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Cover photo: *Cynopterus sphinx* © Aisha Sultana

Fading Fins, Flowing Hopes:

A Perception Study on Denison's Barb and its Riverine System

Sahyadria denisonii (commonly known as Denison's Barb, Red-lined Torpedo Barb, or Miss Kerala) is among the most popular ornamental fishes in aquariums worldwide. However, it is a highly endemic and endangered species, restricted to nine west-flowing rivers in Kerala and the southern tip of Karnataka. Due to its high demand in the aquarium trade over the past few decades, wild populations have seen a drastic decline.

This species is confined to specific stretches of these rivers, typically found at elevations 50–300 m. Within these rivers, populations are highly fragmented due to human interventions such as check dams and altered river flows. Genetic studies have revealed that populations in each river show signs of distinct speciation, underscoring the unique conservation value of each isolated group.

The threats to Denison's Barb extend beyond unsustainable fishing practices to include pollution and habitat degradation. In response, the Zoo Outreach Organisation, in collaboration

with Shoal has secured a grant to map the distribution of this species in its known range across Karnataka and Kerala. The project 'Conserving Denise and Friends' also aims to assess site-specific threats to other native fish species in these rivers and foster community engagement to improve data collection and raise awareness—steps that could ultimately lead to establishing community-based conservation reserves.

The initial phase of the project, led by Kasinath Anil in 2024, involved surveying river stretches to identify the presence or absence of the species and cataloguing threats along the nine rivers and their tributaries. The second phase focused on understanding local perceptions, particularly those of communities living along these rivers. It sought to explore their knowledge, utilisation, and attitudes towards the species, with the goal of informing conservation action plans. This phase also documented the community's relationship with their riverscapes, noting ecological changes based on local observations.

As part of this second phase, we a long with Jithin Vijayan (independent researcher) travelled to Thiruvambady on 27 March 2025. This area, through which the Iruvazhanjippuzha River (a major tributary of the Chaliyar) flows, was identified as a site where Denison's Barb had been previously recorded.

Kasinath had pinpointed seven such locations, forming the core of our study area. Our team decided to begin by interviewing individuals involved in fishing, as they are likely to have intimate knowledge about the species' local presence and historical trade. Tea shops served as our first points of contact, acting as informal hubs where local people exchanged information.

Through these conversations, we successfully identified and connected with key stakeholders, including fishermen, whom we interviewed using semi-structured questionnaires. We also spoke with other local residents to gather diverse perspectives.

Fishermen acknowledged the presence of the species and described fishing methods including nets, crackers, and even electrocution- claiming, somewhat questionably, that electrocution affects only large fish and not smaller ones. They also mentioned that the targeted trade in Denison's Barb had ceased following a ban by the Kerala government, stating that the species doesn't survive long after capture. However, local residents reported ongoing live capture and trade, suggesting that not all fishing has stopped.

Zooreach activities

Some fishermen noted that the fish had previously been exported to cities for Rs. 80–100 per pair, but claimed that declining market prices (down to Rs. 6) had deterred further exploitation. Yet, discrepancies in responses and hesitance to share full details indicated that some information may have been withheld.

Further threats to the species, as identified during our interviews, included habitat loss due to landslides, floods, river widening projects, and removal of river rocks- all of which impact the shallow habitats preferred by the species. Locals also reported pollution from tourists, as well as water overextraction by upstream resorts. While some areas now restrict tourist access to protect the river, enforcement remains a challenge.

Interestingly, many community members expressed a preference for conserving the entire river system rather than focusing on a single species. Some advocated for stricter regulations on pollution and fishing, and suggested forming local action committees to safeguard specific stretches of the river. There is a belief that with strong local involvement, other organisations, including political and social groups, may also join in to support river conservation.

In summary, our perception studies revealed a spectrum of attitudes toward conservation-from strong support to neutrality, but also highlighted significant potential for community-led initiatives.

To be noted that these observations are preliminary in nature, and from a single study area, and these observations are not thoroughly analysed thematically. Although by building awareness and involving local people in stewardship, we can foster a more ecologically sustainable riverine system.

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Caught in a spider web

While out observing firefly behaviour at the Anamalai Tiger Reserve, we noticed a firefly of the species, Abscondita terminalis, rather oddly. The flashes were brighter and quicker than usual. Upon inspection with our headlights, we found a male firefly caught in a spider web. The firefly was trying to escape the web and it flashed with bright, quick bursts when the spider came close to it. Fireflies are so good at avoiding obstacles in the forest as they fly, but they are unable to detect spider webs. Fireflies hardly have any predators because they are toxic and taste bad. Spiders are an exception.

Recorded by Sriram Murali and Chandrasekar Rathnam of Wild and Dark Earth, an NGO that conserves nocturnal habitats in India.
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Firefly with a clutch of eggs

In 2023 at the Anamalai Tiger Reserve, after a night of spectacular synchronous displays, we were looking for any firefly activity(eggs, dead fireflies, etc) the next day. We found this female firefly with a clutch of eggs on open ground. It was applying a protective layer to the eggs with its ovipositor. Upon closer look, this firefly seemed to have lost one of its legs. It's incredible that it was still caring for its offspring. The eggs are a couple of millimeters long and hatch in about four weeks. After three weeks of development, we've observed them to start glowing faintly.

Recorded by Mathi Thumilan and Sriram Murali of Wild and Dark Earth, an NGO that conserves nocturnal habitats in India.
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First photographic record of Grey-headed Fish-Eagle in Debagram Reserved Forest, West Bengal

Grey-headed Fish-Eagle in Debagram Reserved Forest. © Shuchismita Das

The Grey-headed Fish-eagle *Icthyophaga ichthyaetus* is a medium-sized piscivore raptor characterized by its brownish-grey plumage. Although it is a widespread resident in certain regions of India, its distribution is patchy and the population is relatively small despite its expansive range (Ferguson-Lees & Christie 2001). The species is found in the terai regions of the lower Himalaya, extending to Assam, and in central India touching the parts of southern Madhya Pradesh extending to eastern parts of Maharashtra, and southward from Western Ghats of Maharashtra to the foothills of Kerala (Grimmett et al. 2011; Mehta & Kulkarni 2013).

This eagle prefers lowland forests with large waterbodies, particularly slow-running rivers, lakes, perennial forest streams, marshes, seasonally flooded swamp-forest, mangrove swamps, coastal lagoons, and estuaries (Ferguson-Lees & Christie 2001). Nesting occurs in tall trees with open crowns located near waterbodies. Preferred nesting tree species include *Mangifera indica*, *Calophyllum apetalum*, and *Terminalia arjuna* (Balasubramanian & Manikandan 2015).

Adults exhibit a distinctive appearance with a relatively small head, longish neck, powerful grey bill, and a contrasting white belly and tail, marked with a broad black subterminal band. Sexes are alike, with females usually heavier than males. In contrast, juveniles display boldly streaked heads and underparts, diffuse brown tail barring, pale underwings with dark barring on flight feathers, and pronounced dark trailing edges. The Grey-headed Fish-Eagle is currently enlisted as 'Near Threatened' by the IUCN Red List (BirdLife International 2024). Although no systematic population assessments have been conducted, the species faces numerous threats, including deforestation and degradation of waterbodies which are their primary hunting grounds, unsustainable fishing practices, pollution of waterways, and loss of riparian vegetation for nesting (Clarke et al. 2023; BirdLife International 2024).

On 8 October 2023, a pair of Grey-headed Fish-Eagles

were observed perching on an exposed snag overlooking a waterbody, inside the Debagram Reserved Forest (23.159 N, 88.653 E), consisting of western Gangetic moist mixed deciduous type of vegetation located in Nadia-Murshidabad forest division in Nadia, West Bengal. This sighting represents the first photographic record of this species in Debagram forest and is significant as this species is considered rare in the Nadia District. While there are many eBird records of this species from the Bibhutibhusan Wildlife Sanctuary, located approximately 12 km away in the adjacent North 24 Parganas District, only one prior observation was recorded in February 2023 in Nadia (Sarkar 2021)

During a subsequent seasonal survey on 24 January 2024, the characteristic squawk call of an individual of this species was heard emanating from a nest situated atop a tall Arjun tree *Terminalia arjuna*. Another individual was also spotted perching near the waterbody. The pair was observed again at the same location on 25 May 2024. The sighting pattern emphasizes the potential of this understudied area for supporting this Near Threatened species which also acts as a key indicator for the health of aquatic ecosystems as their presence reflects clean water and a healthy prey base, making them valuable tools for conservation biologists. Additionally, conservation efforts should focus on protecting the waterbodies and surrounding forests from anthropogenic disturbances. By ensuring the health of this ecosystem, we can not only safeguard the Grey-headed Fish-Eagle but also maintain the ecological balance of the entire Debagram Forest.

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Observations of the nest of Yellow-wattled Lapwing from the Mookambika Wildlife Sanctuary, Karnataka

The Yellow-wattled Lapwing (YWL) *Vanellus malabaricus* (Boddaert, 1783) is a medium-sized bird that belongs to the Charadriidae family within the Charadriformes order and is native to the Indian Subcontinent, where it is commonly found throughout the area. This bird is distinguished by its black crown, bordered by a narrow white band separating it from the brown of the neck, and notable large yellow wattles on its face (Grimmett et al. 2011). YWL typically inhabits arid environments within open lowland areas. In this study, we observed the nests with YWL eggs from the Mookambika Wildlife Sanctuary, Karnataka.

A faunal survey was carried out by the Western Ghat Regional Centre of the Zoological Survey of India in Kozhikode at the Mookambika Wildlife Sanctuary in Karnataka, India. On 17 June 2022, at 1310 h, during the survey we observed nests with eggs of the YWL in an open lowland area of Areshiroor, located near the Areshiroor Helipad (13.8272°N, 74.7484°E). We recorded three nests containing 4, 4, and 3 eggs. The lengths and breadths of the eggs ranged 35.1–37.9 mm and 26.07–28.7 mm (n = 11); the sizes of the three nests were recorded as 156 mm, 135 mm, and 142 mm (Table 1). The materials used in the construction of the nests included dry cow dung, pellets from the Indian Hare *Lepus nigricollis*, small stones, and dry grass/sticks. House Crows *Corvus splendens* were observed being chased away by the YWL parents close to their nesting areas. All eggs were handled carefully with gloved hands, and the dimensions were measured using Mitutoyo digital calipers accurate to 0.01 mm. To minimize disturbance to the nests and their parents, a maximum of 30 seconds was spent at each nest for the measurement process.

The nesting habits of the YWL have been studied in detail throughout India in states such as Delhi, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Tamil Nadu, Uttarakhand, and West Bengal (Sethi et al. 2010; Jaykar & Spurway 1965; Dhindsa 1983; Gupta & Kaushik 2010; Islam & Rahmani 2004; Mukherjee et

Google Earth map showing the nesting habitat of (open lowland area) of the Yellow-wattled Lapwing V*anellus malabaricus* in Areshiroor, Mookambika Wildlife Sanctuary, Karnataka.

Measurements of nest and eggs of the Yellow-wattled Lapwing *Vanellus malabaricus* from Mookambika Wildlife Sanctuary, Karnataka.

Nest 1 (156 mm) Eggs (*n* = 4)		Nest 2 (135 mm) Eggs (*n* = 4)		Nest 3 (142 mm) Eggs (*n* = 3)	
Length	**Breadth**	**Length**	**Breadth**	**Length**	**Breadth**
35.8	27	35.48	27.2	36.5	26.7
35.27	26.782	37.9	26.07	35.8	26.3
35.16	28.7	36.3	26.4	35.9	26.8
35.1	27.7	36.9	27.1		

The nest, eggs and habitat of Yellow-wattled Lapwing *Vanellus malabaricus* in Areshiroor, Mookambika Wildlife Sanctuary, Karnataka: a—Yellow-wattled Lapwing *Vanellus malabaricus* | b—the nesting habitat in an open lowland area | c—nest #1 | d—nest #2 | e—nest #3 | f—the incubation of the eggs by a parent | g—discarded alcohol bottles | h—cattle grazing near the nesting sites. © M. Kamalakannan.

al. 2014). These lapwings reproduce during the dry season, with peak breeding occurring from March to June, before the onset of the monsoon season (Jaykar & Spurway 1965). The parent was also observed incubating the eggs in the nest.

The current study aligns with these previous findings. It's interesting to note that every nest was built close to dry cow dung, possibly to keep cattle from disturbing the nest while they were grazing nearby and to keep other predators away. Discarded alcohol bottles, plastic debris, grazing cattle, and stray dogs were seen in proximity to the YWL nesting area, all of which may disrupt the nests and eggs. This species is listed under Schedule II of the Indian Wildlife (Protection) Amendment Act 2022. Consequently, it is suggested that forest officials carry out regular patrols within the habitat to protect their nests from the aforementioned dangers, especially during breeding seasons of YWL.

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First sighting report of Black-necked Grebe (*Podiceps nigricollis*) from Chhattisgarh

The Black-necked Grebe *(Podiceps nigricollis)* is an uncommon winter visitor sporadically recorded in Pakistan, Northwest India ie; Punjab, Uttar Pradesh, Maharashtra, Himachal Pradesh, Southwest Gujarat. The species frequents reed bordered *Jheels* with floating vegetation interspersed with expanses of open shallow water in company with little grebe (Ali & Ripley 1987); coastal Odisha and Pune Maharashtra (Rasmussen & Anderton 2012). In nonbreeding season plumage mostly black and white, white throat and sides of head contrast with blackish crown and dusky ear coverts, striking white crescent curve behind eye, steep forehead (Grimmett et al. 2011) are clues to identification.

Various studies at national level Ali and Ripley (1987), Rasmussen and Anderton (2012), Grimmett et al (2011) and state level by D'Abreu (1935) central provinces including, Chhattisgarh, Vidharbha; Vishwakarma et al (2021); Bharos et al (2020); Arjun et al (2023) all in Chhattisgarh, do not mention occurrence of this species in central India inclusive of Madhya Pradesh, Chhattisgarh and Vidharbha region (Maharashtra).

On 20 December 2024, the second author saw it at Kopra Dam (22.06 N, 82.058 E, 210 m) Bilaspur district and photographed, subsequently others had visited this wetland and were lucky to find and photograph it on 21 and 22 December 2024. The bird was first located in company of Eurasian Coot amongst the thinly lotus weeds in noon hours. Next it came out of weeds in open area and during the rest time of the day they mixed with other avian as the fisherman were sailing their boats towards the water edge the black breasted grebe came closer to us all alone and offered opportunities for obtaining photographs and videos. When it was little far from us, we observed it diving in and emerging out in 30-40 seconds and twice it was seen with a fish in its beak.

Our observation period was for about 1 hour from 0630 h to 0730 h. It was solitary and was seen in open clear water patch. The species like Red-crested

Pochard, Eurasian Coot, Common Pochard and other waterfowls were at distance of more than *80* m. This bird stayed for about a week then left, temperature during its stay was between 30°C maximum to 16°C minimum. The species was identified by its nonbreeding physical features as described above (Grimmett et al. 2011) and consultation with experts. In previous study by Vishwakarma et al. (2021) at Kopra dam, this species was not recorded.

The sighting of Black-necked Grebe in Chhattisgarh is a rare sighting and is the first record for the state. The bird might be a passerby on its way to coastal Odisha as Rasmussen and Anderton (2012) mentioned.

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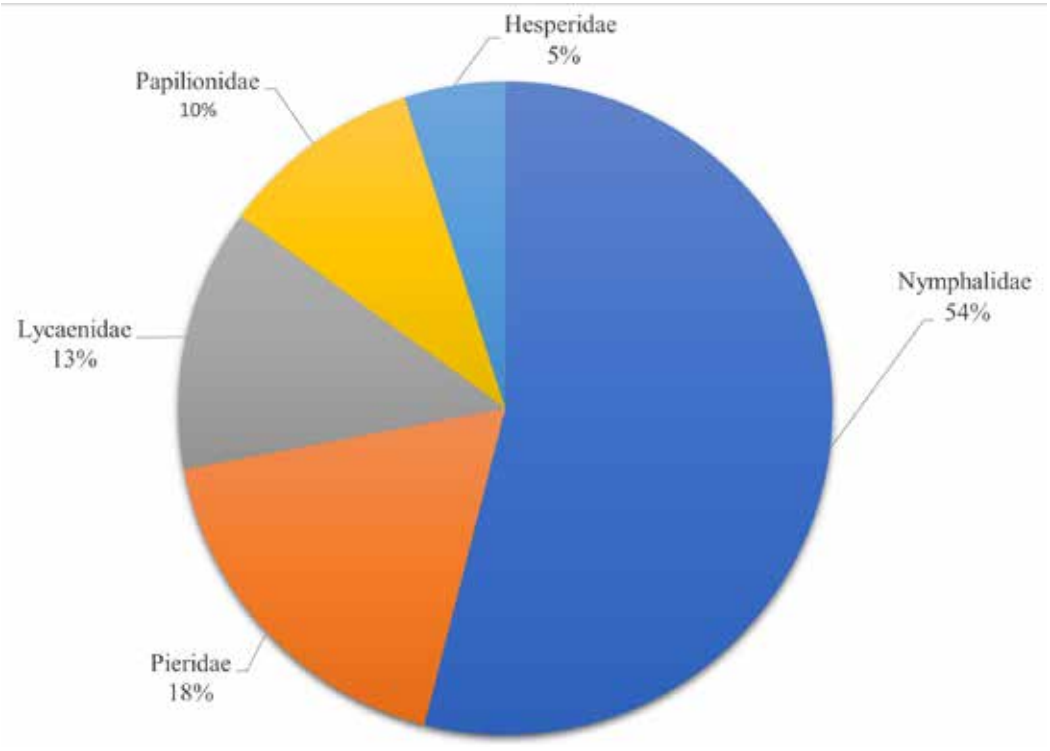
Diversity of butterflies in Nagarbera Town, Assam

A total of 962 butterflies have been reported from the state of Assam (Bishaya et al. 2021). From the review of literature, it has been found that no studies have ever been conducted on butterfly diversity in the sub-urban town of Nagarbera, Assam, India. The present study was done at the town of Nagarbera, Kamrup, Assam.

It lies at the south bank of river Brahmaputra and is situated geographically at 26.11179°N, 91.00358°E. During the present study a total of 20 field surveys were conducted in and around the town in a span of three months from January to March, 2024. The surveys were done during the morning time at 0800–1100 h. Pollard walk method (Pollard, 1982) was used for data collection with slight modification.

A walk of 2–3 hours was done on a 50-meter trail at various locations which included residential, market, forested and partially forested areas, stopping at intervals to spot and capture photos of the butterflies.

The observations concentrated on trying to recognize possible food plants and basking sites of butterflies. Some butterflies were identified on the spot based on the wing colour and patterns and others were identified later using photographs from existing literature (Evans 1932; Kehimkar 2008; Smetacek 2017) During the survey, a total of 39 different butterfly species were found.



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Different butterfly species documented during the present study in Nagarbera Town.

	Family	Common Name	Scientific Name
1.	Nymphalidae	Plain Tiger	*Danaus chrysippus* (Linnaeus, 1758)
2.		Common Crow	*Euploea core* (Cramer, [1780])
3.		Peacock Pansy	*Junonia almana* (Linnaeus, 1758)
4.		Lemon Pansy	*Junonia lemonias* (Linnaeus, 1758)
5.		Grey Pansy	*Junonia atlites* (Linnaeus, 1763)
6.		Chocolate Pansy	*Junonia iphita* (Cramer, 1779)
7.		Dark Evening Brown	*Melanitis phedima* (Cramer, [1780])
8.		Common Evening Brown	*Melanitis leda* (Linnaeus, 1758)
9.		Common Bushbrown	*Mycalesis perseus* (Fabricius, 1775)
10.		Common Five-ring	*Ypthima baldus* (Fabricius, 1775)
11.		Common Four-ring	*Ypthima huebneri* (Kirby, 1871)
12.		Common Leopard	*Phalanta phalantha* (Drury, 1773)
13.		Common Palmfly	*Elymnias hypermnestra* (Linnaeus, 1763)
14.		The Knight	*Lebadea martha* (Fabricius, 1787)
15.		Common Eggfly	*Hypolimnas bolina* (Linnaeus, 1758)
16.		Malayan Eggfly	*Hypolinas anomala* (Wallace, 1869)
17.		Blue Tiger	*Tirumala limniace* (Cramer, [1775])
18.		Common Sailer	*Neptis nata* (Moore, 1857)
19.		Bamboo Tree Brown	*Lethe europa* (Fabricius, 1787)
20.		Common Lascar	*Pantoporia hordonia* (Stoll, 1790)
21.		Grey Count	*Tanaecia lepida* (Butler, 1868)
22.	Lycaenidae	Common Pierrot	*Castalius rosimon* (Fabricius, 1775)
23.		Red Pierrot	*Talicada nyseus* (Guerin, 1843)
24.		Purple Leaf Blue	*Amblypodia anita* (Hewitson, 1862)
25.		Dark Grass Blue	*Zizeeria karsandra* (Moore, 1865)
26.		Forget-me-not	*Catochrysops strabo* (Fabricius, 1793)
27.	Pieridae	Common Grass Yellow	*Eurema hecabe* (Linnaeus, 1758)
28.		Psyche	*Leptosia nina* (Fabricius, 1793)
29.		Redspot Jezebel	*Delias descombesi* (Boisduval, 1836)
30.		Indian Cabbage White	*Pieris canidia* (Sparrman, 1768)
31.		Common Gull	*Cepora nerissa* (Fabricius, 1775)
32.		Common Emigrant	*Catopsilia pyranthe* (Linnaeus, 1758)
33.		Striped Albatross	*Appias libythea* (Fabricius, 1775)
34.	Papilionidae	Lime Butterfly	*Papilio demoleus* (Linnaeus, 1758)
35.		Common Mormon	*Papilio polytes* (Linnaeus, 1758)
36.		Great Mormon	*Papilio memnon* (Linnaeus, 1758)
37.		Common mime	*Papilio clytia* (Linnaeus, 1758)
38.	Hesperidae	Fulvous Pied Flat	*Pseudocoladenia dan* (Fabricius, 1787)
39.		Chestnut Bob	*Iambrix salsala* (Moore, [1866])

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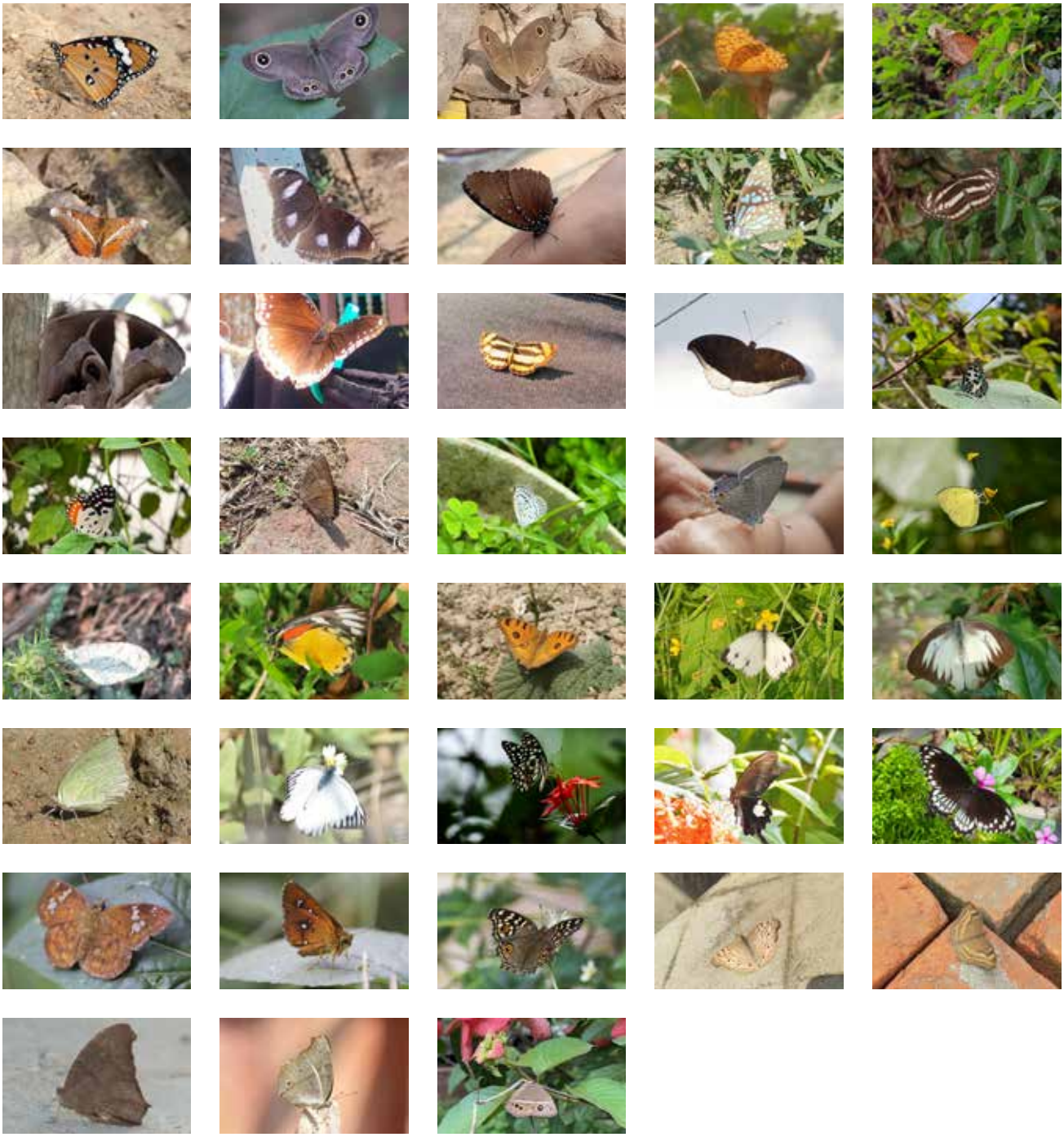

1 —*Danaus chrysippus* | 2—*Euploea core* | 3—*Junonia almanac* | 4—*Junonia lemonias* | 5—*Junonia atlites* | 6—*Junonia iphita* | 7—*Melanitis phedim*a | 8—*Melanitis leda* | 9—*Mycalesis perseus* | 10—*Ypthima baldus* | 11—*Ypthima huebneri* | 12—*Phalanta* phalantha | 13—*Elymnias hypermnestra* | 14—*Lebadea martha* | 15—*Hypolimnas bolina* | 16—*Hypolinas anomala* | 17—*Tirumala limniace* | 18—*Neptis nata* | 19—*Lethe europa* | 20—*Pantoporia hordonia* | 21—*Tanaecia lepida* | 22—*Castalius rosimon* | 23—*Talicada nyseus* | 24—*Amblypodia anita* | 25—*Zizeeria karsandra* | 26—*Catochrysops strabo* | 27—*Eurema hecabe* | 28—*Leptosia nina* | 29—*Delias descombesi* | 30—*Pieris canidia* | 31—*Cepora nerissa* | 32—*Catopsilia pyranthe* | 33—*Appias libythea* | 34—*Papilio demoleus* | 35—*Papilio polytes* | 36—*Papilio memnon* | 37—*Papilio clytia* | 38—*Pseudocoladenia dan* | 39—*Iambrix salsala*.

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Bugs R All

#224
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References

Bishaya, P., K. Saikia & R. Gogoi (2021). Butterfly diversity in Cotton University Campus, Guwahati, Assam, India. *Uttar Pradesh Journal of Zoology* 42(24): 396–403.

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Social interactions recorded in a family of captive Common Gray Langur – a case study

Primate societies are commonly structured organizations with clear social rules which determine patterns of interactions among different classes of individuals that comprise these societies (Lal & Rajpurohit 2010). The Common Gray Langur or Hanuman Langur (*Semnopethicus entellus*) is one such most widely distributed non-human primate species, found in the Indian subcontinent (Roonwal & Mohnot 1977). Langurs live in groups, numbering 40–60 **(**Roberts 1997). Known for their high adaptability, they have a highly variable social organization with social groups such as bisexual troops or all male bands (Lal & Rajpurohit 2010).

In recent years, zoological parks have added animal conservation as their renewed objective besides being centers of public recreation and education (Seidensticker & Doherty 1996). One such transformation is being attempted through enrichment (Maple & Perkins 1996) which entails changeable, interactive features facilitating foraging and other occupational activities for adult animals while stimulating appropriate play for young animals (Coe 2006). Enrichment enables recovery from behavioral problems that arise from captivity like psychological stress, lack of species-specific exploratory behaviors and development of abnormal behaviors like stereotypical pacing (Dawson 2009).

Additionally, scientific understanding of animal interactions in naturalistic environments is very limited (Stoinski et al. 2001). Alternatively, observational studies and behavioural assessments in zoo research programs provide insights into animals' habits and behaviour (Mench & Mason 1997) which collectively pave way for effective enrichment measures to achieve animal welfare.

In the present study, an attempt was made to record various interactions in a family of captive Common Gray Langurs in Padmaja Naidu Himalayan Zoological Park (PNHZP) based on different age groups. The results provide relevant preliminary insights into activity patterns and can be used to plan naturalistic and feasible enrichment measures for the animals which will contribute to maintaining a healthy population in captivity.

Methodology

Study area: Observations of the Common Gray Langurs took place at PNHZP, Darjeeling, India (27°3'N, 88°18'E). The zoo has two enclosures for the species with different total areas that are connected to each other with a small, moderately long tunnel with an area of 2.52 m^2. Enclosure-I has a total area of 55.1 m^2 and Enclosure-II has a total area of 35.5 $m^{2.}$ Enclosure-I has an inbuilt feeding house and a water source. Both the enclosures are well equipped with wooden logs as well as ropes and are 3.6 m high.

Sample size: Subject of study included a family of six langurs all of which are on display. As

the family consisted of members from various age groups, the behaviour to be observed was classified based on members of the same age groups and interactions between the age groups: (i) Young-young interaction, (ii) Young-adult interaction, and (iii) Adult-adult interaction.

Behaviour observation: The report is based on ad-libitum observations (Altmann 1974) that were carried out for 60 hours throughout a period of two months in from July to October 2018. The time period for observation was between morning and early evening. The morning observations were at 0700–1100 h (before mid-day) and the evening observations were at 1400–1600 h (after mid-day).

Frequency percentage of recorded interactions was calculated and graphically represented. Correlation was calculated among the variables to quantify the strength and direction of the interactions among the members of the langur family. MS Excel and R software were used for data analysis.

The interactions have been described in the Table. The pie charts list the percentages of all interactions in different groups. Correlation matrix is provided in the figure.

Among the young group of langurs, it was found that the juveniles and the infant (Individual 4, 5 & 6) generally actively interacted with each other in the form of chasing, wrestling and playing. Other than these, biting each other while wrestling, and swinging from the ropes and the wooden logs were observed. Playing is related to physical development, entertainment and refreshment (Alam et al. 2014). Fitriyani & Purba (2023), in their preliminary observations of the daily activities of Javan Langurs in captivity noted that playing among young individuals often occurred in the form of jumping and circling the cage, paired with chasing and biting each as well as playing with the leaves or plants in the cage.

Ren et al. (2010) in their study of the captive Snub-nosed Langur differentiated playing from chasing and biting under affiliative and agnostic behaviours respectively. Ahsan & Khan (2006) reported in their study of eco-ethology of wild Common Langur that juveniles chased and wrestled each other along with instances of mounting, embracing and greeting. Positive correlations were observed among different categories of interactions like playing & chasing and wrestling & biting.

The interactions between the adults and young ones were limited to parental care that included grooming sessions and breastfeeding. Grooming by adults and breastfeeding displayed a positive correlation (0.8) especially as the mother would also groom the infant while breastfeeding.
In a study made by Alam et al. (2014) on Hanuman Langurs residing in Jessore District of Bangladesh, it was noted that stronger relationships were made between mother and infants within a group when the infants were nursed, groomed and carried by the mother, with instances of allomothering as well. Infants travel and sleep on their mother's chest for survival as they cannot move independently (Sugiyama 1965). During the study it was observed that the adult male participated in play behaviour with the juveniles. Adult males within the group play to encourage the sub-adults to facilitate social development and

communication (Roonwal & Mohnot 1977). Grooming is an important characteristic social interaction in which hands, lips, and tongue are used to pick up ectoparasitic insect and clean debris from body for feeding and hygienic purposes (Kurland 1977). Parr et al. (1997) stated in their study that grooming results in proximity between individuals and reinforces social structures, allowing sympathy within a group.

Mutual grooming was displayed by the adults during observation period, with a higher frequency between the two adult females and showed a strong positive correlation (0.88). Ahsan & Khan (2006), in their study of the eco-ethological study of the Common Langur reported that the relationships between the females in a group were usually positive displaying behaviours like moving, resting, and social grooming.

The adult male also displayed aggression both towards the young ones and adult females, usually in the form of threat or chase during feeding and mating. Social hierarchies and aggression exist for all Hanuman langur group types (Srivastava & Mohnot 1992). Ahsan & Khan (2006) reported similar observations, stating that adult males attacked young individuals during feeding. Adult males also showed aggression when during mating they are disturbed by other adult females (Alam et al. 2014).

This study provides preliminary information on interaction recorded between members in a small group of Hanuman Langurs. The interplay among members of the captive group mirrors the behaviour witnessed in the wild groups of langurs, thus indicating presence of natural species-specific interactions. Comparative studies in the future between wild and captivity will provide comprehensive insights into the psychological status of the animals.

Additionally, studies can be undertaken to investigate activity budgets, enclosure utilisation and visitor effects. There is scope to also explore maternal behaviour and grooming patterns among troop members. These studies can provide a holistic overview of primate behaviour in captivity and in turn aid with animal enrichment and welfare in captivity.

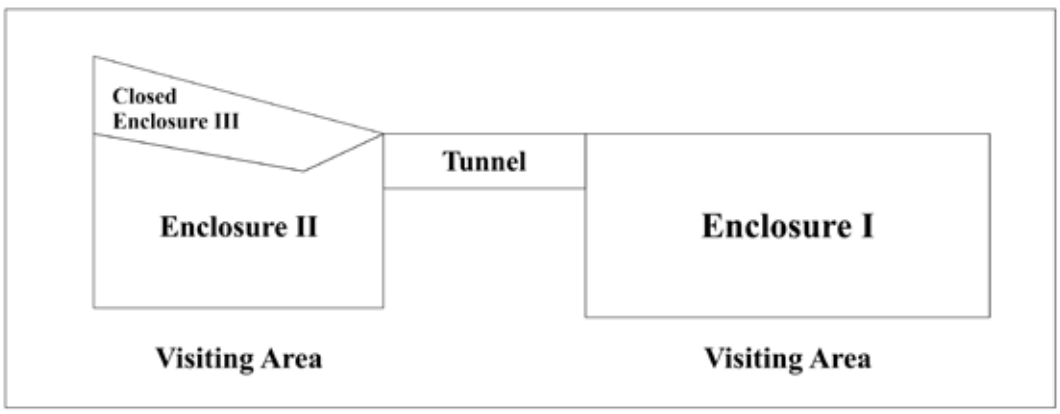
Acknowledgement: The author would like to acknowledge the zoo authorities at PNHZP for this opportunity.

Table 1. Individuals housed at PNHZP

	Name	Sex	Age (as on 2018)	Category
1	Individual 1	Male	9 yr	Adult
2	Individual 2	Female	7 yr	Adult
3	Individual 3	Female	6 yr	Adult
4	Individual 4	Male	2 yr	Juvenile
5	Individual 5	Male	2 yr	Juvenile
6	Individual 6	Male	5 mt	Infant

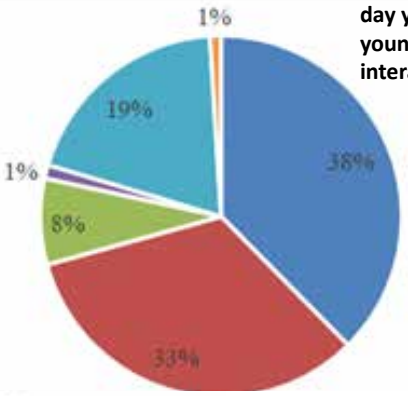
Table 2. List of interactions recorded among members of the Hanuman Langur family.

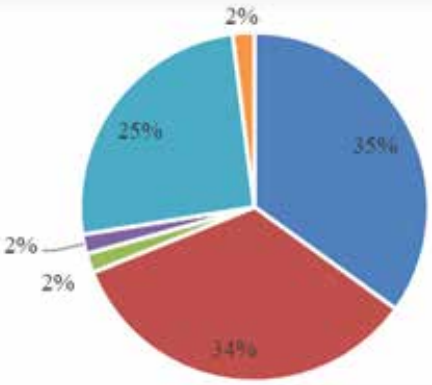
Behaviour	Description
Young-young	
Playing	Running, jumping and catching while exchanging glances between young ones and infants
Chasing	The act of one individual running behind another individual through the length of the enclosure and vice versa
Wrestling	The act of fighting between two individuals by hitting each other using forelimbs
Biting	The act of biting a body part mostly the neck region by an individual in the middle of playing or at the end of a chase
Swinging	The act of hanging from the enclosure net or ropes by their tails or arms
Mounting	The act of climbing on an individual's posterior body region
Young-adult	
Grooming	The act of taking out debris/lice from a young one's body by an adult
Breastfeeding	Feeding breastmilk by a female adult to its infant
Playing	Running, jumping and catching while exchanging glances between adults and young ones
Reverse grooming	The act of taking out debris/lice from an adult's body by a young one
Aggressive	Any act of letting out a shriek and trying to fend off the young ones
Adult-adult	
Female-female grooming	One female grooming the other female by taking out debris/ lice different parts of the body
Female-female reverse grooming	The other female now becoming the groomer to take out debris/lice from the female that groomed her
Male-female grooming	The male would get groomed by the female in the form of taking out debris/lice from different parts of the body
Reverse male-female grooming	The male would now be the groomer and repeat the same pattern
Aggression	Any of letting out a shriek and trying to fend off an adult



Common gray langur enclosure at PNHZP

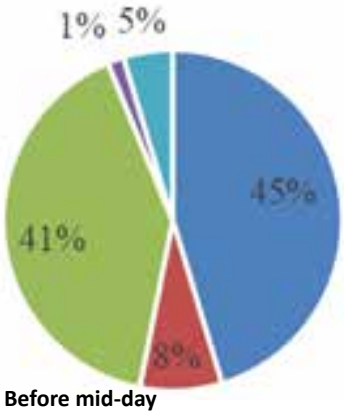
Before mid-day young-young interactions



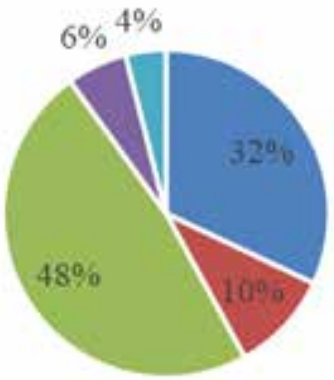


After mid-day young-young interactions

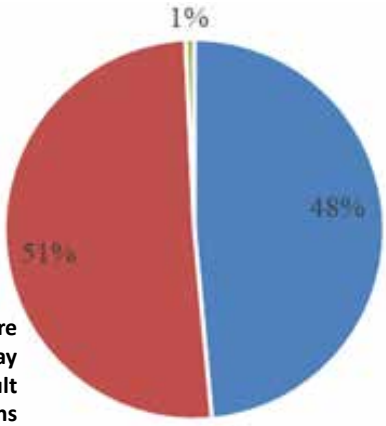
Various interactions as noted during observations



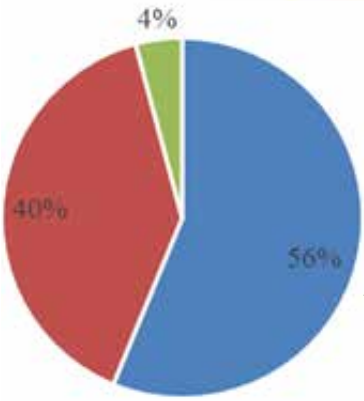
Before mid-day young-adult interactions



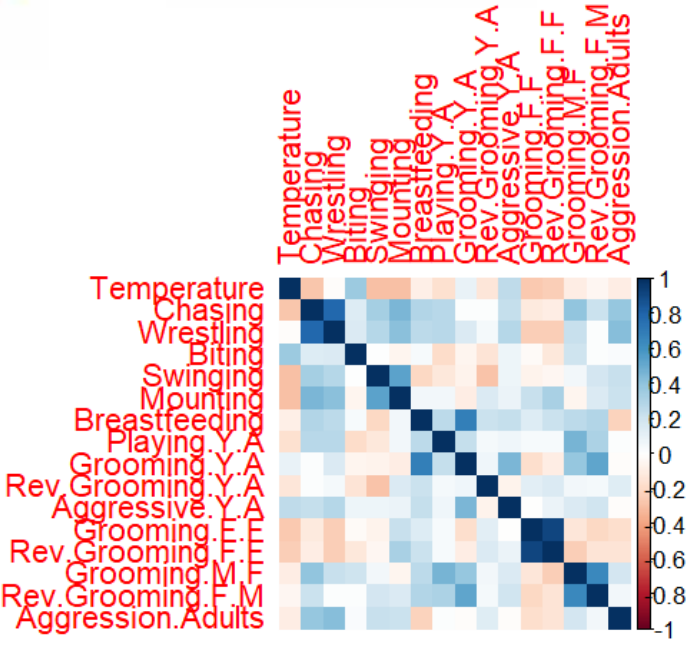
After mid-day young-adult interactions



Before mid-day adult-adult interactions



After mid-day adult-adult interactions



Correlation between the interaction.

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#178
21 May 2025

Beauty Snake *Elaphe taeniura* recorded from Dibrugarh, Assam

Beauty Snake (Beauty Rat Snake / Striped Trinket Snake) *Elaphe taeniura* (Cope, 1861), Syn. *Orthriophis taeniurus,* was described as *Elaphe taenurus* by E.D. Cope (Cope 1861; Schulz et al. 2015; Basfore et al. 2024; Uetz et al. 2025). It is one of the three species of *Elaphe* recorded from India (Mohapatra et al. 2024). Its range of distribution include southeastern Russia, China, Japan, northeastern India, Bhutan, Myanmar, Thailand, northern Laos, northern Vietnam, eastern Malaysia, western Malaysia, Singapore, Brunei, and Indonesia (Wallach et.al. 2014).

In India, there are reports of this species from Arunachal Pradesh, Mizoram, Sikkim, and West Bengal (Smith 1943; Whitaker & Captain 2008; Ahmed et al. 2009; Lalremsanga 2022; Basfore et al. 2024, Uetz et al. 2025). In Arunachal Pradesh it is recorded from seven districts including five protected areas (Nath & Sinha 2021): Lohit District, upper Siang District, upper Subansiri District, lower Subansiri District, Namdapha National Park (Changlang District), Kamlang Tiger Reserve, Eaglenest Wildlife Sanctuary (Athreya 2006), Dihang Dibang Biosphere Reserve (Upper Dibang Vally District), and Itanagar Wildlife Sanctuary (Papumpare District).

Elaphe taeniura **(Cope, 1861). Dibrugarh, Assam, India (27.482711 N. - 94.907438 E.) © Tikendrajit Gogai**

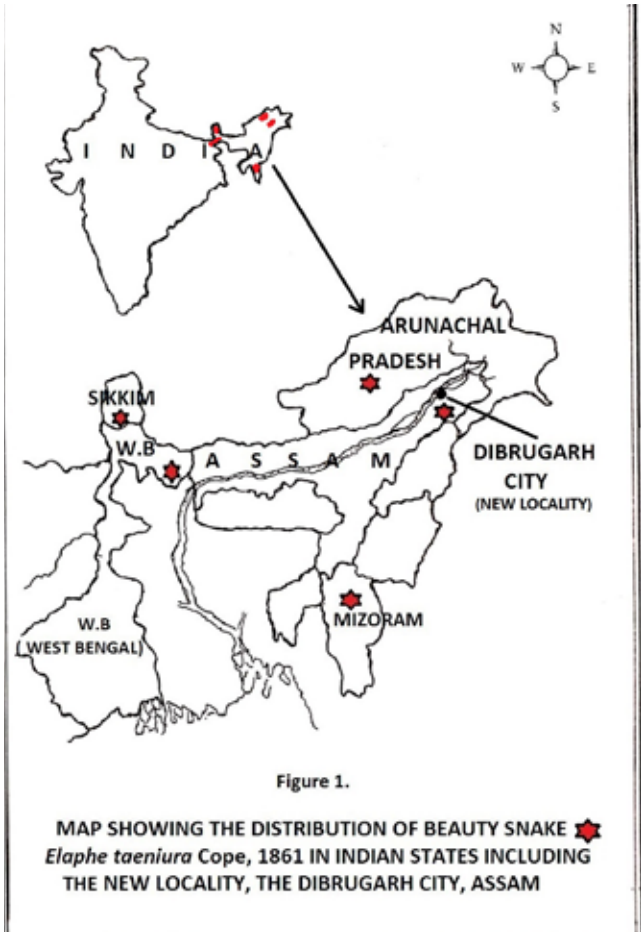
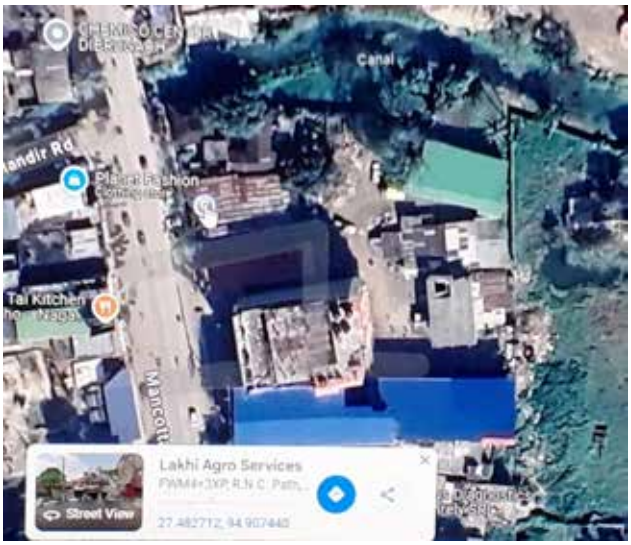


Figure 1.

MAP SHOWING THE DISTRIBUTION OF BEAUTY SNAKE *Elaphe taeniura* Cope, 1861 IN INDIAN STATES INCLUDING THE NEW LOCALITY, THE DIBRUGARH CITY, ASSAM



Although Assam is included in its distribution range (Sharma 2007; Uetz et al. 2025), there is no specific locality record of this species so far (Gayen et al. 2023, Basfore et al. 2024, Uetz et al. 2025). In this communication a specific locality of its distribution in Assam is presented.

A snake of the species *Elaphe taeniura* was recorded in Dibrugarh City (on the south bank of the river Brahmaputra), Assam, India on 24 September 2024. The location was a shop named Lakhi Agro Services (27.4827 N, 94.9074 E; 108 m (354 ft) above MSL) on Mankotta road between Thana Chariali and Assam Police Reserve area of the city. The elevation record is perhaps one of the lowest for this species. The owner of the shop communicated me to rescue a snake from the shop. He sent me a video of the uncommon snake species recorded in his shop not encountered by me earlier. The agro services shop was with some stored grains besides other articles and evidence of rodents. It is connected to some vegetation in its east and north side near the city's main drain.

The snake was rescued and identified as *Elaphe taeniura yunnanensis* (Anderson, 1879) based

on some identifying characters as outlined in literature (Smith 1943; Whitaker & Captain 2008; Schulz et al. 2015). These include: broad black stripes behind eyes, neck region without any pattern, butterfly-shaped dorsal markings and elongated diamond shaped markings (with light center) on sides of the anterior region. Hind body with a mid-dorsal pale stripe bordered on each side by broad black stripe.

The lateral black stripes have pale vertical lines in equal distances. Total length of the snake was 920 mm, body 740 mm, tail 180 mm, head 11.5 mm, and neck region without pattern 21 mm. Number of ventral scales 247 and dorsal scales in mid body 25. Number of scales in the hind vertebral stripe is 3. Anal and sub-caudals divided.

Beauty Snake is a 'Vulnerable' species under IUCN Red List. It is also a schedule II species in Indian Wildlife (Protection) Amendment Act, 2022 (Mohapatra et al. 2024).

The snake was handed over to the forest range officer, Dibrugarh and it was later released in a suitable place.

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#186
21 May 2025

Notes on parturition of Bamboo Pit Viper in wild

Pit vipers are a group of venomous snakes that comprise several genera of vipers with a facial pit; they are terrestrial and arboreal in habit and predominantly found in wet, humid forests and montane habitats as well as in a few dry forest habitats in the Oriental realm (Mallik et al. 2021). Asian Pit Vipers belonging to the genus Craspedocephalus are a complex group of vipers, distributed in southern and southeastern Asia (Mallik et al. 2021). The Bamboo Pit Viper Carspedocephalus gramineus (Shaw, 1802), is the most widespread pit viper, found in most of the dense forests of peninsular India (Mallik et al. 2021).

During a survey on 17 June 2022 in the forest of southern Gujarat 20.510° N, 73.276° E at around 2100 h, the first author observed a gravid Bamboo Pit Viper about 1 m above the ground coiled on fallen branches of a bamboo plant.

On closer observation, the author observed some movement in the belly of the Bamboo Pit Viper. It seemed like the neonates were fully developed and were about to emerge. After about 8–10 minutes the viper showed mild movements, it gently lifted the tail and started to move to push the juveniles out.

The first juvenile appeared being covered in mucosal fluids and making movement by opening its mouth and adjusting the jaws. It clung on to a nearby branch, rubbing its body against the branches to get rid of the mucosal fluids. After giving birth to the first neonate, the female again positioned itself giving birth to four neonates, after which it moved towards the bamboo where it gave birth to the rest.

During the process some neonates fell upon the litterfall while others swiftly clanged on to the branches. The female viper gave birth to thirteen juveniles within two hours, aligning with the reproductive traits commonly found in vipers, showcasing their strategy of giving birth to multiple offsprings to enhance survival rates.

This observation provides valuable insights into the reproductive behaviour of the species and highlights its adaptability in selecting a suitable environment for neonate survival. The neonates' behaviour suggests an innate capability to adapt to their surroundings immediately after birth. This documentation underscores the importance of protecting the woodlands and maintaining their ecological integrity, as these habitats are critical for the species survival.

Observation of Bamboo Pit Viper *Carspedocephalus gramineus* giving birth in the Wild. ©Aadit Patel.

This also reinforces the need for further field studies to document similar behaviours and their ecological implications, in the context of conservation efforts in the Western and Eastern Ghats of India.

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A new record of an endemic and endangered succulent Euphorbia vajravelui for the Eastern Ghats of Tamil Nadu

Euphorbia L. is the largest genus in the family Euphorbiaceae and the sixth largest genus among the flowering plants (Sarojinidevi & Venkatraju 2017), comprising 2,054 accepted species that are cosmopolitan in nature, especially with the highest diversity found in arid and semi-arid regions of the tropics and subtropics (Mabberley 2017; POWO 2024). In India, this genus is represented by 93 species, of which 40 are endemic taxa (Sarojinidevi & Kullayiswamy 2023).

This genus shows a variety of habits, such as herbs, shrubs, trees, and geophytes, present in a few succulent and xerophytic forms (Aditya 2010; Horn et al. 2012).

Euphorbia vajravelui: A–Habit of the plant | B–Habitat of the plant | C–Cyathia | D–Sapling at the Conservatory. © P. Raja.

During the floristic studies in the Sirumalai Hills situated in the southernmost part of the Eastern Ghats in Tamil Nadu, the authors collected an unidentified succulent species of *Euphorbia*. After a detailed scrutiny of the specimens using relevant literature (Matthew 1999; Pallithanam 2001; Binojkumar & Balakrishnan 2010; Balakrishnan et al. 2012), it was identified as *Euphorbia vajravelui*. Binojk. & N.P.Balakr. That is so far reported only in the Western Ghats of Tamil Nadu, hitherto has not been reported anywhere in the Eastern Ghats. Therefore, the present report of *E. vajravelui* is the first record for the Eastern Ghats.

Taxonomic treatment

Key to closely related species of *Euphorbia vajravelui*

1. Branches crowded at apex; space between the wings flat ..... *E. susan-holmesiae*
- Branches not crowded at apex; space between the wings not flat, shallowly curved 2
2. Ultimate branches 2-winged, lower branches 4- or 5-winged; primary peduncles < 1 cm long ..... *E. vajravelui*
- All branches 3-winged; primary peduncles >1 cm long ..... *E. antiquorum*

Euphorbia vajravelui Binojk. & N.P.Balakr., Cact. Succ. J. (Los Angelss) 63(3): 229–232. 1991; Binojkumar, Cact. Succ. J. (Los Angelss) 66(4): 169–170. 1994; Rajendran & al., JETB, 26(1): 223–235. 2002; Binojk. & N.P.Balakr., *Euphorbia* in India 334. f. 69, t. 24. 2010; N.P.Balakr. & al., Euphorbiaceae in Fl. India. 23: 327. 2012.

Description: Shrubs or small trees; stem 3-angled; mature branches angular, 4 or 5 winged, young one flat, 2-winged; wings thin, wavy-margined; spines 2, divaricate, 2–3 mm long. Leaves sessile broadly obovate–suborbicular, 3–5 × 2–4 mm, obtuse–subtruncate at base, entire at margins, obtuse or subacute at apex, fleshy, obscurely nerved, caducous. Cyathia in axillary, solitary or in triads, central one sessile, bearing with male florets; laterals pedunculate, bisexual; peduncles 4–5 mm long; bracts broadly ovate, c. 3 × 2 mm, yellowish. Involucre saucer-shaped, 5 × 5 mm; lobes 5, orbicular, 2 × 1.5 mm, lacerate along apical margin; glands 4 or 5, transversely oblong 3.8 × 1.7 mm, fleshy, strongly pitted, pale yellow. ♂ florets: in 5, fascicles, each 5 or 6-flowered; pedicels 1 mm long, glabrous; anthers c. 0.5 mm long, subglobose; bracteoles obconic, lacerate, 3 × 4 mm. ♀ floret: gynophore c. 2 mm long; ovary ovoid, 5–7 mm across, separating into 3 bivalved, 1-seeded cocci, columella persistent; seeds ovoid, c. 3 × 2 mm, black.

Specimens examined: Tamil Nadu: Theni District, Kurangani, Kottagudi river, 22.xi.2023, P. Raja 69134 (RHT); Dindigul District, Sirumalai hills, Kadaman Kombai, 27.xi.2023, P. Raja 69152 (RHT).

Flowering and fruiting: December–April

Habitat: Occasional in rocky slopes along the outer layer of semi evergreen forests.

Distribution and ecology: *Euphorbia vajravelui* Binojk. & N.P.Balakr. is a succulent small shrubs or subshrubs species endemic to Western Ghats and it was first discovered in the Kalakkad forests of Tirunelveli by Binojkumar & Balakrishnan (1991). After a decade Rajendran et al. (2002) reported its distribution extended to Srivilliputur Hills of Virudhunagar District and Selvakumar et al. (2016) reported its distribution extended to Theni District. Based on the literature, *E. vajravelui* is distributed only in the southern Western Ghats of Tamil Nadu at an altitude of 1,000–1,200 m. Recent exploration on Kurangani Hills of Theni District, the authors recorded >40 matured individuals and 30 saplings in five quadrants (each 32 × 32 m) along the barren slopes along the Kottagudi River an altitude of 617–1,100 m. Subsequently visited Thonimalai Forest, eastern slopes of Palani Hills, Dindigul District where four matured individuals of *E. vajravelui* were recorded from an altitude of 1,333 m. Later,

during the field visit to Sirumalai Hills of Eastern Ghats the authors recorded seven matured individuals associated with evergreen woody species such as *Memecylon edule* Roxb., *Psydrax umbellata* (Wight) Bridson, *Atalantia racemosa* Wight ex Hook., *Psychotria subintegra* (Wight & Arn) Hook.f., *Strobilanthes consanguinea* (Nees) T.Anderson, *Mallotus resinosus* (Blanco) Merr. and herbaceous species such as *Hemionitis arifolia* (Burm.f.) T.Moore, *Spermacoce pusilla* Wall., *Doryopteris concolor* (Langsd. & Fisch.) Kuhn, *Zehneria maysorensis* Arn., and *Begonia malabarica* Lam.

Conservation status: *Euphorbia vajravelui* has been assessed as an Endangered species by the IUCN Red List (2023), with the global population currently estimated at 110–130 mature individuals, and the population is decreasing due to storms and floods. As part of the ex-situ conservation measures, two seedlings collected from the study area are maintained at the Rapinat Herbarium Conservatory.

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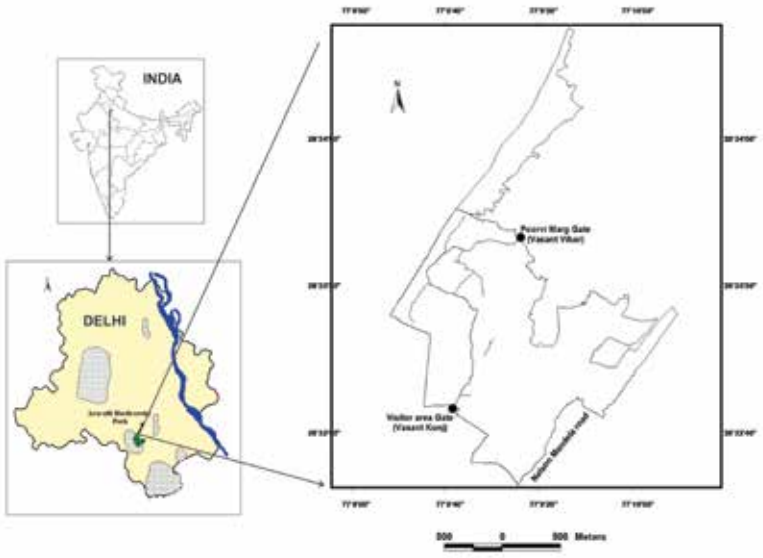
Bat species conservation in Aravalli Biodiversity Park, Delhi, India

The Dusky Leaf-nosed Bat *Hipposideros ater* was first described by Templeton in 1848. According to Saikia (2018) this species has been recorded in Maharashtra and Kerala only but Srinivasulu & Srinivasulu (2006) recorded it from Andhra Pradesh, India also, and described it as a new subspecies *Hipposideros ater nallamalaensis* while other subspecies *Hipposideros ater ater* (India and Sri Lanka) and *Hipposideros ater nicobarulae* (Nicobar Islands, India) are also known from the Indian subcontinent. This bat was not recorded from the northern region of India, so the present record of this species from Delhi is an extant distribution also (Armstrong 2021).

Hipposideros ater was sighted and photographed first time on 20 October 2018 at Delhi Development Authority's Aravalli Biodiversity Park (ABP), Delhi during dusk time. Later monitoring confirmed its permanent roosting site in the cave along with *Rhinolophus lepidus*. The record of *Hipposideros ater* from ABP is the upgradation of a new species in the checklist of bat species of Delhi. Morphometric details were not taken due to some unavoidable circumstances.

The mined cave that has been restored for bat conservation in Aravalli Biodiversity Park, Delhi, India. (Photo: Aisha Sultana)



Map of the study area, Aravalli Biodiversity Park, Delhi, India.

ABP, part of Delhi's ridge, suffered extensive mining (mica, sandstone, and kaolin) and invasive infestation by *Prosopis juliflora*, leading to the loss of its native flora and fauna (Sultana et al. 2013). Spanning 692 acres, it is situated between 77.131E-

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77.180 E and 28.574 N-28.573 N. Due to mining many caves were formed and in due course of time these caves started supporting biodiversity when the restoration work started. ABP has various native plant communities, with notable species such as *Terminalia chebula, Limonia acidissima, Alangium salvifolium, Ficus racemosa, Artocarpus lacucha*, *Butea monosperma*. The park also has rejuvenated ditches and caves, some of which host water bodies and plant species like *Ficus racemosa*, *Bombax ceiba*, *Pterygota alata*, *Syzygium cumini*, and *Mimusops elengii*.

The continuous monitoring revealed the presence of four species of bats in the park, i.e., Indian Flying Fox *Pteropus medius*, Greater Short-nosed Fruit Bat *Cynopterus sphinx*, Blyth's Horseshoe Bat *Rhinolophus lepidus*, and Dusky Leaf-nosed Bat *Hipposideros ater*. Earlier Srinivasulu & Srinivasulu (2007) and later Mishra & Dookia (2015) updated the list of bat species in Delhi. *Rhinolophus lepidus* was mentioned as a record from ABP only Mishra et al. 2018) whereas *Hipposideros ater* was not recorded in either of the studies.

As key pollinators, seed dispersers, and insect predators, bats are susceptible to habitat disruption and can serve as indicator species. Urban restoration sites like ABP, offer the potential to support diverse ecosystems in densely populated cities (Sharma et al. 2022). The restoration of mining pits in Delhi's ABP has significantly benefited frugivorous and insectivorous bats. By restoring vegetation,

The updated list of bat species of Delhi along with new record* (Srinivasulu & Srinivasulu 2007; Mishra & Dookia 2015).

	Bat species	Family	Habitat type	IUCN Status	Population trend (Global) (IUCN)
1	Indian Flying Fox *Pteropus medius* Temminck 1825	Pteropodidae	Forest	NT	Decreasing (Last assessed 2024)
2	Greater Short-nosed Fruit Bat *Cynopterus sphinx* Vahl, 1797	Pteropodidae	Forest	LC	Increasing (Last assessed 2019)
3	Leschenault's Rousette *Rousettus leschenaultii* Desmarest, 1820	Pteropodidae	Forest, caves	NT	Decreasing (Last assessed 2021)
4	Greater Mouse-tailed Bat *Rhinopoma microphyllum* Brunnich, 1782	Rhinopomatidae	Shrubland, caves	LC	Stable (Last assessed 2017)
5	Lesser Mouse-tailed Bat *Rhinopoma hardwickii* Gray, 1831	Rhinopomatidae	Shrubland, grassland, caves	LC	Stable (Last assessed 2017)
6	Egyptian Free-tailed Bat *Tadarida aegyptiaca* E. Geoffroy, 1818	Molossidae	Shrubland, grassland	LC	Unknown (Last assessed 2017)
7	Black-bearded Tomb Bat *Taphozous melanopogon* Temminck, 1841	Emballonuridae	Forest, shrubland, caves	LC	Stable (Last assessed 2019)
8	Greater False Vampire *Lyroderma lyra* (E. Geoffroy, 1810)	Megadermatidae	Forest, shrubland, caves	LC	Unknown (Last assessed 2020)
9	Blyth's Horseshoe Bat *Rhinolophus lepidus* Blyth, 1844	Rhinolophidae	Forest, caves	LC	Unknown (Last assessed 2019)
10	*Dusky Leaf-nosed Bat *Hipposideros ater* Templeton, 1848	Hipposideridae	Forest, shrubland, caves	LC	Unknown (Last assessed 2021)
11	Indian Pipistrelle *Pipistrellus coromandra* Gray, 1838	Vespertilionidae	Forest, caves	LC	Unknown (Last assessed 2019)
12	Least Pipistrelle or Indian Pygmy Bat *Pipistrellus tenuis* Temminck, 1840	Vespertilionidae	Forest, shrubland, grassland	LC	Stable(Last assessed 2019)
13	Greater Asiatic Yellow House Bat *Scotophilus heathii* Horsfield, 1831	Vespertilionidae	Forest, shrubland	LC	Stable (Last assessed 2019)
14	Lesser Asiatic Yellow Bat *Scotophilus kuhlii* Leach, 1821	Vespertilionidae	Forest, shrubland	LC	Stable (Last assessed 2019)

LC = Least Concern, NT = Near Threatened

water bodies, and roosting spaces, the once-degraded pits now provide native fruits like *Ficus*, *Madhuca*, and *Aegle*, supporting frugivorous bats. Additionally, restored water bodies help maintain insect populations, benefiting insectivorous bats. These efforts have boosted bat activity, breeding success, and population growth by creating a habitat that closely mimics natural conditions.

The occurrence of *Hipposideros ater* in ABP showed a way to further research in the long-term bat population in Delhi. Whereas monitoring bat behaviour, breeding, and interactions across the years will reveal restoration sustainability in ABP. Collaborative efforts from ecologists, bat specialists, and restoration experts will holistically update future habitat restoration for effective bat

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