

ZOO'S PRINT

Communicating Science for Conservation

Magazine of Zoo Outreach Organization
www.zoosprint.zooreach.org

ISSN 0971-6378 (Print); 0973-2543 (Online)
Vol. XXXVI, No. 12, December 2021



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Cover photo: An ambigram art of life by Usha Ravindra.

An Ambigram art is a fun play with words where one can read the same words upside down. The words: Monera, Protista, Animalia, Plantae, Fungi (written in order, inside bluegreen globe, our planet) are the five kingdoms of life known to exist only on Earth, while the orbits are representative of our classic, age old quest on 'what is life?'

Romulus Earl Whitaker

a conversation with a reptile guru

RHATC 
Follow the Leader



Romulus, known as Rom to most, famously called the snake man of India is a herpetologist, conservationist, Green Oscar, and Padma Shri awardee whose work has made remarkable contributions to conserve the reptiles of India. When RHATC fellows from Zoo Outreach Organization got an opportunity to meet Rom at the Liana Trust on 29 October 2021, to most of us it was our dream come true. We had a wonderful time conversing with the legend and got to know a lot about his work on cold-blooded animals. Even at the age of 78, he is active and his passion for snakes has not dwindled with age. Thanks to this brilliant snake man working tirelessly for the conservation of reptiles in India who inspires lot of young herpetologists and wildlife conservationists.

Childhood journey

Rom's interest in snakes began at the age of four during 1947 when he first held a snake in his hand in upper New York, in search of spiders and insects during his exploration of the countryside with his friends. He recalls an event with his mother Doris Norden, when he brought home an American garden snake (non-venomous); to his surprise his mother encouraged him and bought him first book on snakes. Rom's mother married Ram Chattopadhyaya, a pioneer in colour film processing and moved to Bombay when Rom was seven. Rom fell in love with the snakes of India and met snake charmers in Bombay.

During his school days in Kodaikanal, Rom met his first venomous snake the Russell's viper that he scooped up with a butterfly net and encouraged by a science teacher to keep it in the aquarium; it built his confidence to take care of the natural world.

Conservation programmes

Rom and colleagues founded the Madras Snake Park in 1970 and Rom and Zai Whitaker set up Asia's first crocodile breeding centre at Madras in 1976 which is now known as the Madras Crocodile Bank Trust & Centre for Herpetology with the specific goal of securing breeding populations of the three species of Indian crocodiles: the Mugger (*Crocodylus palustris*), the Saltwater Crocodile (*Crocodylus porosus*), and the rarest of all, the Gharial (*Gavialis gangeticus*).

The park received early support from the World Wildlife Fund and other international organizations for its pioneering research and work in conservation. The campus of 8.5 acre

is now home to 17 species of crocodiles, turtles, snakes, and lizards. The trust drew the attention of lots of tourists, celebrities, and dedicated young volunteers. Rom became a familiar figure in this Tamil city.

Rom set up a snake venom extraction venture outside Bombay to supply medicine producers. He was introduced to the Irulas, the tribal snake catchers during his field trips to Madras to buy snakes. The tribals were not allowed to kill snakes for the skin industry and he and other colleagues helped them start the Irula Snake-catchers Cooperative Society to catch snakes and to collect the precious venom. Rom's innovative idea helped in providing livelihood to these communities.

Rom and colleagues campaigned to save Silent Valley, an iconic Kerala rainforest, which hit the headlines. Creative conservation move was in place with good collaboration in India which gathered a lot of support from like-minded groups.

Rom fell in love with Agumbe in 1971 during his first visit in search of the King Cobra at the invitation of Kenneth Anderson. In Agumbe he encountered a black tail and caught the snake which was a King Cobra and he still remembers his first interaction where he was face-to-face with the king of snakes. He described that he can never forget the feeling of facing that magnificent 12-foot-long snake all alone and the crazy time it took to get it into a bag.

Agumbe Rainforest Research Station (ARRS) is a field based conservation and research organization founded in 2005 by Rom inside the Agumbe reserved forest in the Western Ghats.

Rom headed a long term study on the ecology and behavior of the King Cobra and catalogued the biodiversity of the region. Rom received two awards in 2009, one indigenous: the Salim Ali Award from the Bombay Natural History Society and one from Switzerland: the Rolex Award for Enterprise for his project on facilitating the establishment of a network of rainforest research conservation and bases around India. Many of the people who were trained by Rom are well know herpetologists.

Published articles and documentaries

Rom has published widely over 200 scientific and popular articles plus several books, including 'Common Indian Snakes, A Field Guide'. He has produced, directed, and presented dozens of wildlife films and wildlife documentaries for National Geographic Television, Children's Film Society of India, and others with the King and I being the most popular.

Survival from snake bite

Rom mentioned getting bitten by a venomous snake is so dumb and nothing to be proud of. He thinks all his snake bites were funny

because he did something stupid, like the first, a water moccasin; the log went under as he was reaching for the snake's neck and it turned at the last moment and nailed him perfectly, while he was pinning on a log in the Everglades. The two rattlesnake bites out in Texas were painful.

Rom's opinion

In Rom's opinion, India being a snake country, people and snakes can coexist well. For example, in few villages of West Bengal people are coexisting with cobras and in a place like Agumbe, people worship snakes; they are more tolerant towards them being in their vicinity. Rom says, education and awareness play an important role in understanding the snakes around us.

Change in peoples' perception towards fear of snakes is essential in better coexistence of snakes and humans in India. The need of the hour is for primary health centres to be trained to deal with snake bite.

Ashritha Anoop

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

Swetha Stotra Bhashyam: a leader of the Global Youth Biodiversity Network



SWETHA STOTRA BHASHYAM, INDIA

“ Swetha Stotra Bhashyam is a budding wildlife biologist from India. She is the Global South Focal Point for the Global Youth Biodiversity Network. She works on policies issues under the Convention on Biological Diversity. She is currently facilitating the creation of GYBN National Chapters and also coordinating several on ground biodiversity conservation projects.




Policy is the ultimate tool to create a permanent change in society. So engaging policymakers at the highest level is an important step to conserve species and their natural habitats. Swetha Stotra Bhashyam is a leader of the Global Youth Biodiversity Network (GYBN) and one of the official youth constituencies of United Nations Convention on Biological Diversity (CBD).

She is a prominent youth voice in influencing policy. She played an instrumental role in the creation of GYBN's many national and regional chapters. She started her talk with a

brief about how she started her journey in climate activism when she was an undergrad in 2009. As soon as she knew about the climate crisis, she wanted to spread awareness to everyone about it. She tried to modify her campaign in many creative ways like talking to people about climate change in blood donation camp, influencing people and catering staff in train while travelling from Delhi to Hyderabad as a part of campaign 350. She was selected for the Climate Conference of the Parties (COP) where she came to know about the difficulties of

influencing the policymaking process. After attending the Climate COP she shifted to Biodiversity COP to avoid the politics happening in the previous one. After that she tried for the Indian Forest Service exam to make a change in the system but was rejected in the interview, unfortunately.

Then she met Sanjay through Priyanka in Biodiversity COP 2012 in Hyderabad. After volunteering at Zoo Outreach Organization, she joined NCBS wildlife masters programme to pursue her career in wildlife field. She witnessed the conflict of human rights and



RHATC Fellows attending Swetha's 'Follow the Leader' session.

wildlife conservation in political extremism affected areas of India during her field excursion of NCBS Masters program. She worked on "CBD in a Nutshell" as a main author besides doing the masters course. After completing her masters, she started doing workshops with young students of various countries on the climate crisis as a part of CBD.

Swetha later introduced us to how Global Youth Biodiversity Network is helping local chapters to raise funding, networking and connecting to the right people to save a particular habitat or a species. She also talked about Aichi Biodiversity Targets and Global Biodiversity Framework. She emphasized on the need for fundamental change of industries as well as holistic cultural change in favour of nature and environment through education. After that she brought out the point of indigenous knowledge and its contribution to the conservation of natural resources. Indigenous communities have been conserving nature for thousands of years in their own cultural and philosophical

way. So the conservation of those indigenous cultures is also significant to conserve natural resources. They are living in 3% of the land and protecting 80% of biodiversity. She highlighted the uneven distribution of food, food wastage, and the crisis because of it. On a global scale everything is interconnected and it needs a whole system change to fix the problem. She talked about the carbon footprint of meat consumption and the 'meatless Monday' trend in the first world countries to reduce their dependence on meat, though Indian culture is already practicing it in its own way. She touched upon controversial topic like 'cool veganism' which people practice only as status symbol. At last she advised that we should choose our role in the fight for nature on the basis of our own strengths and skill sets. She ended her talk with a quote by Yoko Ono, "A dream you dream alone is only a dream. A dream you dream together is reality".

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

Aparna Krishna, an influence for today and hope and necessity for the world tomorrow....



“Would my sacrifice alone contribute? Does it make sense, if its only me who tries it? Will I alone be able to save this world?” In this era of agony and despair it takes a lot of strength and motivation, to begin the change alone, all by yourself. Just like the 17-year-old climate activist, Greta Thunberg, once said, “You must take action. You must do the impossible. Because giving up is never an option”, but how many of us can stand up to do the impossible, be it even in our daily lives?

Here comes the story of a self-empowered youth, who went through the dilemma of eco-depression, “what have we done, what are we doing to our home planet?”, and finally realising how she could bring the change. The lone fact of her taking an action against what she felt and working towards it makes me think greatly of her. Being an electronics and electrical engineer, Aparna Krishna had remained detached from the environment early in her life. She works at Bosch, as a calibration engineer, for functional safety; and interestingly she has personified all the devices and their parts that she is working on. While working in the electric vehicle sector, she came across a video on Kerala floods, and that was all it took to make Aparna work towards the wellbeing of the planet she is living on. Since then, she has been volunteering with several organisations across

Coimbatore, she has learned about Miyawaki forests, been to lake clean ups, restorations, stray dog welfare, tried to look for natural building materials, inks, and is also involved in building a sustainable university campus. Besides her job, she donates her weekends to environmental welfare, and is also working closely with a start-up called Iku, a social media platform which focuses on building communities for sustainability. Disconnected, as the youth is today, Aparna aims to make human communities interconnected and self-sustained for a better future. She is eager to work with communities and work with them to fight climate change and pollution. She wants to find herself with least possible carbon footprint and personally lead a sustainable and plastic free life in future. While volunteering all across she came to know the role of plastic as one of the major villains and was all set to take action against it, just like a true hero.

She visited the RHATC Fellows, and like a true leader she inspired all of us. Giving us a sneak peek into her life, she told us how all the products she uses, starting from her soap to her toothpaste, everything is eco-friendly and plastic free. She did sound a bit worried recalling the fact that she couldn't come up with a good substitute for shampoo, enough to explain her dedication. Not only this, she reuses all the plastic she



Eco-Gifting!
No plastic tape
Reused paper, Natural flowers
Cotton thread to hold



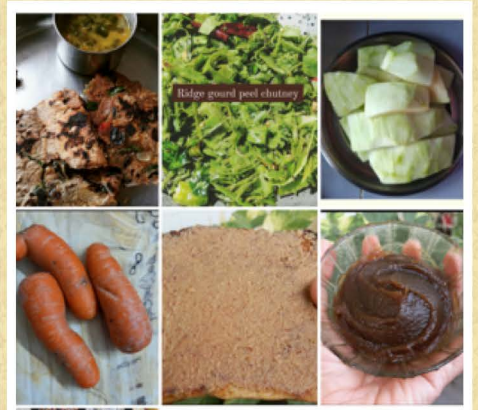
Use paper not plastic ribbons!



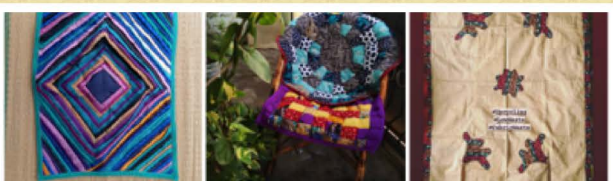
Shampooooooo!! Bathing Soap?



Hair care + Bathing needs!
Soapnuts, besan, arappu,
Hibiscus leaves, Shikakai,
Grounded Raw rice + moong
& random experiments!



Food diversity & waste
1. Include millets, diverse foods
For better nutrition & soil health
2. Food scrap to recipes
3. Buying "Ugly" veggies
4. Make peanut butter, jams
at home to avoid transport footprint



Waste is not waste,
until we waste it!
1. Fabric waste to mats, seaters etc
2. Flower waste to personal care
3. Onion peels to natural colours

The shields of an Eco-Warrior



Refuse single-use by carrying reusables
Use what you have.



Simple, but most impactful
Carry your bag.

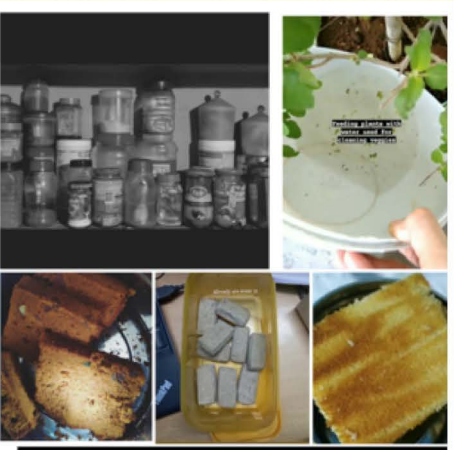
Create pouches out of fabric scraps to avoid single use plastics



Rejuvenate in nature, get back strongly on why you do, What you do!



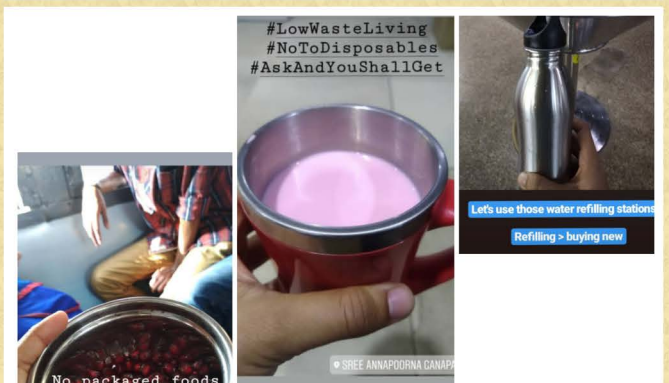
Avoiding smaller plastics
1. Cut the corner, but leave it intact. Will not choke animals/birds!
2. Use coir scrubs, to avoid microplastics into waterbodies and ultimately oceans
3. Manage dry waste properly. Clean it, Dry it, recycle it



Reusing what we already have.
1. Old product bottles, to store new spices/groceries
2. Reuse veggies washed water for plants, reduce water usage
3. Existing boxes, to buy snacks guilt free :)



Questions to ask before buying new:
1. Do I really need it?
2. If yes, is there something I can lease or reuse?
3. If no, Can I borrow it for a short time?
4. If no, can I buy it second hand?
5. If no, I can buy, but is there a sustainable product, which is in my budget too?
6. If no, then buy it.
Always wait, the impulse to buy will fade. Give it few days, if you still need it, go for it!



No packaged foods
A low waste travel by carrying reusables!

gets due to packaging. Also, she influences her friends and her roommate to follow the same, and has been successful enough to start a Coimbatore chapter of The Gigatonne Challenge, a big step towards climate change and climate action, with two of her friends because it wasn't possible for her to do it alone. Shyly, I remember, she mentioned how her friends used to make fun of her choices and how she would choose cleanliness drives over friend outings, and with a spark in her eyes suddenly she said, "but now they ask me about such drives and also join me at times". She also influences people through social media and has a big fan base who out there are following her, be it trying out her floor cleaner recipes or her face pack preparations. But something that intrigued me was, she always came back to a point, "Nature is not something out there. Nature includes us, we are pretty much a part of it and we are just a small part in a vast interconnected and an interdependent web, equally humble and empowering". So beautifully she put up her thought across and achieved understanding it to her audience! Inspired by Arun Krishnamurthy, founder of Environment Foundation of India, I guess she has done and is doing a lot to make her idol proud. As much interesting her journey as an environmentalist is, so is her life. She is a little bit of everything, a hula hooper newbie, a freelancing environmental volunteer, sustainability enthusiast, a dancer, and a person who tries to use traditional knowledge and skills to have less impact. She ensures to have a very low waste lifestyle and is trying her best to cut down her carbon footprint, something I guess every informed youth is

trying to do today some way or the other, just that she is one of them who has already excelled in it. She inspired all the RHATC Fellows by her talk, and her aura and her humbleness made her very popular amongst us.

This young environmentalist has been doing her share to save her planet, her home, herself and her future and is an inspiration for all out there. "Imperfect environmentalist" she called herself, but I would leave it up to the audience to decide how perfect and important she is in today's world, and how all of us would love to be influenced by her.



Volunteering with Organisations, Different schools

Trisa Bhattacharjee
 RHATC Fellow, 2021-22, Zoo Outreach Organization, Coimbatore, Tamil Nadu, India.

Vishal Ahuja's conservation journey - a loopy tale



During the IUCN Primates Red List Assessment in 2010 it came to notice that there was very little data on the endemic Chamba Sacred Langur *Semnopithecus ajax*. In order to collect more data and of this species Wildlife Information Liaison Development (WILD) launched the 'The Himalayan Langur Project' in 2012.

The project was kickstarted by Martina Anandam, Tariq Ahmad, and Vishal Ahuja with the guidance of Dr. Sanjay Molur. Vishal Ahuja has a background in Botany and Zoology, and he is native to the town of Chamba in Himachal Pradesh. Chamba is located at an altitude of 1,006 m above mean sea level on the banks of the Ravi River, at its confluence with the Sal River. The terrain is rugged and hilly, and it receives snowfall in winters.

Over the years, 90% of Chamba Valley's oak, pine, and broad-leaved forests have been replaced by a mosaic of terrace agriculture. Only a negligible fragment of ~17 km² of protected forest is left at the Khajjiar-Kalatop Wildlife Sanctuary. Due to the fragmented forests and the conversion of forests to agricultural land there is not enough food plants in the home range for the Chamba Sacred Langurs, Rhesus Macaques, Black Bears, and the Himalayan Porcupine, making them use the land in between fragmented forests and thus, raid crops.

The objective in the first phase of 'The Himalayan Langur Project' was to understand the taxonomy of the Chamba Sacred Langur, its distribution range, mapping of conflict zones and the threats to conservation. This was done through field surveys and community interviews. Of the 244 sites surveyed, the team found out that the Chamba Sacred Langur was found in 124 sites. Of these 124 sites, 76 reported conflicts with Langurs due to crop raiding. During this phase the long-standing taxonomic ambiguity about the Himalayan Langurs, *Semnopithecus ajax* and *Semnopithecus hector* were resolved on morphological basis.

Vishal and his colleagues from WILD also began conducting education and outreach programs and workshops in schools and communities. A book called ACHAMBA was created by Brenda de Groot and the WILD team.

The communities were educated about Gaula, which is the local name for the Chamba Sacred Langur. Up until the workshop the locals did not know that Gaula was endemic to their region, but once they knew there were small changes in the way they viewed Gaula and there was a

sense of pride around it. Once there was a pride around Gaula they worked towards coexistence.

Vishal and the team at WILD also collaborated with the forest department in Chamba to educate the tourist guides about plant identification and equipped and empowered them to share scientific information regarding their identification and importance with tourists. Vishal also takes under trainee forest officers in and around Khajjiar-Kalatop Wildlife Sanctuary for botany tours.

In the second phase of the project Vishal surveyed 51 villages to find out the crop yield lost due to crop raiding. During the study 100% of the respondents claimed that Maize was the most vulnerable crop followed by Barley (43% respondents), 30% respondents responded that wheat was the least vulnerable to damage caused by animals. The results of the survey showed that on average 57% expected yield was lost due to crop raiding. This staggering number made it clear that the communities were severely impacted from crop raiding from the economic aspect. And it goes without saying that for conservation to be successful the support of the local community is required, the situation here was tricky because the community was directly impacted by the wildlife.

In order to mitigate the Human-Animal interaction, in the third phase of the project Vishal focused on understanding the plants the animals feed on. For this he sampled



the vegetation in Khajjiar-Kalatop Wildlife Sanctuary and other areas in Chamba. The total number of plants he sampled and identified to date are 247 species. His observation and records to date show that the langurs, bears, and macaques feed on 25 species of plants.

With the knowledge of what the animals feed on, the final phase of the project was to restore the native vegetation to mitigate the human-wildlife interactions. Another

goal was to improve the sustainability of livelihoods in Chamba.

To achieve both these goals Vishal has partnered with the local farmers to plant a few native trees in their farms. The idea behind this is that the animals are anyways coming to the farm to raid, but if they have their native foods, they will go for that over crops like maize.

In July 2020 the pilot project for restoration began. A total of 110 plants (6 species) were planted in a farm near Gujnui. In February 2021 more native plants were planted in three villages around Chamba. And in June 2021 over 300 native plants were planted around the Khajjiar-Kalatop Wildlife Sanctuary.

In June 2021 Vishal won the Mud on Boots Project by Sanctuary Nature Foundation. The Mud on Boots project has leaders who may not fit the mold, but are self-motivated, dedicated, knowledgeable, innovative, eager to learn, and are making a real difference on the ground, often against formidable odds. The research and restoration efforts achieved thus far by Vishal is no easy feat. The climatic conditions like extremely cold temperatures and snowfall allows him to do field work only in certain months. The terrain he works in is arduous and unforgiving. One of his allies and supporters in the journey of research and restoration is the Forest Department in Chamba.

Besides the research and restoration work Vishal does, Vishal is also a part of a band. He can play seven instruments. He is also

a fitness enthusiast and treks the mountains with his friends. In future he plans to have more education and outreach programs with the help of forest department in communities and schools surrounding Khajjiar-Kalatop WS to encourage and educate them to plant and nurture native food plants preferred by wildlife to reduce crop-raiding and to combat the climate crisis.

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

Guiding towards Nature. A conversation with Payal Mehta

**“Nature has always had more force than education.”
 – Isaac Newton**

Nature guides or naturalists as they are popularly called, are the bridge between nature and people who visit a natural area. The recent past has seen a steady increase in ecotourism. Naturalists such as Payal Mehta not only ensure that their guest, i.e., tourists have a good experience, but also make people fall in love with nature.

It's hardly any child's dream to grow up and become a nature guide. Payal, being from the metropolitan city of Mumbai, never knew this kind of profession existed. Post her Masters' she took up a corporate job. But something must have not fit right because when she heard about Taj Safaris starting a training program exclusively for employees they were going

to hire for their upcoming resorts in central India, Payal grabbed the opportunity. That one decision changed her life. While talking to us RHATC Fellows during an interactive session, she reminisced about how she thoroughly enjoyed going to the same protected area every day. In a bid to check out something new, Payal had stumbled upon something she instinctively knew she would do for the rest of her life.

One may think that nature guides are lucky to be constantly in the wilderness. While it is definitely a perk of the occupation, Payal was quick to point out that sometimes it may not be



all smooth-sailing. There is always the fear of the unknown, the different dynamics of the group that one has to take care of, the disappointment of not sighting an animal, and lastly the struggle to find sufficient time with the family. A nature guide also has to prepare and study beforehand. It is all



worth the hustle of waking up early since you get to explore new places and meet people from all around the world.

Naturalists connect people to nature. And there are several ways to do it; one can work as a nature guide locally, i.e., based in one place as a freelance or as part of a lodge, a travelling guide who is with his/her guest throughout the trip or an entrepreneur who may start their own company. Irrespective of how one decides to pursue this profession, a nature guide's role is not just limited to showing animals or plants to the guests. A nature guide is the primary source of information for that particular region. They are a friend, a helper and in emergencies, a first-aid provider! To be able to play so many roles simultaneously, one needs to have good observation and communication skills apart from knowledge about wildlife.

Payal made us realize that nature tourism can aid conservation. Although, there is

no empirical data to measure the impacts, especially the positive ones, nature tourism can enable a shift in behavior and attitudes with the right guidance and information provided by the naturalist. A good example of that would be to gently nudge tourists to observe the fauna and flora apart from the usual charismatic species such as tigers, elephants, or rhinos. In doing so, not only are other species brought in focus but helps people understand how complex an ecosystem is. Nature tourism is not bound to dense forests and can encourage people to appreciate different landscapes. A country like India is blessed with several types of landscapes that include the rainforests of the north-east, cold deserts of trans-Himalaya, floodplains of Assam, Thar desert in the west, and many more. It might be impossible to show all these landscapes to people but there are smaller places that are representatives of vast landscapes. Kishen Bagh, an ecological park amidst the sprawling city of Jaipur is one such example. Kishen Bagh was initially





changes in land-use and compromised the privacy of local residents. Yet all is not lost. Experts in the field like Payal Mehta, Harsha J., and others are tying up with organisations to come up with courses that will equip future nature guides with tools and techniques necessary for ethical tourism.

created as a cactus garden and had failed miserably. Finally the park was restructured by Pradip Krishen and other like-minded people to represent the diverse micro-habitats of the desert.

A trail through the Park educates the tourists about the semi-arid landscapes called Roee in local culture. The park has planted only natives like Seenio and Bui scrubs, Munj grass and trees like Khejri, Rohida and Dhatura that cloth the undulating dunes. There are also ponds inside the park that welcome various species of birds.

Nature tourism or ecotourism as it is popularly called, not only helps educate the general

public about the importance of conserving natural habitats and its denizens but contribute to the repository of ecological information of a certain place. It creates watchers of the forest who know it well and can tell if the landscape and inhabitants are keeping healthy or not.

Like any other industry, nature tourism cannot keep expanding infinitely. In the bid to widen its avenues, the ecotourism industry is stressing natural resources and increasing our carbon footprint. Lack of formal training has caused disturbances to wildlife. Rapid burst of resorts and lodges to meet the demand of the growing industry has caused

Naturalists present a sneak-peak of the natural world to people. They do so by wearing many hats, including that of a care-taker, driver, educator and the list can go on. They shoulder the responsibility of spreading awareness about the natural world in an ethical and easy-to-digest form. If you are an aspiring naturalist reading this, I hope this article was able to nudge you in the direction Payal hopes to see in the future of ecotourism.

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

Record of albino Trinket Snake from Nashik, Maharashtra, India

On 21 March 2021 we spotted an adult albino Trinket Snake *Coelognathus helena* (Serpentes: Colubridae) at Ozar (20.0947° N & 73.9281° E) Niphad, Nashik near the dense vegetation. The snake was captured by Mr. Sandeep Karate and identified by Mr. Sushant Ranshur. The captured snake was active and healthy. The total body length was 45.72 cm and light pink in colour with patches on the body and with red eyes.

The genus *Coelognathus* (Fitzinger, 1843) includes seven species (*helena*, *subradiatus*, *radiates*, *flavolineatus*, *celebensis*, *enganensis*, and *erythrurus*) of which *C. flavolineatus* (Schlegel), *C. helena* (Daudin), and *C. radiatus* (Boie) are found in India (Schulz 2013). The Trinket Snake is a non-venomous, active and diurnal colubrid snake. The adult trinket is dark brown in colour and shows transverse black spots. A vertical black streak can be found below



Normal and albino Trinket Snake. © Sushant Ranshur.

the eye, whereas an oblique black streak can be found behind the eye. The lower part of the body is yellowish with or without black spots. Albinism is rarely observed

in animals. It is a genetic disorder caused by loss of pigmentation in skin and eyes, hence lacking particular coloration (Sayyed 2012). In complete albinism, both skin



Adult albino Trinket Snake. © Sushant Ranshoor.

and eye lack melanophores while in partial albinism it is only the skin or eye melanophore that is affected (Spadola & Insacco 2010). Mahabal & Thakur (2014) had reviewed the records of colour aberration among the Indian herpetofauna and recorded six instances

of albino *C. helena* from different parts of India but not from Nashik. Hence, the present observation of albino trinket snake could be the first record from Nashik, Maharashtra.

After recording and photographing all details, the

snake was released in the wild with the help of forest department.

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Citation: Dethe, V.D. & S.B. Ranshoor (2021). Record of albino Trinket Snake from Nashik, Maharashtra, India. *Reptile Rap* #214, In: *Zoo's Print* 36(12): 15–16.

Additional distribution record for the Thackeray's Cat Snake from southern Western Ghats

Boiga is a genus of snakes with 35 species, out of which 17 are found in India (Uetz et al. 2021). The Thackeray's Cat Snake *Boiga thackerayi* is the second endemic snake to Western Ghats from the genus, first being *Boiga dightoni* (Giri et al. 2019).

The colubrid *Boiga thackerayi* was described in 2019 from Maharashtra. It is an arboreal snake, is active at night, and is the first known species of *Boiga* which feeds on frog eggs (Giri et al. 2019).

During a night trail on 31 October 2021 around 2140 h in Mojo Plantation spice farm, located near Galibeedu village, Kodagu district, Karnataka, we spotted an adult species of *B. thackerayi* (12.476N 75.709E; 1,100 m) of approximately 1 m long, at a height of about 1.5 m on a Cardamom plant *Elettaria cardamomum* which was right next to a pond. Several individuals of the charismatic Little Tree Frog *Rhacophorus lateralis*, endemic to Western Ghats, were also observed and on the Cardamom plants.



Dorsal view of head of Thackeray's Cat Snake *Boiga thackerayi* from Mojo plantation, Kodagu District, Karnataka, India.
© Arpan Joshi.



Side view of head of Thackeray's Cat Snake *Boiga thackerayi* from Mojo plantation, Kodagu District, Karnataka, India.
© Arpan Joshi.



Dorsal body of Thackeray's Cat Snake *Boiga thackerayi* from Mojo plantation, Kodagu District, Karnataka, India.
© Arpan Joshi.



Habitat at the site where the Thackerayi's Cat Snake was spotted at Mojo Plantation. © Ashritha Anoop.

The snake was found in a rain forest habitat with native trees which also had plantations of Black Pepper, Cardamom, Coffee, Vanilla, Cinnamon, Kokam, Ginger, Turmeric, Allspice, and other fruits and vegetables.

The snake was identified by the pattern and coloration. The snake had smooth scales with no keels or apical pits on the dorsal side. It was uniform brown in colour with dark blotches all over the dorsal body and paired subcaudals. We did not collect the specimen because we did not want to disturb the snake. Thus, the detailed scale count or any other identification method was not done.

Boiga thackerayi is distributed in the states of Karnataka, Tamil Nadu, and Kerala from the Western Ghats. This is an additional sighting from the state of Karnataka other than the locations listed in Ganesh et al. (2021).

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Acknowledgements: I thank Arpan Joshi and Ashritha Anoop for their contributions of photographs.

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Citation: Komanduri, A. (2021). Additional distribution record for the Thackeray's Cat Snake from southern Western Ghats. *Reptile Rap* #215, In: *Zoo's Print* 36(12): 17–18.



Conservation of the Indian Flying Fox at Murappanadu Sacred Grove in Tamil Nadu

The order Chiroptera comprises 25% of all mammal species (Mickleburgh et al. 2002) and the global number of taxa now exceeds 1,400 species. India is known to have more than 127 species of bats (Talmale & Saikia 2018), and in Tamil Nadu, there are 35 species of bats (Kamalakannan & Nameer 2019). Among them, the Indian Flying Fox *Pteropus medius* Temminck 1824 (formerly *Pteropus giganteus*) is the largest.

Flying Foxes aid in seed dispersal for nearly 300 plant species and play a vital role in forest regeneration (Shilton et al. 1999). Despite their ecological services, they are still threatened by hunting for meat and habitat destruction due to anthropogenic encroachments in several cases (Dey et al. 2013) leading to consistent decrease (Venkatesan 2007) and becoming locally threatened. Hence, it necessitates the need



A view of 'Inthu Marathu Sudalai' sacred grove at Murappanadu Village and a colony of Indian Flying Fox *Pteropus medius* roosting in the trees, *Terminalia arjuna* and *Ficus religiosa*. © M. Punitha Stephen & K. Kamaraj.



to recognize and study the roosting and foraging landscapes of *P. medius* in order to understand their habitat selection strategy which will enable us to provide information for the planning of forest management strategies for conserving *P. medius* (Mildenstein et al. 2005). Even in these situations, *P. medius* and its roosting areas are conserved thanks to sacred groves, they are forest fragments protected by local communities as being the sacred residence of local deities and sites for religious cultural rituals. There are numerous sacred groves in and around Tamil Nadu such as Agraharam and Palakode in Dharmapuri and Nattamangalam in Salem (Murugan 2019), Madhukaatu Kali sacred grove in Pudukottai, Tamil Nadu (Tangavelou et al. 2013). These places serve as valuable storehouses of biodiversity. Sacred groves are distributed over a wide ecosystem and help in the conservation of rare and endemic flora as well as fauna (Mohanta et al. 2012; Tangavelou et al. 2013). In this context, the roosting ecology of *P. medius* in a sacred grove of Thothookudi District was documented.

The distribution and survey of *P. medius* bats was studied in a sacred grove of Murappanadu village (8.7170° N; 77.8317° E), Karungulam block in Thothookudi District of Tamil Nadu during January 2017 through March 2021. This sacred grove locally called 'Inthu Marathu Sudalai' temple which covers an area of about 200 acres is located 150 m away from the running perennial Tamirabarani River. This is one kilometer away from Murappanadu village, the northern side of

the Tirunelveli-Thoothukudi National Highway (NH 138). The ecologically unique features in the sacred landscape have facilitated bats to select the roosting place in the particular habitat.

In the study area, a bat colony of *P. medius* (ca. 250) was observed in undisturbed conditions in three trees. The height and girth at breast height (GBH) of *Ficus religiosa* (tree #1) is 28 m and 243 cm, *Terminalia arjuna* (tree #2) 24 m and 152 cm, and *Terminalia arjuna* (tree #3) 27 m and 182 cm, respectively.

In this sacred grove, the bats are considered as sacred animal and worshipped by the local people residing in and around the villages. They believe that the bats are serving as guards protecting the tree and the deity would punish if anybody hurt the bats. Thus, the bat colony is protected inside this sacred grove for several decades.

Fruit bats in India cause considerable damage to the orchards and get themselves killed in the hands of cultivators (Srinivasulu & Srinivasulu 2002). In such a reality, it is surprising to hear that bats are still conserved by local communities. One such unique habitat is our study area (250 bats), where the bat abundance is lower than Madhukaatu Kali sacred grove (431 bats on *Acacia leucophloea* and *Pongamia pinnata*) (Tangavelou et al. 2013) while lower than Agraharam (500 bats on *T. indica*), Palakode (2,000 bats on *Ficus religiosa*) in Dharmapuri and Nattamangalam (1,000 bats on *T. indica*) in Salem (Murugan



2019). Extirpation of any species from the ecosystem will have hazardous impact on the ecosystem. When an animal like *P. medius*, a potential seed disperser is removed, the results will be disastrous. As its population is declining consistently, it is vital to conserve its roosting places in order to maintain their healthy population in this anthropogenically influenced ecosystem. In the future, environmental awareness program to these local peoples can be conducted to focus on the ecological importance of the flying foxes in sacred grove and its beneficial role as a pollinator and seed disperser and health hazards arise due to hunting and consumption of bats.

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Acknowledgements: We thank: the University Grants Commission (UGC), New Delhi, and SERB, Department of Science & Technology, Government of India, for their financial assistance through major research projects; Dr. S. John Kennady, principal; and the management of St. John's College, Palayamkottai for the support and help in providing facilities.

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Citation: Balamurugan, S., E. Sophia, D.P. Swamidoss & S.S. Isaac (2021). Conservation of the Indian Flying Fox at Murappanadu Sacred Grove in Tamil Nadu, India. *Small Mammal Mail #440*, In: *Zoo's Print* 36(12): 19–21.

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Invertebrate Conservation & Information Network of South-Asia (ICINSA)

Newsletter of the
Invertebrate Conservation & Information Network of South-Asia (ICINSA)

First record of Blackvein Sergeant from southern West Bengal



Blackvein Sergeant *Athyma ranga* sighted in Gobaria Forest of Ajodhya Hill, Purulia, West Bengal, India. ©Adarsha Mukherjee.

Sergeant butterflies belong to the *Athyma* genus. This genus belongs to the brush-footed butterflies of the subfamily Limenitidinae under the family Nymphalidae (Saji & Ogale 2021). This species is also legally protected under Schedule II of Indian Wildlife Protection Act of 1972 (Saji & Ogale 2021).

The butterfly Blackvein Sergeant *Athyma ranga* Moore 1858 has a distribution in India along Western Ghats from Karnataka to Kerala,

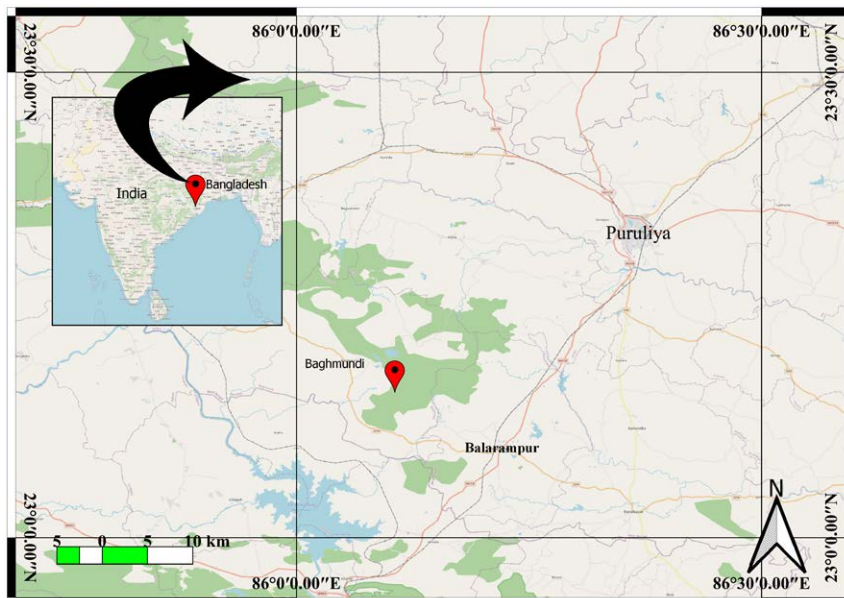
central India and North-East India in Arunachal Pradesh, northeast Sikkim, Tripura, Assam, Meghalaya (Smetacek 2017; Kehimkar 2016; Saji & Ogale 2021)).

The author photographed a single specimen of Blackvein Sergeant during a field study on 07 December 2020 at 1401h from Gobaria Forest of Ajodhya Hills in Purulia, West Bengal using a Nikon D5600 camera with 70–300 lens. The specimen was not collected from the study area.

The species was identified on the basis of UP single prominent broad white band on wings crossed by black veins, no cell streak but obscure bluish spots on UPF, discal spot in 1b not joined to spot in 2 (Kehimkar 2016). Also, the image of the species was uploaded on the Butterflies of India website with media code fx184 (Saji & Ogale 2021). The area Gobaria Forest where the species was sighted is under Ajodhya Hills of Purulia District. The Gobaria Forest

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Study area where Blackvein Sergeant *Athyma ranga* was sighted.

is a dense forest of Ajodhya Hill & Chota Nagpur Plateau. According to Google Earth, Gobaria Forest where Blackvein Sergeant *Athyma ranga* was sighted is located at 23.10°N & 86.06°E, 361 m elevation. The study area is a dry deciduous forest with some moist patches & the temperature varies between 2.8°C to 52°C (Samanta et al. 2017). The average annual rainfall of the area ranges 1,100–1,500mm (Das 2016).

The species Blackvein Sergeant *Athyma ranga* is reported from north Bengal

(Sinha et al. 2019) but there is no mention of the species from the districts of West Bengal under Chota Nagpur Plateau Area: Purulia, Bankura, and Midnapur (Samanta et al. 2017; Das 2018; Mukherjee & Mondal 2020; Mahata et al. 2020). As well as *Athyma ranga* was not reported from Howrah, Kolkata, Nadia, North & South 24 Parganas (Mukherjee et al. 2015). So, this is the first record of Blackvein Sergeant *Athyma ranga* from southern West Bengal.

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Citation: Mukherjee, A. (2021). First record of Blackvein Sergeant from southern West Bengal. *Bugs R All* #218, In: *Zoo's Print* 36(12): 22–24.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) published with the financial support of Zoological Society of London.

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Acknowledgements: I am thankful to the Purulia Forest Department. I am thankful to the reviewers. I am thankful to all the members of the Green Plateau (Non-Governmental Organization). I am also thankful to Mr. Subhendu Khan, Mr. Ayan Mondal, Mr. Supriya Samanta, Mr. Aniruddha Singhamahapatra, Mr. Diptesh Goswami, Mr. Supriya Mahato, Mr. Arjun Kumar, Mr. Debashis Mahato, Mr. Ankit Goswami, Mr. Arindam Sanu Dey, and Mr. Santanu Bag for their encouragement, support, and help.



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Toddalia asiatica: new larval host plant of two *Papilio* species from eastern India

Toddalia asiatica (L.) Lam. is a woody climber plant, member of Rutaceae family. It is a native plant in many countries of Africa and Asia. In the Indian sub-region *T. asiatica* is confined to the lower subtropical Himalaya, in southern India it is common in Nilgiri and Palani Hills, in the Eastern Ghats of Andhra Pradesh, in the scrub forests of Odisha as well as in coastal areas of southern West Bengal (Rajkumar et al. 2008; Sen & Bhakat 2018).

T. asiatica is already known as larval host plant of few Indian butterflies. These are Common Banded Awl *Hasora chromus chromus* (Cramer, [1780]) (Hesperiidae), Red Helen *Papilio helenus daksha* Hampson, 1889, Paris Peacock *Papilio paris tamilana* Moore, 1881 (Papilionidae) and Small Salmon Arab *Colotis amata modestus* (Butler,

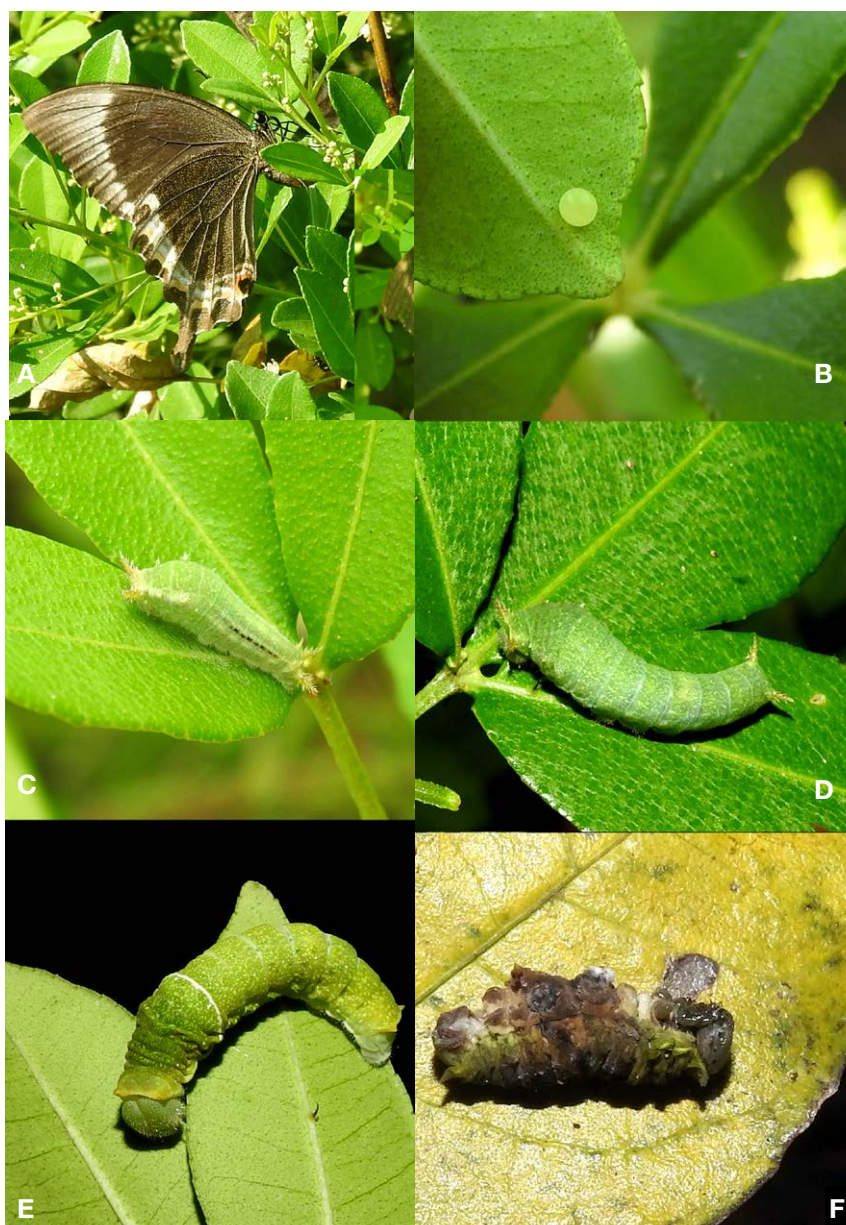


Image 1. *Papilio crino*: A—Female *P. crino* laying eggs on *T. asiatica*. (31.x.2020) | B—Egg of *P. crino* (31.x.2020) | C—Larval stage of *P. crino* (12.xi.2020) | D—Larval stage of *P. crino* (17.xi.2020) | E—Larval stages of *P. crino* (21.xi.2020) | F—Dead caterpillar of *P. crino* (26.xi.2020).

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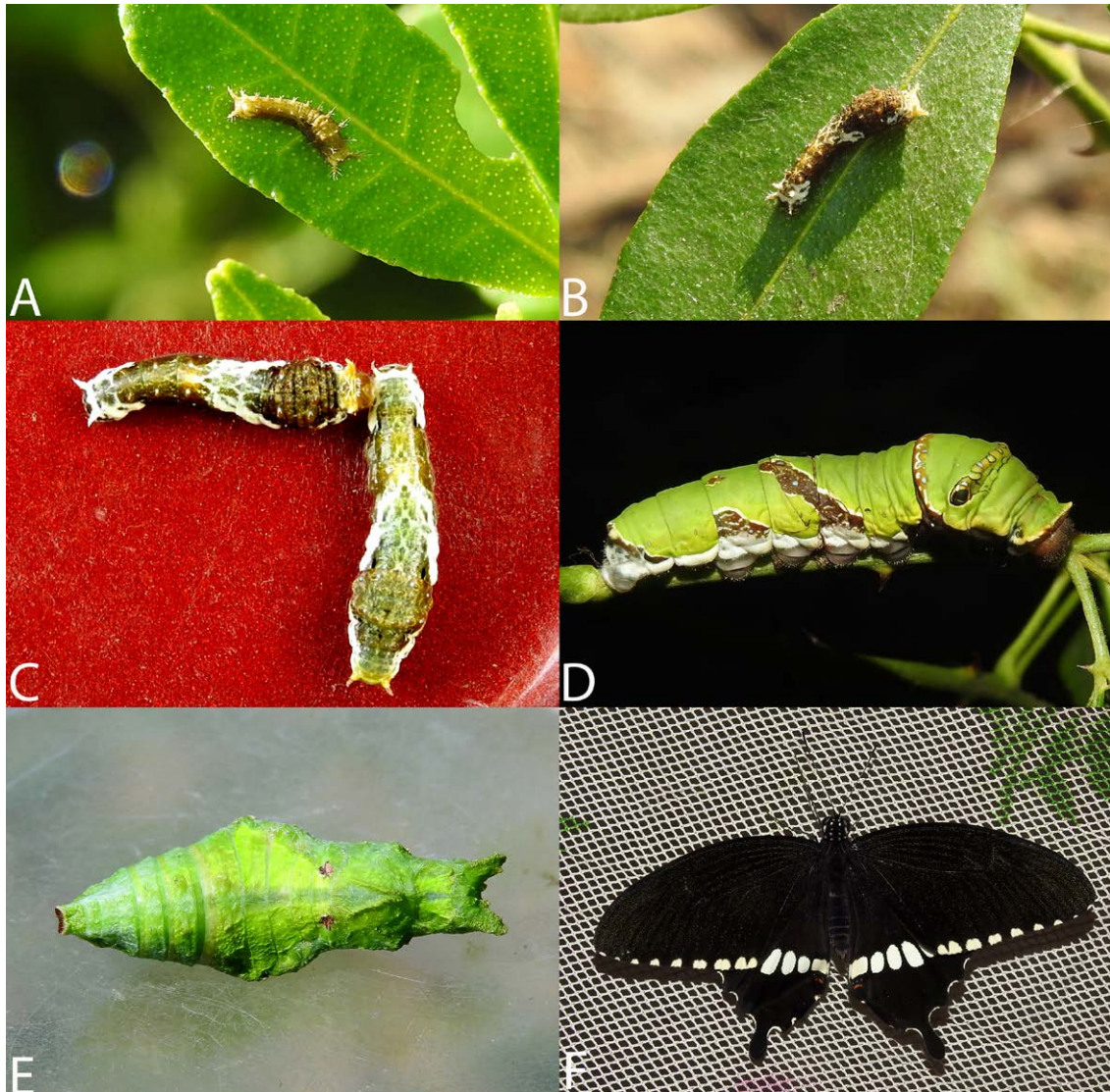


Image 2. *Papilio polytes romulus*: A—Larval stage of *P. p. romulus* on (31.x.2020) | B—Larval stage of *P. p. romulus* from Talsari, Odisha (19.xii.2020) | C—Larval stage of *P. p. romulus* on (17.xi.2020) | D—Final Instar larva of *P. p. romulus* (21.xi.2020) | E—Pupae of *P. p. romulus* (10.xi.2020) | F—Newly emerged male of *P. p. romulus* (31.xi.2020).

1876) (Pieridae) (Nitin et al. 2018). In the present note, for the first time *T. asiatica* is documented as a new larval host plant of two Papilionidae butterflies *Papilio crino* Fabricius, 1793 and *Papilio polytes romulus* Cramer, [1775] from the coastal areas of southern West Bengal and Odisha, India.

***Papilio crino* Fabricius 1793 or Common Banded Peacock (Image 1A–F)**

It is an uncommon Papilionidae butterfly confined mainly in the peninsular India, distributed from southern India to Madhya Pradesh, Odisha, and West Bengal (Varshney & Smetacek 2015; Kehimkar 2016).



Previously known larval host plants of this butterfly are *Chloroxylon swietenia* DC. (Wynter-Blyth 1957; Kunte 2000; Robinson et al. 2010) (Rutaceae), which is mainly distributed in southern India. Most recently Mukherjee & Ghosh (2018) reported *Citrus limon* (L.) Osbeck as another larval host plant from Bankura District of West Bengal.

On 31 October 2020, at 1345 h, a Peacock Butterfly was seen laying eggs on the leaves of *T. asiatica*, at the Ghersai area (21.6308°N, 87.5319°E), Purba Medinipur District, West Bengal. The individual has been observed laying more than seven eggs at different branches of the plant. All eggs were laid underneath the leaves. A single egg was collected on that day, but unfortunately it remained unfertilized. Thereafter, on 12 November 2020, a single caterpillar was observed on the same plant, and collected on the same day for rearing.

The caterpillar was rearing in a small plastic container, and fresh young leaves of *T. asiatica* were provided regularly. On 26 November 2020, the caterpillar died before the initiation of pupal stage. Although rearing was unsuccessful, by confirming the egg laying adult individual as a female *P. crino*, here I report, *T. asiatica* as a new larval host plant of *P. crino*.

***Papilio polytes romulus* Cramer, [1775] or Common Mormon (Image 2 A–F)**

Papilio polytes romulus or Common Mormon is a commonly found butterfly all over India (Varshney & Smetacek 2015; Kehimkar 2016). Previously recorded larval host plants of this butterfly are *Aegle marmelos* (L.) Corrêa; *Atalantia racemosa* Wight ex Hook.; *Citrus aurantiifolia* (Christm.) Swingle; *C. maxima* (Burm.) Merr.; *C. limon*; *C. medica* L.; *Clausena anisata* (Willd.) Hook.f. ex Benth.; *Glycosmis pentaphylla* (Retz.) DC.; *Murraya koenigii* (L.) Spreng.; *M. paniculata* (L.) Jack; *Ravenia spectabilis* Engl.; *Triphasia* sp.; and *Zanthoxylum rhetsa* DC. (Rutaceae) (Wynter-Blyth 1957; Kunte 2000, 2006; Robinson et al. 2010; Nitin et al. 2018; Karmakar et al. 2018).

During September 2020 to December 2020, I observed many caterpillars (larvae of different instars) of *P. p. romulus* from Bara Solemanpur Village (21.6722°N, 87.5764°E), Shankarpur (21.6344°N, 87.5581°E), Ghershai area (21.6308°N, 87.5319°E) of Purba Medinipur District, West Bengal and from Talsari Coastal area (21.5853°N, 87.4336°E) of Odisha. Two caterpillars were collected on 31 October 2020 from Ghershai area and one final instar caterpillar was collected on 04 November 2020, from Shaankarpur, Purba Medinipur, West Bengal. Then after, larvae were reared in a small plastic container and two males of *P. p. romulus*

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emerged. Findings of several larval instars and successful rearing of *P. p. romulus* on *T. asiatica* confirm it as a new larval host plant.

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Acknowledgement: I am thankful to Aaratrik Pal for help in plant identification.

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Citation: Payra, A. (2021). *Toddalia asiatica*: new larval host plant of two *Papilio* species from eastern India. *Bugs R All* #219, In: *Zoo's Print* 36(12): 25–28.

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Feeding activity of antlion of *Myrmeleon* sp. in different soil samples from Thrissur District, Kerala

The antlions or myrmeleontids are the largest and widespread family of the Order Neuroptera and constitute about 2,000 species (Mansell 1996). Their psammophilous larvae prefer dry, loose soil like sand and a few members among this group construct conical pit traps and employ sit-and-wait predation strategy (Mansell 1996; Devetak 2014). All the species under tribe Myrmeleontini use this strategy to capture incautious wanderers (Stange 2002).

The larva of Myrmeleontini capture the prey with pit traps, but the size of the prey should not exceed their conical pits (Heinrich & Heinrich 1984).

They remain at the bottom of the pit until the prey falls into the trap. There are

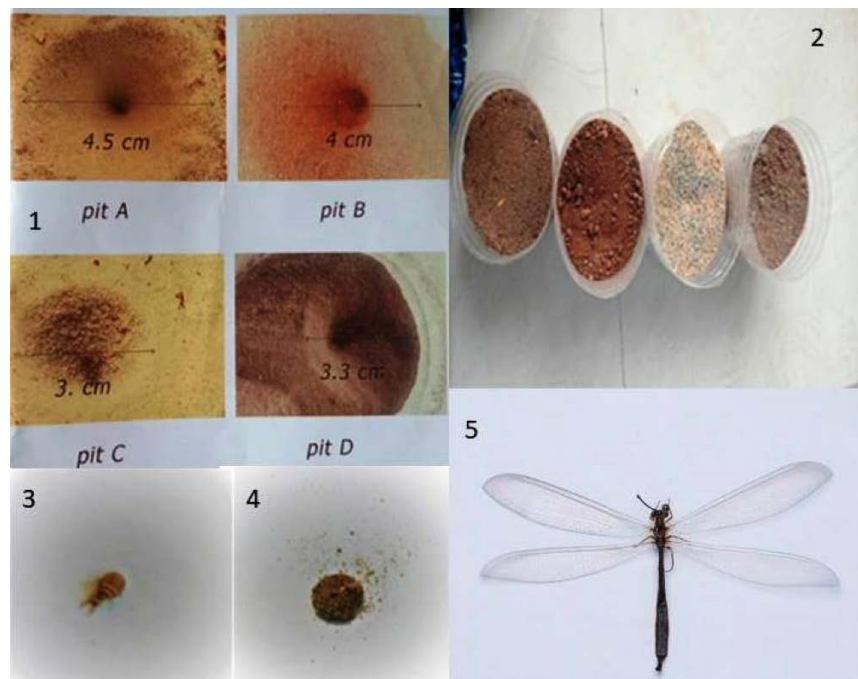


Image 1. Soil samples with different types of pits. | Image 2. Different types of soil samples used in this study. | Image 3. Second instar larvae of antlion (*Myrmeleon* sp.). | Image 4. Pupal stage of *Myrmeleon* sp. | Image 5. Adult stage.

three different larval instars for antlion, which differ in their head-width and body length (Arnett & Gotelli 1999). Sand tossing, prey beating, grasping and prey submersion are the foraging techniques used by the larva (Devetak et al. 2010).

They can sense arrival of prey excellently by the help of soil vibrations (Fertin & Casas 2007). All encounters with the prey need not be successful, while there are chances of escaping of prey from the pit. Preys like ants show defensive attack against the antlion larva

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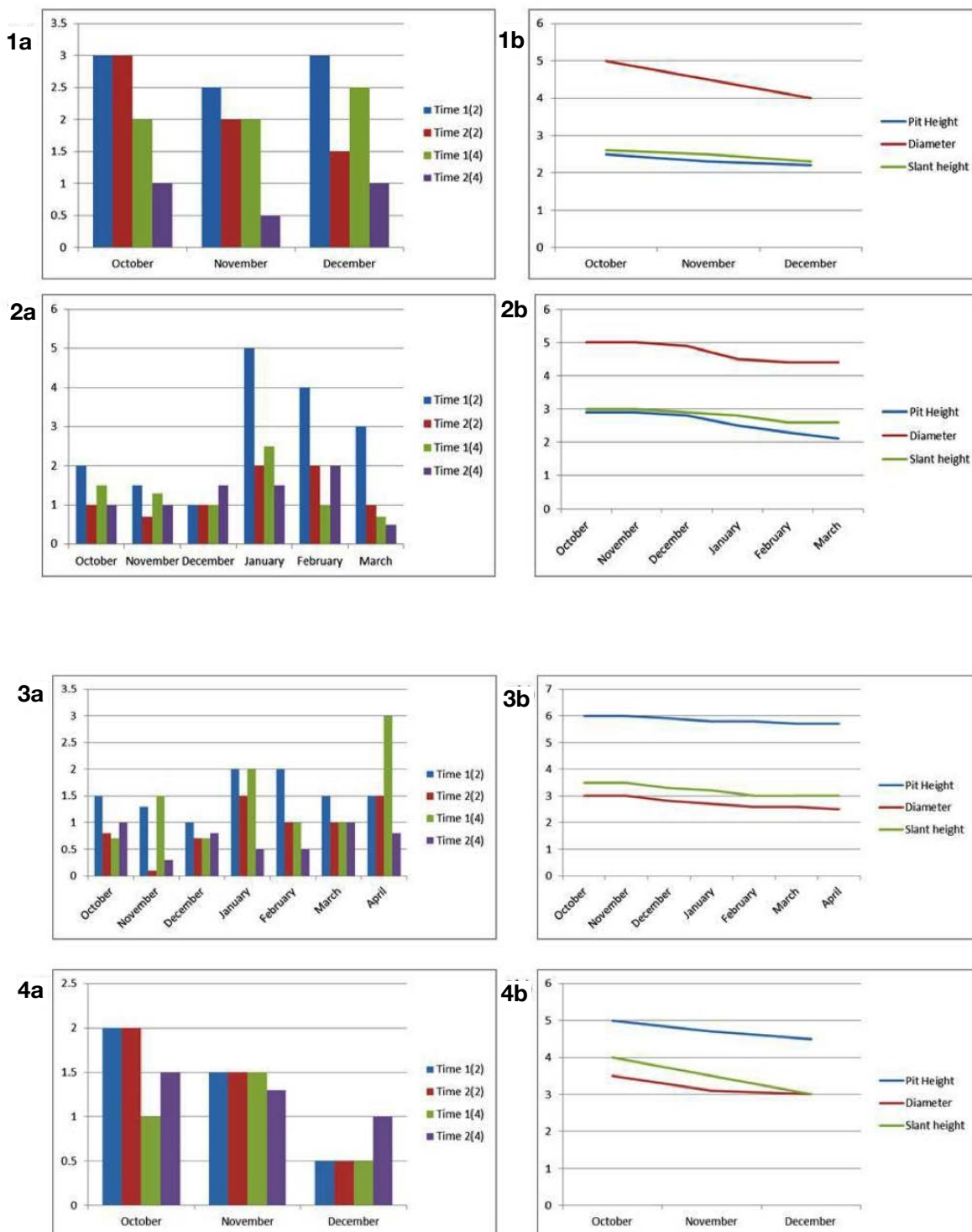


Fig. 1a, 2a, 3a and 4a: Feeding activity of antlion in soil sample A, sample B, sample C and sample D, time 1 and time 2 represents the time taken by the ant trapped in the pit and time taken by the predator to capture the prey. (2) and (4) represents the activity towards the ant of length 2mm and 4mm respectively. Graph 1b, 2b, 3b and 4b: Represents the pit characters in soil sample A, sample B, sample C and sample D.

**Table 1. Activity of larva in different soil samples.**

Month	Size of food (ant) (mm)	Average time for dipping (min)				Average time for capturing (min)			
		A	B	C	D	A	B	C	D
October	4 2	2 3	1.5 2	0.7 1.5	1 2	1 3	1 1	1 0.8	1.5 2
November	4 2	2 2.5	1.3 1.5	1.5 72	1.5 1.5	0.5 2	1 0.7	0.3 0.1	1.3 1.5
December	4 2	2.5 3	1 1	0.7 1	0.5 0.5	1 1.5	1.5 1	0.8 0.7	1 0.5
January	4 2	SFA	2.5 5	2 2	SFA	SFA	1.5 2	0.5 1.5	SFA
February	4 2		1 4	1 2			2 2	0.5 1	
March	4 2		0.7 3	1 1.5			0.5 1	1 1	
April	4 2			3 1.5				0.8 1.5	

SFA - Stop Feeding Activity

which will cause severe injury and leads to the death of antlion (Lucas & Brockmann 1981). The prey with large body size is found difficult to kill and is not preferred by antlion. Thus, the successful predation and body mass of prey is negatively correlated (Scharf et al. 2010).

In this work, a comparison of the feeding activity of a *Myrmeleon* sp. was documented by growing its larva in different types of soil. The feeding habits and time for the emergence of the adult varied in different soil. The chemical composition of each type of soil is entirely different because they are collected from different habitats.

Dissimilarities in foraging and emerging behaviour among different soil sample give an idea regarding the adaptability of *Myrmeleon* sp. in different microhabitats. It also reveals the survival range of the species. This study helps to monitor the feeding and pit building behaviour and helps to observe the activity of predators towards different sized prey samples.

Single replications of four individuals of second instar larva (L2) of *Myrmeleon* sp. were selected as the working samples. Four different types of soil sample were collected from different places and marked, Sample A, Sample B, Sample C, and Sample D. [Sample A- moderately fine soil from Azhikode



Table 2. Pit size variation in different soil samples.

Pit character	Height (cm)	Diameter (cm)	Slant height (cm)
A	2.2-2.5	4-5	2-2.6
B	2.2-2.9	4.5-5	2-3
C	5-6	2-2.8	3-3.5
D	4.5-5	3-4	3-4

(original habitat of the species under study), Sample B- moderately coarse soil collected from Karupadanna, Sample C- fine-grained soil from Azhikode-Munakkal beach and Sample D- coarse-grained soil from Azhikode riverside (Image 2). Second instar larvae of *Myrmeleon* sp. (Image 3) collected from Azhikode were placed in the four plastic containers with four different soil samples (one larva per sample) and fed them with ants. Soil samples were tested and the sand characters like particle density, pH, pore size volume and mineral content (NPK) were measured. The study also evaluated the feeding efficiency and variation in pit making behaviour of *Myrmeleon* sp. in different soil samples.

The study was done over a period of six months starting from October 2018, when antlion larvae reared in four soil samples started feeding and ended in April 2019, when they stopped their feeding activity (antlions from Sample A and Sample D quit feeding after 3 months). Each soil sample was kept at a height of 10 cm in a container.

Two sizes of ants (2 and 4 mm) of different species were provided as the food in a controlled and regular manner. Dipping time, feeding time, pit forming behaviour, time for consuming the prey and duration for the emergence of adult etc. were systematically observed in all the four soil samples.

Characteristics of pits like pit height (in cm), diameter (in cm) and slant height (in cm) in each sample were noted separately. Nature of soil samples was estimated through soil tests conducted at Soil Science lab in KFRI (Kerala Forest Research Institute) for comparing their properties for evaluating soil type preference for efficient predation. Variation in the foraging time and pit making behaviour of the larva in each soil sample were compared and evaluated by graphical methods.

The foraging success of an antlion larva conceivably depends on where its pit is located, how well it is constructed, as well as on how the larva responds to prey in the pit and a possible change of prey availability through time. The activity of *Myrmeleon* larva in different soil samples are represented in the Table 1 and their pit size variation in Table 2. The feeding activity of larva and the pit characters in different soil samples are plotted.

Results of this work showed that pits built-in fine-grained soil would be more effective in prey capture than those built in coarse-

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grained soil. The efficiency of prey capture was influenced by different pit design features like depth, pit angle and diameter (Lucas 1982). The proportion of fine-grained particle in soil affects the dimension of pit diameter and depth, features that directly affect prey capture success. Pit dug in fine-grained soil was more efficient, bigger and deeper than the pit dug in coarse-grained soil (Farji-Berener 2003). Pit size decreased with increased particle density. Pit diameter and pit depth were negatively correlated with particle density and reduction in pit size can negatively affect prey capture success (Devetak et al. 2012). Feeding frequency also played a significant effect on pit size during the study. Result of the work showed that the pit height increased with the particle density of soil and fine-grained soil enhanced the prey capture success than that of other samples. Pit diameter decreased with increase in particle density of the sample.

The soil test revealed an alkaline pH of all soil samples which were greater than 7. The mineral contents especially the microelements like Ca, P, K, Mg, and N were estimated. Among them, N and P were found important, because its value and abundance determine the reproductive success and efficiency of antlion. It gives an idea about the nutrient value and fertility of the soil sample. In this study the NPK values of each sample are; sample A: N-137.80, P-67.26,

K-399.84, sample B: N-211.99, P-172.26, K-208.32, sample C: N-53.00, P-12.13, K-28 and sample D: N-63.60, P-21.46, K-40.32. This indicates soil samples selected are the ideal growing medium for antlion. Soil characters act as the main variables and limiting factor in this study.

In the whole study, larger-sized ant species (4 mm) fell as prey to antlion easily than the smaller species (2 mm). The maximum duration of feeding recorded for seven months (October 2018 to April 2019) in sample C, and minimum for three months in sample A and sample D.

During the experiment, features of the pit, like its height and diameter decreased with the growth of antlion larva (mainly after December month) and pit making were ceased at the stage of pupation and after seven months pupa emerged to an adult. A positive correlation was observed between pit characters like slant height and pit height with the particle density of the sample. A negative correlation was observed between pit diameters with particle density so that the soil samples like moderately fine soil from Azhikode (Sample A) and moderately coarse soil from Karupadanna (Sample B) were having their pit diameter more than usual (5 cm). Soil samples with more value of particle density and porosity were seen in fine-grained soil from Azhikode Munakkal

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beach (Sample C) and coarse-grained soil from Azhikode riverside (Sample D). Thus, the study revealed that the characteristics of soil is crucial in feeding efficiency of antlion.

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Acknowledgements: The authors are grateful to the principal, Christ College (Autonomous), Irinjalakuda, Kerala for providing the facilities for undertaking this work. The corresponding author offers sincere gratitude to CSIR, Government of India, for financial support in the form CSIR junior research fellowship (08/376(0010)/2019-EMR-I). Many thanks to Ms. Anila for providing literature support.

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Citation: Misiriya, A.M., T.B. Suryanarayanan & C. Bijoy (2021). Feeding activity of antlion of *Myrmeleon* sp. in different soil samples from Thrissur District, Kerala. *Bugs R All* #220, In: *Zoo's Print* 36(12): 29–34.

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Observation of the Asian Orb-weaving Spider from India

The oriental spider genus *Talhybia* was erected by Thorell in 1898 with *T. depressa* Thorell, 1898 as its type. *T. depressa* was originally described based on an immature male specimen, and later the genus was rediagnosed after 111 years since its original description along with the description of its first representative female individual by Han et al. (2009). The genus is monotypic (Han et al. 2009) consisting of a single nominal species, viz., *T. depressa* reported from China, Myanmar, and the Philippines (World Spider Catalog 2021). Importantly, the genus *Talhybia* has not been sighted in India so far and this would be the first record from India.

Field work was carried out in Ultapani Forest Range of Chirang Reserve Forest (26.770 N, 90.289 E), Kokrajhar District, located in the western part of Assam.



Talhybia cf. *depressa* mimicking the tree bark surface. © Paris Basumatary.



Talhybia cf. *depressa*, front view. © Paris Basumatary.



Talhybia cf. *depressa*, dorsal view. © Paris Basumatary.

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It mainly comprises of dense tropical semi-evergreen, tropical moist deciduous and riverine forest along with small patches of woodland and grassland (BirdLife International 2021). On 21 December 2020, at 1030 h, we sighted a small rounded object moving sluggishly on a tree twig, and upon closer observation we were awestruck to see a spider wrapped around the twig and resting motionlessly at a height of over 1.7 m above the ground. We captured in situ photos of the individual in its natural habitat. The spider was later recognized to be of the genus *Talhybia* after comparing the photographs with online resources and taxonomic literature (Bay 2020; World Spider Catalog 2021; Han et al. 2009).

The female of *T. cf. depressa* is a medium sized orb weaver, dull whitish-brown coloured with greenish pigmentation. The body is roundish, flattened dorso-ventrally and is densely covered with whitish-black setae. Carapace with a pair of blackish chevron markings at mid of caput and fovea. Abdomen elliptical with conical shaped projection posteriorly; dorsum with numerous dark brownish orbital spots and pleated at both the lateral sides and a pair of tubercles seen at mid edges. The dorsum of abdomen is seen with greenish colour algal like deposition, which lets it blend superbly with the surface characteristics of the tree.

The previous records of *T. depressa* are from Myanmar, Yunnan in China, and

Philippines (World Spider Catalog 2021), and its occurrence in India represents the westernmost record of its entire range.

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Acknowledgements: Our sincere thanks to the additional principal chief conservator of forest & central head of the department, Bodoland Territorial Region, Kokrajhar for granting the study permit. Our heartfelt thanks go to Durga Brahma (Member, Biodiversity Conservation Society, Ultapani, Kokrajhar) for hosting us and aiding in field work.

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Citation: Basumatary, P. & D. Brahma (2021). Observation of the Asian Orb-weaving Spider from India. *Bugs R All* #221, In: *Zoo's Print* 36(12): 35–36.

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New record of lesser-known Single Silverstripe *Lethe ramadeva* (Lepidoptera: Nymphalidae: Satyrinae) from Sikkim Himalaya, India



Lethe ramadeva in Lachen Valley, North Sikkim photographed on 05 July 2021. © Tamding Chewang Lachenpa.

In the last decade, systematic studies on butterflies have been carried out in spatially different sites across the Sikkim-Darjeeling Himalaya, covering a wide geographical range, with studies being carried out in all major protected areas, and agriculture-based land-use systems of the region

(Pradhan & Khaling 2020; Sharma et al. 2020). These have led to the rediscovery of a few species, namely, *Symbrenthia silane*, *Lethe margaritae*, *Neptis nycteus*, and *Lethe nicetella* in the landscape after almost 100 years (Kunte 2010; Rai et al. 2012; Dewan et al. 2018), and in addition a new species

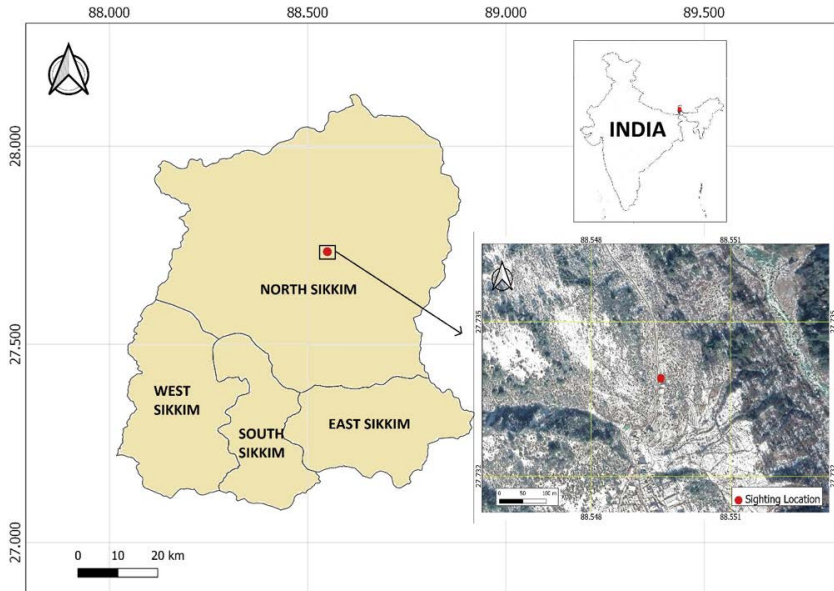
Tajuria illurgioides has only recently been reported from the region (Sherpa 2021). These recent studies indicate that rediscovery of extremely rare species, and discovery of unreported species are still possible from the landscape.

In Sikkim, 691 species of butterflies have been

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Map showing the current sighting location of *Lethe ramadeva* in Lachen Valley, North Sikkim, India.



Landscape view of the Lachen Valley, North Sikkim. © Tamding Chewang Lachenpa.

recorded so far (Sharma et al. 2020; Sherpa 2021), out of which the genus *Lethe* is represented by 36 species (Haribal 1992), which includes *Lethe ramadeva*. However, this species has not been recorded in Sikkim, which is an integral part of the Himalaya biodiversity hotspot, ever since its discovery (de Nicéville 1887). *Lethe ramadeva*, commonly known as Single Silverstripe is protected under Schedule I of the Wildlife Protection Act 1972 in India, but has not been assessed by IUCN. It was first described from Sikkim (de Nicéville 1887), based on a male individual obtained from Otto Moller's collection for the month of August 1886 from the "interior of Sikkim", yet the precise location of the collection site is unknown (de Nicéville 1887).

Historically, in addition to Sikkim, this species has been known to occur in the adjoining Darjeeling Himalaya (de Nicéville 1894), Bhutan



Table 1. Comparison of morphological characters of *Lethe ramadeva* with closely allied *Lethe baladeva*.

Morphological character	<i>Lethe baladeva</i>	<i>Lethe ramadeva</i>
Expanse	55–65mm	60–70mm
Under Forewing	Four white straight bands	Four straight bands
Eyespots	Equal sized near margin not reaching the inner edge	Equal sized near margin between two bands, not reaching the inner edge
Under Hindwing	Two silvery bands and marginal eyespots	One central band and marginal eyespots

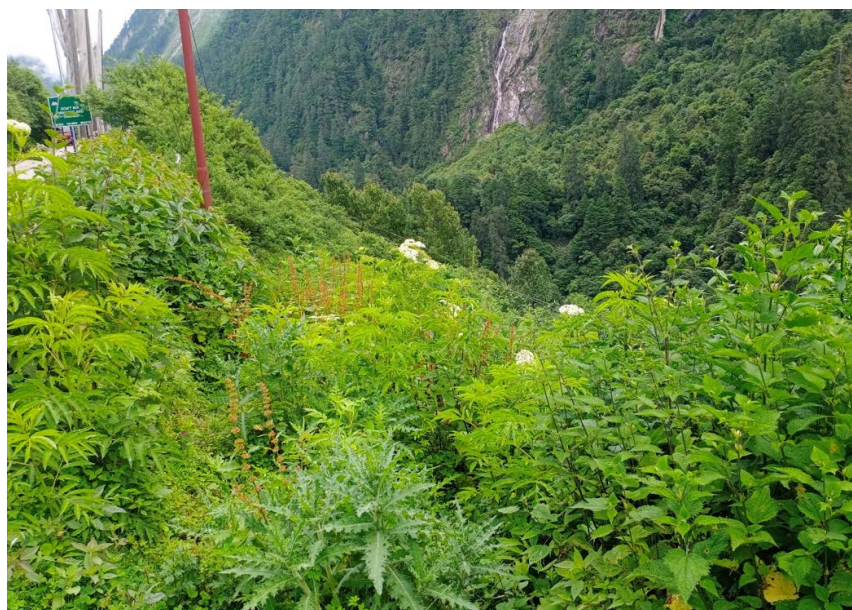
Note: Based on descriptions provided by Kheimkar (2016).

(de Nicéville 1894), and has recently been photographed in Arunachal Pradesh (www.ifoundbutterflies.org) in India. The species has been reported to be active from June–August (de Nicéville 1894), yet very little is known about their habitat requirements, while details on its host plants are hitherto unknown. The butterfly was first sighted by the author on 05 July 2021, near a motorable road that leads to Gurudongmar Lake, in Lachen Valley, North Sikkim and was subsequently identified as *Lethe ramadeva* based on the photographs and description of the species (de Nicéville 1887; Kheimkar 2016).

The photographs of the sighted individual were also sent to experts for confirmation of its identity. *Lethe ramadeva* differs from closely allied *Lethe baladeva* in some morphological characters.

The current sighting took place at around 1330 h in a forest edge (27.7339°N & 88.5495°E), at an elevation of 2,720 m, and approximately 5 m from a motorable road. The photographed individual was basking on the leafy undergrowth of the forest, whose vegetation is characterized by *Acer* sp., *Hippophae salicifolia*, *Salix* sp., and *Artemisia vulgaris*.

Three more individuals were observed flying over *Acer* and *Salix* trees. On 7 July 2021, the author again sighted the species, suggesting it to



Habitat of *Lethe ramadeva* in Lachen Valley, North Sikkim.
© Tamding Chewang Lachenpa.

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be fairly common in the locality, and highly active near the forest edge between 1200 h and 1400 h. *Lethe ramadeva* was sighted flying in tandem with Chumbi Wall *Chonala masoni* on both occasions.

The precise type locality of the species is unknown, while in the absence of other distribution records from Sikkim, the closest published locality record for this species is in Tonglu (Elwes & Moller 1888), which is a part of modern-day Darjeeling, about 90 km (linear distance) from the current sighting location.

Thus, in the absence of newer records of *Lethe ramadeva* from Sikkim, we conclude that the current sighting of a live individual from Lachen Valley, North Sikkim is the first record of the species probably after 135 years in the Himalayan state of Sikkim, India.

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Acknowledgements: I would like to acknowledge the contribution of Mr. Aditya Pradhan, Ashoka Trust for Research in Ecology and the Environment (ATREE), Eastern Himalaya-Northeast India for reviewing literature, and writing the first and final draft of the manuscript.

I would also like to thank Dr. Bhoj Kumar Acharya, Department of Zoology, Sikkim University, and Mr. Nawang Bhutia, Butterflies and Moths of Sikkim, Yuksom for identifying the species, and Mr. Kinzong Bhutia, Khangchendzonga Conservation Committee, Yuksom, for all the support and encouragement.

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Citation: Lachenpa, T.C. (2021). New record of lesser-known Single Silverstripe *Lethe ramadeva* (Lepidoptera: Nymphalidae: Satyrinae) from Sikkim Himalaya, India. *Bugs R All* #222, In: *Zoo's Print* 36(12): 37–40.

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Butterfly diversity of Sundarvan, Ahmedabad, Gujarat

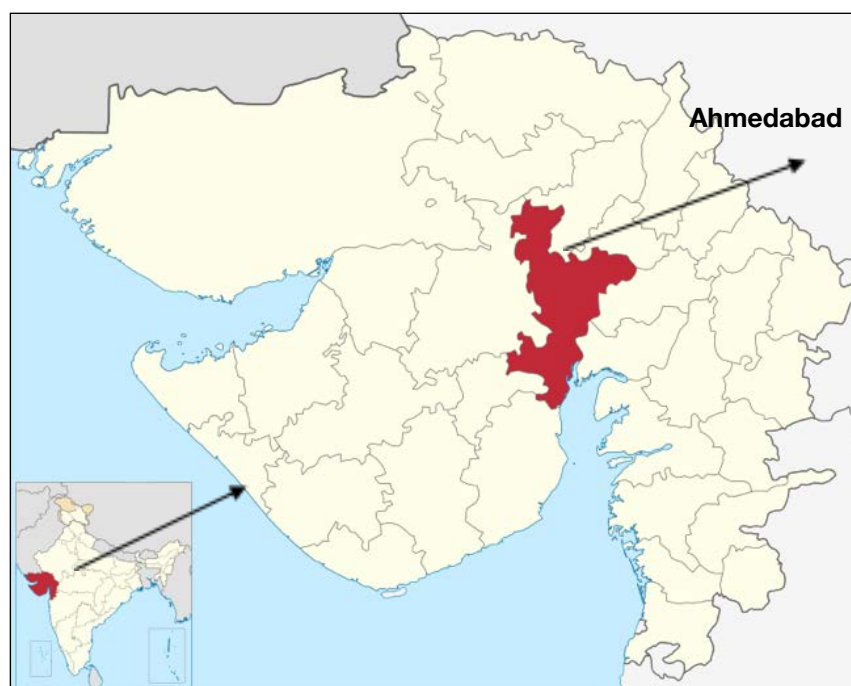
Several studies have been conducted on butterflies found in forests, grasslands as well as urban areas in India. Butterflies are conspicuous insects that often bear brightly coloured wings and exhibit a fluttering flight. Distributed worldwide, there are more than 28,000 species of butterflies, with about 80% found in tropical regions (Tiple 2011). The Indian subcontinent bearing a diverse terrain, climate and vegetation, hosts about 1,504 species of butterflies (Tiple 2011).

Sundarvan – a nature discovery centre is located in the heart of Ahmedabad, Gujarat, India. This four-acre land was originally a mango orchard, converted into a nature discovery centre in 1978. It is a green oasis of the city and has been categorized as a mini zoo

by the Central Zoo Authority (CZA).

Sundarvan plays a very crucial role in sensitizing and creating appreciation for wildlife, especially lesser-known species like snakes and other reptiles (Sivakumar 2020). Availability of nectar sources, plants suitable for egg laying and open sunny

places attract varied species of butterflies in the area. The study area experiences hot, semi-arid climate. Apart from the monsoon season, the climate is extremely dry in Ahmedabad. Humidity stays very high in the summer and the area receives average rainfall of 789 mm per year. The present study aimed to produce a checklist



Geographical location of the study area in Gujarat.

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Enlarged view of sampling sites: Sundarvan - A nature discovery centre.

of butterflies found in Sundarvan, Ahmedabad.

The study was conducted for one year, from January 2019 to January 2020. Sampling sites were visited twice in a day during the one year covering all the seasons, viz., winter, summer, and monsoon. Random sampling method and direct observation method were used during the study period.

The habitat surveyed has a wide range of shrubs,

herbs, and grass species including a wide variety of ornamental species planted by Sundarvan management (Sivakumar 2020). A total of nine sampling sites were selected, classified as water body, adventure park, butterfly garden, campsite, dense vegetation, wetland, aquarium, office area and miscellaneous (consist of mixed vegetation).

Butterflies were recorded by visual observations, with the help of binoculars

(Bushnell Nature View 8*40) and a DSLR camera (Nikon D5200 – 18–140mm lens). Butterflies were observed and identified using field guides and photographs (Evans 1932; Wynter-Blyth 1957; Lewington 1999; Kunte 2000; Parasharya & Jani 2007; Kehimkar 2016). Species richness was calculated by the total number of species found in a group in an area.

Twenty-four species of butterflies representing five families were recorded. Family Nymphalidae showed the maximum species richness, comprising of 10 species (42%), followed by Pieridae (7 species, 29%), Papilionidae (4 species, 17%), Lycaenidae (2 species, 8%), and Hesperidae (1 species, 4%). The percentage of occurrence shows that Nymphalidae was the most common family and Hesperidae was the family with lowest occurrence.

Based on visual observations, each species was designated



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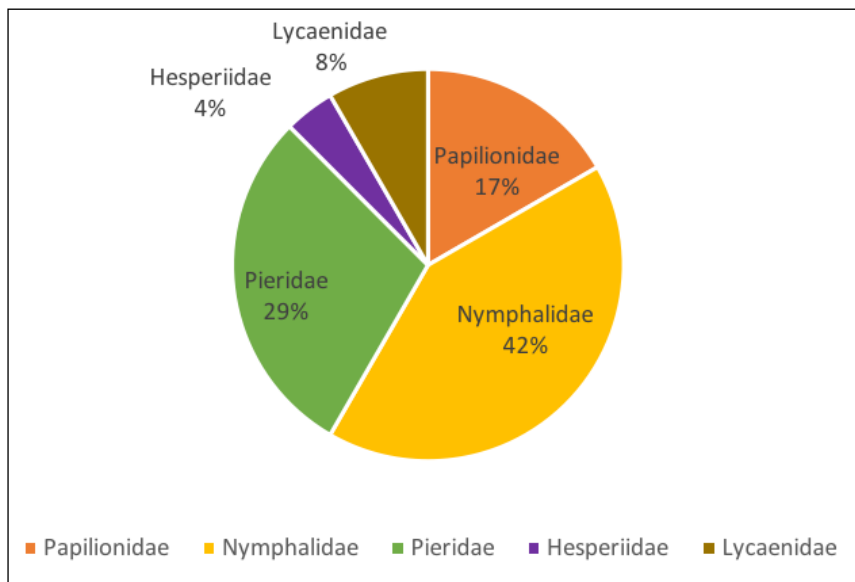
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	Common Name	Scientific Name	Abundance Rating	Conservation status (IUCN)	WPA Status
Nymphalidae (10)					
1.	Lemon Pansy	<i>Junonia lemonias</i>	Abundant	NE	
2.	Peacock Pansy	<i>Junonia almana</i>	Rare	LC	
3.	Plain Tiger	<i>Danaus chrysippus</i>	Common	LC	
4.	Striped Tiger	<i>Danaus genutia</i>	Rare	NE	
5.	Common Evening Brown	<i>Melanitis leda</i>	Common	NE	
6.	Common Crow	<i>Euploea core</i>	Frequent	LC	Schedule IV
7.	Great Eggfly	<i>Hypolimnas bolina</i>	Rare	NE	
8.	Common Sailer	<i>Neptis hylas</i>	Common	NE	
9.	Yellow Pansy	<i>Junonia hierta</i>	Rare	NE	
10.	Danaid Eggfly	<i>Hypolimnas misippus</i>	Rare	NE	Schedule I
Pieridae (7)					
11.	Common Grass Yellow	<i>Eurema hecabe</i>	Abundant	NE	
12.	White Orange Tip	<i>Ixias marianne</i>	Uncommon	NE	
13.	Crimson Tip	<i>Colotis danae</i>	Uncommon	NE	
14.	Common Emigrant	<i>Catopsilia pomona</i>	Common	NE	
15.	Small Salmon Arab	<i>Colotis amata</i>	Common	NE	
16.	Cabbage White	<i>Pieris rapae</i>	Common	NE	
17.	Pioneer	<i>Belenois aurota</i>	Uncommon	NE	
Papilionidae (4)					
18.	Tailed Jay	<i>Graphium agamemnon</i>	Uncommon	NE	
19.	Common Jay	<i>Graphium doson</i>	Common	NE	
20.	Common Mormon	<i>Papilio polytes</i>	Frequent	NE	
21.	Common Lime	<i>Papilio demoleus</i>	Abundant	NE	
Lycaenidae (2)					
22.	Plains Cupid	<i>Luthrodes pandava</i>	Common		
23.	Lime Blue	<i>Chilades lajus</i>	Common	NE	
Hesperiidae (1)					
24.	Common Banded Awl	<i>Hasora chromus</i>	Uncommon	NE	

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Family wise composition of butterflies at Sundarvan, Ahmedabad.

with an abundance category. The following categories were specified, ordered based on increasing abundance of the species.

As shown in the above pie chart, three species (12%), Lemon Pansy, Common Grass Yellow, and Common Lime were designated as abundant. Nine species (38%) were marked as common, including Common Jay, Plain Tiger, Common Emigrant, Common Evening Brown, Common Sailer, Small Salmon Arab, Cabbage White, Plains Cupid, and

Lime Blue based on their occurrence. Two species (8%) were categorized as frequent, including Common Mormon and Common Crow. Five species (21%), Peacock Pansy, Striped Tiger, Great Eggfly, Yellow Pansy, and Danaid Eggfly were identified as rare. Five species were rated as uncommon, which included Tailed Jay, White Orange Tip, Crimson Tip, Pioneer, and Common Banded Awl.

Abundance and richness of butterflies can be affected by the seasonal changes. The

green oasis of the city area showed higher abundance in the spring season, moderate abundance in the post monsoon season and less abundance in the winter. It was also noted that availability of the butterflies varied with the seasonal changes. During unfavorable seasons, that are winter and summer, a low population was maintained. Some species within a family are likely to be more stress tolerant and are likely to survive in these months.

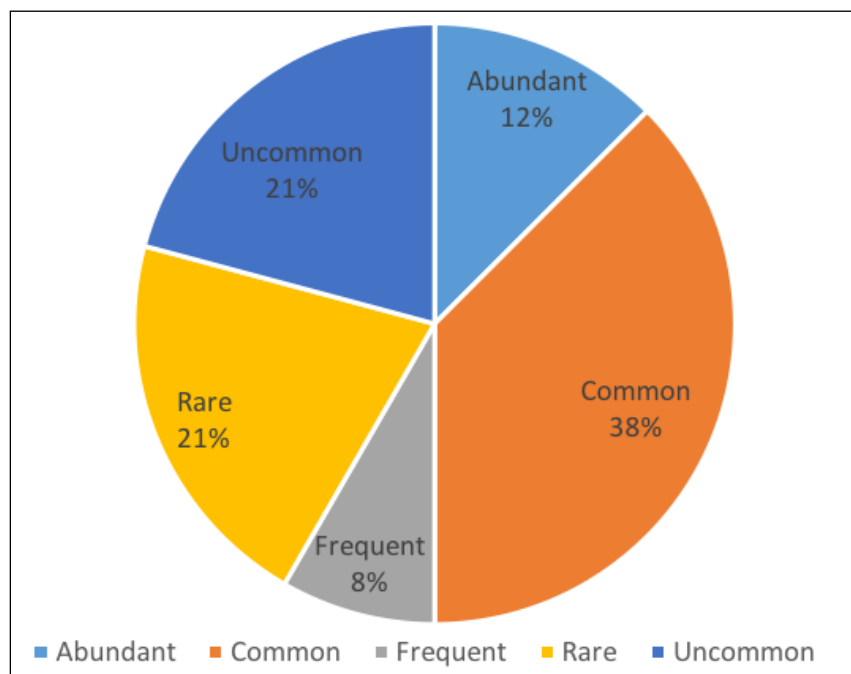
Preference of butterflies in this habitat is associated with availability of plants and some nectar plants. Some of the floral species also attracts the butterflies. The flora in the premises of Sundarvan is of mixed type including plants, trees, shrubs, etc. The study area includes the plant and trees species of the families Annonaceae, Meliaceae, Rutaceae, Nyctaginaceae, Apocynaceae, Amaryllidaceae, Lamiaceae,

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Combretaceae, Fabaceae, Boraginaceae, Verbenaceae, Malvaceae, Fabaceae, Lythraceae, Amaryllidaceae, Rubiaceae etc namely *Polyalthia longifolia*, *Azadirachta indica*, *Murraya koenigii*, *Bougainvillea spectabilis*, *Thevetia peruviana*, *Crinum asiaticum*, *Vitex negundo*, *Terminalia catappa*, *Tamarindus indica*, *Citrus limon*, *Cordia sebestena*, *Lantana camara*, *Hibiscus rosa-sinensis*, *Caesalpinia pulcherrima*, *Catharanthus roseus*, *Ixora coccinea*, *Crinum asiaticum*, *Punica granatum*, and *Annona squamosa* are found. Some butterflies are attracted to the nectar plants, medicinal plants and flowering plants.

Thus, Butterfly abundance can be seen as per the availability of food, plants, breeding sites, and availability of nectar plants. The richness of plant and trees species in the premises of Sundarvan shows 38% abundance of common



Abundance rating (%) of butterflies observed at Sundarvan, Ahmedabad.

species, 21% abundance of uncommon species as well as rarely sited species of butterflies. Apart from being one of the most prominent biodiversity indicators, butterflies also act as our native gardener for their dependence on indigenous plants for completion of the life cycle (Kunte 2000).

Butterfly diversity is largely dependent on a rich flora, because larval host-plant relationships are often very specific (Murphy &

Wilcox 1986). Conservation of butterfly diversity is achievable by enhancement of vegetation in habitats specifically preferred by butterflies (Lawton et al. 1998). Some butterflies are ecological indicator species and play a vital role by cross-pollination of plants (Bonebrake et al. 2010). The rich diversity of Nymphalidae and Pieridae in Sundarvan indicates a varied assemblage of floral species. The flora in Sundarvan is of a mixed type, with herbs,

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Common Banded Awl. © Deep Shah.



Common Crow. © Deep Shah.



Common Evening Brown.
© Deep Shah.



Common Jay. © Deep Shah.



Common Lime. © Deep Shah.



Lemon Pansy. © Deep Shah.



Pioneer. © Deep Shah.



Plains Cupid. © Deep Shah.

palm and other unidentified species dominating the vegetation in the tropical climate (Sivakumar 2020). Our study reports richness

of butterflies which includes some rare and threatened species listed under schedule I under the Wildlife Protection Act, 1972.

Further, standard data we present here can serve as reference for similar future studies. We can try to mitigate the impact of human disturbances by planting native trees and plants, supporting local species as well. This can help prevent threatened species from being driven to the brink of extinction.

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Acknowledgements: We thank Ms. Vandana Thakur for helping with the fieldwork and providing necessary guidance throughout our research. We are also grateful to Sweta Singh and Shameer for their help in preparation of the map. Lastly, we thank the reviewers and editors for their invaluable comments and suggestions, which helped improve our manuscript.

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Citation: Shah, D. & M. Shah (2021). Butterfly diversity of Sundarvan, Ahmedabad, Gujarat. *Bugs R All* #223, In: *Zoo's Print* 36(12): 41–47.

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Butterflies: it's raining lifers at Rainforest Retreat

We had been to Rainforest Retreat (12.477°N, 75.709°E), an organic plantation of coffee, cardamom, and vanilla in Galibeedu, Kodagu district, Karnataka as part of our RHATC fellowship. We reached the Rainforest Retreat on 30 October 2021 afternoon. The last study on butterflies of Kodagu district was done 86 years ago (Home 1935). On 31 October after breakfast at 0930 am, our hunt for butterflies began in and around the estate. To our surprise we spotted five Medus Brown in the same area. They were co-operative enough to give us a chance to take photographs. Several white butterflies were flying near the bushes. Though we waited for 10 to 20 minutes, they were not in the mood to settle down. After that, we went for the ridge walk adjacent to Rainforest Retreat's Mojo Plantation. As we descended, we could spot some restless grass yellows. Butterfly activity started to increase steadily and we spotted the rare Dark Pierrot and a tiny Dingy Scrub Hopper. We enjoyed capturing commonly seen butterflies such as Chocolate Pansy, Lemon Pansy, Common Sailor, and Plain Tiger. As we strolled along the coffee plantation, we found a Blue Admiral and an active Common Map. As we crossed the small water stream we were hoping we could

see a lot of butterflies mud puddling. We found only one Dark Blue Tiger sipping the minerals from the soil.

On 1 November, Dr. Sujatha Goel, the organic plantation owner, took us for a plantation tour and showed us a wide variety of trees and crops. As the weather was cloudy, butterfly activity was pretty less. Later, a little sunlight brought butterflies like Psyche, Plain Tiger, Common Gull, and Common Wanderer out into the open.

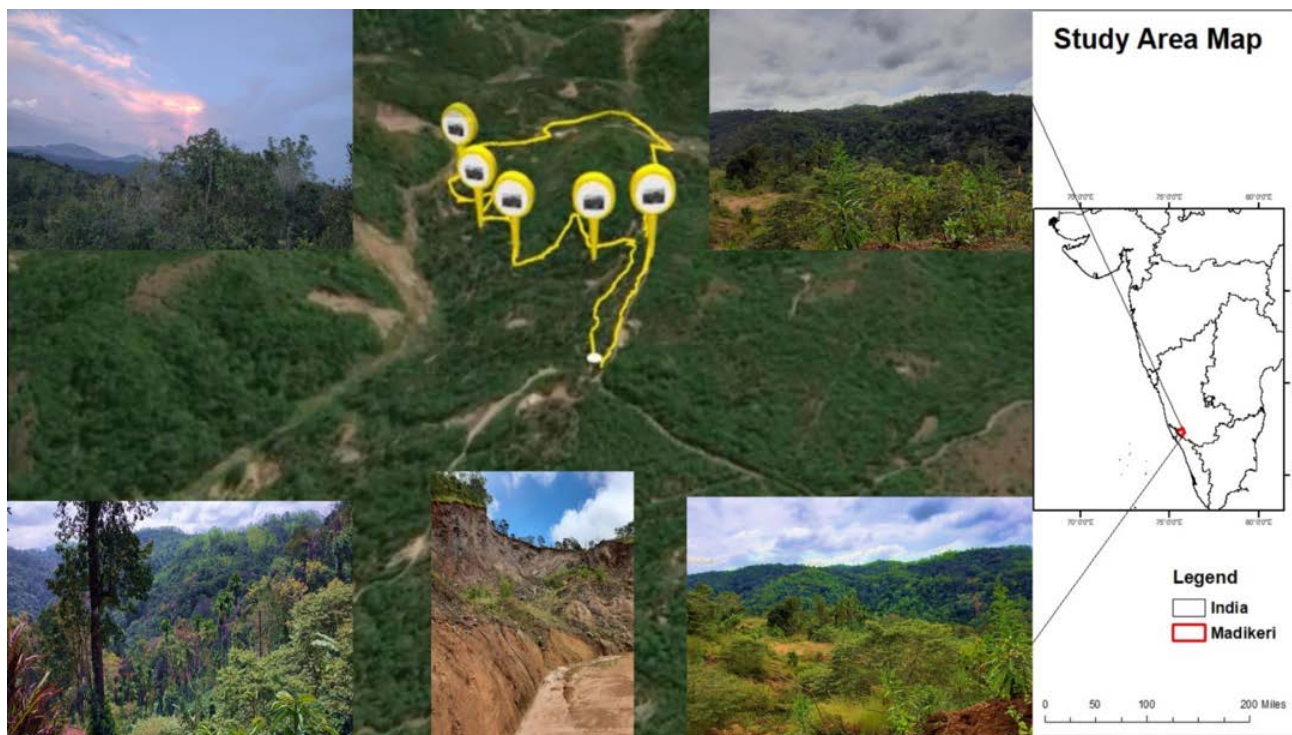
An interesting observation during our photography was seeing a female Danaid Eggfly. The female mimics in appearance the similar-sized Plain Tiger, a toxic butterfly with the toxic Milkweed *Calotropis gigantea* as its host plant. The vibrant colour of the Plain Tiger advertises its unpalatable nature to predators around, so the Danaid Eggfly female sends out the same signal although not being toxic. In addition to showing Batesian mimicry, the females were seen flying with the Plain Tigers.

We encountered a total of 58 butterflies, Nymphalidae was the most abundant family with 26 species (44.8%), followed

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In and around Rainforest Retreat.

by Lycaenidae with 10 species (17.2%), Papilionidae with eight species (13.7%), Pieridae & Hesperidae with seven species each (12% each), and Riodinidae with no representation. The high abundance of family Nymphalidae in the area may probably be attributed to the high abundance of grasses and reeds, which form the major food plants of these butterflies. The localities which yielded higher diversity have very good flowering plants and dense vegetation which provide favourable habitat for butterflies. Two species are protected under Schedule I, one species under Schedule II, and one species under Schedule IV of the Indian Wildlife (Protection) Act 1972. The native tree

composition and organic farming technique may have helped to support this great variety of butterflies.

As SS was first time visiting the Western Ghats, most of the species were lifers for him, his first time encounters of them. You can find some of the Western Ghats endemic butterflies at Rainforest Retreat by donating very little blood to the leeches, so be prepared for it and try to inspect the ground before lying down for an eye-level photo as there may be an innocent Malabar Pit Viper resting after a handsome meal of a Malabar Gliding Frog.



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List of butterflies observed at Rainforest Retreat, Galibeedu, Kodagu, Karnataka.

	Scientific Name	Common Name	Schedule of WPA-1972
Papilionidae (Swallowtails)			
1	<i>Graphium teredon</i> (C. & R. Felder, 1865)	Southern/ Narrow-banded Bluebottle	–
2	<i>Graphium doson eleius</i> (Fruhstorfer, 1907)	Common Jay	–
3	<i>Graphium agamemnon menides</i> (Fruhstorfer, 1904)	Tailed Jay	–
4	<i>Pachliopta hector</i> (Linnaeus, 1758)	Crimson Rose	I
5	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	Common Rose	–
6	<i>Papilio polytes romulus</i> (Cramer, 1755)	Common Mormon	–
7	<i>Papilio helenus daksha</i> (Hampson, 1889)	Red Helen	–
8	<i>Papilio polymnestor</i> (Cramer, 1775)	Blue Mormon	–
Pieridae (Whites & Yellow)			
9	<i>Eurema hecabe hecabe</i> (Linnaeus, 1758)	Common Grass Yellow	–
10	<i>Eurema blanda silhetana</i> (Wallace, 1867)	Three-spot Grass Yellow	–
11	<i>Catopsilia Pomona</i> (Fabricius, 1775)	Lemon Or Common Emigrant	–
12	<i>Hebomoia glaucippe australis</i> (Butler, 1898)	Great Orange-tip	–
13	<i>Pareronia hippia</i> (Fabricius, 1787)	Common Wanderer	–
14	<i>Delias eucharis</i> (Drury, 1773)	Common Jezebel	–
15	<i>Cepora nerissa phryne</i> (Fabricius, 1775)	Common Gull	–
Nymphalidae (Brush-footed)			
16	<i>Parantica agela agela</i> (Stoll, 1782)	Glassy Tiger	–
17	<i>Tirumala limniace exoticus</i> (Gmelin, 1790)	Blue Tiger	–
18	<i>Tirumala septentrionis dravidarum</i> (Fruhstorfer, 1899)	Dark Blue Tiger	–
19	<i>Danaus chrysippus chrysippus</i> (Linnaeus, 1758)	Plain Tiger	–
20	<i>Danaus genutia genutia</i> (Cramer, 1779)	Striped Tiger	–
21	<i>Euploea core core</i> (Cramer, 1780)	Common Crow	–
22	<i>Euploea sylvester coreta</i> (Godart, 1819)	Double-branded Crow	–
23	<i>Melanitis leda leda</i> (Linnaeus, 1758)	Common Evening Brown	–
24	<i>Lethe rohria neelgheriensis</i> (Guerin Meneville, 1843)	Common Tree Brown	–
25	<i>Mycalesis patnia junonia</i> (Butler, 1868)	Glad-eye Bushbrown	–
26	<i>Ypthima baldus madrasa</i> (Evans, 1924)	Common Five-ring	–
27	<i>Ypthima huebneri</i> (Kirby, 1871)	Common Four-ring	–
28	<i>Ypthima ceylonica</i> (Hewitson, 1865)	White Four-ring	–



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	Scientific Name	Common Name	Schedule of WPA-1972
Nymphalidae (Brush-footed)			
29	<i>Cupha erymanthis maja</i> (Fruhstorfer, 1898)	Rustic	–
30	<i>Neptis hylas varmona</i> (Moore, 1872)	Common Sailor	–
31	<i>Orsotriaena medus mandata</i> (Moore, 1857)	Medus Brown	–
32	<i>Neptis jumbah nalanda</i> (Fruhstorfer, 1908)	Chestnut-streaked Sailor	–
33	<i>Elymnias caudata</i> (Butler, 1871)	Tailed Palmfly	–
34	<i>Kaniska canace viridis</i> (Evans, 1924)	Blue Admiral	–
35	<i>Athyma ranga karwara</i> (Fruhstorfer, 1906)	Blackvein Sergeant	–
36	<i>Cyrestis thyodamas indica</i> (Evans, 1924)	Common Map	–
37	<i>Mycalasis anaxias anaxias</i> (Hewitson, 1862)	White-bar Bushbrown	II
38	<i>Junonia iphita pluvialalis</i> (Fruhstorfer, 1900)	Chocolate Pansy	–
39	<i>Junonia lemonias vaisya</i> (Fruhstorfer, 1912)	Lemon Pansy	–
40	<i>Hypolimnas misippus</i> (Linnaeus, 1764)	Danaid Eggfly	I
41	<i>Hypolimnas bolina jacintha</i> (Drury, 1773)	Great Eggfly	–
Lycaenidae (Blues)			
42	<i>Nacaduba kurava canaraica</i> (Toxopeu, 1927)	Transparent Six Lineblue	–
43	<i>Prosotas dubiosa indica</i> (Evans, 1925)	Tailless Lineblue	–
44	<i>Tarucus ananda</i> (de Niceville, 1884)	Dark Pierrot	IV
45	<i>Spindasis lohita lazularia</i> (Moore, 1881)	Long-banded Silverline	–
46	<i>Discolampa ethion ethion</i> (Westwood, 1851)	Banded Blue Pierrot	–
47	<i>Caleta decidia</i> (Hewitson, 1876)	Angled Pierrot	–
48	<i>Jamides celeno aelianus</i> (Fabricius, 1793)	Common Cerulean	–
49	<i>Jamides bochus bochus</i> (Stoll, 1782)	Dark Cerulean	–
50	<i>Zizula hylax hylax</i> (Fabricius, 1775)	Tiny Grass Blue	–
51	<i>Zizeeria karsandra</i> (Moore, 1865)	Dark Grass Blue	–
Hesperidae (Skippers)			
52	<i>Lambrix salsala luteipalpis</i> (Plotz, 1886)	Chestnut Bob	–
53	<i>Pothanthus</i> sp.	Dart	–
54	<i>Udaspes folus</i> (Cramer, 1775)	Grass Demon	–
55	<i>Pseudocoladenia dan dan</i> (Fabricius, 1787)	Fulvous Pied Flat	–
56	<i>Sarangesa dasahara davidsoni</i> (Swinhoe, 1912)	Common Small Flat	–
57	<i>Caprona ransonnettii potiphora</i> (Hewitson, 1873)	Golden Angle	–
58	<i>Aeromachus dubius</i> (Elwes & Edwards, 1897)	Dingy Scrub Hopper	–

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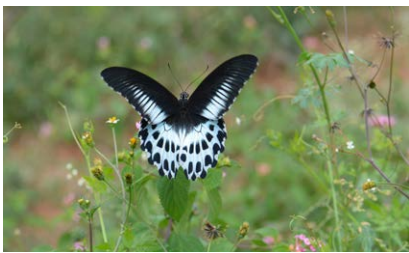
Tailed Jay.



Common Mormon.



Red Helen*.



Blue Mormon.



Common Grass Yellow.



Common Jezebel.



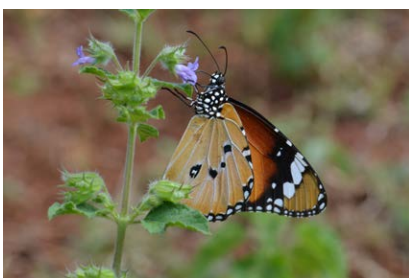
Common Gull.



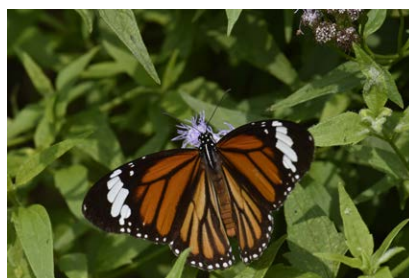
Glassy Tiger.



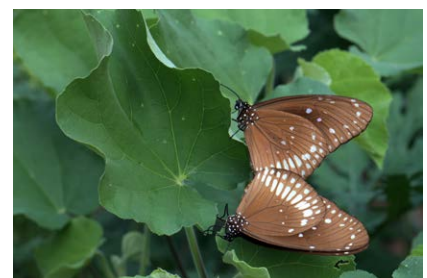
Dark Blue Tiger.



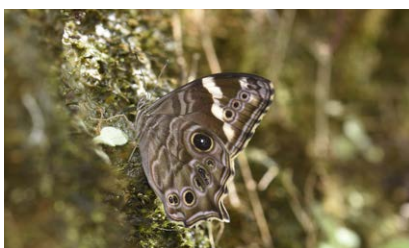
Plain Tiger.



Striped Tiger.



Common Crow.



Common Tree Brown.



Glad-eye Bushbrown*.



Common Four-ring.

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Rustic*.



Common Sailor.



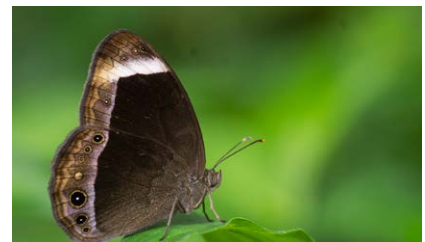
Medus Brown.



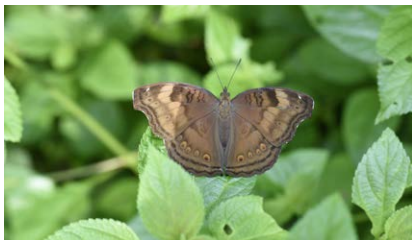
Blue Admiral.



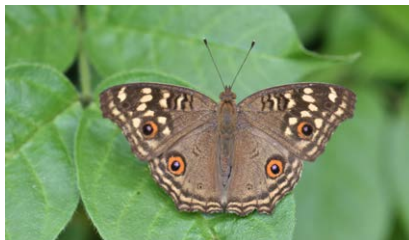
Common Map.



White-bar Bushbrown.



Chocolate Pansy.



Lemon Pansy.



Danaid Eggfly.



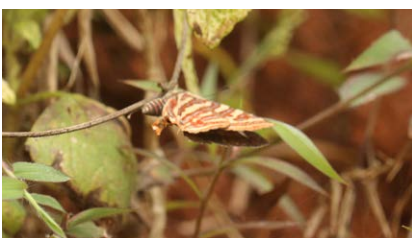
Transparent Six Lineblue.



Tailless Lineblue.



Dark Pierrot.



Long-banded Silverline*.



Banded Blue Pierrot.



Common Cerulean.

Bugs R All

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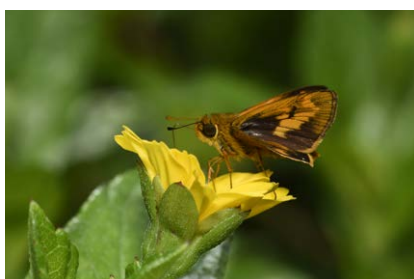
Tiny Grass Blue.



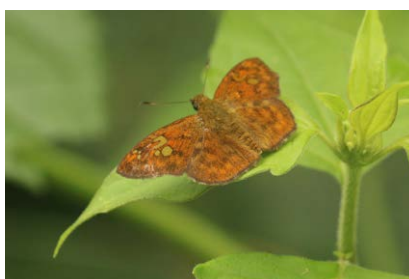
Dark Grass Blue.



Chestnut Bob.



Dart.



Fulvous Pied Flat*.



Common Small Flat.



Golden Angle*.

Photo credits: All the images were taken by C.V. Nishanth except the images indicated with an asterisk (*) were taken by Supriya Samanta.

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Acknowledgements: We would like to thank Drs. Sujatha Goel & Anurag Goel for providing logistic support and deputing Mr. Muthu Pandi on the ridge walk. We are also thankful to RHATC fellows and mentors for their encouragement and support.

Citation: Nishanth, C.V. & S. Samanta (2021). Butterflies: it's raining lifers at Rainforest Retreat. *Bugs R All* #224, In: *Zoo's Print* 36(12): 48–54.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) published with the financial support of Zoological Society of London.
For communication, Email: zp@zooreach.org



Record of Mandarin Duck and Smew in Maguri-Matapung Beel, Assam

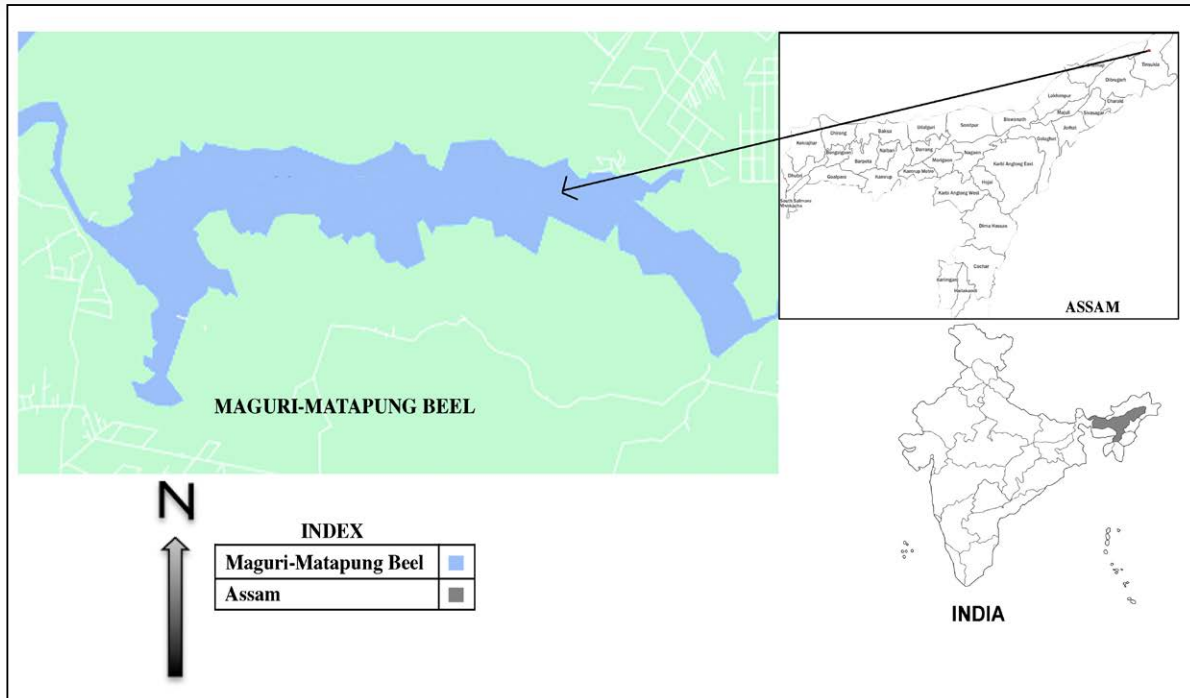


Mandarin Duck *Aix galericulata* along with the flock of Indian Spot-billed Duck *Anas poecilorhyncha* and a pair of Cotton Pygmy Goose *Nettapus coromandelianus* in Maguri-Matapung Beel, Tinsukia, Assam. © Imon Abedin.

Assam is the land of some unique flora and fauna, which makes it a paradise for nature and wildlife lovers. The state boasts a rich biodiversity as the geographical location of the state is marked with great natural resources (Abedin 2021). Maguri-Matapung Beel, a small fresh water body (27.5767° N & 95.3953° E) located at Natun Rungagora Gaon of Tinsukia District, Assam. It is an Important Bird Area IBA site under Dibru-Saikhowa Complex which also covers the Dibru-Saikhowa National Park, Poba Reserve Forest, Kobo Chapori (River Island), Amarpur

Chapori and the adjacent riverine tract of the Brahmaputra and Lohit Rivers (Islam & Rahmani 2004).

The Maguri-Matapung Beel is a community preserved lake - conserved and maintained by the people in the fringe areas. The waterbody is surrounded by villages, tea gardens and agricultural land on one side while on the other side by grassland. It is a crescent shaped waterbody that receives water from the Dibru River. The beel is mostly used for fishing and tourism



Map illustrating the sighting location of Mandarin Duck *Aix galericulata* & Smew *Mergellus albellus* in Maguri-Matapung Beel, Tinsukia District, Assam.

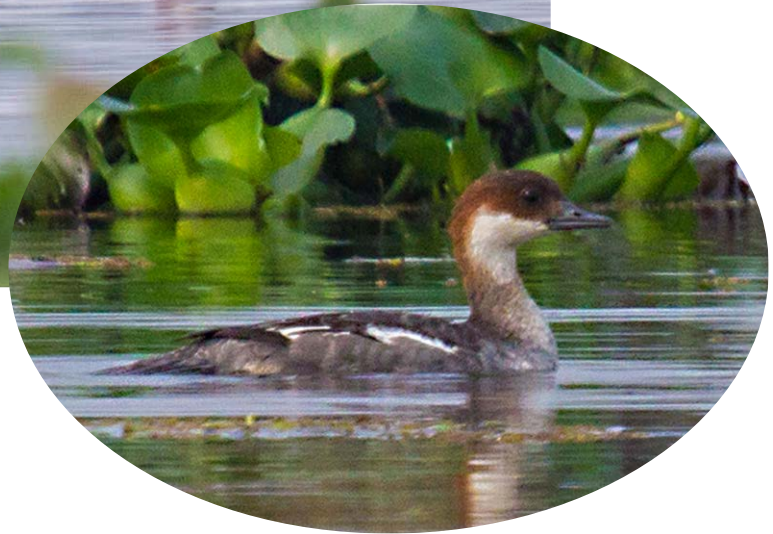
purpose. It is a hotspot for birds as well as fishes (Dwivedi 2009). During the regular bird observations, two rare species of ducks Mandarin Duck *Aix galericulata* and Smew *Mergellus albellus* were sighted in the waterbody. Both the birds were observed using 8 x 40 binocular and documented using a 400 mm lens without disturbing the birds.

Mandarin Duck *Aix galericulata* (Linnaeus)
(Aves: Anseriformes: Anatidae)

On 8 February 2021, during a bright afternoon in Maguri-Matapung Beel, an unfamiliar duck was spotted with a flock of Indian Spot-billed Ducks *Anas poecilorhyncha*. We went to the site next morning and sighted the unusual duck and confirmed it as a male Mandarin Duck *Aix galericulata* (Linnaeus). The identification was

done with the help of a field guide (Grimmett et al. 2011). The lone male Mandarin Duck *Aix galericulata* was with a flock of Indian Spot-billed Ducks *Anas poecilorhyncha* and a pair of Cotton Pygmy Goose *Nettapus coromandelianus*. We observed the bird for around 30 minutes at a distance of around 100 m. The characters for identification are – brilliantly coloured duck with a greenish-black forehead and a purple crest near the back of the head. The sides of the head are creamy white with a chestnut patch below eyes. The side of the neck and the cheeks have longer brown feathers. The upper breast is maroon and the lower breast and belly is white in colour.

The Mandarin Duck is a perching duck species. It prefers wooded ponds, shallow



Smew *Mergellus albellus* with a Eurasian Wigeon *Anas penelope* and a Ferruginous Duck *Aythya nyroca* in Maguri-Matapung Beel, Tinsukia, Assam. © Imon Abedin.

lakes, marshes and fast flowing rocky streams to swim, wade, and feed in. This species was once widespread in eastern Asia, but due to the destruction of forests and its habitat have reduced populations drastically in eastern Russia, China, and Japan, however, is thought to still hold some 5,000 pairs. This species migrates to Asia during winters in lowland eastern China and southern Japan (Madge & Burn 1987). In India, this species is considered vagrant as there are very few records of this species. In northeastern India, it was recorded from a tea garden near Rungagora in Dibru-Saikhowa Complex (Stevens 1915) and Baker (1902) sighted six individuals in Subansiri River, Lakhimpur District in Assam. Two pairs were also sighted in Manipur (Gimson 1934).

In the recent records, a single individual was recorded in Chandel District, Manipur (Choudhury 2009; CCNCS 2013) and a female duck reported from Baksa District (Das et al. 2015) and Maguri Beel, Tinsukia, Assam and Sikhe Lake, Ziro, Arunachal Pradesh (Ahmed & Rajpoot 2021).

Smew *Mergellus albellus* (Linnaeus) (Aves: Anseriformes: Anatidae)

On 29 January 2018, a female of Smew *Mergellus albellus* (Linnaeus) was sighted along with a flock of Eurasian Wigeon *Anas penelope* (5) and Ferruginous Duck *Aythya nyroca* (3). We were able to observe the bird for about an hour from a distance of around 60–70 m. A few identification characters that helped us identify the species – the hooked

tip and serrated edges of bill, overall grey coloured body and reddish-brown head and white cheek. In flight, it showed black and white wings. The Smew is the only living species of the genus *Mergellus*. This species is known to breed in the northern Taiga of Europe and the Palearctic. It needs trees for breeding. It lives in fish-rich lakes, reservoirs and slow rivers. This is a migrant species, it leaves its breeding areas and winters on sheltered coasts or inland lakes of the Baltic Sea, the Black Sea, northern Germany and the low countries, with a small number reaching Great Britain mostly at regular sites (www.luontoportti.com). In India, there are a very few records from northern India. In Assam, this species was reported from the far north-eastern part of the Dibru-Saikhowa Biosphere Reserve (Choudhury 2006).

The present note is the sighting report of Mandarin Duck (Male) in Matapung Beel. In the case of Smew, it was the first record from Maguri-Matapung Beel, Tinsukia, Assam.

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- Acknowledgements:** I thank M. Gogoi, B. Hatibaruah, J. Dutta, P. Phukan, P. Hatibaruah for their efforts in the field. I also thank my parents for their constant support and encouragement. I express my gratitude to A. Rokade, S. Ranade & J. Biswas for their generous help in writing of this document.
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- Citation:** Abedin, I. & J. Abedin (2021). Record of Mandarin Duck and Smew in Maguri-Matapung Beel, Assam. *Bird-o-soar* #107, In: *Zoo's Print* 36(12): 55–58.

Record of colour aberrant Jungle Babbler from West Bengal coast, India



Colour aberrant Jungle Babbler from Shankarpur, Purba Medinipur, West Bengal, India. Photographs taken on A - 10.ii.2020 and B - 13.xi.2019.
© Arajush Payra.

Jungle Babbler *Argya striata* is a member of the family Leiothrichidae and is commonly found in the Indian subcontinent. These birds are gregarious in nature and generally foraging in small groups of 6–10 individuals. During birding in coastal area of Shankarpur (21.636°N, 87.571°E, 15m), Purba Medinipur District, West Bengal, India, on 13 November 2019, at 1545 h, a single individual of colour aberrant Jungle Babbler *Argya striata* was spotted among the flock of normal coloured Jungle Babbler. Initially they were busy foraging on the ground among the bushy

shrubs of *Clerodendrum*. Later, the moment I reached closer to them, they flew away and sat on a *Casuarina* tree branch.

The individual was partially white. Bill, eyes, and feet were normal in colour. Crown, ear coverts, chin, and throat had normal coloured feathers. Mantle, back and rump were patchily white. Breast and belly to vent with white feathers. Tip and edges of the tail white, while upper parts of tail normal greyish-brown. In the field, it is very difficult to differentiate progressive greying

and leucism in birds (van Grouw 2013). To ascertain the exact aberrant form of the bird (whether the individual is progressive greying or leucistic), I visited the place of sighting a few times, and again encountered the colour aberrant individual on 10 February 2020, at 1600 h, among the flock of normal coloured Jungle Babbler where it was previously sighted.

After taking some photographs, I checked the plumage colour pattern with the photographs of previous individual. The white patches looked similar and confirmed both of the sightings as the same colour aberrant Jungle Babbler. According to van Grouw (2013) and Mahabal et al. (2016) classification, in case of leucistic bird white patterns are in general patchy and bilaterally symmetrical. Presence of some white feathers on the face and a few white outer primaries are typical characteristic for leucism. However, in case of early progressive greying stage, white feathers are randomly spread and with the aging after every moult, white feathers will increase (van Grouw 2013; Mahabal et al. 2016).

Jungle Babbler moult their body and flight feathers once every year (Zacharias 1979). Moult of body and flight feathers usually occurs at a very slow pace for longer duration from February to November (Zacharias 1979; Zacharias & Mathew 1988). In flight feathers, the moult of the primaries and upper coverts occur from the proximal to the distal end. In the secondaries moult begins from both ends, and in the tertiaries,

moult occurs less frequently without any temporal relation to the progress of moult in the rest of the flight feathers (Zacharias 1979). The plumage colour of the adult birds remains the same throughout the year, as moult is not temporally separated from breeding.

However, the timing of present observations (13 November 2019; 10 February 2020) does not fall under the usual moulting period of Jungle Babbler. Through the examination of photographs taken during present observations, increase in white feathers was not observed. The white patches look same after a gap of about 89 days of first sighting. But close examinations of body and flight feathers for longer time span during moulting period were required for the confirmation of moult and increasing in white feathers. Thus, it becomes very difficult to conclude the exact colour aberrant form, regarding these present observations from West Bengal coast.

Although rare, in India a few records are available on colour aberrant Jungle Babbler from Gujarat (Newnham 1886); Maharashtra (Janakiraman & Prasad 1961; Pande et al. 2003; Sani & Kasambe 2007) and Madhya Pradesh (Gupte 1969). But the case of leucism in Jungle Babbler has only been reported once from Maharashtra (Sani & Kasambe 2007) and the rest are the cases of progressive greying and melanism (Mahabal et al. 2016). Hitherto, no published records are available concerning colour aberration in Jungle Babbler from eastern India,

particularly from West Bengal (Mahabal et al. 2016). Hence, this present report may prove to be the first photographic record of a colour aberrant Jungle Babbler from West Bengal.

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Acknowledgements: I am grateful to Dr. Anil Mahabal (retired scientist, Zoological Survey of India) and Dr. Satish Pande (director, Ela Foundation), for their significant suggestions and help regarding the confirmation of colour aberration. I am also thankful to Bappa Payra for his assistance during the field.

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Citation: Payra, A. (2021). Record of colour aberrant Jungle Babbler from West Bengal coast, India. *Bird-o-soar* #108, In: *Zoo's Print* 36(12): 59–61.

Human-Jungle cat interaction in rural West Bengal



Jungle Cat in shrubbery. © Tanima Choudhury.

The Jungle Cat *Felis chaus* is listed as 'Least Concern' (LC) on the IUCN Red List (Gray et al. 2016). It is listed under the CITES Appendix II and the Schedule II Part I of the Wildlife (Protection) Act, 1972 of India. In Turkey, Jungle Cats hunt water birds mainly during the winter (Ogurlu et al. 2010).

In India, despite the laws protecting them, Jungle Cats have been known to come into conflict with the local villagers when they enter villages to raid their poultry sheds (Tikader 1983). In West Bengal, tribal people in areas like Junglemahal still perform centuries-old hunting festival called 'Shikar Utsav' where animals are hunted using traditional weapons like spear. In 2021 as many as 200 animals including the protected

jungle cats were hunted during the 'Shikar Utsav' performed from January to June (Nibedita 2021). In 2010–2011, 27 Fishing Cats and 10 Jungle Cats were reported dead in West Bengal and 38 Fishing Cats were reported dead in Bangladesh from 2010 to 2013 (Mukherjee et al. 2012; Chowdhury et al. 2015). The main cause for these killings was because the local villagers believed them to be a threat to their livestock and poultry. The small wild cats were snared and then starved or beaten to death. Their remains were then hung for display (Chowdhury et al. 2015).

One of the major obstacles to wildlife management is the human-wildlife negative interaction. This mainly occurs as a result



Jungle Cat attempting to steal ducks from wooden and metallic netted poultry shed. © Tanima Choudhury.

of the encroachment of the ever-expanding human population into the territories of these wild animals and subsequent competition for the limited resources between the two parties. In most cases, the animals are killed by mobs of local people in these conflicts before the forest officials can come and try to mitigate the problem. In November 2016, a Leopard which had entered Mandawar Village, Gurgaon, Haryana was beaten to death by a mob of 1,500 people.

The present study was done in Belun Village (23.0362° N, 88.2486° E), Ketugram, Purba Bardhaman District, West Bengal, India to determine the actual impact of the poultry hunting behaviour of the Jungle Cats. Toguad hunting, trail camera (HC-550A) and Qnotici Digital trail camera (PR-300C)

were used for the study. The villagers kept the birds in wooden sheds, concrete sheds, tin sheds, mud sheds, and metallic netted sheds. All sheds were self-made.

The average number of poultry lost per month was studied for four months of June–September 2021. Two houses were selected for the study. One house had three wooden sheds each of which were able to house 10–11 poultry. The other house had a metallic netted shed and could house 20 poultry. Both houses were located near paddy fields. The wooden and netted sheds were on an average $104.14 \pm 7.18 \times 63.5 \pm 3.2 \times 38.75 \pm 9.89 \text{ cm}^3$ and $81 \times 82 \times 86 \text{ cm}^3$ in dimensions, respectively. According to the survey done on the monthly incomes of the poultry owning households, the relatively

wealthier households opted for the concrete sheds, netted sheds, tin sheds as they were easier to make and could house more birds though the building materials were more costly than those of the mud sheds and wooden sheds. The netted sheds lost 8.5 ± 0.7 birds and the wooden sheds lost 3.3 ± 3.5 birds per month. In both cases attempts were made on sheds during 35% of days per month. The netted sheds lost more birds as after sometime in India's humid climate the net rusted away and created openings for the Jungle Cats to capture the birds. Improving the quality of sheds could help to reduce the number of birds lost, thereby helping to reduce the conflict between the villagers and the Jungle Cats in the rural villages.

Studies done in Kanha National Park in 2011–2012 revealed that large carnivores like Tigers were responsible for 71% of the total livestock killed there. The forest officials accepted 95% of the kills for compensation, so retaliatory actions against the carnivores was not undertaken by the villagers (Miller et al. 2016). In villages like Belun which are not near protected forest, no compensation is given to the villagers for their loss of poultry, increasing the chances for retaliatory action by the villagers against the wild cats.

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Citation: Choudhury, T., T. Choudhury, T. Ghosh, A. Ghosh, U. Hazra & N. Ghorai (2021). Human-Jungle cat interaction in rural West Bengal. *Mammal Tales* #35, In: *Zoo's Print* 36(12): 62–64.

Documentation of the globally threatened Indian Pangolin and its threats from Ajudhya Hills, Purulia, West Bengal, India



Indian Pangolin at Ajudhya Hills captured in camera trap. © Supriya Samanta/ Purulia Forest Department.

MOULTRIE 26°C @CAM04 12 AUG 2021 10:33 pm

Pangolins are one of the most trafficked mammals on Earth (Aisher 2016). Chinese Pangolin *Manis pentadactyla* Linnaeus, 1758 and Indian Pangolin *Manis crassicaudata* Gray, 1827 are found in India out of eight in the World (Menon 2014). The Indian Pangolin is an 'Endangered' species according to the IUCN Red list and listed as Appendix 1 on CITES (Mahmood et al. 2019). It is also a Schedule I species as per Indian Wildlife Protection Act, 1972 (Menon 2014). According to the census of wild animals in

southern West Bengal 2002 report by Wildlife Wing, West Bengal Forest Department, Indian Pangolin population in Purulia district was 42.

During an opportunistic camera trap survey one Indian Pangolin was photographed on 12 August 2021 at Ajudhya Hills of Purulia district, West Bengal, India. Purulia Forest Department also rescued two Indian Pangolins from poachers at Bararola and Serengdi village adjacent to Ajudhya Hills on 22 and 28 August 2021, respectively.

Interstate poaching activity between West Bengal and Jharkhand, forest fire, deforestation, killing for consumption of meat, habitat destruction are major threats to the last remaining Pangolin population in Ajodhya Hills.

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Acknowledgements: We are grateful to Mr. Debasish Sharma, Divisional Forest Officer of Purulia Division for his permission and support. We are also thankful to RHATC mentors and fellows & all the members of Green Plateau for their continuous encouragement.

Citation: Samanta, S., S. Mahato & A. Mukherjee (2021). Documentation of the globally threatened Indian Pangolin and its threats from Ajodhya Hills, Purulia, West Bengal, India. *Mammal Tales* #36, In: *Zoo's Print* 36(12): 65–66.

BOOK REVIEW

Matriarch: Autobiography of an elephant

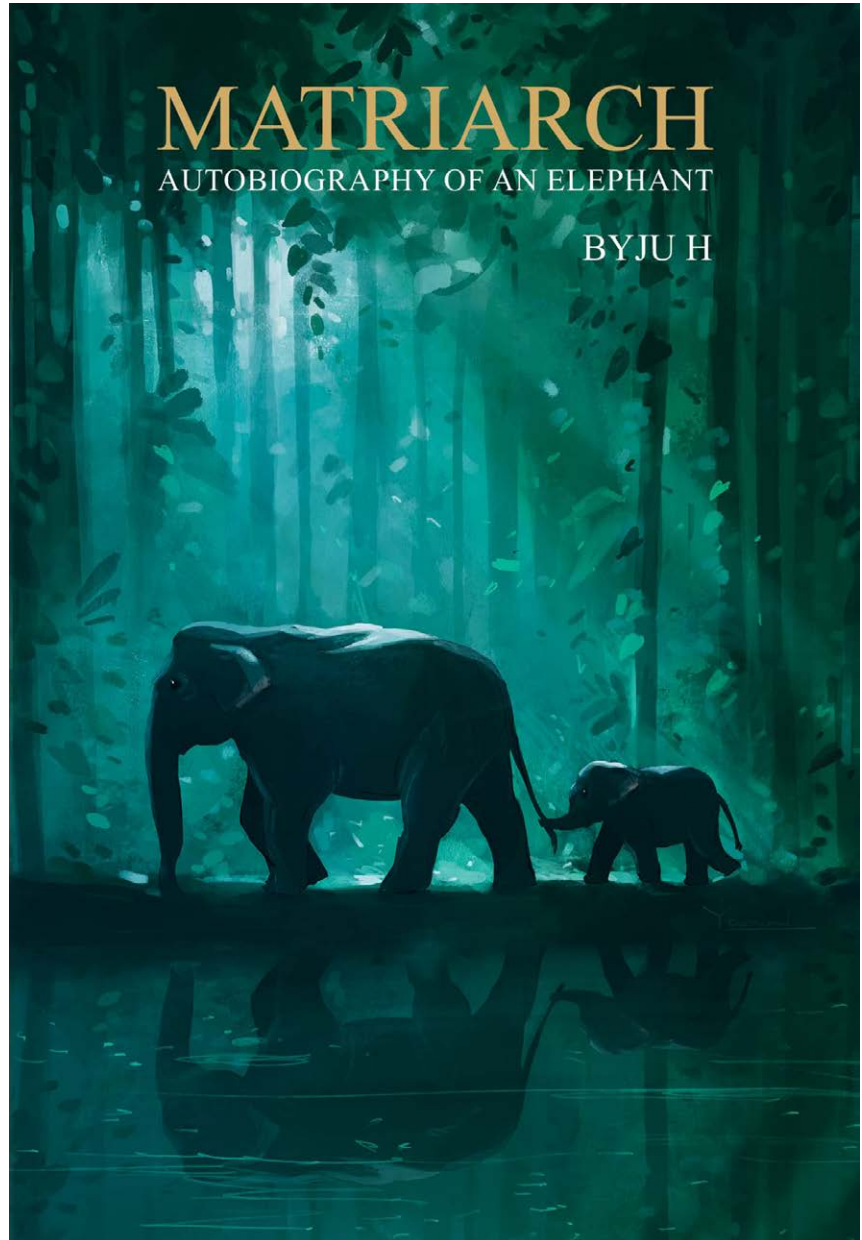
Author: Byju, H.

Published by Neythal Pathippakam (Jan 2022); Price: Rs. 300.00

"He stood still, and we could feel the electric current through his body. I tried to pull him away. The attempt was futile. His body sends many distress calls. Before he could succeed in pushing us through the fence, he collapsed. His trunk had fumes coming. The trunk had burn marks. The burning smell of the flesh was disturbing. The distress calls followed."- Banti, the Matriarch.

Banti is 55, a true mother, grandmother, and head of a family. They live in the vast scape of Nilgiri Biosphere Reserve, more specifically around Masinagudi and Singara. She is friendly with her neighbours, especially with the wild Sundhari & family, and Bhama & the gang who live in the camp nearby. Banti has a friend named Siva; a forest man who is known to her from the time Siva was a young tribal boy.

Thanks to Banti, we are able to hear more about their family life, the arrangement within their family, their relationship with



other families, daily routines, food and landscape preferences, and emotions. Banti is old and wise, so, she knows how to tell her true story to the reader without boring. She does not need to invent any twists and turns as their life is

otherwise full of that, and hence no fabrication and imagination.

From her jubilant and all your landscape filled with joy and food, long migratory movements, peaceful living along with tribes in

BOOK REVIEW

her younger days, she has seen everything. She narrates how they lost their landscape to dams and estates, buildings and cultivation, their regular and migratory paths to roads and obstructions.

She understands some of these, but not everything; she is confused between a gun-wielding doctor and a bandit. Why would one help and another kill using the same-looking weapon in hand? She is also confused about how humans behave differently towards them in the day and at the night. She empathizes with the behaviour of her young adult relatives when they come of age and their need to be aggressive.

Banti also opens a door on her love affair and how she longed to show her daughter to her father. Meanwhile, while she takes a rest, she lets her love Siddu talk to us and the errand boy Murthy to narrate their ordeal. I believe we live in a better world, in comparison. Banti and her sisters and others in the family passionately bring up the young and teach them how to grasp bamboos, bend, stand over them and feed on leaves.

Banti knows her neighbours in the camp well; she has a friend, Bhama, who sarcastically tells Banti that she is the Matriarch of the camp. The camp is not much of an ordeal nowadays according to the inmates, as before.

However, Banti is all agony and pains with the plenty of problems they have, and she feels, living in their own home is becoming stressful. From Jackfruit poisoning, electric fencing, bursting crackers, throwing fire, high beam lights, noisy traffic, and trenches, she has a long list to worry and negotiate, apart from handling their natural predators like Wild dog and Tiger from not attacking their young calves.

The book portrays the changes that happened in the landscape and the impact it created on their natural life over six or seven decades. This could be related to any other major elephant habitats anywhere in the country. The cover design and illustrations are also neatly done in tandem with the narration. This book is a brilliant effort in retrospection for conservationists to understand the changes that happened around

us through the past decades in a simple read.

Banti made me sad. She made me ashamed of what we did/do to them. She made me think. I need to stop her frequently from narrating, to take stock of what she said and ponder over it. She knows not everyone can be kind like her friend, Siva, the forest man, but she wants to live with us, co-exist with us. It is her and their rights as much as ours. She wants us to understand their needs, freedom, and movements. I told her, the best man to convey her story and feelings to the human is Byju. Byju obliged Banti and made a beautiful narration on her behalf. Byju feels he has to do so, expecting nothing in return from the largest existing land animals called Elephants!

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ZOO'S PRINT

Communicating science for conservation

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We welcome articles from the conservation community of all SAARC countries, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and other tropical countries if relevant to SAARC countries' problems and potential.

Type — Articles of semi-scientific or technical nature. News, notes, announcements of interest to conservation community and personal opinion pieces.

Feature articles — articles of a conjectural nature — opinions, theoretical, subjective.

Case reports: case studies or notes, short factual reports and descriptions.

News and announcements — short items of news or announcements of interest to zoo and wildlife community

Cartoons, puzzles, crossword and stories

Subject matter: Captive breeding, (wild) animal husbandry and management, wildlife management, field notes, conservation biology, population dynamics, population genetics, conservation education and interpretation, wild animal welfare, conservation of flora, natural history and history of zoos. Articles on rare breeds of domestic animals are also considered.

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Publication Information

ZOO'S PRINT, ISSN 0973-2543

Published at: Coimbatore

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Owner: Zoo Outreach Organisation, 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti, Coimbatore, Tamil Nadu 641035, India.

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