: Sciuridae) from India. *Small Mammal Mail* 8(1): 8.
- Sharma, S.K. (2004).** Occurrence of albino Common Palm Civet and Northern Palm Squirrel in southern Rajasthan. *Zoo's Print* 19(5): 1483.
- Solano, F. (2014).** Melanins: skin pigments and much more types, structural models, biological functions, and formation routes. *New Journal of Science* 1–28. <https://doi.org/10.1155/2014/498276>
- van Grouw, H. (2006).** Not every white bird is an albino: sense and nonsense about colour aberrations in birds. *Dutch Birding* 28(2): 79–89.
- van Grouw, H. (2013).** What colour is that bird. *British Birds* 106: 17–29.
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**Kirnalee Patel<sup>1</sup>, Meera Makwana<sup>2</sup>, Hiren J. Patel<sup>3</sup> & Geeta S. Padate<sup>4</sup>**

<sup>1&2</sup> Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand 248001, India.

<sup>3&4</sup> Division of Avian Biology and Wildlife Biology, Department of Zoology, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat 390002, India.

Emails: <sup>1</sup>kirnaleepatel18@gmail.com (corresponding author), <sup>2</sup>meeramakvana@gmail.com,

<sup>3</sup>hirenp9408@gmail.com, <sup>4</sup>geetapadate@gmail.com

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## Roost and foraging behaviour of Fulvous Fruit Bat

The Fulvous Fruit Bat *Rousettus leschenaulti* (Desmarest, 1820) is a medium sized fruit bat species found commonly in India and belongs to the family Pteropodidae (Old world fruit bats), suborder Yinpterochiroptera (or Pteropodiformes), order Chiroptera in class Mammalia, sub-phylum Vertebrata, phylum Chordata in kingdom Animalia. Its global distribution is known to range from southern and southeastern Asia -- Iran to Indonesia.



**An individual of Fulvous Fruit Bat, *Rousettus leschenaulti* roosting at upper side of the staircase wall of Government Senior Secondary School Premises of Deshalpar-Vandhay village in tahseel Bhuj, district Kachchh, Gujarat, India. © Arpan Joshi.**

We have reported collective population of about 175 individuals of *Rousettus leschenaulti* at one nocturnal / foraging and five diurnal roosting sites explored through our recent three periodic but systematic bat diversity surveys of 8–10 days each in Nakhatrana, Bhuj, Mandvi, Anjar, Abdasa, and Lakhpatt tahseels of the Kachchh district in Gujarat, India conducted through December 2020 to August

2021. Of these six roosting sites though we observed 1–5 individuals of this fruit bat at each of the five roosting sites notably huge congregation of 150–175 individuals were found roosted at sixth roosting site, i.e., an unattended semi-dark portion of the dilapidated village fort premises (22.980847° N, 69.101718° E and 28.47 m elevation from the sea level) of Pokalia village in Mandvi tahseel of Kachchh district in

Gujarat on 20 March 2021. We have never seen such a huge population ever of this species of bat earlier. They were found roosting in close proximity of each other at the ceiling and upper portion of circular peripheral wall of this roost; and seen flying inside the roost periodically with utterance of loud peculiar noise as witnessed in [video footage](#). The floor underneath their colonial roost was full of their guano.





A colony of Fulvous Fruit Bat *Rousettus leschenaulti* roosting in the ceiling and upper portion of circular peripheral wall of village fort premises of Pokalia village in Mandvi tahseel of district Kachchh, Gujarat, India. © Arpan Joshi.

*Rousettus leschenaulti* is a frugivorous bat species that feeds upon fruit, foliage, inflorescence, and nectar of different plant species. Their roosting preference may differ as per the seasonal and regional availability of food sources. In the surveyed study area of Kachchh district we have seen the cultivation of fruit trees like Pomegranate *Punica granatum*, Banana *Musa* spp., Mango *Mangifera indica*, and Sapodilla *Manilkara zapota* along with some native and natural fruit trees like Banyan *Ficus benghalensis*, Peepal *Ficus religiosa*, Jamun *Syzygium cumini*, Neem *Azadirachta indica*, Neelgiri *Eucalyptus globulus*, Tamarind *Tamarindus indica*, Jungle Jalebi *Pithecellobium dulce*,

Jungle Berries *Polyalthia cerasoides*. We have seen *R. leschenaulti* feeding upon fruits / foliage / inflorescence of Sapodilla, Mango, Jungle Berries, and Banyan trees. We have noticed many partially eaten pomegranate and jungle berries fruits at nocturnal / foraging roosts in Deshalpar - Vandhay village of Bhuj Tahseel in Kachchh District. Individuals of this bat species usually emerges out of their diurnal roosts in evening by soon after the sunset, find and forage to the available nearby food sources and return to their diurnal roost after midnight but strictly before the sunrise next day. Usually they prefer to cling / hang on branches of the food source trees and feed directly upon



**Table 1. Detailed account of roosting sites of Fulvous Fruit Bat, *Rousettus leschenaulti* reported during periodic Bat Diversity Assessment Surveys executed through December 2020 to August 2021 in Kachchh district of Gujarat, India.**

Date of Observation	Name of the Bat Roost	Name of the Village/ Settlements	Name of the Tahseel	Geographical Coordinates of Bat Roost in Degree	Type of Roost	Population (No. of Individuals)
<b>Diurnal Roosting Sites</b>						
1 20.iii.21	Old unattended dilapidated building of Dharmshala near bus stand of the village	Kotada - Roha	Nakhatrana	23.149033°N 69.242443°E	An individual of <i>Rousettus leschenaulti</i> was found roosting on the semi-dark upper wall portion of this roost. However, on 05 August 2021 revisit, we couldn't find any individual.	1
2 20.iii.21	An old unattended structure at Kalyaneshwar Madeve temple located near the village river.	Kotada - Roha	Nakhatrana	23.148500°N 69.246058°E	An individual of <i>Rousettus leschenaulti</i> was found roosting on the semi-dark upper wall portion of this roost. However, on 05 August 2021 revisit, we couldn't find any individual.	1
3 20.iii.21	Guru Mandir Art Gallery	Dedhiya	Mandvi	22.984315°N 69.121397°E	Individuals of <i>Rousettus leschenaulti</i> was found roosting on the semi-dark ceiling portion of this roost. This roost premises was under renovation and its caretakers told us that there used to roost 40–50 individuals of this bat species since last more than 20 years.	4
4 20.iii.21	An old unattended semi-dark portion of the dilapidated village fort premises	Pokalia	Mandvi	22.980847°N 69.101718°E	Individuals of <i>Rousettus leschenaulti</i> was found roosting on the semi-dark ceiling and upper wall portion of this roost. Villagers told us they have been seeing individuals of this bat species roosting here since last more than 30 years.	150–175
5 06.viii.21	Inside the kotha located in premises of Darbar Gadh	Nagrecha	Mandvi	23.002193°N 69.214782°E	An individual of <i>Rousettus leschenaulti</i> was found roosting on the semi-dark upper wall portion of this roost. However, on 05 August 2021 revisit, we couldn't find any individual.	1
<b>Nocturnal / Foraging Roosting Sites</b>						
1 24.xii.20	First floor portion of both the staircases of Government Senior Secondary School	Deshalpar - Vandhay	Bhuj	69.437400°E 23.206144°N	Individuals of <i>Rousettus leschenaulti</i> was found roosting here during night time only. They bring plucked fruits to this site, roost there and eat them. Afterwards they fly back to their unknown nearest day roost. We observed their presence 2045–2200 h.	5







**Table 2. Detailed account of morphological measurements noted of a male individual of Fulvous Fruit Bat *Rousettus leschenaulti* found roosting at Dharmshala roosting site located near bus stand of village Kotada - Roha in Nakhatrana tahseel of Kachchh district of Gujarat, India.**

	Character	Measurements in millimetres (mm)
1	Head and Body length (HB)	121.86
2	Tail length (T)	10.25
3	Forearm length (FA)	84.30
4	Foot length (HF)	13.2
5	Thumb length (Thumb)	20.35
6	Ear length (E)	18.5
7	Femur (F)	29.07
8	Tibia length (TIB)	44.66
9	Wing Span length (WSP)	466
10	3rd Metacarpal (3 Mt)	55.52
11	1st Phalanx of the 3rd Metacarpal (1 Ph 3 Mt)	35.75
12	2nd Phalanx of the 3rd Metacarpal (2 Ph 3 Mt)	42.24
13	4th Metacarpal (4 Mt)	53.25
14	1st Phalanx of the 4th Metacarpal (1 Ph 4 Mt)	28.28
15	2nd Phalanx of the 4th Metacarpal (2 Ph 4 Mt)	30.21
16	5th Metacarpal (5 Mt)	52.23
17	1st Phalanx of the 5th Metacarpal (1 Ph 5 Mt)	26.24
18	2nd Phalanx of the 5th Metacarpal (2 Ph 3 Mt)	27.68

the preferred available food thereon but sometimes they also choose to pluck up the fruits of their choice, bring them to nocturnal / foraging roosts and eat thereon.

We caught an individual of this species from Dharmshala roost of Kotada-Roha village located in Nakhatrana tahseel of Kachchh district in Gujarat with a hand net for taking morphological measurements and released

it back safely at the said roost (Table 2).

Morphologically, it is fulvous brown on the crown of head, back, flanks and throat but belly is more greyish in the median area. It prefers to roost inside semi-dark portions of manmade structures alike houses, pyramids, tunnels, forts, havellies, and at openings of the natural caves.

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**Arpan Joshi<sup>1</sup>, K.R. Senacha<sup>2</sup>, Mamta Rawat<sup>3</sup>, Sumit Dookia<sup>4</sup> & Mayank Bohra<sup>5</sup>**

<sup>1,3,5</sup> The ERDS Foundation, 1002, G-2-B Block, Golf Links Residency, Sector 18B, Dwarka, New Delhi 110075, India.

<sup>2</sup> Indian Bat Conservation Foundation (IBCF), Vasai (West), Mumbai, Maharashtra 401202, India.

<sup>4</sup> University School of Environment Management, Guru Gobind Singh Indraprastha University, Golf Course Rd, Sector 16C, Dwarka, Delhi 110078, India.

Emails: <sup>1</sup>arpanjoshia8@gmail.com (corresponding author),

<sup>2</sup>senacha@gmail.com, <sup>3</sup>rawatscorner@gmail.com,

<sup>4</sup>sumitdookia@gmail.com, <sup>5</sup>mayank.bohra20@gmail.com

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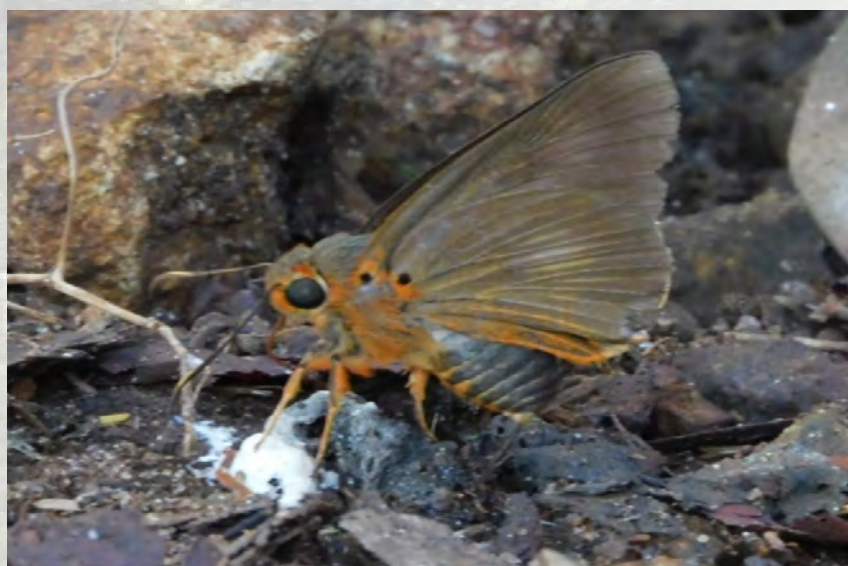
## Rare sighting of Orange Awlet recorded in Pachamalai Hills of Eastern Ghats, India

### Introduction

Butterflies are one of the most fascinating insect groups and they have been considered as indicators of the health of an ecosystem. Changes in abundance and distribution of butterflies have been linked to a range of factors, including habitat loss and fragmentation, land use, and climate changes (Thomas et al. 1998).

Butterflies are the pollinators, and they play a major role in the food chain, being prey for birds, reptiles, spiders, and predatory insects (Thangapandian et al. 2014). India has 1,800 species and subspecies of butterflies (Kunte et al. 2015) of which peninsular India hosts 350 species, and 331 species are found in the Western Ghats (Kunte 2000).

The Orange Awlet comes under the family HesperIIDae



Orange Awlet attracted to the bird droppings. © R. Santhosini.

and have powerful skipping flights. They fly straight and hover at leaves. The Orange Awlet consists of three subspecies of which *Burara jaina fergusonii* (de Nicéville, 1894) ranges from southwestern India to northern Maharashtra (Dash et al. 2020; Saji et al. 2021). The identifying characteristics of the species as described by Kehimkar (2016) & Bhakare & Ogale (2018) as: the wings span of this species is 60–70 mm.

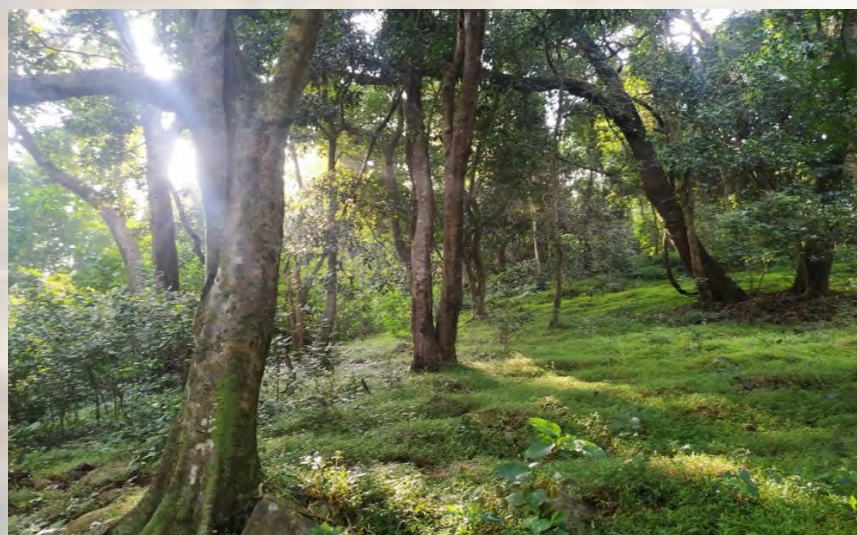
Underside brown with orange cilia on legs, body, hindwing termen and base. Black spot at the base of both wings. A prominent basal costal orange streak. The male upper forewing band is composed of a black spot before mid-vein 2 and a smaller separate spot above it. The species is active at dusk when males are territorial, patrolling small areas close to the ground. During the daytime, both sexes visit flowers but are



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**Orange Awlet habitat from Mamarathu Solai from Solamathi Village in Pachamalai Hills. © T. Siva.**

active only in thick shade. Attracted to bird droppings and wet mossy rocks. Females are often spotted hovering near the host plant. Always rest below the leaf with closed wings. It prefers dense evergreen forests in regions of heavy rainfall at low elevation. The Orange Awlet is a forest insect and never found on plains (Kehimkar 2016; Bhakare & Ogale 2018). The previous records of this Orange Awlet *Burara jaina fergusonii* were found in Western Ghats of Tamil Nadu from Nilgiris, Coimbatore, Virudhunagar Districts and Tiruvannamalai

District of Jawadhu Hills from Eastern Ghats (Saji et al. 2021).

## **Sighted at Pachamalai Hills of Eastern Ghats at Tiruchirappalli District**

The present note is to report the occurrence of Orange Awlet for the first time from the Pachmalai Hills of the Eastern Ghats in Tiruchirappalli District. We went to observe birds and butterflies in Pachamalai Hills from Top Sengattupatti Village on 18–19 September 2021. On 19 September 2021, a bird and butterfly survey was carried out

at Mamarathu Solai in Solamathi Village (11.291998 N, 78.621621 E. 796 m).

The butterfly was firstly sighted on the ground sitting on the bird droppings. As we just crossed the place the butterfly suddenly flew fast. It was then that we realized the species belongs to the Hesperidae family. After waiting for few minutes, we again observed the butterfly sitting on the bird droppings and on closer observation we identified it as Orange Awlet. The habitat was shaded by a high canopy cover and the ground had moisture in the place. It was photographed by the second author on 19 September 2021 at 0803 h using SLR camera B600 Nikon. During that time, we observed only one individual. The present report is the first photographic record of the butterfly from the Eastern Ghats part of Pachamalai Hills. There are no scientific information, reports, and articles on this species from the Eastern Ghats.



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## References

**Bhakare, M. & H. Ogale (2018).** *A Guide to Butterflies of Western Ghats (India) Includes Butterflies of Kerala, Tamilnadu, Karnataka, Goa, Maharashtra and Gujarat state* (May 2018 ed.), Mumbai, x+496 pp.

**Dash, S.K., P. Arajush & N.D. Gaurab (2020).** Record of Orange Awlet *Burara jaina jaina* (Moore, [1866]) (Lepidoptera: Hesperidae: Coeliadinae) from Odisha, Eastern India. *Journal of the Bombay Natural History Society*, Vol. 117. <https://doi.org/10.17087/jbnhs/2020/v117/144575>.

**Kehimkar, I. (2016).** *Butterflies of India*. Bombay Natural History Society, Mumbai, xii+528 pp.

**Kunte, K. (2000).** *A Lifescape: Butterflies of Peninsular Indian*. Indian Academy of Sciences, Bangalore, and University Press, 270 pp.

**Kunte, K., P. Roy, S. Kalesh & U. Kodandaramaiah (2015).** *Butterflies of India*. v. 2.10. Indian Foundation for Butterflies, Bangalore, Available from <http://www.ifoundbutterflies.org/>.

**Saji, K., S. Kalesh, K.M. Bhakare, P. Churi, P. Manoj & K. Kunte (2021).** *Burara jaina* (Moore, [1866]) – Common Orange Awlet. Kunte, K., S. Sondhi & P. Roy (Chief Editors). *Butterflies of India*, v. 3.17. Indian Foundation for Butterflies. <http://www.ifoundbutterflies.org/sp/545/Burara-jaina>

**Thangapandian, M., A. Ganesh, P. Ramaraj, C. Selvakumar & S. Janarthan (2014).** Diversity and Status of Butterflies in the city Chennai, Tamil Nadu. *Hexapoda Insecta indica* 21: 1–9.

**Thomas, J.A., D.J. Simcox, J.C. Wardlaw, W.G. Elms, M.E. Hochberg & R.T. Clark (1998).** Effects of latitude, altitude and climate on the habitat and conservation of the endangered butterfly *Maculinea arion* and its *Myrmica* ant host. *Journal of Insect Conservation* 2: 39–46.

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**T. Siva<sup>1</sup>, R. Santhosini<sup>2</sup>, A.S. Thileepan<sup>3</sup> & A. Muthusamy<sup>4</sup>**

<sup>1&4</sup> Research Department of Zoology, Nehru Memorial College (Autonomous and Affiliated to Bharathidasan University), Puthanampatti, Tiruchirappalli District, Tamil Nadu 621007, India.

<sup>2</sup> Junior Research Fellow, Tropical Butterfly Conservatory, (TBC), Melur, Sri Rangam (TK), Tiruchirappalli, Tamil Nadu 620006, India.

<sup>3</sup> 28/1, Balaji Nagar, Papanasam, Thanjavur, Tamil Nadu 614 205, India.

Emails: <sup>1</sup>sivanaturewild@gmail.com (corresponding author), <sup>2</sup>santhosini97@gmail.com, <sup>3</sup>kas.thileepan@gmail.com, <sup>4</sup>muthusamy9514@gmail.com

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## Distribution record of three new spiders of the genus *Gasteracantha* from Nepal

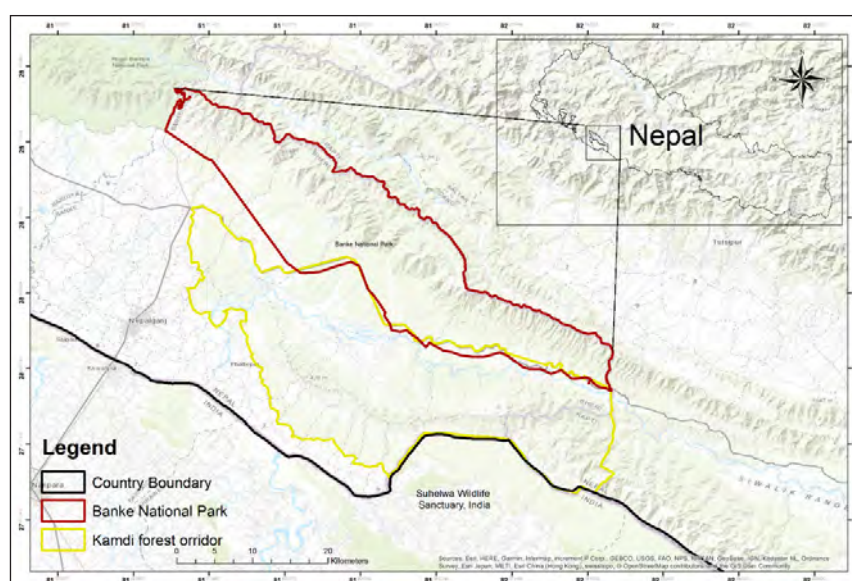
In Nepal, studies on spiders were initiated in the 20th century. Till date, there are 23 families, 79 genera, 222 species of spiders recorded from Nepal, among 79 genus of species recorded, four of them are endemic species (Siliwal & Molur 2007).

The study area lies in the western low land of Nepal with an elevation of 153–1,247 m between 28.36°–27.82°N & 82.43°–81.53°E. Banke National Park (BaNP) is surrounded by the Suhelwa Wildlife Sanctuary (SWS) in India in the south and Bardia National Park (BNP) in Nepal in the west. BaNP is rich in biodiversity and is a treasure house for 124 species of plants, 34 species of mammals, more than 300 species of birds, 24 species of reptiles, seven species amphibians and 58 species of fish. It contains an array

of eight ecosystems. A subtropical type of climate is prevailed with three distinct seasons summer, monsoon, and winter being the dominant season.

The study was conducted between 27 March to 14 April 2019, when I was involved in line transect method to count the animal density in BaNP and Kamdi Forest corridor. Before I noticed

the structure of the spider in the study area, I was fascinated by its colour and spines. It was the first time I noticed *Gasteracantha kuhli* C.L. Koch, 1837), in Lamjung, Nepal (28.10°N & 84.44°E). But for the first time I started collecting these species opportunistically when I found them in my line transect. Probably for collecting all three species I had walked at least 30



**Study area showing Kamdi Forest corridor and Banke National Park, Nepal.**





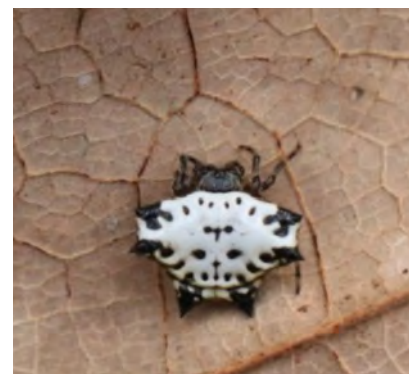
**Table 1: Dorsal view of three species of spiders detected in Banke District belongs genus *Gasteracantha*.**



**Family:** Araneidae  
**Species:** *Gasteracantha hasselti*  
 C.L. Koch, 1837  
**Guild/ GPS location:**  
 Orb-web builders/  
 N 28.23°  
 E 81.71°  
 Elevation: 177 m



**Family:** Araneidae  
**Species:** *Gasteracantha kuhli* C.L.  
 Koch, 1837  
**Guild/ GPS location:**  
 Orb-web builders/  
 N 28.23°  
 E 81.71°  
 Elevation: 192 m



**Family:** Araneidae  
**Species:** *Gasteracantha sanguinolenta* C.L. Koch, 1844  
**Guild/ GPS location:**  
 Orb-web builders/  
 N 28.23°  
 E 81.69°  
 Elevation: 204 m

line transect each having the length of approximately 1.2km to 2km. Photographs of dorsal view were first searched in Google, leading to dilemma in identification. I had adopted a morphospecies approach (assumption based on photographs and colours) to identify the spider species and confirmed that the species (from photographed) belonged to the orb weavers. In order to verify, I even checked the former researched works having the

photograph of spiders.

Three species of family Araneidae was first identified from Nepal, Banke District (Table 1). All three species *Gasteracantha hasselti* C.L. Koch, 1837, *G. kuhli* C.L. Koch, 1837, and *G. sanguinolenta*, C.L. Koch, 1844 belong to the family Araneidae (Adarsh & Nameer 2015). *G. hasselti* is found to occur in India, China and Indonesia. *G. kuhli* occurrence is recorded from India, China, Malaysia,

Japan, Philippines, whereas *G. sanguinolenta* are found to be recorded abundantly in South Africa.

The spider species *G. kuhli* is commonly known as black-and-white spiny spider even found in hilly region of Nepal, once observed myself in my backyard forest area in Lamjung (elevation of 528 m), Nepal. *Gasteracantha hasselti* is commonly known as Hasselt's Spiny Spider and is yellow in color. It is mostly sighted outdoors in





the web. All the three species bear spines with different primary colors in their body and *G. sanguinolenta* has white color with some black points embedded in dorsal side (Table 1). This study depicts new distribution record from Nepal in fact the genus is recorded for the first time. This initiation of work on spider will contribute arachnologists in upcoming days to motivate the researchers for bringing spider studies to the notice.

## References

- Adarsh, C.K. & P.O. Nameer (2015).** Spiders of Kerala Agricultural University Campus, Thrissur, Kerala, India. *Journal of Threatened Taxa* 7(15): 8288–8295. <https://doi.org/10.11609/jott.2468.7.15.8288–8295>
- Siliwal, M. & S. Molur (2007).** Checklist of spiders (Arachnida: Araneae) of south Asia including the 2006 update of Indian spider checklist. *Zoos' Print Journal* 22(2): 2551–2597. <https://dx.doi.org/10.11609/JoTT.ZPJ.1509.2551-97>

## Sagar Raj Kandel

Tribhuvan University, Central Department of Environmental Sciences, Kirtipur 44618, Kathmandu, Nepal.  
Email: [peace\\_ocean88@yahoo.com](mailto:peace_ocean88@yahoo.com)

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For communication, Email: [zp@zooreach.org](mailto:zp@zooreach.org)

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# Survival of Purple-rumped Sunbird chick

The Purple-rumped Sunbird *Leptocoma zeylonica* (Aves: Passeriformes: Nectariniidae), a tiny bird feeds mainly on nectar. Often seen hopping and hovering around flowers, the male has a green metallic crown and shoulder patch, a dark brown body with purple rump, a purple throat, lemon-yellow underparts, and whitish flanks. The female is light greyish-brown above and pale yellow below. This species is found in a variety of habitats with trees, including scrub, flowering plants, and cultivation.

On 21 July 2021, one of our neighbours brought two Purple-rumped Sunbird chicks in a coconut shell. The chicks had fallen from a nearby tree due to heavy winds. We kept the chicks in a pot that was filled by coconut coir pith. We brought a few termites and tried to feed the chicks, the chick started chirping and suddenly two adult Purple-rumped Sunbirds (male & female) came into a nearby tree and started. We moved the pot to the corner of the balcony. One of the two chicks died after a few hours (probably from injury from the fall). The adults came to the pot and fed the chick with insects throughout the day. Most of the day they rested on Yellow Bells *Tecoma stans* (Lamiales: Bignoniaceae) tree very close to that balcony. We observed this behaviour till 1800 h after that parents did not come. To keep the chick safe from domestic cats, we kept the pot inside our home during the night.

Purple-rumped Sunbird  
*Leptocoma zeylonica*  
(male).





Purple-rumped  
Sunbird chicks.



Pot kept in the  
corner of the  
veranda.



Yellow Bells  
Tecoma stans.



Insect feeding by adult  
Purple-rumped Sunbird.



Healthy chick.  
© R. Athirsta.



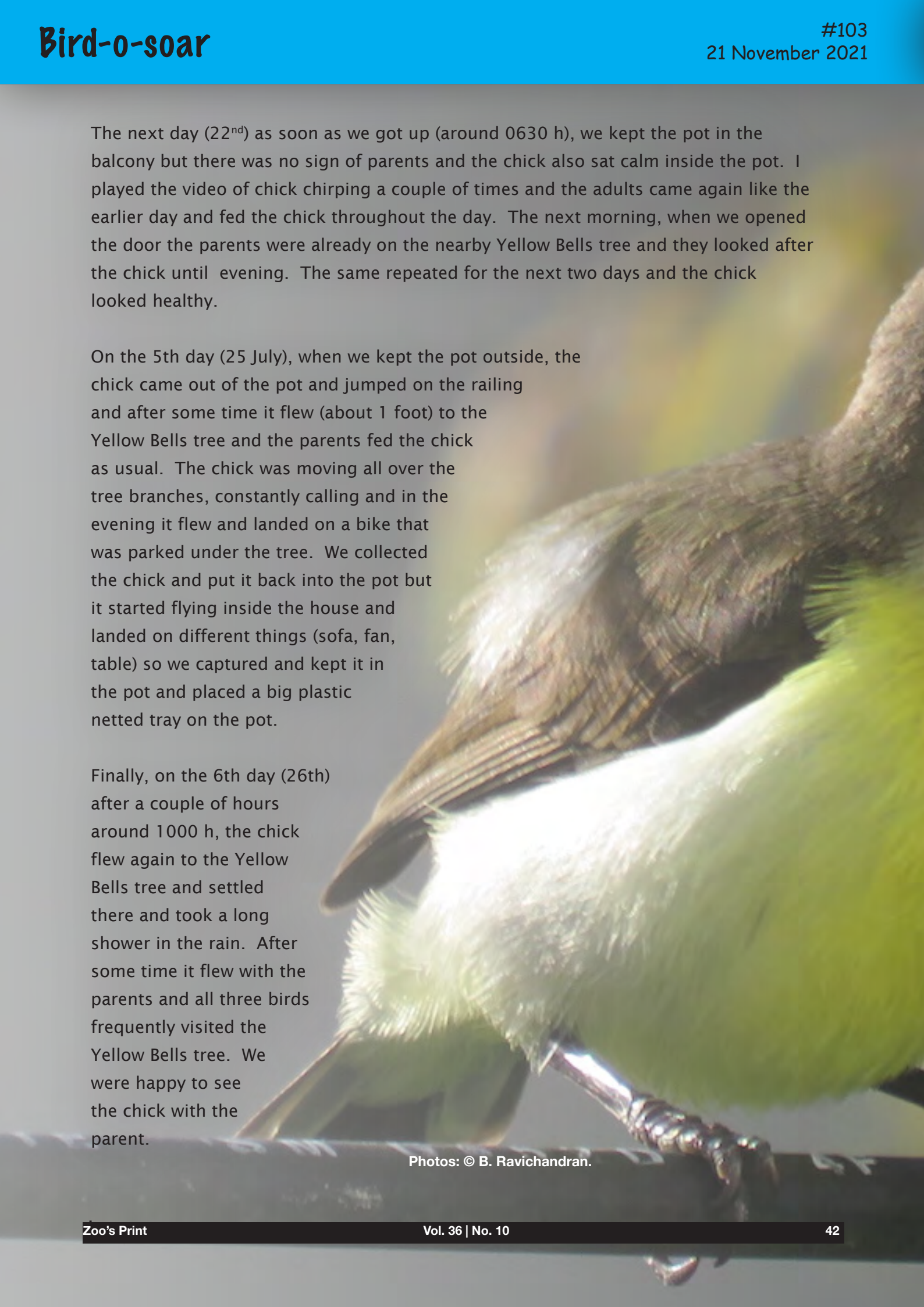


The next day (22<sup>nd</sup>) as soon as we got up (around 0630 h), we kept the pot in the balcony but there was no sign of parents and the chick also sat calm inside the pot. I played the video of chick chirping a couple of times and the adults came again like the earlier day and fed the chick throughout the day. The next morning, when we opened the door the parents were already on the nearby Yellow Bells tree and they looked after the chick until evening. The same repeated for the next two days and the chick looked healthy.

On the 5th day (25 July), when we kept the pot outside, the chick came out of the pot and jumped on the railing and after some time it flew (about 1 foot) to the Yellow Bells tree and the parents fed the chick as usual. The chick was moving all over the tree branches, constantly calling and in the evening it flew and landed on a bike that was parked under the tree. We collected the chick and put it back into the pot but it started flying inside the house and landed on different things (sofa, fan, table) so we captured and kept it in the pot and placed a big plastic netted tray on the pot.

Finally, on the 6th day (26th) after a couple of hours around 1000 h, the chick flew again to the Yellow Bells tree and settled there and took a long shower in the rain. After some time it flew with the parents and all three birds frequently visited the Yellow Bells tree. We were happy to see the chick with the parent.

Photos: © B. Ravichandran.





We have heard that the parents would reject the abandoned/ fallen chick in case a human touched it, but in this case we observed the parents take care of the chick for six days and finally fly off with it.



Chick outside the pot (4th day).



Chick moved to a nearby tree branch (5th day).



Chick in the rain (6th day). © R. Athirista.

Purple-rumped Sunbird  
*Leptocoma zeylonica*  
(female).

## B. Ravichandran<sup>1</sup> & R. Athirista<sup>2</sup>

<sup>1</sup> ZOO & WILD, Coimbatore, Tamil Nadu 641035, India.

<sup>2</sup> E.B. Colony, G.N. Mills, Coimbatore, Tamil Nadu 641029

Emails: <sup>1</sup>ravi@zooreach.org (corresponding author)

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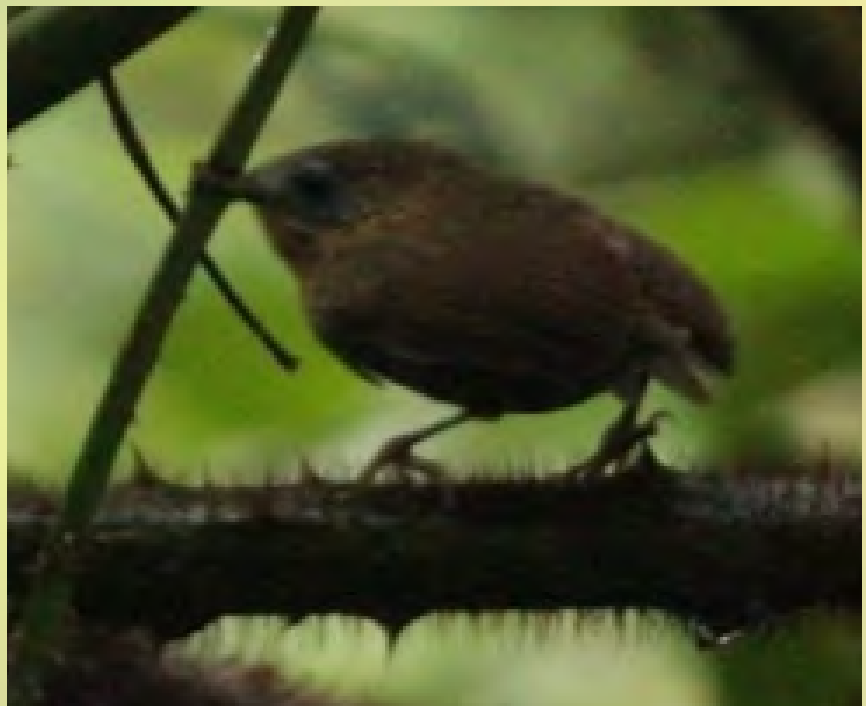


## An observation on the occurrences of Rufous-throated Wren-Babbler in Darjeeling Hills, India

The Rufous-throated Wren-Babbler *Spelaeornis caudatus* (Blyth, 1845), an endemic species of the eastern Himalaya, was reported from Darjeeling in 1845 by Edward Blyth. It has a distribution range that extends from eastern Nepal to Arunachal Pradesh (Rasmussen & Anderton 2005). Its altitudinal range extends from 1,500–2,500 m; occasionally up to 3,100m (IUCN 2016), and has been categorized as 'Near Threatened' (BirdLife International 2017).

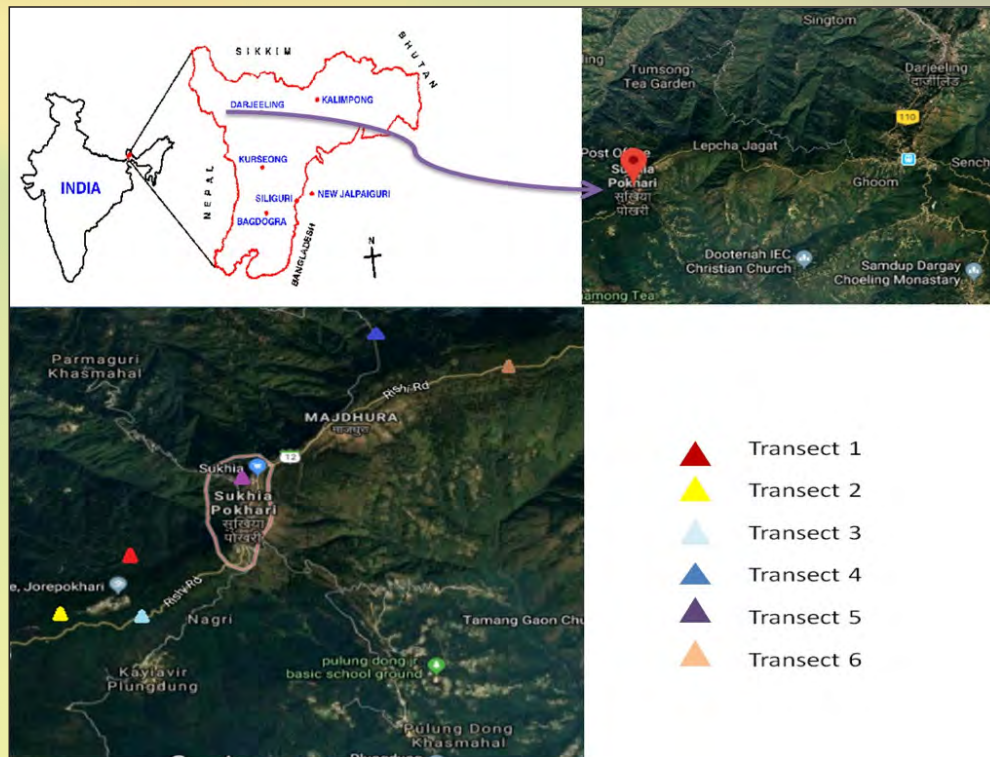
The bird is a silent skulker and inhabits moist dense broadleaved forest among thick undergrowth, especially ferns, mossy rocks, and fallen trees in narrow gully (Grimmett et al. 1998). There are no species-specific studies on it except for a first-time record (Rahut 2013) and mentions of its presence (Rangini et al. 2014).

Jorepokhri Salamander Sanctuary is situated in



(a) Adult (b) juvenile Rufous-throated Wren-Babbler *Spelaeornis caudatus*.





Map of the study area showing respective transects.

Table 1. Observations noted during visual encounters of Rufous-throated Wren-Babbler.

No. of sighting	Time	Flock size	Flock composition	Canopy level	Activity	Locality (Coordinates)	Vegetation type
1	0700 h	Moderately sized flock (Visually encountered 4)	Single species	Ground	Foraging	27.1656° N 88.2769° E	Among the weeds and grass ( <i>Hydrocotyle javanica</i> ) on the forest floor
2	0706 h	Visually encountered 1	Mixed flock	0.3 m above the ground	Foraging	27.0022° N 88.2858° E	Under growth of <i>Polygonum molle</i> and <i>Rubus</i> sp

Table 2. Encounter rate calculated as number of individuals sighted divided by the total km walked in its suitable habitat.

Transect no.	No. of individuals	Km walked	Encounter rate
1	5	56	0.089
2	-	42	
3	-	42	
4	-	21	
5	-	14	
6	-	56	

Sukhia Pokhri, a small town located at a distance of 11 km from Asia's highest railway station, Ghoom in Darjeeling (2,258m). Sukhia Pokhri with an average elevation of 2,194 m experiences warm temperate moist evergreen/deciduous forest type (Champion & Seth



Table 3. Details of transects walked.

Transect no.	Transect name	Transect length (km)	Start point	End point	Vegetation
1	Maney Bhanjyang Road	4	26.996447N 88.165274E	26.991459N 88.148677E	Dense vegetation with little sunlight penetrating the upper canopy, dense undergrowths dominated by trees of <i>Quercus</i> sp., <i>Alnus nepalensis</i> , <i>Castanopsis</i> sp., <i>Evodia</i> sp., <i>Michelia</i> sp. and abundance of undergrowths such as <i>Polygonum</i> sp., <i>Rubus</i> sp., <i>Urtica</i> sp., <i>Herpetospermum pedunculatum</i> and different species of ferns.
2	Jorepokhri Road	3	26.995877N 88.165712E	26.986921N 88.145305E	Dry coniferous type of vegetation with tall pine trees ( <i>Cupressus cashmeriana</i> , <i>Pinus roxburghii</i> , and <i>Cryptomeria japonica</i> ) and patches of dense cover of <i>Sinarundinaria maling</i> .
3	Simana Road	3	26.993662N 88.165712E	26.985642N 88.144680E	Moderately dense vegetation of pine trees as well as broad-leaved trees like <i>Castanopsis</i> sp., <i>Michelia</i> sp., <i>Acer campbellii</i> , <i>Persea</i> sp., <i>Symplocos</i> sp. with considerable densities of undergrowth of <i>Sinarundinaria maling</i> and <i>Eurya</i> sp.
4	Mim Road	1.5	27.006294N 88.172860E	27.014696N 88.181612E	Moist vegetation with patches of <i>Cryptomeria japonica</i> , young broad-leaved trees like <i>Alnus nepalensis</i> and very few large trees like <i>Castanopsis</i> sp. and <i>Quercus</i> sp. The density of trees is comparatively low with moderate density of undergrowth of <i>Rubus</i> sp. and various species of ferns.
5	Gurasey Parmen	1	27.000966N 88.166550E	27.002953N 88.168747E	Very scanty forest coverage with few large trees of <i>Rhododendron</i> sp. and some young trees like <i>Acer campbellii</i> , with a good density of undergrowths of <i>Glochidion acuminatum</i> , <i>Polygonum</i> sp. and ferns along with terrace farming on the hill slopes.
6	Darjeeling Road	4	27.007715N 88.175177E	27.012668N 88.196823E	Dense but dry pine forest ( <i>Cryptomeria japonica</i> ) and trees like <i>Symplocos</i> sp., <i>Prunus</i> sp., <i>Quercus</i> sp. and dense patch of <i>Cestrum</i> sp., <i>Tetrastigma rumicispermum</i> , <i>Rubus</i> sp. that make up the undergrowth on road sides.



1968). The area receives average annual precipitation of 2,547 mm; with the highest average precipitation, i.e., 781.5 mm in July. With an average temperature of 17.9°C, August is the warmest month and with 6.6°C, January is recorded as the coldest month of the year. The vegetation type in the different transects differ significantly in the ratio of floral species.

Six transects were studied seven times each between July and September 2017, of which transects 1, 2, and 3 were located in the protected area of Jorepokhri Salamander Sanctuary and transects 4, 5, and 6 were located in the adjoining forests. The transects were surveyed by walking at a speed of 1 km/hr recording all sightings of Rufous-throated Wren Babbler. Distances walked were noted to obtain a crude estimate of relative abundance (Bibby et al. 2000).

During the study period, the bird was sighted only twice. The bird was observed only in transect 1, with an encounter rate of 0.089/km. The trees that make up the top canopy of transect 1 reaches heights of up to 40 m from the ground. The dominant trees in the transect were *Quercus lamellosa*, *Alnus nepalensis*, *Q. fenestrata*, *Castanopsis hystrix*, *Acer campbellii*, and *Q. lineata*. The vegetation constituting the under-storey was *Polygonum molle*, *Rubus* sp., *Laportea terminalis*, *Urtica dioica*, and *Viburnum erubescens*.

The vegetation in transect 1 is similar to the habitat descriptions provided by (Ali & Ripley

1971; Inskipp & Inskipp 1991), i.e., the area has dense canopy and shrub undergrowth with moisture-laden forest floor. The bare minimum study of the vegetation of all the transects studied showed that the vegetation of different transects did not differ much in the species level but greatly differed in the ratio of occurrences of floral species in different transects. The very low encounter rate calculated by this study as 0.089/km even in its historically known suitable habitat justifies its conservation status as 'Near Threatened' and may get upgraded to 'Vulnerable' if the current rate of habitat loss persists.

The sighting of a juvenile in the study area suggests that they might be breeding in the area. Identifying crucial factors involved in nest-site selection is essential for implementing conservation measures for birds and their habitats (Gokula & Vijayan 2001). Moreover, this study also suggests possible range extension of the bird because it was described to breeding above 2,400 m (Ali & Ripley 2001) but the study area has an average altitude of 2,258 m.

This study has demonstrated the importance of relatively mature forest for the endemic birds and an urgent need to strengthen the protected area network by expansion and management. Since this species has a narrow ecological niche, it has become increasingly rare with a very small, rapidly declining population, largely as a result of widespread loss of its habitat (BirdLife International 2000). Activities aimed for



infrastructure development like construction of roads and towers for installation of high-tension lines has resulted in the massive felling of trees and canopy clearance threatening the very existence of this species in the area.

**Rasmussen, P.C. & J.C Anderton (2005).** *Birds of South Asia: The Ripley Guide- Vol. 1. 1st edition.* Smithsonian Institution and Lynx Editions, Washington, D.C. & Barcelona, 378 pp.

## References

**Ali, S. & S.D. Ripley (1971).** *Handbook of the birds of India and Pakistan*, Volume 6. Oxford University Press, London.

**Ali, S. & S.D. Ripley (2001).** *Handbook of the birds of India and Pakistan-Vols. 6.* Oxford University Press, New Delhi.

**Bibby, C.J., N.D. Burgess, D.A. Hill & S. Mustoe (2000).** *Bird census techniques.* Elsevier.

**BirdLife International (2017).** *Spelaeornis caudatus* (amended version of 2016 assessment). The IUCN Red List of Threatened Species 2017: e.T22716112A110904337. <https://dx.doi.org/10.2305/IUCN.UK.2017-1.RLTS.T22716112A110904337.en>. Downloaded on 24 October 2021.

**Blyth, E. (1845).** Notices and descriptions of various new or little-known species of birds. *Journal of Asiatic Society Bengal* 14: 588.

**Champion, H.G. & K.S. Seth (1968).** A Revised Survey of Forest Types of India. Govt. of India Press, New Delhi, 404 pp.

**Gokula, V. & L. Vijayan (2001).** Nest-site characteristics of Spotted Munia *Lonchura punctata* in Mudumalai Wildlife Sanctuary, Southern India. *Journal of South Asian Natural History* 5: 187–190.

**Grimmett, R., C. Inskipp & T. Inskipp (1998).** *Birds of the Indian Subcontinent.* Oxford University Press, Delhi.

**Inskipp, C. & T. Inskipp (1991).** *A guide to the birds of Nepal. 2nd edition.* A. & C. Black Christopher Helm & Smithsonian Institution Press, London & Washington.

**Rahut, B. (2013).** First record of Rufous-throated Wren Babbler *Spelaeornis caudatus* from Buxa Tiger Reserve, West Bengal, India. *Indian BIRDS* 8(4): 105–106.

**Rangini, N., M.S. Lodhi, L.M.S. Palni, S. Chaudhry & P.K. Samal (2014).** A review of avifaunal diversity of Dihang Dibang Biosphere Reserve, Arunachal Pradesh. *Indian Forester* 140(10): 998–1004.

**Avantika Thapa<sup>1</sup>, Dawa Bhutia<sup>2</sup> & Ruja Yonle<sup>3</sup>**

<sup>1–3</sup> P.G. Department of Zoology, Darjeeling Government College, Darjeeling, West Bengal 734101, India.  
Emails: <sup>1</sup>thapaavantika08101993@gmail.com,  
<sup>2</sup>dbhutia16@gmail.com (corresponding author),  
<sup>3</sup>rujasyonle@rediffmail.com,

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## Additional record of endemic and threatened Yellow-throated Bulbul from Andhra Pradesh, India

Yellow-throated Bulbul *Pycnonotus xantholaemus* is a threatened passerine (IUCN status 'Vulnerable'), endemic to scrub forests of the Eastern Ghats, inland hillocks of the Deccan Peninsula and eastern slopes of the southern Western Ghats (BirdLife International 2019; Praveen et al. 2019; Jha 2021). It is primarily found in scrub forests on hills with exposed rocky outcrops and has patchy distribution across its distribution range (Ali & Ripley 1987; Subramanya et al. 2006). In this note, I report two new locations of this species from Andhra Pradesh.

On 17 January 2020, at 0630 hours, I visited Shri Ghanagiri Lakshmi Narasimha Swamy Temple (14.0675°N 77.5817°E) in Penukonda town, Ananthapur. This hill forms a part of the Palkonda Range of the Eastern Ghats. The habitat was typical of the Yellow-throated Bulbul

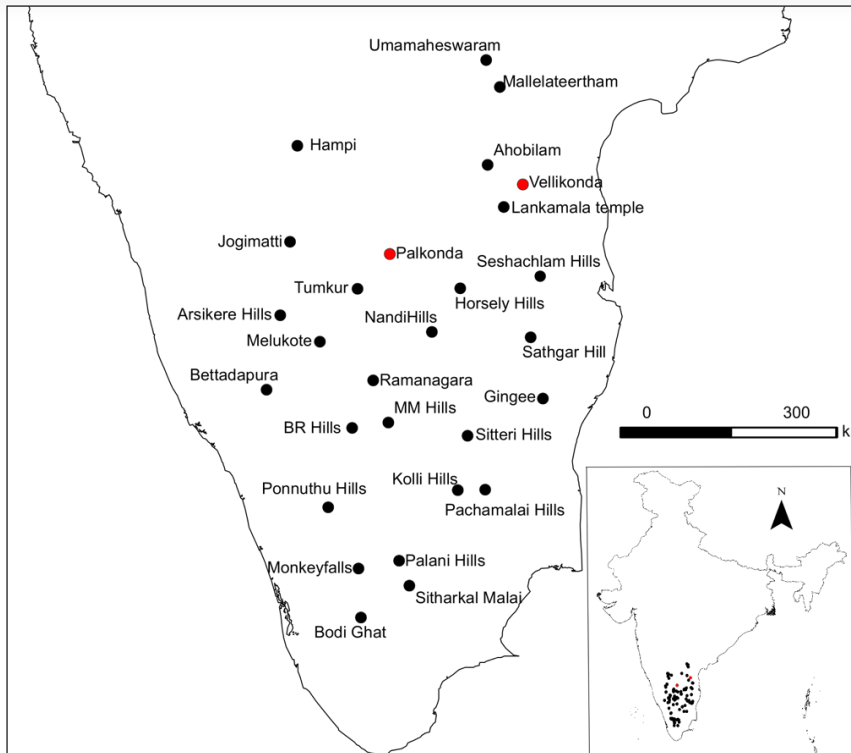


Yellow-throated Bulbul at Penukonda, Andhra Pradesh.



Yellow-throated Bulbul at Cumbum forest, Andhra Pradesh.





Map showing known occurrences of Yellow-throated Bulbul (black) and additional records (red). Inset shows the locations in India. Coordinates of known locations were taken from Jha & Vasudevan (2020).

habitat, an expansive rugged terrain with steep slopes and exposed boulders, shrubs and trees growing amidst the rock. A road from the foothills to the top was under construction; vegetation and rocks had been cleared on both sides of this road.

While birdwatching along this road, I heard the call of the Yellow-throated Bulbul, a rolling and fast paced call, similar to that of White-browed Bulbuls but melodious and shorter.

I followed the calls and spotted four individuals feeding on berries of *Cocculus hirsutus* growing on *Hardwickia binata* tree. During my two-hour stay at the site, I saw up to 13 individuals and heard calls from multiple places.

On 18 January 2020, at 0930 hours, I visited Ghutika Siddheswaram Temple (14.8944°N 79.1633°E), Nellore. This temple lies on the detour at Seetharamapuram-Udaygiri

Road and lies nestled inside the Cumbum Forest in the Velikonda Range of the Eastern Ghats. Unlike the previous habitat, the habitat here was quite moist and dense, with several old-growth trees and a high canopy. Except for a few devotees, there was not much human activity and the surrounding habitat seemed undisturbed.

A Changeable Hawk-Eagle *Nisaetus cirrhatus* was seen nesting in the area. I heard Yellow-throated Bulbul's call from the valley and played the species' call to re-confirm its identity. Visual sightings for a shy and rare species such as Yellow-throated Bulbul are very limited and call playback is known to increase the contact rate for such species (Mosher et al. 1990). The bird responded to the call playback, perched onto a nearby tree and soon flew across the valley. During my one-hour stay at the site, I saw only a single individual but heard a few from across the valley.

A recent study had predicted the distribution of the species



in these areas (Jha & Vasudevan 2020). With these confirmed records, the species is likely to be present in suitable habitats distributed across these hill ranges and nearby hillocks.

## References

- Ali, S. & S.D. Ripley (1987).** *Handbook of the birds of India and Pakistan*. Compact edition. Oxford University Press, New Delhi, 737 pp.
- BirdLife International (2019).** *Pycnonotus xantholaemus*. The IUCN Red List of Threatened Species 2016: e.T22712719A94345114. Downloaded on 15 February 2019.
- Jha, A. (2021).** Field observations of Yellow-throated Bulbul *Pycnonotus xantholaemus* in Deccan Peninsula, India. *Journal of Bombay Natural History Society* 118: 1–4.
- Jha, A. & K. Vasudevan (2020).** Environmental niche modelling of globally threatened Yellow-throated bulbul, *Pycnonotus xantholaemus* for conservation prospects in the Deccan Peninsula, India. *Current Science* 119(11): 1815–1823. <https://doi.org/10.18520/cs/v119/i11/1815-1823>
- Mosher, J.A., M.R. Fuller & M. Kopeny (1990).** Surveying woodland raptors by broadcast of conspecific vocalizations. *Journal of Field Ornithology* 61: 453–461.
- Praveen, J., R. Jayapal & A. Pittie (2019).** Threatened birds of India (v2.1) [cited 11 March 2020]. <http://www.indianbirds.in/india/>
- Subramanya, S., J.N. Prasad & S. Karthikeyan (2006).** Status, habitat, habits and conservation of Yellow-throated Bulbul *Pycnonotus xantholaemus* (Jerdon) in south India. *Journal of the Bombay Natural History Society* 103: 215–226.

## Ashish Jha

Kerala Agricultural University, Vellanikkara, Thrissur, Kerala 680656, India.  
Email: aashishjha89@gmail.com

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## Breeding notes on Bengal Bushlark in a fragmented habitat of Bangladesh

The Bengal Bushlark *Mirafra assamica* is a common passerine bird species which is widely distributed throughout south and southeast Asia. *Mirafra assamica* differs from congener *M. affinis*, *M. erythrocephala* and *M. microptera* through habitat selection, call, flight movement and other types of behavior (Alström 2018). The species is very common and found throughout the country. This species is documented as 'Least Concern' (Onu 2015). It is usually observed in pairs, sometimes solitary or in small groups. It prefers to forage in open grassland, paddy field, bushy area or fallow land (Onu 2015). It feeds on seeds, weevils, beetles, and other insects (Haque & Kamruzzaman 2008). However, the breeding behavior of this species is poorly known. Here, we described some observations on breeding activities of the Bengal Bushlark at Jahangirnagar University Campus (23.8797° N, 90.2680° E)

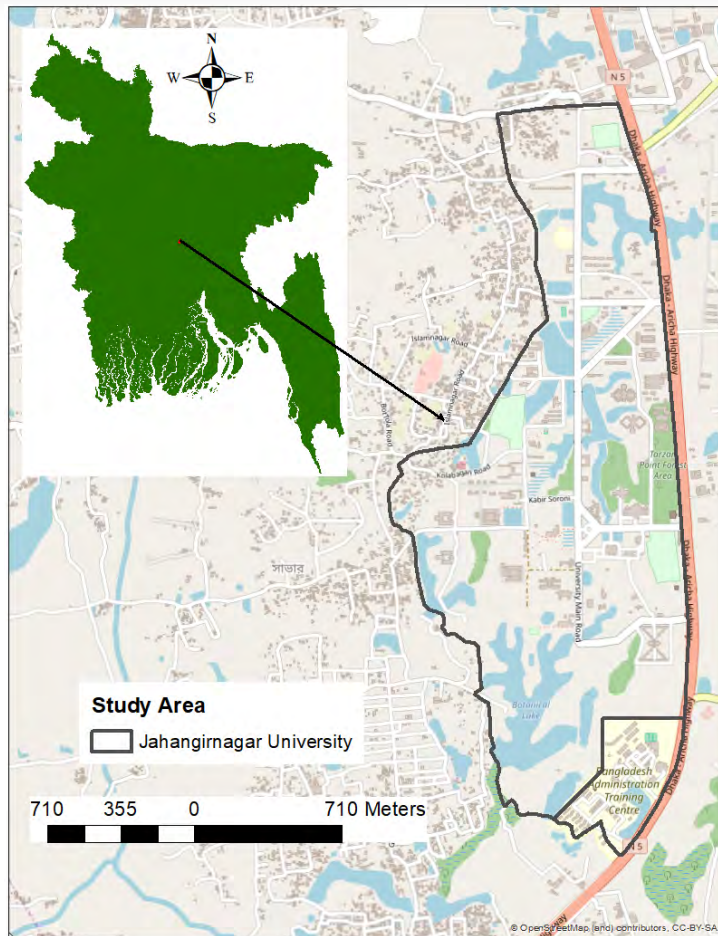


Nest of Bengal Bushlark.



Eggs of Bengal Bushlark.





**Map of the Jahangirnagar University campus in central Bangladesh.**

Jahangirnagar University Campus is far away from, about 32 km north of Dhaka, the capital of Bangladesh. The study area has diverse ecological habitat and locally is well known for its large number of bird species (Nahid et al. 2016, 2020). The study area supports a total of 195 bird species belonging to 43 families (Begum 2016). The Bengal Bushlark has been confirmed as a resident breeding bird species in this area (Begum 2016). The

climate of the study area is hot and humid during summer with rain whereas dry and cool during winter (Nahid et al. 2018). A total of 917 species of vascular plants have been identified from this area belonging to 574 genera and 145 families (Khan et al. 2021).

On 1 May 2013, we identified a nest built by the Bengal Bushlark in an open grassland habitat of the study site for the first time. The

cup-shaped nest was located on the ground and made of long dried grass on the top and small soft grass on the ground. The Bengal Bushlark builds its nest on the ground in a shallow depression or cattle hoof-print and the nest is lined with finer grass and placed under a dome of growing grass (Haque & Kamruzzaman 2008). A total of six nests of Bengal Bushlark was found in that grassland habitat during May 2013 (Table 1). Two nests were found with eggs among which one nest had two eggs and another nest had three eggs (Table 1). The eggs of Bengal Bushlark were brown in color with dark to brown blotches on the blunt end. The average size of Bengal Bushlark eggs was 19.5 x 16 mm (n= 2). The female usually lays 3–4 greenish eggs with 2 x 1.5 cm in size (Haque & Kamruzzaman 2008).

During the study period, two Bengal Bushlark nests were predated, and four nests were destroyed. Nests containing eggs were predated, however, the complete but empty nests were destroyed (Table 1).

Table 1. Overview of Bengal Bushlark nests found in 2013.

Nest No.	Date nest found	Nest content	Predated/Destroyed	Date of Predated/Destroyed	Nest GPS Position
1	1.v.2013	2 eggs	Predated	4.v.2013	23.8770°N 90.2653°E
2	8.v.2013	Empty, complete nest	Destroyed	10.v.2013	23.8771°N 90.2651°E
3	9.v.2013	3 eggs	Predated	12.v.2013	23.8771°N 90.2651°E
4	17.v.2013	Empty, complete nest	Destroyed	18.v.2013	23.8771°N 90.2651°E
5	17.v.2013	Empty, complete nest	Destroyed	19.v.2013	23.8770°N 90.2653°E
6	27.v.2013	Empty, complete nest	Destroyed	29.v.2013	23.8771°N 90.2650°E

The potential nest predator might be Bengal Monitor Lizard *Varanus bengalensis*, Small Indian Mongoose *Herpestes auropunctatus* and different species of snakes as it was very common in this habitat (pers. obs.) (Nahid et al. 2020). All the nests were located very close to human movement trail in the grassland habitat. People living around the grassland habitat grazed their livestock in that area, as a result both human and livestock used to move randomly in the grassland. Though the nests were well camouflaged with the surroundings, accidentally the nests were destroyed by unintentional activities by the local people. It might be most of the nests

were destroyed while walking through the grasses. Ground or close to ground nests are more prone to predation (Isaksson et al. 2007; Nahid et al. 2016) and rodents, squirrels, and monitor lizards play a very important role

in nest predation (Pangau-Adam et al. 2006; Nahid et al. 2020).

Our observations provide the initial information on breeding behavior of the Bengal Bushlark. This result will lead



Predated nest of Bengal Bushlark.



to further studies on the breeding biology of this species especially incubation period, nestling, fledgling, and parental behavior. This observation will also help to conserve the breeding ground of the Bengal Bushlark as their nests are at high risks of being predated or destroyed.

## References

- Alström, P. (2018).** Bengal Bushlark *Mirafra assamica*. In: del Hoyo, J., A. Elliott, J. Sargatal, D.A. Christie & E. de Juana (eds.). *Handbook of the Birds of the World Alive*. Lynx Editions, Barcelona.
- Begum, S. (2016).** *Birds of Jahangirnagar University Campus*. Dhaka: Arannayk Foundation Bangladesh, 96 pp.
- Haque, E.U. & M. Kamruzzaman (2008).** Bengal Bushlark, pp. 499–500. In: Siddiqui, K.U., M.A. Islam, S.M.H. Kabir, M. Ahmad, A.T.A. Ahmed, A.K.A. Rahman, E.U. Haque, Z.U. Ahmed, Z.N.T. Begum, M.A. Hassan, M. Khondker & M.M. Rahman (eds.). *Encyclopedia of Flora and Fauna of Bangladesh*. Vol. 26: *Birds*. Asiatic Society of Bangladesh, Dhaka.
- Isaksson, D., J. Wallander & M. Larsson (2007).** Managing predation on ground-nesting birds: The effectiveness of nest enclosures. *Biological Conservation* 136: 136–142.
- Khan, S.A., S. Sultana, G.M. Hossain, S.S. Shetu & M.A. Rahim (2021).** Floristic composition of Jahangirnagar University Campus-A semi-natural area of Bangladesh. *Bangladesh Journal of Plant Taxonomy* 28(1): 27–60.
- Nahid, M.I., F. Fossey, B.G. Stokke, S. Begum, E. Røskft & P.S. Ranke (2020).** How does human disturbance affect brood parasitism and nest predation in hosts inhabiting a highly fragmented landscape? *Global Ecology and Conservation* 24: e01295. <https://doi.org/10.1016/j.gecco.2020.e01295>.
- Nahid, M.I., F. Fossey, S. Begum, E. Røskft & B.G. Stokke (2016).** First record of Common Tailorbird *Orthotomus sutorius* parasitism by Plaintive Cuckoo *Cacomantis merulinus* in Bangladesh. *Avian Research* 7: 14.
- Nahid, M.I., S. Begum, M.M. Feeroz & M.K. Hasan (2018).** Yellow-footed Green Pigeon: Notes on nesting behaviour of *Treron phoenicoptera* in a semi-urban area of Bangladesh. Bird-o-soar #15. In: *Zoo's Print* 33(4): 15–18
- Onu, T. (2015).** *Mirafra assamica*. In: IUCN Bangladesh. *Red List of Bangladesh Volume 3: Birds*. IUCN, International Union for Conservation of Nature, Bangladesh Country Office, Dhaka, Bangladesh, 427pp.
- Pangau-Adam, M.Z., M. Walter & M. Mühlenberg (2006).** Nest predation risk on ground and shrub nests in forest margin areas of Sulawesi, Indonesia. *Biodiversity and Conservation* 15: 4143–4158.
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<sup>1-5</sup> Department of Zoology, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh.  
 Emails: <sup>1</sup>nahid\_1511@yahoo.com (corresponding author), <sup>2</sup>nskhan.ju38@gmail.com, <sup>3</sup>bsajeda@yahoo.com, <sup>4</sup>feerozmm@yahoo.com, <sup>5</sup>mkhasan@juniv.edu
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## Extended distribution of the lesser-known Pink-flowered Swamp Orchid from West Bengal, India

Orchidaceae are one of the largest group of flowering plants distributed throughout the world. In India, the family is represented by 1,256 species belonging to 155 genera and among them 388 species are endemic to India (Singh et al. 2019). A total 460 species and six varieties of orchids belonging to 110 genera are found to occur in West Bengal (Mitra et al. 2020). Around 850 Indian orchid species are commercially highly important for their magnificent flowers.

During a field survey in September 2019, the author came across an interesting population of *Eulophia* in fruiting stage in the Lalgarh-Jhitka Forest Range at Ramgarh (22.6923° N, 87.0852° E). The area is dominated by dry-deciduous forest. That time it was not identified due to lack of flowers. Next year on 20 July 2020 the author revisited the locality and found it in

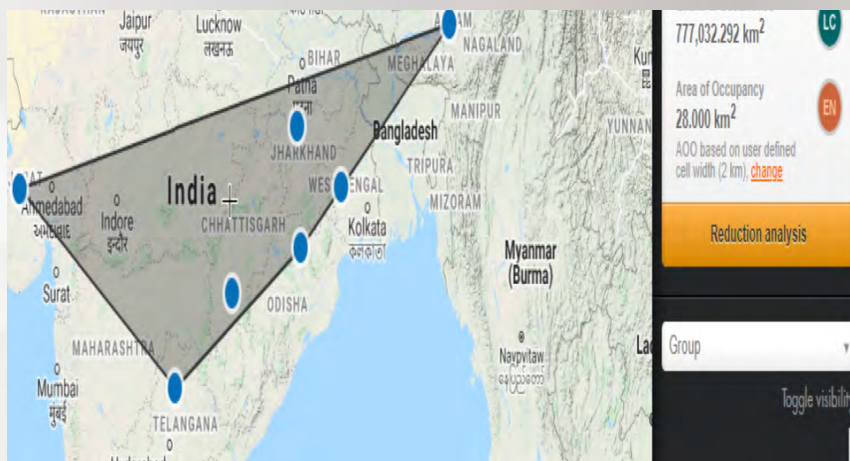


*E. diffusiflora*. © Soumya Das Chakraborti.

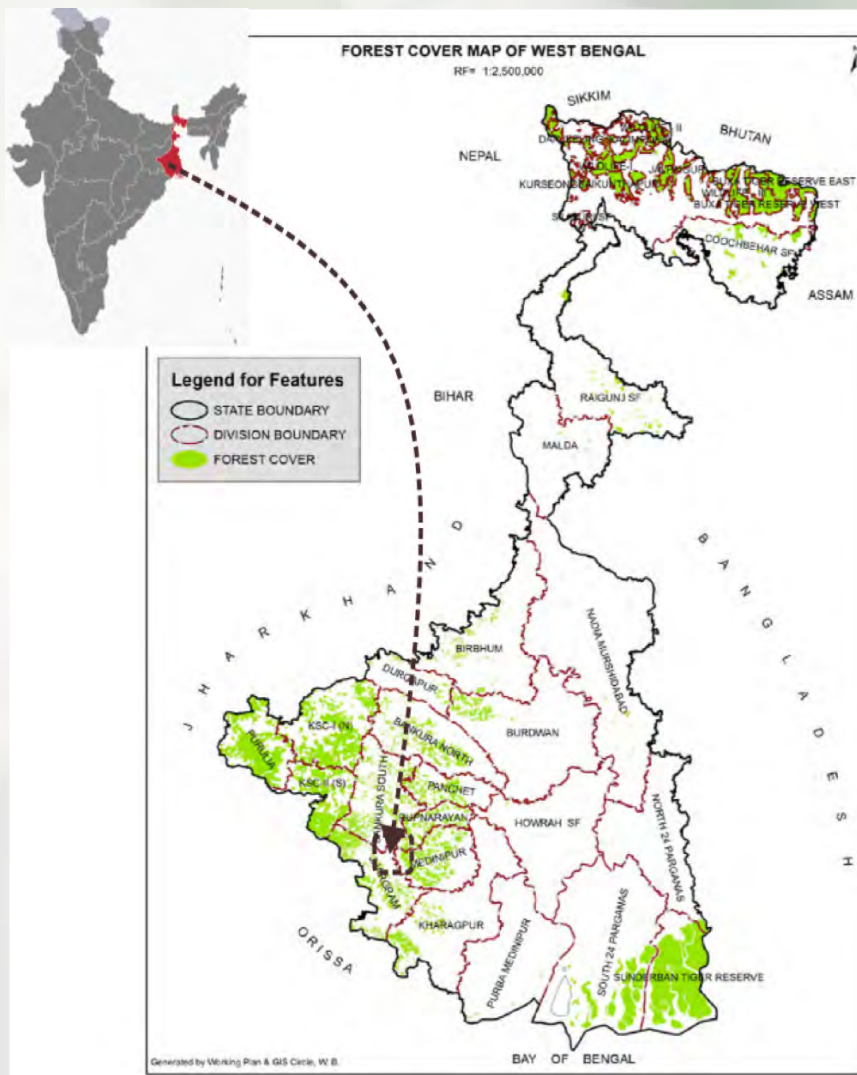
flowering stage. On critical observation and perusal of literature (Hooker 1890; Prain 1903; Misra 2007; Rao 2011; Bhatt et al. 2015) it was identified as *Geodorum laxiflorum* Griff. Recently

by expansion of the genus *Eulophia* (sensu lato) based on molecular as well as morphological data by Chase et al. (2021) included this under the genus *Eulophia* and proposed the name





**Distribution map of *E. diffusiflora* in India with areas of occupancy and extent of occurrence (Map created with GeoCAT: <https://geocat.kew.org>)**



**Study area of *Eulophia diffusiflora* in West Bengal. West Bengal Forest Cover Map. Source: [www.westbengalforest.gov.in](http://www.westbengalforest.gov.in).**

*Eulophia diffusiflora* M.W. Chase, Kumar & Schuit. The genus *Eulophia* comes under sub-family Epidendroideae, tribe Cymbideae, subtribe Eulophiinae and as of now consists of about 270 species. In West Bengal it is known as Paglaguri.

This forest land is a part of Chotanagpur Plateau popularly known as Jangalmahal. This orchid is found in Lalgah-Jhitka Forest Range of Jhargram (Jhargram Forest Division), Paschim Medinipur (Rupnarayan Division) up to an extended part of the forest Bankura District (Bankura South and Panchet Division), Ajodhya Hills in Gobaria Forest (Purulia Division) of West Bengal. The fresh flowers were collected and dissected. Images are attached.

*Geodorum laxiflorum* W. Griffith, *Calcutta J. Nat. Hist.* 5: 356 (1845); J.D. Hooker, *Flora of British India* 6: 18 (1890); Plant terrestrial, perennial, geophytic herb, ca. 30–35 cm tall. Corms in chain, compressed laterally, globular to ovoid, greenish brown, with scars of fallen

leaves ca. 2.4–4 cm X 4–6 cm. Roots few, vermiform, 0.2 cm X 6–10 cm, yellowish to brown. Stem acaulescent, pseudo-stem ca. 10 × 1 cm, enclosed by four foliar imbricating sheaths ca. 8–10 cm. Leaves 2–3, cauline, alternate, distichous, ca. 12–20 × 3–5 cm long, elliptic-lanceolate to ovate-lanceolate, plicate, acute to sub-acuminate, base elongate to form sheathing base, margin undulate.

Inflorescence shorter than the leaves, 18–22 cm long, arising laterally from the base of pseudo-bulbs, bearing white membranous sheaths at base. Peduncle erect, ca. 20–27 × 0.2 cm, green, rachis decurved at the top, with four membranous tubular sheaths; ca. 2.5–4 cm long with two sterile bracts; pedicel with ovary 1.3 cm long, ribbed; bracts green, oblong lanceolate, ca. 1.1 × 0.3 cm, membranous with acute apex, 3 veined, ca. 1 × 0.3 cm. Raceme laxly diffuse flowered with 6–14 flowers. Flowers white to off-white, sepals and petals spreading, 1.5–2.5 cm across. Sepals 3, subequal, 7-veined, lateral



**Inflorescence of Swamp Orchid *E. diffusiflora*. © Soumya Das Chakraborti.**

veins branched; dorsal sepals oblong, acute, 2.4 × 0.7 cm; lateral sepals oblong, acute, base oblique, ca. 2.4 × 0.6 cm.

Lip superior, sessile, cymbiform, square-shaped, entire, emarginate, 14-veined, base ventricose, ca. 2 × 1.7 cm; epichile undulate, edges deflexed; disc with warts and brown coloured thick dots starting at the base of the hypochile and ending before the apex; hypochile golden brown within, epichile base yellow and apex pink-coloured. Column 5–6 mm long, short, stout, hairy, apex with teeth at the side; anther ca 2.6–2.8mm, ovate-

orbicular, 2-lobed, white; caudicle broadly spathulate or subquadrate, apex dilated, hooded towards pollinia; viscidium ovate-subcordate, light brown; clinandrium shallow, prolonged, or acuminate behind, keeled, with a conical tooth towards the stigma. Capsule spindle shaped ca. 4–6 cm long.

As the name suggests, Pink-flowered Swamp Orchid it grows in swampy humus rich soil to laterite rich soil in the shady *Shorea robusta* dominated forest. Extremely rare in dry deciduous forests, at an elevation range of about 135 m.





Whole plant with fruit. © Soumya Das Chakraborti.

Flowering: May–July.

Fruiting: July–September.

**Distribution: Endemic to India** (Assam, Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Odisha, Telangana, and West Bengal).

#### Associated species:

1. *Shorea robusta* C.F.Gaertn. Dipterocarpaceae
2. *Curculigo orchiodes* Gaertn. Hypoxidaceae
3. *Aristolochia indica* L. Aristolchiaceae
4. *Chromolaena odorata* (L.) R.M.King & H.Rob.

Asteraceae

5. *Chlorophytum borivillianum* Santapau & R.R.Fern.

Asparagaceae

6. *Curcuma montana* Roxb.

Zingiberaceae

7. *Ichnocarpus frutescens* (L.)

W.T.Aiton Apocynaceae

8. *Casearia graveolens* Dalzell

Salicaceae

9. *Hemidesmus indicus*

(L.) R.Br. ex Schult.

Asclepiadaceae

10. *Flacourtia indica* (Burm.f.)

Merr. Flacourtiaceae

11. *Chlorophytum*

*borivillianum* Santapau & R.R.Fern. Anthericaceae

12. *Morinda citrifolia* L.

Rubiaceae

13. *Evolvulus nummularius*

(L.) L. Convolvulaceae

14. *Stephania japonica*

(Thunb.) Miers

Menispermaceae

15. *Lygodium japonicum*

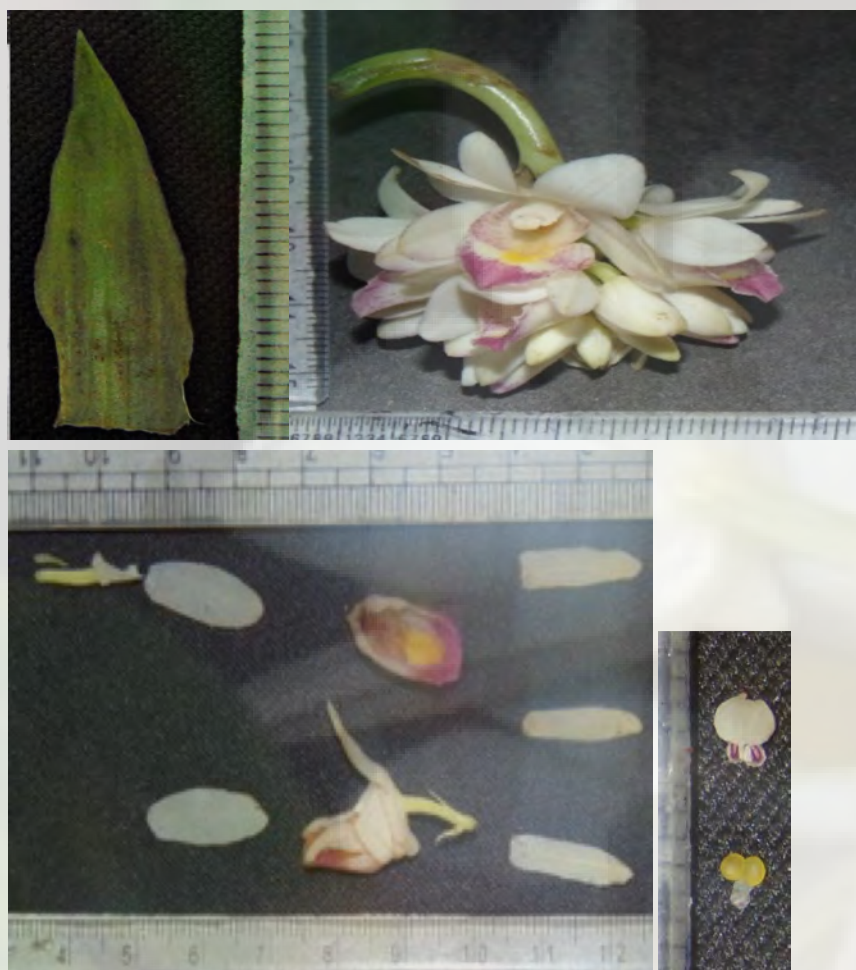
(Thunb.) Sw. Schizaeaceae

16. *Hemionitis tenuifolia*

(Burm.f.) Christenh.

Adiantaceae.

This species is reported from seven states of India, but the exact field status and population size is not known. More intensive floristic survey is required to assess its exact IUCN Status. A preliminary



**Bract, flowers, dissected floral parts & pollinia. © Soumya Das Chakraborti.**

GeoCAT analysis is provided.

This endemic orchid is found in extremely rare swampy habitats in tropical dry deciduous rain forests.

These habitats are threatened by various anthropogenic activities such as agricultural invasion in the forested land as well as environmental threats such as invasive species, irregular, and heavy rains and requires immediate conservation measures.

## References

- Bhatt, M.R., J.S. Jalal & P.S. Nagar (2015).** Extended distribution of *Geodorum laxiflorum* (Orchidaceae) in Gujarat, India. *Richardiana* XV(9): 333–341.
- Chase, M.W., A. Schuiteman & P. Kumar (2021).** Expansion of the orchid genus *Eulophia* (Eulophiinae; Epidendroideae) to include *Acrolophia*, *Cymbidiella*, *Eulophiella*, *Geodorum*, *Oeceoclades* and *Paralophia*. *Phytotaxa* 491(1): 47.
- Hooker, J.D. (1890).** Orchidaceae In: *Flora of British India* Vol.6. L. Reeve & Co. London. 1017pp.
- Mitra, S., S. Bandyopadhyay and S. K. Mukherjee (2020).** Taxonomic

census of orchids of West Bengal, India, *Plant Archives* Vol.- 20 No. 2, 2020 pp. 3951–3980.

**Misra, S. (2007).** *Orchids of India: A Glimpse*. Bishen Singh Mahandira Pal Singh, Dehra Dun, 402pp.

**Prain, D. (1903).** Orchidaceae In: *Bengal Plants* Vol-II. N. W & Co. Calcutta.

**Rao, B.R.P. & K. Prasad (2011).** *Geodorum laxiflorum* Griffith (Orchidaceae), a new distributional record for southern peninsular India. *Journal of Indian Botanical Society* 90(1&2): 195–196.

**Singh, S.K., D.K. Agrawala, J.S. Jalal, S.S. Dash, A.A. Mao & P. Singh (2019).** Orchids of India: A pictorial guide. Botanical Survey of India, Kolkata, 548pp.

## Soumya Das Chakraborti

A science communicator and researcher, Sitarampur Village, Chingra Post, Sarenga, Bankura District, West Bengal 722150, India. Email: soumya.daschakraborti@gmail.com

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Scientist: B.A. Daniel

Researcher: R. Marimuthu, Priyanka Iyer

Other staff: B. Ravichandran, K. Geetha, S. Radhika, Arul Jagadish, K. Raveendran, S. Sarojamma

ZOO'S PRINT magazine is informal and newsy as opposed to a scientific publication. ZOO'S PRINT magazine sometimes includes semi-scientific and technical articles which are reviewed only for factual errors, not peer-reviewed.

## Address

Zoo Outreach Organisation

Post Box 5912, 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti, Coimbatore, Tamil Nadu 641035, India

Phone: +91 9385339862 & 9385339863

E-mail: [zooreach@zooreach.org](mailto:zooreach@zooreach.org)

Website: [www.zoosprint.zooreach.org](http://www.zoosprint.zooreach.org),

[www.zooreach.org](http://www.zooreach.org)





Pleiades is known as  
Karthigai in Tamil. Taurus  
Constellation is known as  
Rishabam (the zodiac sign).  
Aldebaran is known as  
Rohini in Tamil .