ZOO'S PRINT

Communicating science for conservation

Magazine of Zoo Outreach Organisation
www.zoosprint.org

ISSN 0971-6378 (Print); 0973-2543 (Online)
Vol. XLI, No. 2, February 2026

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Vol. XLI, No. 2, February 2026 ISSN 0971-6378 (Print); 0973-2543 (Online)

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Cover photo: A mature Ditch Jewel *Brachythemis contaminata* preying on mating pair of Three-lined Sprite damsel flies *Pseudagrion decorum*. © Abhilash.

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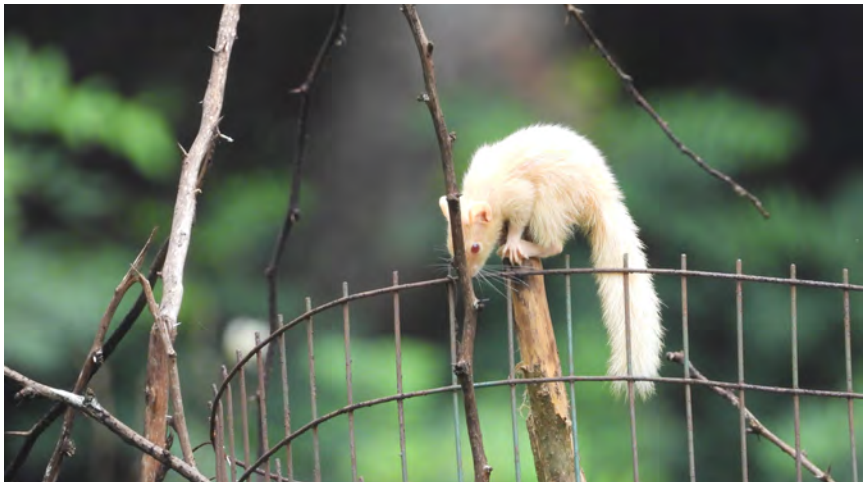
40 years

First record of albinism in the Indian Palm Squirrel *Funambulus palmarum* from Chennai, Tamil Nadu, India

Albino animals are extremely rare in the world. Colour morphs in mammals, including albinism, leucism, and melanism, are uncommon in the wild and are a result of genetic mutations affecting the pigmentation of the animal. Albinism is the complete absence of melanin in the body (Oetting & Adams 2018). The Indian Palm Squirrel *Funambulus palmarum* is a common rodent species in southern India and is widely adapted to urban and rural environments (De, K. 2025).

On 13 September 2025 at Arignar Anna Zoological Park (AAZP), Vandalur, inside the Nilgiri Langur enclosure (12.8797° N, 80.0840° E), I observed an albino Indian Palm Squirrel. The squirrel exhibited a uniform white coat and reddish eyes, characteristics diagnostic of albinism. It was actively climbing a tree during the daytime, at 1102 h inside the enclosure. Only a single individual was observed. The sighting lasted



An albino Indian Palm Squirrel *Funambulus palmarum* was observed at Arignar Anna Zoological Park. © S. Jeswin.

approximately 20 minutes, during which photographic evidence was recorded. This record represents the first such observation from Chennai.

The squirrel's activity and movements were similar to normal conspecifics. No other albino individuals were observed in the vicinity.

Albinism is a rare genetic condition in wild mammals due to reduced survival against predators and lower fitness. Although *Funambulus palmarum* is widely distributed and abundant across southern India, reports of leucism had been recorded (Samson et al. 2017). Report of albinism in *F. tristriatus* was documented by Sayyed et al. (2015). But albinism in *F. palmarum* is extremely rare. The survival of these individuals is low due to poor camouflage capability (Stephenson et al. 2022). However, the persistence of this albino squirrel in an urban habitat suggests reduced predation pressure in the zoo setting (Cosentino et al. 2023). This is the first photographic evidence of albinism in *F. palmarum* in city fauna. These are documented for the science enthusiasts to get fascinated about learning genetics and colour morph variations in common urban wildlife.

Acknowledgements
I thank AAZP and the Tamil Nadu Forest Department for their wonderful maintenance of the zoological park and their conservation effort towards wildlife, I also thank Dr. K. Narasimmarajan for reviewing this short note and thank the editors of Zoo's Print for considering this note.

References

Cosentino, B.J., J.P. Vanek & J.P. Gibbs (2023). Rural selection drives the evolution of an urban–rural cline in coat color in gray squirrels. *Ecology and Evolution* 13(10): e10544.
De, K. (2025). Review of hypopigmentation in *Funambulus* (Rodentia: Sciuridae) with a new observation from the Indian subcontinent. *Mammalia* 89(5): 532–536.
Oetting, W.S. & D. Adams (2018). Albinism: Genetics, pp 1–8. In: *Encyclopedia of life sciences*. John Wiley & Sons, Ltd.
Samson, A., B. Ramakrishnan & S. Bargavi (2017). Leucism in the three-striped palm squirrel *Funambulus palmarum* at Gudalur Forest Division, Tamil Nadu, southern India. *THERYA* 8(3): 261–262.
Sayyed, A., A. Mahabal & A. Nale (2015). A first record of albinism in Jungle Palm Squirrels *Funambulus tristriatus* (Rodentia: Sciuridea) from India. *Zoos' Print Journal* XXX(12): 18–19.
Stephenson, B.P., Z. Velani & N. Ihász (2022). The effect of albinism on avian predator attack rates in eastern garter snakes. *Zoology* 150: 125987.

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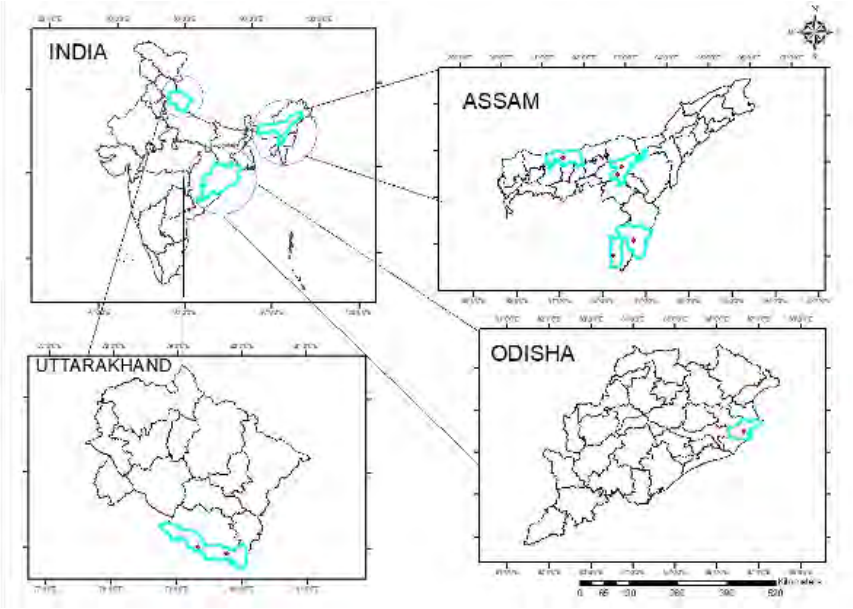
Citation: Jewin, S. (2026). First record of albinism in the Indian Palm Squirrel *Funambulus palmarum* from Chennai, Tamil Nadu, India. Small Mammal Mail #457, In: *Zoo's Print* 41(2): 01–02.

Recent sightings of large Burmese Pythons in India, with a new size record from Assam

Snakes belonging to the families *Boidae* and *Pythonidae* represent some of the most remarkable reptiles, exhibiting an exceptional diversity of morphology, behaviour, and ecology. The Indian subcontinent is home to three species of pythons: the Indian Python *Python molurus* Linnaeus, 1758, the Burmese Python *P. bivittatus* Kuhl, 1820, and the Reticulated Python *Malayopython reticulatus* Schneider, 1801. Until recently, the Burmese Python was regarded as a subspecies of the Indian Python (Whitaker & Captain 2004); however, these two taxa are now recognized as distinct species.

The Burmese Python occurs in the Indo-Chinese subregion, southern China, Hong Kong, and Hainan. It inhabits a wide range of ecosystems, including marshes, swamps, grasslands, woodlands, mangroves, coastal plains, rainforests, and rocky foothills. In India, the species has been reported from Corbett and Rajaji National Parks in Uttarakhand; the Bhitarkanika Wildlife Sanctuary in Odisha; areas south of Kolkata; the Valmiki Tiger Reserve in Bihar; and the northeastern region along the

A ~5.2 m (17.2 ft) long Burmese Python rescued at Assam University, Silchar, and released into the Inner Line Reserve Forest, Assam. © Kaushik Dasgupta.



Map showing records of large-sized Burmese Pythons (greater than 4.2 m (14 ft)) from different parts of India.

Brahmaputra and Barak rivers. Additional records include the Hastinapur Wildlife Sanctuary and the Sumera Block of Aligarh in Uttar Pradesh. Bhupathy (1995) provided an overview of the distribution of the Burmese Python in India, indicating a broad distribution across northeastern India.

The species is listed as 'Vulnerable' on the IUCN Red List (Stuart et al. 2012), with habitat loss and poaching for meat, skins, traditional medicine, and the international live-animal trade identified as major threats. In nature, Burmese Pythons can reach lengths of up to 6 m, with an average size of approximately 3.5 m. These mostly nocturnal, generalist predators are sometimes described as semi-aquatic, as they are typically found near water sources, where they prey on mammals, birds, reptiles, and amphibians (Stuart et al. 2012).

Burmese pythons are relatively common in the Assam University, Silchar campus and in the adjoining forested areas, and are frequently observed in human settlements, including inside houses. In this report, we document an extraordinary case: a ~5.24 m (17.2 ft), over 100 kg Burmese Python captured by the first author on 5 December 2024 near Girls' Hostel-1 (24.686° N, 92.750° E) at Assam University, Silchar. The length of the python was measured using a measuring tape, and its weight was obtained using weighing equipment at a nearby hardware shop in Irongmara market by placing the snake inside a container. The individual was subsequently released into the Inner Line Reserve Forest, Assam. Reportedly, this is the largest living Burmese Python officially recorded in Assam to date.

Previously, the longest recorded individual in Assam measured ~4.25 m (14 ft) and was found in Nagaon District (Bora 2022). Another specimen recorded by us in Patharkandi of Sribhumi District measured ~4.54 m (15 ft). A third individual, measuring approximately ~4.5 m (14.9 ft), was rescued from the Hatizan–Daodhara area of Baksa District (NET 2022). In Borghat Chapanala of Nagaon District, another python measuring ~4.85 m (16 ft) was discovered (Jain 2020).

Larger individuals have also been documented from other parts of India. For instance,

Table. Burmese Pythons recorded at various sites in and around the Assam University, Silchar campus.

Date	Place	GPS Co-ordinates	
		Latitude	Longitude
27.x.2022	MPHH+77V, Choto Jalenga Pt I, Assam 788117	24.67963° N	92.72834° E
17.xi.2022	Hmarkhawlien, Near Fulertal, Lakhipur, Assam	24.79017° N	93.01900° E
27.xi.2022	MQ82+4HC Barjalenga Pt I, Assam 788113	24.66531° N	92.75139° E
21.xii.2022	Choto Jalenga pt 1, Assam,788011	24.68181° N	92.73989° E
24.iii.2023	Banglaghat, Srikona	24.82737° N	92.73459° E
15.v.2023	Teliatilla, Irongmara, 788011	24.68039° N	92.74156° E
08.vi.2023	Dorgakona,Chatla road, Silcoorie grant, Silchar, 788011	24.70267° N	92.76606° E
11.vi.2023	MPHH+77V, Choto Jalenga Pt I, Assam 788117	24.67963° N	92.72834° E
23.vi.2023	Near Gas Agency, Irongmara, Cachar, 788011	24.68234° N	92.74169° E
26.vi.2023	Near Chatla Janata College, Baghmara, Cachar, Assam 788117	24.71219° N	92.74577° E
12.vii.2023	Near Boys Hostel 2, AUS, 788011	24.68723° N	92.74812° E
14.vii.2023	From MLA Gully, Irongmara, AUS, 788011	24.68891° N	92.74345° E
08.viii.2023	Somewhere Dorgakona, Cachar, Assam 788011	24.70041° N	92.75042° E
09.viii.2023	S-cube, Assam University, Silchar, 788011	24.68847° N	92.75036° E
10.x.2023	Near Girls hsotel 5, AUS, 788011	24.68681° N	92.74928° E
13.x.2023	Near Dorgakona, Cachar, 788011	24.69747° N	92.75742° E
23.xii.2023	Borjalenga, 788117	24.67578° N	92.75438° E
23.xii.2023	Chirukandi, Silchar, Cachar, Assam 788026	24.82478° N	92.75547° E
03.iii.2024	Borjalenga, 788117	24.67631° N	92.72627° E
09.v.2024	Damcherra Tripur, Rajarampur, Kalinagar T.E, Karimganj, 788166	24.56464° N	92.48378° E
03.vi.2024	Near Dorgakona Bazar, Cachar, 788011	24.69899° N	92.76197° E
03.vii.2024	Near Durgatilla, Irongmara, Silchar, Assam 788011	24.68944° N	92.73912° E
12.vii.2024	Choto Jalenga pt 1, Assam 788011	24.66404° N	92.71434° E
14.vii.2024	Professors colony, Assam University, Silchar, 788011	24.69601° N	92.74623° E
12.viii.2024	Teliatilla, Irongmara, 788011	24.68513° N	92.73862° E
05.ix.2024	Dorgakona, Near Assam University, 788011	24.69193° N	92.75232° E
03.x.2024	Teliatilla, Irongmara, 788011	24.68716° N	92.73809° E
09.x.2024	Somewhere at Barik Nagar, Cachar	24.75154° N	92.79574° E
18.x.2024	Somewhere at Itkhola, Silchar, 788003	24.84226° N	92.80361° E
05.xi.2024	Hatitilla, Irongmara, 788011 (Raju da)	24.68797° N	92.73921° E

Date	Place	GPS Co-ordinates	
		Latitude	Longitude
19.xii.2024	GH-1, AUS, Silchar, Assam University, 788011	24.68707° N	92.75001° E
26.xii.2024	GH-1, AUS, Silchar, Assam University, 788011	24.68706° N	92.74992° E
26.xii.2024	GH-1, AUS, Silchar, Assam University, 788011	24.68679° N	92.75006° E
29.xii.2024	Near by patharkand bypass, Karimganj, 788724	24.59132° N	92.32027° E
30.xii.2024	GH-1, AUS, Silchar, Assam University, 788011	24.68670° N	92.75004° E
06.i.2025	Near, GH-1, AUS, Silchar, Assam University, 788011	24.68711° N	92.74994° E
27.i.2025	Near GH-1, AUS, Silchar, Assam University, 788011	24.68598° N	92.74979° E
27.i.2025	NearGH-1, AUS, Silchar, Assam University, 788011	24.68637° N	92.74994° E
06.ii.2025	Near Amul point, AUS, Assam 788011	24.68444° N	92.749234° E
06.ii.2025	Near GH-1, AUS, Silchar, Assam University, 788011	24.68581° N	92.74971° E
06.ii.2025	Near GH-1, AUS, Silchar, Assam University, 788011	24.68591° N	92.74976° E
07.ii.2025	Near GH-1, AUS, Silchar, Assam University, 788011	24.68678° N	92.74940° E
18.xii.2024	GH-1, AUS, Silchar, Assam University, 788011	24.68701° N	92.75010° E

a ~4.85 m Burmese Python was rescued near Bhitarkanika National Park in Odisha (NDTV 2018). A separate report from Kashipur in Udham Singh Nagar District, Uttarakhand, also documented a ~4.85 m individual in 2020 (Hindustan Times 2020). Globally, the longest known Burmese Python was discovered in Kashipur, Uttarakhand, in 2025, measuring 6.06 m (20 ft) and weighing approximately 170 kg (Sethi 2025). This surpassed the previous world record of a 5.75 m (19 ft) individual recorded in southern Florida (Jones 2023).

The present python was found near a girls' hostel at Assam University, inside a drainage channel close to the gymnasium, causing panic among students and university staff. With prompt action from a wildlife expert at Assam University, forest officials, and residents, the snake was safely rescued. Its weight and length were recorded, and it was subsequently released back into its natural habitat.

Based on surveys and rescue records, the surrounding area appears to provide suitable habitat for the Burmese Python. Records of python breeding in Assam University premises during pandemic days are there, where four young ones reported in 2022. Numerous individuals have been recorded from the same location and nearby areas. To date, we have documented 43 individuals from various sites in and around the Assam University, Silchar Campus. Most sightings have occurred near the university hostels, which are bordered by forested terrain. Pythons are frequently observed resting on trees or hunting animals in the vicinity of the hostel area. The surrounding

landscape, characterized by dense forest cover, small water channels, and an abundant supply of prey such as small mammals and cattle, offers ideal foraging conditions for the species (Joshi & Singh 2015).

Acknowledgements
We express our sincere gratitude to Sanjivita Paul for her assistance in preparing the map of Burmese Python sighting locations. We also thank the Cachar Forest Department for their support during rescue operations in the district, as well as the local residents for their cooperation and for providing valuable first-hand information. We further extend our appreciation to the head of the Department of Ecology and Environmental Science, Assam University, Silchar, for the support rendered to this study.

References

Bhupathy, S. (1995). Distribution of *Python molurus bivittatus* in India. *Cobra* 21: 2–5.

Bora, P. (2022). 14-foot Burmese python weighing over 55 kg rescued in Assam's Nagaon, *India Today*, 9 July. https://www.indiatoday.in/india/story/14-foot-burmese-python-rescued-in-assam-nagaon-1973541-2022-07-08. Accessed on 29.vii.2025.

Hindustan Times (2020). Watch: 16-feet-long Burmese python rescued by Uttarakhand Forest dept, 20 October. https://www.hindustantimes.com/videos/india-news/16-feet-long-burmese-python-rescued-by-uttarakhand-forest-deptvideo/video-mHMcasUSZokSrFosTk98pI.html. Accessed on 09.xii.2025.

Jain, S. (2020). 16-Foot Burmese Python Rescued In Assam, *NDTV*, 14 July. https://www.ndtv.com/offbeat/16-foot-burmese-python-rescued-in-assam-watch-video-2262353. Accessed on 09.xii.2025.

Jones, D. (2023). A record-breaking Burmese python-as long as a giraffe is tall-caught in Florida, *NPR*, 13 July. https://www.npr.org/2023/07/13/1187497592/record-breaking-burmese-python-longest-florida. Accessed on 09.xii.2025.

NDTV (2018). 16-Feet-Long Python Rescued In Odisha's Kendrapara District, 11 May**.** https://www.ndtv.com/india-news/16-feet-long-python-rescued-in-odishas-kendrapara-district-1850982. Accessed on 09.xii.2025.

Northeast Today (2022). Assam: 14.9-ft Long Burmese Python rescued in Baksa; Safely released in Manas National Park, 7 August. https://northeasttoday.in/northeast/assam/assam-14-9-ft-long-burmese-python-rescued-in-baksa-safely-released-in-manas-national-park. Accessed on 08.xii.2025.

Sethi, N. (2025). Giant 170-kilogram python captured in Uttarakhand's Kashipur, *The New Indian Express*, 18 February. https://www.newindianexpress.com/nation/2025/Feb/18/giant-170-kilogram-python-captured-in-uttarakhands-kashipur. Accessed on 09.xii.2025.

Stuart, B., T.Q. Nguyen, N. Thy, L. Grismer, T. Chan-Ard, D. Iskandar, E. Golynsky & M.W.N. Lau (2012). *Python bivittatus.* The IUCN Red List of Threatened Species 2012: e.T193451A2237271. https://doi.org/10.2305/IUCN.UK.20121.RLTS.T193451A2237271.en. Accessed on 09.xii.2025.

Whitaker, R. & A. Captain (2004). *Snakes of India. The Field Guide.* Draco Books, Chennai, 481 pp.

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Citation: Sonar, B., N.R. Talukdar & P. Choudhury (2026). Recent sightings of large Burmese Pythons in India, with a new size record from Assam. Reptile Rap #270, In: *Zoo's Print* 41(2): 03–07.

ISSN 2230-7052
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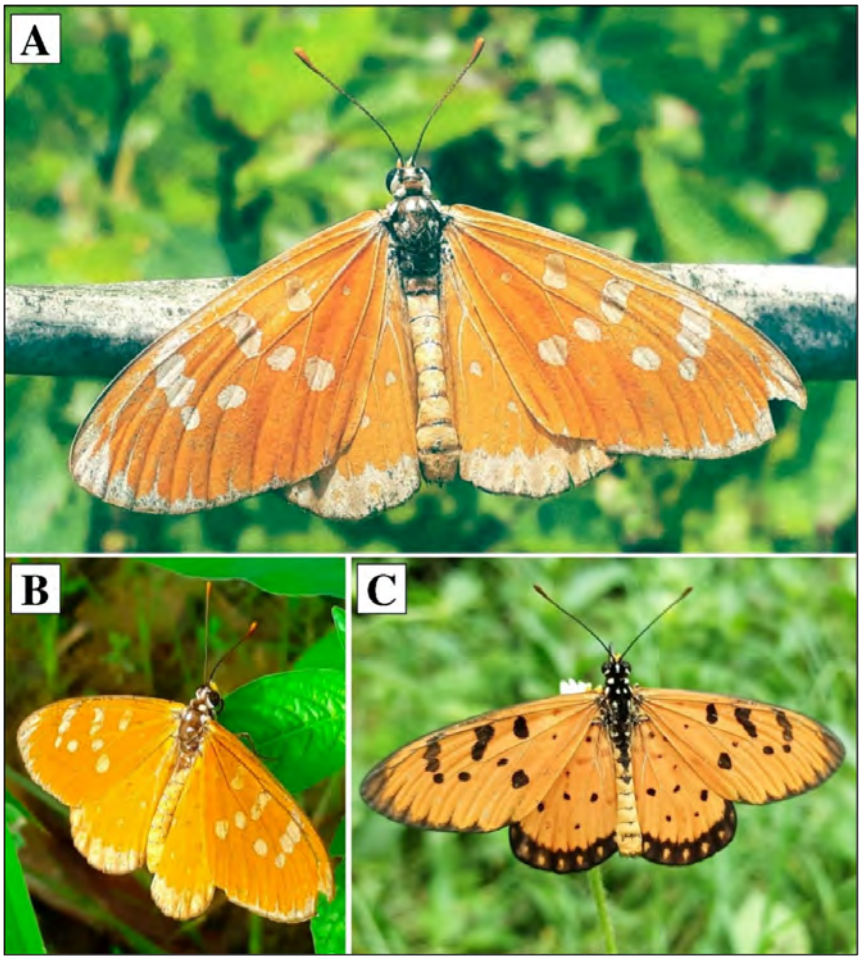
Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)

A rare aberration of Tawny Coster butterfly from Myanmar

Butterflies have a wide variety of patterns and colours on their wings, which are important for three basic survival aspects, camouflage for predator avoidance, thermoregulation and mate selection (Wang et al. 2020). Pigments' genesis and diversification have long been a perplexing subject and have been connected to a number of evolutionary aspects. Due to recent advancements in high throughput molecular screening, the interspecies and intraspecies variations of these colouration patterns have been holistically understood, and have been linked to several pigment proteins, regulatory RNAs, and epigenetic factors (Zhang et al. 2017). However, occasional genetic mutations can result in aberrant coloration or patterns. Such occurrences have important implications for understanding butterfly genetics and evolutionary adaptations but documenting them is rare (Chakrovorty et al. 2020).



Adult Tawny Coster butterfly *Acraea terpsicore* (Linnaeus, 1758), (A, B) Specimen with aberrant wing colouration, (C) Normal specimen. © Kyaw Khin.

The Tawny Coster butterfly *Acraea terpsicore* (Linnaeus, 1758) (Lepidoptera: Nymphalidae: Heliconiinae: Acraeini) is a widely distributed species which ranges from southeast Asia to Oceania (Kinyon 2004; Chowdhury et al. 2021). This study documents a rare aberration of the species which lacks the black pigmentation of the wing spots and discusses in detail the morphological features of

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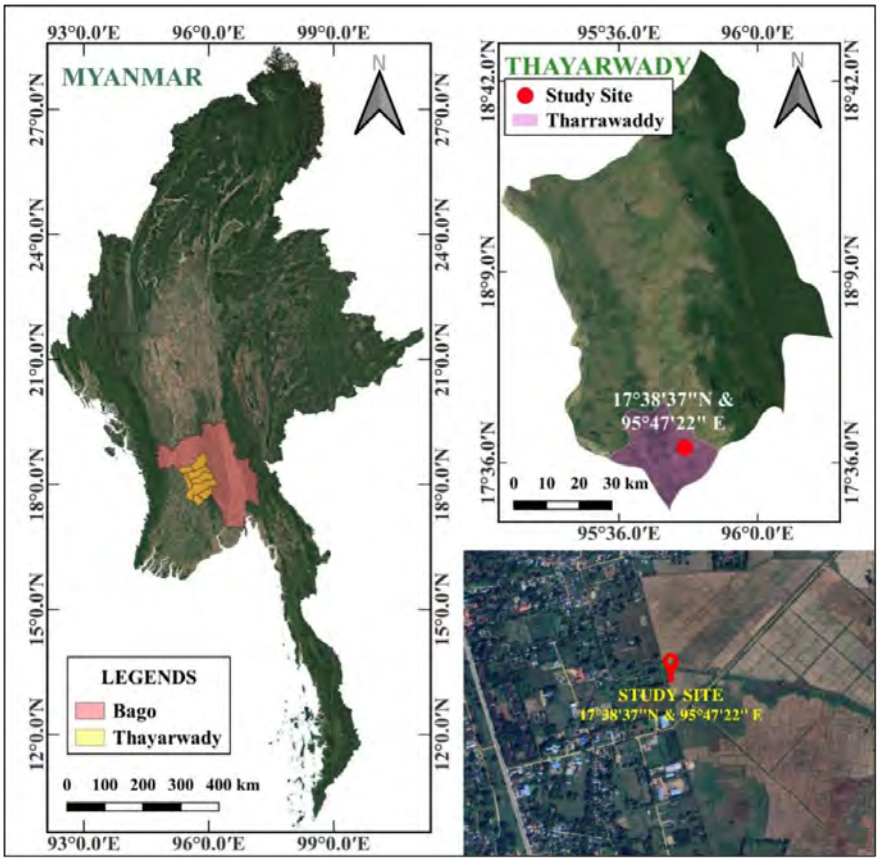
the documented species; however, the genetic basis of the aberration is out of the scope of this article.

Field observations were conducted in Thayarwaddy, western Bago region of lower Myanmar (17.64361111 & 95.78944444), where an aberrant *Acraea terpsicore* was documented on 23 July 2022. It was observed flying near grass and perching on a plant (~0.5 m) and an electric wire (~1.5 m). The specimen was photographed using Samsung SM-G610F and compared with standard descriptions available in the literature (Bingham 1907; Kehimkar 2008). Other environmental conditions, behavioral aspects, and social relations with other butterflies were noted.



Map of the study area.

The documentation of similar aberrations was searched from digital databases and online portals like, The butterflies of India website, iNaturalist, Global Biodiversity Information Facility, Facebook, and Flickr. The map of the study area was created using QGIS v3.28.2 software (https://qgis.org), EPSG Registry database version v10.076 (31.08.2022. The shapefile of administrative boundary of Myanmar was downloaded and appropriate plugins were used to render the district and study site images (Chakrovorty et al. 2023).

Systematic Position

Order: Lepidoptera Linnaeus, 1758
Superfamily: Papilionoidea Latreille, 1802
Family: Nymphalidae Rafinesque, 1815
Subfamily: Heliconiinae Swainson, 1822
Tribe: Acraeini Boisduval, 1833
Genus: *Acraea* Fabricius, 1807
Species: *Acraea terpsicore* (Linnaeus, 1758)

Acraea terpsicore (Linnaeus, 1758) (syn. *A. violae*) can be identified from the combination of following characters, basal and discal marking on hindwings (HW) present with marginal

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spots, HW discal dots separated and placed more basal than the spots below it, discal dot on cubital vein 2 not in line with discal dots in anal and cubital vein 1, forewings (FW) completely scaled and abdomen yellow with black bands (Bingham 1907; Van Son 1963). *Acraea terpsicore* has a tawny upper side. FW have a black marginal area with triangle like projections that increases in size from tornus towards apex, apex completely black. A black oblique spot is present in post-basal area of FW cell above the point from where cubital vein bifurcates. Another oblique spot lies over discocellular area, below this lies another spot in postmedial region of area 3 and area 4. Three irregular dots near subapical area are sometimes connected giving the appearance of an oblique streak. In area 1b, one small dot-like spot is present on post-basal area and another bigger spot is present near postmedian area.

HW have a black marginal border with series of whitish-orange submarginal spots. Three black spots are present on cell near basal area, post-basal area and on discocellular area (origin of the first cubital vein) respectively. Irregular spots are present on post median and submarginal areas, if connected by a line, gives a “W” shaped mark. HW with broad terminal band with tawny ovoid spots in the wing vein interspaces. The underside of FW is ochreous yellow. HW varies from ochreous yellow to reddish-tinged yellow-ochre, with more defined black markings and larger white spots along basal margin. Antennae, head, and thorax are black with ochreous and white markings, while the abdomen is black at the front and ochreous at the rear, featuring fine black transverse lines. Fringe of cilia on the outer margin of FW and HW are short and black (Bingham 1907). Females are similar to the males but have a duller ground color. The black spots on both wings are larger, the upper postdiscal spots forms an irregular oblique band. The black terminal bands are wider; the protuberances are more developed. The underwing is paler and duller with more distinct markings on the HW (Bingham 1907).

The abnormal specimen seen in Thayarwaddy exhibited significant deviations from the wild-type wing pattern of *Acraea terpsicore* and lacked the distinct black colouration of the spots on FW and HW. The difference in placement of dots otherwise falls under the purview of individual variations as observed commonly in this species. All the spots present on FW and HW including the black colouration of apex, costal margin and marginal area were greyish white in colour. Interestingly, the cilia on the outer margin of FW and HW, the dorsal part of antennae and the dorsal part of thorax retained their black colouration. The white spots on both the forewings and hindwings were bilaterally asymmetrical.

The individual retained the bright tawny colouration of wings which eliminates the chances of scales being brushed off. Few black scales were evident on marginal area of FW

ISSN 2230-7052
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and HW indicated mosaicism. The spot seems to be in an inverted colour scheme, where all the black spots are inverted to white spots. Despite these phenotypic abnormalities, the animal behaved normally in flight, basking and interacting with the environment. This finding indicates that the aberration did not negatively affect the butterfly's ability to move or to interact ecologically.

Acknowledgements
The authors acknowledge iForNature-Nature Club, Kolkata, India, for providing with the necessary infrastructure to draft the manuscript. The authors are thankful to Kyaw Khin for the image of a normal *Acraea terpsicore* specimen.

References

Bingham, C.T. (1907). *The Fauna of British India including Ceylon and Burma. Butterflies, Vol. II.* Taylor and Francis, London, 480 pp.

Chakrovorty, A., B. Bhattacharjee & A. Samadder (2023). Distribution of hoverfly *Eupeodes corollae* from eastern India: new record from the states of Assam and Odisha. Bugs R All #272, In: *Zoo's Print* 38(9): 29–32.

Chakrovorty, A., A. Garai, B. Bhattacharjee & A. Samadder (2020). Genetic aberration in a Continental Common Pierrot from West Bengal, India. Bugs R All #186, In: *Zoo's Print* 35(5): 111–112.

Chowdhury, S., M.F. Braby, R.A. Fuller & M.P. Zalucki (2021). Coasting along to a wider range: niche conservatism in the recent range expansion of the Tawny Coster, *Acraea terpsicore* (Lepidoptera: Nymphalidae). *Diversity and Distributions* 27(3): 402–415.

Kehimkar, I. (2008). *The Book of Indian Butterflies*. Bombay Natural History Society, Mumbai, Oxford University Press, UK, 497 pp.

Kinyon, S. (2004). *An Illustrated Checklist for the Butterflies of Myanmar.* Smithsonian Institution, 197 pp.

van Son, G. (1963). Key to southern African species of *Acraea*. *Transvaal Museum Memoirs* 14(1): 8–122.

Wang, W.L., D.O. Suman, H.H. Zhang, Z.B. Xu, F.Z. Ma & S.J. Hu (2020). Butterfly conservation in China: from science to action. *Insects* 11(10): 661.

Zhang, L., A. Martin, M.W. Perry, K.R.L. van der Burg, Y. Matsuoka, A. Monteiro & R.D. Reed (2017). Genetic basis of melanin pigmentation in butterfly wings. *Genetics* 205(4): 1537–1550.

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Citation: Naing, M.K., H.P.P. Maung, B. Bhattacharjee & A. Chakrovorty (2026). A rare aberration of Tawny Coster butterfly from Myanmar. Bugs R All #297, In: *Zoo's Print* 41(2): 08–11.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA)

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A new record of the Thomisidae spider *Phrynarachne ceylonica* from Garbhanga Reserve Forest, Assam, India

The family Thomisidae Sundevall, 1833, is a diverse group of ambush predators represented by 210 species under 44 genera in India, with about 68% endemicity (Singh & Singh 2021). Within Thomisidae, the genus *Phrynarachne* Thorell, 1869 is remarkable for its extreme masquerade strategy, with species mimicking bird droppings as camouflage (Roy et al. 2010). These spiders are considered among the rarest worldwide, with 37 species known (World Spider Catalog 2026). Historical records in India indicate that only four species are included in the genus *Phrynarachne*: *P. ceylonica* (O. Pickard-Cambridge, 1884); *P. tuberosa* (Blackwall, 1864); *P. peeliana* (Stoliczka, 1869) and *P. decipiens* (Forbes, 1884) (Das et al. 2024). *Phrynarachne*

Phrynarachne ceylonica. © Monish Kumar Thapa.

ceylonica was first described from Sri Lanka (Pickard-Cambridge, 1884), with later reports from China, Taiwan, and Japan. Simon (1895) mentioned its presence in India, but without a proper description. After more than a century, Das et al. (2019) confirmed the species in India for the first time from Sonapur, Assam, describing a specimen larger than those from east Asia and suggesting geographic size variation. Despite this richness, large parts of Guwahati, Assam remain poorly surveyed.

The present note records *Phrynarachne ceylonica* for the first time from Garbhanga

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Reserve Forest, Assam, adding a third confirmed locality for India and extending its known distribution within the state.

On 7 September 2025, five individuals of *P. ceylonica* were sighted during a biodiversity walk in Garbhanga Reserve Forest, Kamrup District, Assam (26.0811° N, 91.7694° E, 167.4 m) at approximately 0941 h. The specimen was observed in its natural habitat resting on a leaf of *Ficus hispida*. Identification was based on its characteristic body shape, coloration, and resemblance to bird droppings, consistent with published descriptions (Das et al. 2019; Zhu & Song 2006). The individuals were documented through photographs.

The spider exhibits a dark brownish-grey opisthosoma with prominent tubercles, irregular markings, and a distinct posture resembling bird droppings, which aids its masquerade strategy.

This spider species has been recorded from Sri Lanka, China, Taiwan, Japan (Dash & Sivaperuman 2021), as well as from India, including Assam (Sonapur) and the Andaman and Nicobar Islands (Dash & Sivaperuman 2021). The present study adds a new record from Garbhanga Reserve Forest.

This finding represents the third confirmed record of *P. ceylonica* from the country and the second modern locality in Assam after Sonapur (Das et al. 2019). Its detection at a new site suggests that the species may be more widely distributed but often overlooked due to its cryptic bird-dung mimicry.

The Garbhanga sighting fits this pattern, demonstrating the persistence of a species that had remained unreported in India for more than a century. Singh & Singh (2021) recorded 17 Thomisidae species from Assam, including other Phrynarachne members. The addition of *P. ceylonica* from Garbhanga expands this list and highlights the underexplored arachnid diversity of Assam's forests. Given the high endemism of Indian Thomisidae and the ongoing habitat loss, systematic surveys are imperative to ascertain the true diversity and ecological function of these spiders.

References

Das, S., J. Kalita & N. Mahanta (2019). New report of *Phrynarachne ceylonica* (O. Pickard-Cambridge, 1884) (Araneae: Thomisidae) from Assam, India. *International Journal of Scientific Research and Reviews* 8(2): 985–990.

Das, S., J. Kalita, N. Mahanta, D. Brahma & P. Basumatary (2024). New record of *Phrynarachne decipiens* (Forbes 1884) (Araneae: Thomisidae) from India. *Acta Arachnologica* 73(1): 63–66.

Dash, M. & C. Sivaperuman (2021). Notes on the presence of *Phrynarachne ceylonica* (O. Pickard-

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Cambridge, 1884) from the Andaman and Nicobar Islands. *World News of Natural Sciences* 35: 48–55.

Pickard-Cambridge, O. (1884). On two new genera of spiders. *Proceedings of the Zoological Society of London* 52(2): 196–205.

Simon, E. (1895). *Histoire naturelle des araignées, 2nd edition*. Roret, Paris.

Singh, R. & G. Singh (2021). Diversity and distribution of crab spiders (Thomisidae: Araneomorphae: Araneae: Arachnida) in India. *International Journal of Zoology and Applied Biosciences* 6(3): 132–161.

World Spider Catalog (2026). World Spider Catalog. Version 26. Natural History Museum Bern, online at http://wsc.nmbe.ch. Accessed on 12.xii.2025.

Zhu, M.S. & D.X. Song (2006). A new discovery of the male spider and a new record from China (Araneae, Thomisidae). *Acta Zootaxonomica Sinica* 31: 549–552.

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Citation: Thapa, M.K., N. Yeasmin & L. Dutta (2026). A new record of the Thomisidae spider *Phrynarachne ceylonica* from Garbhanga Reserve Forest, Assam, India. Bugs R All #298, In: *Zoo's Print* 41(2): 12–14.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA)

ISSN 2230-7052
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Invertebrate Conservation & Information Network of South Asia (ICINSA)

Notes on natural history of pantropical huntsman spiders from West Bengal, India

Heteropoda venatoria (Linnaeus, 1767), commonly known as pantropical huntsman spider, belonging to family Sparassidae, is found globally in the tropical regions including India, with a size of the females measuring 2.5–3.0 cm and males measuring 2.0–2.5 cm, excluding the legs (Sebastian & Peter 2009). These spiders are often found in human habitations and gardens (Ross et al. 1982; Sebastian & Peter 2009). In the present communication, I report two opportunistic observations on the natural history of pantropical huntsman spiders *Heteropoda venatoria* from an urban locality of West Bengal in eastern India.

Panihati (22.69° N, 88.37° E, 13 m) is an urban locality of North 24 Parganas District in West Bengal, India. It is a part of Lower Gangetic Plains physiographic zone and is located beside the Ganga River. Visual observations and photographic documentations were carried out during the study. Observations were made from a safe distance to minimize any disturbance to their natural behaviours. The spiders were identified as *Heteropoda* cf. *venatoria* from visual observations and photographs following Sebastian & Peter (2009), Jäger (2014), and Mondal et al. (2020).

On 13 July 2022 at 1028 h, a *Hemidactylus flaviviridis* gecko (Squamata: Gekkonidae) was observed to feed on a male *Heteropoda* cf. *venatoria* spider, perching on a shaded cemented brick wall at about 1.3 m height from the ground in my residence in the study area. The spider was still moving slowly, that proves it was still alive. Then after some minutes, the gecko took the spider to a higher part of the wall, at about 1.8 m from the ground, orienting itself in head-below position. The spider was dead by then. It jerked the spider a few times by its jaws and continued the devouring. Because of jerking, three legs of the spider detached from its cephalothorax and dropped below. At 1037 h, the gecko further placed itself at a higher darker horizontal crevice of the wall, at about 2 m height from the ground and placed itself there horizontally and continued to feed on the remaining parts of the spider, including the remaining legs.

Feeding completed at 1113 h. The gecko was seen to stay in the same spot until 1120 h, when observation was ended. In this present observation, the gecko completed the spider-feeding in 45 minutes. Photographs of this observation was taken with a Lenovo K33a42 smartphone camera. The gecko was about 8 cm in snout to vent length and the tail length was about 4.5 cm. *H. flaviviridis* is widespread in northern and eastern India and in all the districts of West Bengal (Deuti 2013). The gecko was identified following Daniel (2002) and Deuti (2013). This is a commonly seen household gecko species in the study area, and I have seen them feeding on *Periplaneta americana*

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***Hemidactylus flaviviridis* gecko feeding on *Heteropoda cf. venatoria* spider. © Tanmoy Bhowmick.**

The gecko feeding on the spider. © Tanmoy Bhowmick.

The gecko feeding on the remaining leg parts of the spider. © Tanmoy Bhowmick.

The gecko after completing feeding on the spider. © Tanmoy Bhowmick.

cockroaches, winged termite alates, leafhoppers and moths in this locality.

A second opportunistic observation was made on 30 May 2025, inside a bathroom of my residence, in which a female *Heteropoda* cf. *venatoria* spider was observed to feed on an adult *Periplaneta americana* (Insecta: Blattodea), commonly known as American Cockroach. The spider was observed to hold the cockroach by the cockroach's thorax, at 2201 h. The cockroach was slowly moving its antennae and legs, and subsequently after one minute it stopped moving. It proves that it was a fresh catch for the spider. The spider was

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***Heteropoda cf. venatoria* predating on a *Periplaneta americana*. © Tanmoy Bhowmick.**

The spider feeding on the cockroach. © Tanmoy Bhowmick.

The spider carrying the cockroach to a higher reach of a vertical wall. © Tanmoy Bhowmick.

The spider after completing feeding on the cockroach. © Tanmoy Bhowmick.

perching motionlessly on a cemented vertical short wall, at about 10 cm above the ground. I assume the spider had caught the cockroach, when the cockroach was foraging on the floor of the bathroom. At 2206 h, the spider took the cockroach by walking, on a higher perch of a nearby vertical wall. It perched at about 1.6 m from the ground. It continued to feed on the cockroach by changing the position of the puncturing spot of the spider's chelicera on the cockroach. At 0225 h of 31 May 2025, the spider completed the cockroach-feeding and

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left the body of the cockroach on the vertical wall, attached to the wall with some silken threads of the spider. The complete feeding process took about 4.5 hours. The spider was observed to perch on the same spot until 0232 h, when the observation was ended. Photographs of this observation was taken with a Nikon Coolpix B500 camera. *Heteropoda* cf. *venatoria* is commonly seen inside the houses of this area and I have seen them undergoing ecdysis and carrying egg sacs, inside houses. American cockroach is a common insect also found inside the houses of this area and is considered as a household pest.

Heteropoda venatoria spiders are known to be predated by toads, frogs, geckoes, agama lizards and birds (Ewunkem et al. 2016). These spiders are reported to feed on cockroaches, mealybugs, aphids, ants, bees, flies, moths, butterflies, *Gryllus domesticus* cricket, *Isometrus maculatus* scorpion, *Labochirus* whip scorpion, *Hemidactylus frenatus* gecko and *Pipistrellus* bat in the wild and various insects of different instars in laboratory condition, including *Drosophila melanogaster* fly, unidentified Drosophilidae, mealworm larvae *Tenebrio molitor*, *Acheta domesticus* cricket, and cabbage looper larva (*Trichoplusia ni*) (Bhattacharya 1941; Ross et al. 1982; Ewunkem et al. 2016; Neogi & Islam 2017; Karmakar et al. 2023).

Food habit data of animals in urban environments are important to understand the prey use and for planning the conservation measures, because of rapid rate of habitat degradation (Purkayastha & Purkayastha 2012). *Hemidactylus flaviviridis* gecko is a sit-and-wait forager, reported to feed on insects; spiders of family Dictynidae, Oecobiidae, Miturgidae, Pholcidae, Gnaphosidae, Salticidae, Filistatidae, Scytodidae, Araneidae and Theridiidae; centipedes; plant materials; other congeneric gecko like *Hemidactylus frenatus* and occasionally cannibalistic (Sharma & Vazirani 1977; Daniel 2002; Ibrahim 2003; Deuti 2013; Parves & Alam 2015; Narwade et al. 2024). In the present communication, *Hemidactylus flaviviridis* gecko is reported as a predator of *Heteropoda* cf. *venatoria* spider (family Sparassidae) from West Bengal, India. To the best of my knowledge, this is a newly reported prey item of this gecko species from India. Interestingly, *Heteropoda* spider is known to feed on *Hemidactylus* gecko (Neogi & Islam 2017). This complex predator-prey dynamics between them should be studied in detail.

References

Bhattacharya, G.C. (1941). Food and habits of the house-spider (*Heteropoda venatoria*, Linn.). *Journal of the Bombay Natural History Society* 42(4): 821–825.

Daniel, J.C. (2002). *The Book of Indian Reptiles and Amphibians.* Oxford University Press, Oxford, 240 pp.

Deuti, K. (2013). *Lizards of West Bengal*. Citadel, Kolkata, 56 pp.

Ewunkem, J.A., N.N. Ntonifor & M.C. Parr (2016). Bioecology of *Heteropoda venatoria* (Linnaeus) (Araneae: Sparassidae) and its implications in a tropical banana agroecosystem. *Journal of Global Agriculture and Ecology* 5(3): 164–175.

Ibrahim, A.A. (2003). Diet and reproduction of the Indian Leaf-toed Gecko, *Hemidactylus flaviviridis* (Sauria: Gekkonidae) in Ismailia Governorate, with consideration to its distribution in the Suez Canal Area, Egypt. *Journal of Union of Arab Biologists Cairo* 19(A): 125–151.

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Invertebrate Conservation & Information Network of South Asia (ICINSA)

Jäger, P. (2014). *Heteropoda* Latreille, 1804: new species, synonymies, transfer and records (Araneae: Sparassidae: Heteropodinae). *Arthropoda Selecta* 23(2): 145–188.

Karmakar, A., A. Deb & S.C. Bohra (2023). Predation of a whip scorpion by a Pantropical Huntsman Spider. Bugs R All #271, In: *Zoo's Print* 38(9): 26–28.

Mondal, A., D. Chanda, A. Vartak, & S. Kulkarni (2020). *A field guide to the spider genera of India.* Published by Ayan Mondal, 408 pp.

Narwade, D.K., B.V. Deore, J.S. Rupali & E.V. Madhuri (2024). Reporting cannibalistic behavior in the Yellow Belly Gecko *Hemidactylus flaviviridis* Ruppell, 1835 (Reptilia: Gekkonidae), from Ahmednagar district of Maharashtra, India. *Uttar Pradesh Journal of Zoology* 45(18): 215–219.

Neogi, A.K. & M.N. Islam (2017). Giant Crab Spider: Predation of Common House Gecko *Hemidactylus frenatus* Schlegel, 1836 by Giant Crab Spider *Heteropoda venatoria* Linnaeus, 1767. Bugs R All #160, In: *Zoo's Print* 32(8): 22–24.

Parves, N. & S.M.I. Alam (2015). *Hemidactylus flaviviridis* (Reptilia: Gekkonidae): Predation on congeneric *Hemidactylus frenatus* in Dhaka, Bangladesh. *The Herpetological Bulletin* 132: 28–29.

Purkayastha, J. & A. Purkayastha (2012). A case of White-breasted Kingfisher *Halcyon smyrnensis* preying on a gecko *Hemidactylus aquilonius*. *Asian Journal of Conservation Biology* 1(1): 45–46.

Ross, J., D.B. Richman, F. Mansour, A. Trambarulo & W.H. Whitcomb (1982). The life cycle of *Heteropoda venatoria* (Linnaeus) (Araneae: Heteropodidae). *Psyche* 89: 297–305.

Sebastian, P.A. & K.V. Peter (2009). *Spiders of India.* Universities Press, Hyderabad, 614 pp.

Sharma, R.C. & T.G. Vazirani (1977). Food and feeding habits of some reptiles of Rajasthan. *Records of the Zoological Survey of India* 73(1-4): 77–93.

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Citation: Bhowmick, T. (2026). Notes on natural history of pantropical huntsman spiders from West Bengal, India. Bugs R All #299, In: *Zoo's Print* 41(2): 15–19.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA)

ISSN 2230-7052
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A record of interference predation during mating in Odonates

Mating pair of *Pseudagrion decorum* in wheel position. © Abhilash.

Odonates (dragonflies and damselflies) are highly predatory insects that are widely distributed across the world; they typically feed on other smaller insects, and occasionally prey upon other odonates (May 2019). Living in riparian zones provides adult odonates with access to a plentiful food supply, allowing them to feed on the numerous emerging aquatic insects and other terrestrial species (Griffith et al. 1998; Cleary et al. 2025) thus, becoming recipients of cross-boundary dietary subsidies (Kautza & Sullivan 2016). Lakes in particular, offer rich marginal vegetation that supports oviposition and provides a favorable balance between predator presence and resource availability (Kalkman et al. 2008).

During a nature walk on 11 October 2025 at around 1315 h, the authors observed and recorded an ecological phenomenon of predation in odonates at Sindhuvalli Lake (12.048° N; 76.693° E), Nanjangud, Mysuru District, Karnataka, India. The place of observation (lake) was surrounded by paddy fields and thick green vegetation. A mating pair of Three-lined Sprite *Pseudagrion decorum* Rambur, 1842 in wheel position was observed in the littoral zone perched on the twigs of aquatic plants. Soon, the pair was attacked by a Ditch Jewel *Brachythemis contaminata* Fabricius, 1793 and started to devour the male which was still mounted to the female in the tandem position. Priyadarshana (2021) documented *Brachythemis contaminata* feeding on *Pseudagrion rubriceps* and *Ischnura senegalensis.* However, the study did not report any specific instance of a *Brachythemis contaminata* preying on mating pairs of damselfly species.

The observed behaviour can be categorized as intraguild predation, where two species that compete for similar food resources also engage in predation on one another thus

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A mature Ditch Jewel *Brachythemis contaminata* preying on mating pair of Three-lined Sprite damsel flies *Pseudagrion decorum*. © Abhilash.

combining elements of both competition and predation. In this case, the Ditch Jewel (a dragonfly) and the Three-lined Sprite (a damselfly), though both belonging to the order Odonata, interact at different trophic levels, with the larger dragonfly preying on the smaller damselfly.

Additionally, the event exemplifies opportunistic predation, as the Ditch Jewel exploits the vulnerability of the mating pair for an easy meal. Despite being closely related, these species demonstrate trophic differentiation, with dragonflies generally acting as more aggressive predators than damselflies. This interaction illustrates resource partitioning and trophic stratification within overlapping ecological niches.

References

Cleary, D.F.R., A.M. Bijlmer, D. Wielakker & N.J. de Voogd (2025). Damselflies and dragonflies in distress: The impact of forest fires and logging on odonate assemblages. *Ecological Indicators* 173: 113382.

Griffith, M.B., E.M. Barrows & S.A. Perry (1998). Lateral dispersal of adult aquatic insects (Plecoptera, Trichoptera) following emergence from headwater streams in forested Appalachian catchments. *Annals of the Entomological Society of America* 91: 195–201.

ISSN 2230-7052

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Kalkman, V.J., V. Clausnitzer, K.D.B. Dijkstra, A.G. Orr, D.R. Paulson & J. van Tol (2008). Global diversity of dragonflies (Odonata) in freshwater. *Hydrobiologia* 595: 351–363.

Kautza, A. & S.M.P. Sullivan (2016). The energetic contributions of aquatic primary producers to terrestrial food webs in a mid-size river system. *Ecology* 97(3): 694–705.

May, M.L. (2019). Odonata: Who They Are and What They Have Done for Us Lately: Classification and Ecosystem Services of Dragonflies. *Insects* 10(3): 62.

Priyadarshana, T.S. (2021). Do predatory adult odonates estimate their adult prey odonates' body size and dispersal ability to proceed with a successful attack? *Journal of Threatened Taxa* 13(7): 18949–18952.

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Citation: Abilash, H.R. & C. Sylvester (2026). A record of interference predation during mating in Odonates. Bugs R All #300, In: *Zoo's Print* 41(2): 20–22.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA)

A partially leucistic male Shikra in Udaipur, Rajasthan

The Shikra *Accipiter badius* is a small-sized member of the family Accipitridae. The species is categorized into 'Least Concern' on the IUCN Red List (BirdLife International 2021). It is found across Sub-Saharan Africa, the Middle East, and southern & southeastern Asia (Kemp & Kirwan 2024). It is one of the most commonly occurring raptors in the Indian subcontinent. Shikras inhabit forests, woodlands, and open areas such as savannas, shrublands, and grasslands. They can also be found in farmlands, plantations, gardens, and in urban areas. A recent assessment of India's birds (SOIB 2020) estimates that the population of the Shikra has remained stable over the past two decades. Adult males have a reddish iris, blue-grey upperparts and fine brownish-orange barring on underparts. Females have a yellowish iris, and brownish upperparts apart from heavier barring on the underparts. Both have narrow dark barring on the tail. The females are slightly larger.

Colour aberrations are common among organisms. These aberrations can be heritable (due to genetic mutation) or non-heritable (due to disease, nutritional deficiency, trauma, and environmental pollution) (van Grouw 2013). The six commonest heritable colour aberrations are albinism, leucism, brown, dilution, ino, and melanism (Mahabal et al. 2016). Leucism identified as the most common type of colour aberrations in numerous Indian avian species (Guay et al. 2012). There were a few published reports about aberrant colour in raptors from India. The albino changeable Hawk-Eagle was discovered in Rajasthan's Sitamata Wildlife Sanctuary (Parashar & Sharma 2010). Only a single instance of complete leucism in female Shikra has been reported near Pavagadh Hill,

Partially leucistic male Shikra. © Anil Kumar Sharma.

Gujarat (Upadhyay et al. 2023). Here, we document the first leucism in male Shikra.

On 21 July 2024, at 1106 h the first and second authors were birding in the urban areas of Udaipur City (Rajasthan). Near Bhuwana Circle 24.3724 N & 73.4234 E, they observed a single pale-coloured bird flying on the main road to another side and perching on an electricity wire. Several photographs of this interesting individual were taken using a Nikon P900 camera. The bird was observed for approximately 15 minutes until it disappeared. It was identified as a Shikra, with normally coloured legs and beak, yellow-orange eyes, and an off-white base around the beak. Unlike normal individuals, it has a completely white belly and partially white remiges (wing feathers) as well as rectrices (tail feathers). As the reddish colour of iris can be recognised; it is a male one. From the above observations, it has been clear that the bird was a partially leucistic male Shikra.

In this predatory species, leucism may be beneficial for camouflage while searching for prey. Such colour aberrations are originated from abnormal embryonic development (mutation) (Sharma & Tripathi 2024), and identifying colour mutations in the field can be extremely challenging (van Grouw 2013).

Acknowledgement
We are grateful to Dr. Vikas Saxena for providing incredibly helpful comments and suggestions that have enriched this article.

References

BirdLife International (2021). *Accipiter badius*. The IUCN Red List of Threatened Species 2021: e.T22695490A197951702. Accessed on 08.i.2026.

Guay, P.J., D.A. Potvin & R.W. Robinson (2012). Aberrations in plumage colouration in birds. *Australian Field Ornithology* 29(1): 23–30.

Kemp, A.C. & G.M. Kirwan (2024). *Shikra (Accipiter badius), version 1.0. In: Birds of the World* (J. del Hoyo, A. Elliott, J. sargatal, D.A. Christie, and E. de Juana,Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

Mahabal, A., H. Van Grouw, R.M. Sharma & S. Thakur (2016). How common is albinism really? Colour aberrations in Indian birds reviewed. *Dutch Birding* 38: 301–309.

Parashar, M. & S.K. Sharma (2010). Sighting of albino Changeable Hawk Eagle *Nisaetus limnaeetus* in Sitamata Wildlife Sanctuary in south Rajasthan. *Journal of the Bombay Natural History Society* 106(3): 341–342.

Sharma, A.K. & A.K. Tripathi (2024). Colour aberrations in Black-headed Ibis. Bird-o-soar #244, In: *Zoo's Print* 39(8): 23–25.

SoIB (2020). State of India's birds, 2020: Range, trends and conservation status. The SoIB Partnership, 50 pp.

Upadhyay, K., D. Mori & M. Patel (2023). Observation of a Leucistic female Shikra *Accipiter badius* at a nest near Pavagadh Hill, Gujarat. *Flamingo Gujarat* 6(2): 55–60.

van Grouw, H. (2013). What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106(1): 17–29.

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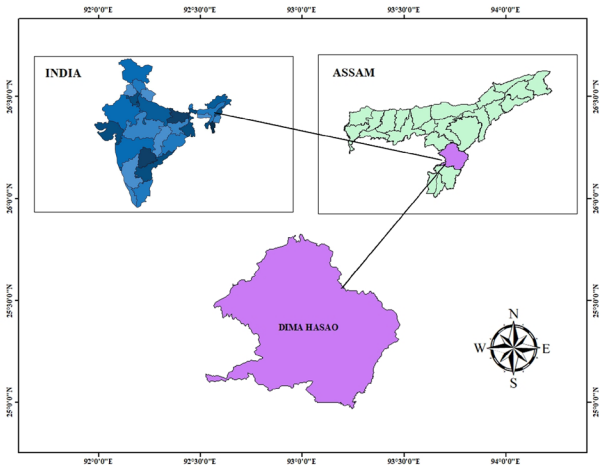
Citation: Sharma, A.K., N.L. Choudhary, A.K. Tripathi & N. Chishty (2026). A partially leucistic male Shikra in Udaipur, Rajasthan. Bird-o-soar #283, In: *Zoo's Print* 41(2): 23–24.

Daoyung and the Dimasas: folk ethics and hornbill survival in Assam's hills

During a field visit to Dima Hasao, I came across an interesting folk tale about the Great Hornbill (Daoyung). A 73-year-old Dimasa woman explained that while hunting does occur, it is strictly prohibited during the breeding season. Among the Dimasa, hunting Daoyung during the breeding season is considered a serious sin and a violation of cultural norms. This article examines how Dimasa cultural beliefs around the Daoyung conserve the species in the district.



Male and female Daoyung (*Buceros bicornis*) with Dima Hasao map (Source: Map courtesy of Sashanka Gogoi).

Folk ethics and traditional beliefs have long played a vital role in conserving wildlife and maintaining ecosystem balance. Across cultures, sacred groves, tabooed and totemic species, have acted as informal systems of protection, preventing overexploitation and conservation of biodiversity. Indigenous conservation strategies are categorized as: protection of ecosystems (sacred groves, forests, rivers), protection of species (totems, tabooed animals), and regulation of resource use (closed seasons for hunting, fishing, harvesting). As such, sacred groves are protected for their spiritual significance, which in turn serve as reservoirs of biodiversity, conserving flora, fauna, soil, water, and air while contributing to carbon sequestration, temperature regulation and traditional knowledge. Such cultural, spiritual, and religious beliefs promote biodiversity conservation and ecological harmony, reflecting a worldview where humans are part of nature (Barre et al. 2009).

The Dimasas and the Daoyung (Great Hornbill)

The Dimasas is a group of indigenous people, with the population of 137,184, mainly dwelling in the districts of Dima Hasao, Karbi Anglong and Cachar districts of Assam, and a lesser population in Hojai, Karimganj and Hailakandi districts of Assam and Dimapur district of Nagaland. The earliest records of the Dimasa date back to the Ahom Buranji, where they are mentioned as the "Timisa" during the reign of the Dimapur Kingdom. The Dimasas speak the Dimasa language, a Tibeto-Burman language, and possess Mongoloid features belonging to the Indo-Mongoloid (Kirata) racial group. Presently, Dimasa is a non-scheduled language and the community is recognised as a Scheduled Tribe (under 6th Schedule) in the Constitution of India. The term "Dimasa" is derived from three words in their language: Di (water), Ma (great), and Sa (son), meaning "Son of the Great River" or "Son of the Brahmaputra". For the Dimasas, the forest is more than a source of subsistence; it is an integral part of their cultural and spiritual life, regarding the forests, rivers, and mountains sacred (Medhi & Borthakur 2013; Parbo et al. 2023).

The Dimasa belief system is a syncretic mix of Hinduism and Animism, with a strong emphasis on nature worship, which promote harmonious coexistence with the land, animals, plants, or natural features. Geographically bridging Assam's plains and the hills of Manipur and Nagaland, Dima Hasao lies in the southern Assam within two biodiversity hotspots—Indo-Burma and Eastern Himalaya—and is characterized by its rolling hills, lush forests, and diverse flora and fauna, with many rare, endangered, and economically important species. About 88.71% of the district is forested, having three reserve forests (Langting-Mupa, Krungming, Barail) (Medhi et al. 2014). Recognized as an important area for avian diversity (about 400 species), the enriched forests of Dima Hasao accommodate five hornbill species — Austen's Brown Hornbill *Anorrhinus austeni*, Great Hornbill *Buceros bicornis* (Daoyung), Rufous-necked Hornbill *Aceros nepalensis* (Daoyung), Oriental Pied Hornbill *Anthracoceros albirostris* (Daojeng), Wreathed Hornbill *Rhyticeros undulatus* (Daorai) (Ahmed et al. 2024).

The connection with nature is evident in the Dimasa approach to wildlife, as seen in their folk wisdom, such as the belief shared by an elderly Dimasa woman. The elderly lady was an inhabitant of Gadain Shibraipur village of Langting, Dima Hasao aged around 73 years. While she was interviewed regarding the ethnobiology among the Dimasas, she brought up an interesting belief to us. She narrated that killing of hornbills during its breeding season is a sinful act. She explained that during the breeding period, the female Daoyung seals herself inside a hollow tree cavity with her eggs or chicks, relying solely on the male to bring food. If the male is killed during this time, the female and her offspring would likely starve, as the male is their primary provider. Thus, such action would not only result in the death of the male but also the inevitable death of the female and their offspring due to starvation. Her love and respect for nature serve as a reminder to protect the delicate balance of

nature, especially during vulnerable times like the breeding seasons of the hornbill. According to her, such an act is not only ecologically destructive but morally reprehensible—a belief passed down through generations based on long-standing observation and intimate understanding of hornbill behaviour. She further emphasized that killing newborn chicks is viewed as a mortal and unpardonable sin, reflecting the sacredness of all life.

Traditional beliefs and modern approaches to hornbill protection

Hornbills are the world's largest flying frugivorous species, known for their selective diet of ripe fruits (generally figs and lipid-rich fruits). Being great seed dispersers, they play a key role in tropical forest regeneration, making them indicators of a healthy ecosystem (Ahmed et al. 2024).

All hornbill species, except for Ground Hornbills (*Bucorvus*), exhibit a unique and fascinating breeding behaviour, walling up the entrance of the cavity nest. After copulating, the female seals herself within a tree cavity nest, leaving the male alone outside to care for her and her offspring for two to four months. Then, the female lays eggs inside the nest and remains inside the nest throughout the incubation period. The hornbills (either both mates or just the female, based on the species) narrow the entrance, leaving just a slit through which the male can pass in the food (Pawar et al. 2018). Hornbills' dependency on mature forests with large trees with cavities makes them particularly vulnerable to deforestation and habitat modification. In northeast India, large-scale hunting and habitat alteration from jhuming and uncontrolled seasonal fires contribute to rapid biodiversity loss. Reduced tree density and increased fragmentation negatively affect hornbill populations, disrupting their foraging behaviour and breeding success. The species is further threatened by hunting for feathers, beaks, casque, and bushmeat, especially during the breeding season. Consequently, the Great Hornbill is listed in Appendix I of CITES, categorized as 'Near Threatened' by the IUCN, and protected under Schedule I of the Indian Wildlife Protection (Amendment) Act, 2022 (Pawar et al. 2018; The WildLife (Protection) Amendment Act, 2022).

Rooted in spiritual and ecological knowledge, the Dimasa's traditional wisdom functions as an informal conservation system, where spiritual beliefs, customs, and taboos foster the protection of forests and wildlife without reliance on scientific enforcement. Similar beliefs exist among other indigenous groups in northeast India and beyond. In Arunachal Pradesh, the Idu Mishmi considers the Great Hornbill as sacred bird, and its consumption disrupts spiritual balance, bringing misfortune, illnesses, or death (Nijhawan & Mihu 2023). Among the Tangsa and Wancho tribes of Arunachal Pradesh, Great Hornbill, Rufous-necked Hornbill, Wreathed Hornbill, and Oriental Pied Hornbill are believed to possess evil spirits, and fear of bringing them home may cause bad omens and deadly diseases (Jugli et al. 2020). The Ao, Nyishi, and Karbi tribes of Nagaland, Arunachal Pradesh, and Assam respectively further protect hornbills as totemic symbols of prosperity (Nigam et al. 2025;

Sangma 2020; Sridharan et al. 2023). Besides, the Garo and Khasi emphasize preserving old-growth trees for nesting, the Apatani support hornbills through agroforestry with alder trees, and the Angami and Konyak impose seasonal hunting bans based on lunar cycles (Nigam et al. 2025). These culturally embedded taboos and folk ethics serve as community-based conservation strategies protecting the hornbill and their forest habitats by discouraging their hunting through moral and spiritual restrictions.

The indigenous ethics, when aligned with modern ecological strategies, reflect as a dynamic biodiversity conservation tool, predominantly for hornbill conservation. The Nyishi tribe of Arunachal Pradesh has substituted the use of hornbill beaks in traditional headgear with fiberglass replicas, reducing hunting pressures; programs like the Hornbill Nest Adoption Program (HNAP) launched by the Nature Conservation Foundation (NCF) in 2012, and artificial nest boxes, women's involvement in conservation education, and hornbill-based ecotourism in Pakke Tiger Reserve to engage local hunters-turned-conservationists to protect nests, and thereby to diversify livelihoods and strengthen management. Similarly, in Nagaland's Hornbill Festival exhibition, with ornaments made from real beaks having shifted to replicas and cultural motifs, linking heritage celebrations with awareness and conservation-friendly livelihoods, and the Valparai Hornbill Monitoring Programme in Tamil Nadu has worked with habitat restoration, planting nesting trees, and promoting sustainable agroforestry (Nigam et al. 2025). Thus, the reinterpretation of indigenous belief systems with scientific approaches can lead to encouragement of long-term, community-driven hornbill conservation.

The Great Hornbill stands for its great cultural and ecological significance (Pawar et al. 2018). However, the indigenous knowledge on the Daoyung among the Dimasas has been transmitted orally, encouraging cultural reverence and conservation awareness. While the species is recorded in local avifaunal (Ahmed et al. 2024) and ethnozoological surveys (Parbo et al. 2023), research in Dima Hasao remains limited. Critical gaps exist in systematic data on population size, density, and trends, as well as breeding ecology, nesting site distribution, habitat use, movement patterns, and landscape connectivity in fragmented forests. The seasonal availability of fruiting trees, impacts of human activities such as hunting and logging, contributions of traditional knowledge to conservation, local genetic diversity, and effects of land-use change and climate variability are also poorly documented.

Conservation of the Great Hornbill in Dima Hasao is to be achieved by resolving these gaps through evidence-based approaches, through population surveys, nest monitoring, habitat mapping, and ethnobiological studies.

Conclusion

Indigenous communities often link forests and wildlife to their cultural and spiritual beliefs, leading to traditional conservation practices. Cultural taboos, such as bans on hunting during reproduction, further support species

conservation for future generations. Among the Dimasas, killing the Daoyung, especially males during the breeding season, is both an ecological and spiritual violation, disrupting the forest ecosystem integrity. The traditional ethics not only strengthen legal compliance but also ensure that conservation strategies are rooted in local values, creating a holistic and sustainable approach to preserving biodiversity, particularly the Great Hornbill, in the context. Initiatives to reduce hunting pressures, support sustainable livelihoods, restore habitats, and to promote conservation education are taken, which eventually safeguard hornbills and preserve cultural heritage for the long term.

On a closing note, the integration of indigenous and local ecological knowledge, such as the Dimasa community's reverence for the Great Hornbill, with modern science can strengthen community-led biodiversity protection and conservation in the midst of today's global ecological challenges.

References:

Ahmed, M.F., T. Langthasa & D. Lahkar (2024). Dima Hasao: Explore the Wonders of Nature. Dima Hasao Forest Division (West), North Cachar Autonomous Council and Aaranyak, Assam, India, 230 pp.

Barre, R.Y., M. Grant & D. Draper (2009). The role of taboos in conservation of sacred groves in Ghana's Tallensi-Nabdam district. *Social & Cultural Geography* 10(1): 25–39.

Jugli, S., J. Chakravorty & V.B.M. Rochow (2020). Tangsa and Wancho of north-east India use animals not only as food and medicine but also as additional cultural attributes. *Foods* 9(4): 528.

Medhi, P. & S.K. Borthakur (2013). Wild edible plants sold by the Zeme Nagas at the makeshift market of Mahur, Dima Hasao district of Assam. *Pleione* 7(1): 84–93.

Medhi, P., A. Sarma & S.K. Borthakur (2014). Wild edible plants from the Dima Hasao district of Assam, India. *Pleione* 8(1): 133–148.

Nigam, R., M.A. Khalid, C. Singh & A.A. Siddiqui (2025). Integrating community participation and traditional knowledge in Hornbill conservation: Bridging the past and future, pp. 19–26. In: Singh, M.P. (editor). *Biodiversity in India: Implementation and Barriers of Regulatory Acts.* M/S Academic Publishers & Distributors, Lucknow, India

Nijhawan, S. & A. Mihu (2023). Relations of blood: Hunting taboos and wildlife conservation in the Idu Mishmi of northeast India. *Journal of Ethnobiology* 40(2): 149.

Parbo, D., P.K. Saikia, A. Kumar, N. Parbosa & B.K. Boro (2023). Ethnozoological knowledge of Dimasa Kachari of Dima Hasao, Assam, India. *Mukt Shabd Journa*l 12(7): 1278–1311.

Pawar, P.Y., R. Naniwadekar, T.R.S. Raman & D. Mudappa (2018). Breeding biology of Great Hornbill *Buceros* bicornis in tropical rainforest and human-modified plantation landscape in Western Ghats, India. *Ornithological Science* 17(2): 205–216.

Sangma, R.D. (2020). Rediscovering the significance of totems among the Karbis of Assam. Master thesis, Department of Sociology, Sikkim University, India.

Sridharan, K., T. Pawar, A. Sharma & S. Ji (2023). The architecture of the Ao Nagas: Culturally deep-rooted to venerate and conserve the local biodiversity, pp. 115–1127. In: Chakrabarti, A. & V. Singh (eds). *Design in the Era of Industry 4.0, Volume 2*. ICORD 2023. Smart Innovation, Systems and Technologies. Springer, Singapore.

The Wild Life (Protection) Amendment Act (2022). Ministry of Law and Justice, Government of India, New Delhi, 165 pp.

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Citation: Parbo, D. (2026). Daoyung and the Dimasas: folk ethics and hornbill survival in Assam's hills. Bird-o-soar #284, In: *Zoo's Print* 41(2): 25–29.

First report of Red-necked Grebe *Podiceps grisegena* and sightings of Pallas's Gull *Ichthyaetus ichthyaetus* from Chhattisgarh

The Red-necked Grebe *Podiceps grisegena* breeds in the northern Palearctic regions, winters south to the Mediterranean, north Africa and Iran (Ali & Ripley 1987). This species is winter vagrant in northwest of region recorded in Iranian Sistan, northeastern Afganistan, northern and central Pakistan, western Gujarat, northwestern Himachal Pradesh, western Gangetic plains and also reported from Assam and Bangladesh (Rasmussen & Anderton 2012). It winters on open lakes and estuaries. In its habits, it is more secretive than the Great Crested Grebe and is easily overlooked in winter plumage. It often leaps when diving (Rasmussen & Anderton 2012). It is slightly smaller than Great Crested Grebe with shorter, stouter neck, square head shape, stockier body which is often pulled up at rest and prominent black-tipped yellow bill. It is reported from Indian subcontinent from Jawai backwaters and Bharatpur in Rajasthan, Gujarat and Uttar Pradesh (Grimmett et al. 1998). It has also been reported from Pong Dam, Himanchal Pradesh by Kumar & Paliwal (2015). Various studies at national level by Ali & Ripley (1987), Rasmussen & Anderton (2012), Grimmett et al. (1998, 2014) and at state level Hewetson (1956) including Vidhabha; D'Abreu (1935) central provinces; Chandra & Singh

Red-necked Grebe *Podiceps grisegena.* © Jageshwar Verma.

Pallas's Gull *Ichthyaetus ichthyaetus.* © Gopi Kishan Sahu.

(2004) Madhya Pradesh and Chhattisgarh; Chandra et al. (2015); Vishwakarma et al. (2021); Bharos et al. (2020, 2021, 2023); Arjun et al. (2023) all in Chhattisgarh, did not mention occurrence of this species in central India inclusive of Madhya Pradesh, Chhattisgarh and Vidharbha region (Maharashtra).

The site was visited by the third author on 17 February around 1700 h. He noticed a group of eight grebes, when this photograph was examined later, it comprised of two Great Crested Grebe (GCG) *Podiceps cristatus*, five Little Grebe *Tachybaptus ruficollis*, and a Rednecked Grebe (RNG) *Podiceps grisegena* at a little distance, identified by its slightly smaller size than Great Crested Grebe, square head and redneck. Around 65 avian species were present at the tank. To confirm this, he revisited the site the following morning and successfully obtained exclusive images.

The tank was regularly visited till 25 February 2025. All these days three species of grebes remained together but maintained a distance of at least 50 m from several fishing boats and water edges. Till 0700 h grebes were maintained a more or less static thereafter commenced to leap and dive till 1000 h. Thereafter resorted to preening feathers and leisure. During the hot noon hours, intermittent feeding and resting activities continued, confined within a radius of 50–70 m.

At one point, RNG emerged with a piece of food, which was promptly seized by GCG. The bird was still stayed till preparation of this paper. It was further observed that RNG remained under water for average of 50 to 90 seconds, and emerged out at distance of 20–35 m.
On 22 February between 1700–1800 h, a bird was seen swimming away from us to other shore, disturbed by the fishing boats laying nets. First and second author observed that once it dived with a leap and came out at short distance. No other avian species was present in close proximity. It is probably a vagrant bird strayed in this pocket. This is the first sighting record of the species from Chhattisgarh, central India including Madhya Pradesh and Vidharbha.

Pallas's Gull *Ichthyaetus ichthyaetus*, also known as the Great Black-headed Gull, breeds in west-central Asia and winters in eastern and southeastern Asia. In India, it has been recorded from the Gangetic Plains, Assam Valley, Cachar, the eastern coast, and with a few records from central India (Rasmussen & Anderton 2012).

During birdwatching on 22 February 2025, between 1700–1800 h, the first and second authors observed this bird at Kurud Dam, Raipur District; however, it could not be photographed adequately. The species is often found solitary, inhabiting large inland lakes and rivers, and is also observed around fishing boats along the coast. It is a widespread winter visitor to coastal areas (Grimmett et al. 1998). A solitary individual was recorded in the state in 2024 at Ruse Dam, Rajnandgaon District (Prateek Thakur, pers. comm.), and several sightings have been reported over the past three years at Gangrel Dam, Dhamtari District (Gopi Kishen Sahu, pers. comm.). The bird sighted on 22 February was probably on its return journey from the eastern coast.

References

Ali, S. & S.D. Ripley (1987). *Compact handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka.*2nd ed. Oxford University Press, Delhi, 737 pp.

Arjun, M.S., B.P. Panda, P.R. Arun & A.M.K. Bharos (2023). Status of ornithological works from the state of Chhattisgarh, India, and conservation implications: A review. *Journal for Nature Conservation* 75(6): 126471.

Bharos, A.M.K., F. Bux, A. Bharos & J. Verma (2020). Status and composition of avifauna in Kurud Dam, Raipur District-Chhattisgarh, India. Bird-o-soar # 48, In*: Zoo's Print* 35(6): 05–21.

Bharos, A.M.K., A. Vishwakarma, J. Verma, A. Bharos & D. Verma (2021) Significance of wetland and it's dependent Avifauna in Bangoli Wetland Complex, Raipur District, Chhattisgarh, India. *Journal of Biological Studies* 4(1): 1–23.

Bharos, A.M.K., J. Verma, A. Bharos, F. Bux, A. Vishwakarma & D. Verma (2023). Status and composition of avifauna in Mandhar Wetland Complex, Raipur District-Chhattisgarh, India. *Cheetal* 60(2): 61–72.

Chandra, K. & R.K. Singh (2004). Avifauna of Madhya Pradesh and Chhattisgarh, *Zoo's Print Journal* 19(7): 1534–1539.

Chandra, K., S.K. Dutta, R.K. Gupta & A. Raha (2015). Diversity and conservational status of avifauna in Bastar Plateau of Chhattisgarh, India*, Ambient Science* 2(1): 31–43

D'Abreu, E.A. (1935), A list of the birds of the Central India province. *Journal of the Bombay Natural History Society* 38(1): 95–116.

Grimmett, R., C. Inskipp & T. Inskipp (1998). *Birds of the India Subcontinent,* Oxford University Press, 466 pp.

Grimmett, R., C. Inskipp & T. Inskipp (2014). *HelmField Guides: Birds of the Indian Subcontinent, 2nd Edition.* Oxford University Press, 556 pp.

Hewetson, C.E. (1956). Observations on the bird life of Madhya Pradesh, *Journal of the Bombay Natural History Society* 53(4): 595–645.

Kumar, A. & R. Paliwal (2015). Galloanserae and Aquatic Neoaves of Pong Dam Wetland, Himachal Pradesh- Status and Conservation Issues, pp. 307–321. In: Mamta, R., S. Dookia & C. Sivaperuman (eds.). *Aquatic Ecosystem: Biodiversity, Ecology and Conservation*. Springer, New Delhi, 333 pp.

Rasmussen, P.C. & J.C. Anderton (2012). *Birds of South Asia: The Ripley Guide*. *Vols 1 & 2. (2nd edn.).* National Museum of Natural History, Smithsonian Institution, Michigan State University & Lynx Edicions, Washington, D.C., Michigan & Barcelona. 684 pp.

Vishwakarma, A., F.M. Anthony, S. Tiwari & S. Choubey (2021). Avifaunal diversity of winter season in Kopra Reservoir of Bilaspur, Chhattisgarh, India. *Proceedings of the Zoological Society* 74: 118–126.

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Citation: Bharos, A.M.K., A. Bharos & J. Verma (2026). First report of Red-necked Grebe *Podiceps grisegena* and sightings of Pallas's Gull *Ichthyaetus ichthyaetus* from Chhattisgarh. Bird-o-soar #285, In: *Zoo's Print* 41(2): 30–32.

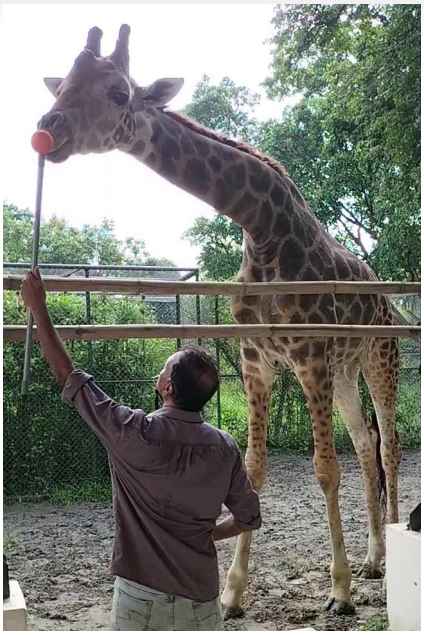
Introducing operant-based behaviour training for Giraffe at the Assam State Zoo

Giraffes (*Giraffa* spp.) are widely housed in zoos because of their charismatic appeal and popularity among visitors. However, their tall stature, unique anatomy, heightened vigilance and avoidance behaviour unfamiliar to veterinary equipment or procedures pose distinct challenges for medical care in zoos (Dadone 2015). Zoos around the world are increasingly adopting behavioural training programmes that use positive reinforcement–based operant conditioning to encourage voluntary Giraffe participation in medical care, with documented successes at Cheyenne Mountain Zoo (Dadone 2015; Dadone et al. 2016) and Dubai Safari Park (Booth et al. 2022). Positive reinforcement training (PRT) encourages animals to willingly participate in procedures that are often perceived as aversive, such as veterinary treatments or transport, by rewarding desired behaviours (Brando & Norman 2023).

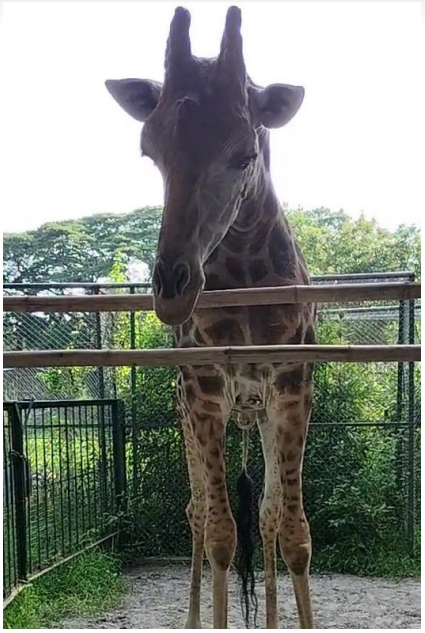
In recognition of this, a pilot behavioural training program based on voluntary participation and positive reinforcement training (PRT) was implemented with a six-year-old male Giraffe, Vijay, at the Assam State Zoo (ASZ) in India between August and October 2024. This is the first such initiative undertaken for Giraffe at the ASZ and the first to be documented for Giraffe in Indian zoos.

A restricted-contact training setup, as described by Dadone et al. (2016), was created by modifying an existing secondary exit in the Giraffe building, where sliding and removable bamboo barriers were installed to provide a flexible training space. The adjoining yard remained open so that Vijay could voluntarily disengage from the session if desired. All sessions were conducted under strict safety protocols. The training tools used included a brightly coloured ball affixed to a stick, which served as the target, a whistle as the bridging stimulus (a consistent sound used to mark the exact moment a correct behaviour occurred), and food rewards (apple, carrot, and leaf lettuce), identified through preference assessments, were used as reinforcement.

The training team consisted of the primary trainer and two keepers. Each session was conducted by the primary trainer in coordination with one of the keepers. Training sessions were conducted four to five times per week between 1500 h and 1600 h, lasting approximately 15–20 minutes each. Prior to each session, the primary trainer briefed the participating keeper on the session objectives and procedural flow. Mock rehearsals were conducted when necessary to ensure consistency and preparedness. Where possible, sessions were held during best environmental conditions – minimising visual and auditory distractions and ensuring appropriate weather (no rain or drizzle) – to enhance the likelihood of desired behaviour occurring (antecedent arrangements). Vijay's temperament was assessed before each session to confirm a relaxed state, indicated by his attentiveness to the trainer, relaxed ear posture, and absence of flared nostrils and lack of eye tension (e.g., widened eyes or visible sclera). Post-session reviews were conducted to evaluate



Target touch



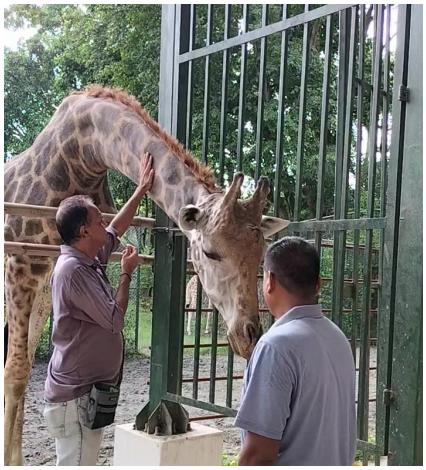
Recall and station

Back-up

Foot on the board

Hoof touch and rub (a)

Hoof touch and rub (b)



Neck touch and rub

Neck poke

Goal behaviours performed by Vijay. © Tushar Kulkarni.

Table. Summary of Goal Behaviors Taught to Vijay and Sessions Required for Establishment

	Goal behaviour	Description	Sessions to establish
1	Target touch	Vijay touches the target on cue, marked by a whistle and followed by reinforcement.	4
2	Recall and station	Vijay approaches the trainer on cue and stands at the training area.	5
3	Back-up	Vijay steps backward on all four legs on cue, without turning.	8
4	Foot on the board	Vijay lifts his forelimb and places it onto a wooden board (60 × 40 x 1.8 cm) on cue.	10
5	Hoof touch and rub	Vijay allows tactile interaction with his hooves, including touching and gentle rubbing, on cue while maintaining his forelimb on the board.	8
6	Neck touch and rub	Vijay allows tactile interaction and hand movements along his neck on cue while maintaining its position.	9
7	Neck poke	Vijay tolerates graduated tactile pokes at venipuncture sites on his neck on cue while maintaining his position.	5

Vijay's responses and level of engagement, guiding adjustments to the training strategy for subsequent sessions.

Differential reinforcement of successive approximations (Pryor 1999; Peterson 2004) was used to teach goal behaviours to Vijay. Following the principle of shaping, each goal behaviour was deconstructed into smaller, manageable steps. Reinforcement was provided for responses that progressively approximated the desired behaviour, and the process continued until Vijay consistently and reliably performed the complete goal behaviour.

Vijay was trained in seven goal behaviours to build a foundation for progressively developing more complex behaviours, enabling his voluntary participation in healthcare procedures such as hoof care and blood draws. A training plan was prepared for each goal behaviour, outlining the reinforcement strategies, incremental steps, and progression criteria to guide the shaping process. The table above summarises the behaviours taught and the number of sessions in which each behaviour was established by Vijay.

The first four goal behaviours are foundational and serve as prerequisites for the subsequent three. The 'Hoof touch and rub' behaviour can be shaped to train Vijay to voluntarily place his foot on a block of appropriate height and perform fetlock flexion (hoof curling), allowing access to the underside of the hoof for inspection, cleaning, and trimming. This behaviour also leads to stepping onto a block for foot radiographs. Similar training methods can be applied to all limbs for hoof care and radiographs. The 'neck touch and rub' and 'neck poke' behaviors prepare Vijay for future blood collection from venipuncture sites on the neck by gradually desensitizing him to increasing pressure and sensation with a blunt needle

before introducing an actual needle. Behavioural training, also known as medical or husbandry training, integrates operant conditioning with positive reinforcement into husbandry and veterinary care, is transforming the field and enhancing animal welfare and well-being (Martelli & Krishnasamy 2023). By training animals to voluntarily participate in medical behaviours, many high-risk procedures can be performed without the need for chemical or physical restraint (Callealta et al. 2019). Anaesthesia is widely recognized as high risk in giraffes due to their unique anatomy and specialised cardiovascular physiology, with historical anaesthesia-related mortality rates of 25–35% reported (Calle, 1988; Vitali et al., 2020); however, with consistent practice and experienced personnel, current-day giraffe anaesthesia shows significantly improved morbidity and mortality outcomes compared with historical trends (Swenson et al., 2025). Implementing this programme for all Giraffe at the Assam State Zoo and evaluating long-term outcomes will, therefore help establish behavioural training as a best practice and contribute to the global evidence of its value in enhancing captive Giraffe welfare and veterinary care.

This behavioural training initiative for Vijay at the ASZ demonstrated the effectiveness of positive reinforcement and operant conditioning in training a Giraffe for voluntary participation in veterinary care procedures. By integrating behavioural science into Giraffe husbandry, this initiative marks a notable advancement in Giraffe management at the ASZ.

Acknowledgements

We thank keepers Jitu Kan Rajbongshi and Surjya Kumar Das for their participation, and the veterinary team and support staff of the ASZ for their assistance during this programme. We acknowledge Amy Schilz and Diana Miller from the International Centre for the Care and Conservation of Giraffe for their valuable insights on Giraffe behaviour training during Tushar Kulkarni's participation in the 2024 Giraffe Care Workshop at the Cheyenne Mountain Zoo, Colorado Springs, USA.

References

Booth, D., A. Kamau, H. Kayondo, A.M. Sumaya & M.W. Ashraf (2022). Training a giraffe (*Giraffa camelopardalis reticulata*) for voluntary foot radiographs at Dubai Safari Park. *Journal of Zoological and Botanical Gardens* 13(4): 688–698.

Brando, S. & M. Norman (2023). Handling and training of wild animals: Evidence-and ethics-based approaches and best practices in the modern zoo. *Animals* 13(14): 2247. **Calle, P.P. & J.C. Bornmann II (1988).** Giraffe restraint, habituation, and desensitization at the Cheyenne Mountain Zoo. *Zoo Biology* 7(3): 243–252.

Callealta, I., I. Lueders, I. Luther-Binoir & A. Ganswindt (2019). Positive reinforcement conditioning as a tool for frequent minimally invasive blood and vaginal swab sampling in African Lions (*Panthera leo*). *Journal of Applied Animal Welfare Sci*ence 23(4): 508–519.

Dadone, L. (2015). Advances in Giraffe care: Trained medical behaviours. *VetCom* 56: 10–13.

Dadone, L., A. Schilz, S. Friedman, J. Bredahi, S. Foxworth & B. Chastain (2016). Training giraffe (*Giraffa camelopardalis reticulata*) for front foot radiographs and hoof care. *Zoo Biol*ogy 35(3): 228–236.

Martelli, P. & K. Krishnasamy (2023). The role of preventative medicine programs in animal welfare and wellbeing in zoological institutions. *Animals* 13(14): 2299. **Peterson, G.B. (2004).** A day of great illumination: B.F. Skinner's discovery of shaping. *Journal of the Experimental Analysis of Behaviour* 82(3): 317–328.

Pryor, K. (1999). *Don't shoot the dog! The new art of teaching and training.* 1st ed. Bantam Books, New York, 187 pp.

Swenson, J., Shea, M., Eyres, A. & H. Haefele (2025). Morbidity and mortality associated with 50 individual pasture immobilizations of giraffe (Giraffa camelopardalis) over 18 years (2004–2022) at a single institution. Journal of Zoo and Wildlife Medicine 56(3): 525-532.

Vitali, F., E.K. Karuiki, D. Mijele, T. Kaitho, M. Faustini, R. Preziosi, F. Gakuya & G. Ravasio (2020). Etorphine–azaperone immobilization for translocation of free-ranging Masai Giraffes (*Giraffa camelopardalis tippelskirchi*): A pilot study. *Animals* 10(2): 322.

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Citation: Kulkarni, T. & A. Kumar (2026). Introducing operant-based behaviour training for Giraffe at the Assam State Zoo, Mammal Tales #163, In: *Zoo's Print* 41(2): 33–36.

Use of tree cavity for denning by Rusty-spotted Cat in Keonjhar, Odisha

The Rusty-spotted Cat *Prionailurus rubiginosus* is reported as the smallest wildcat of Felidae family in class Mammalia, order Carnivora (Prater 1971; Menon 2014). This species is distributed in the Indian subcontinent, including Nepal, India and Sri Lanka. In India, it is reported from an elevation range up to 2,480 m. Despite wide distribution, it is rarely sighted and categorized as 'Near Threatened' species in the IUCN Red List (Mukherjee et al. 2016) and protected as Schedule I species in the Wildlife Protection Act (1972) of India. It occupies moist and dry deciduous forests, mixed species woodlands, and are observed active in modified habitats and human habitations as adaptive behaviour (Bora et al. 2020; Chaudhary et al. 2022). The population of this species is threatened due to loss of habitat by anthropogenic pressure in the form of modification and disturbance of natural habitats (Mukherjee et al. 2016).

Rusty-spotted Cat in sleeping position in day den. © Bharati Patel.

Camera-trap and photographic records provide critical evidence for confirming the presence, distribution, and relative abundance of this species (Chaudhary et al. 2022; Palei et al. 2023). The Rusty-spotted Cat predominantly inhabits dry and moist deciduous forests, including isolated forest fragments (Mukherjee et al. 2016). Although it exhibits both terrestrial and semi-arboreal behaviour, the use of tree cavities has not yet been documented from India, and information on cavity characteristics as well as whether the species is a facultative or obligate cavity user remains unknown (Kumara & Singh 2007). Ecological data and reliable estimates of local abundance are limited, likely due to the species' nocturnal and highly elusive behaviour (Nowell & Jackson

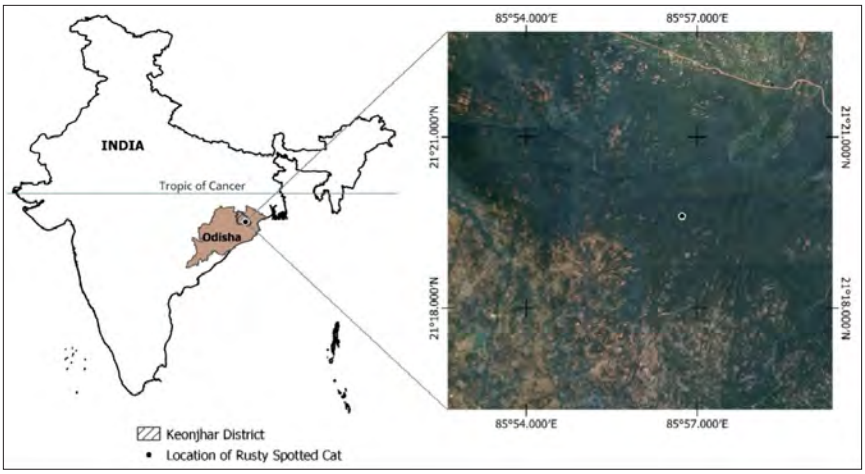
Habitat and host tree. © Bharati Patel.

1996; Bhandari et al. 2025), which continues to constrain the development of effective conservation strategies.

The present report is from Keonjhar wildlife division of Odisha where an adult Rusty-spotted Cat was observed denning in a tree cavity during day on 26 February 2025. The species was observed while inspecting the cavity during the survey of flora and microhabitat structures in the forests of Keonjhar Wildlife Division. The tree height was measured using altimeter. Tree girth and cavity dimensions were measured using a measuring tape. The characteristics of the host tree and cavity is described below:

The cavity host tree species was an unhealthy *Syzygium nervosum* DC. The girth at breast height of host tree was 106 cm. Tree height was 24.8 m. Cavity occupied by the Rusty-spotted Cat was at the base of main stem of the tree. It was a naturally formed cavity in the form of hollow stem as core had rotten till base of the tree. Height of cavity entrance was 157 cm, cavity entrance length was 28 cm, cavity entrance width was 17 cm, vertical depth of cavity was 60 cm, horizontal depth of cavity was 36 cm, width of cavity floor was 18 cm, cavity orientation was oriented to the north-east direction. The cat was observed sleeping in the tree cavity with head facing down, hiding between the forelegs. It was identified with its unique fur pattern.

A review of cavity using vertebrates of India lists 517 vertebrate species using cavities as a primary or secondary



Location map showing the observation site of the Rusty-spotted Cat in Odisha.

nesting/denning resource for their survival (Patel et al. 2021). It includes two felines, Jungle Cat *Manis chuas* and Leopard Cat *Prionailurus bengalensis*.

The Rusty-spotted Cat was not listed due to lack of literature and reports on its tree cavity use. With this observation, there is an addition to the list of cavity-users, and 518 species are now known to use tree-cavities.

Large trees and natural cavities are one of the important habitat resources for the Rusty-spotted Cats. The use of tree cavities indicates special habitat requirements of the species. Often, the survival of dependent species depends on the presence of these structures, especially if the species is an obligate cavity user. Considering the type of cavity use reported here, the species can be considered an obligate cavity user. Due to its large body size, this species might prefer large trees.

The species has been reported to use both forests with thick canopy, mixed forests, thorn woodlands and forest areas with anthropogenic activities (Bora et al. 2020; Chaudhary et al. 2022). Therefore, biotic pressure is the biggest threat to the rusty-spotted cats.

Removal of large old, unhealthy and dead trees during salvage logging, for fuelwood collection or considering them as 'hazard trees' in human-dominated landscapes depletes habitat resources for habitat specialist species such as cavity users. Protection of structures such as large dying and dead trees will help to conserve the habitat for these species.

References

Bhandari, B., V. Thapa, P. Mahatara, N. Dhakal, D. Pariyar, S. Gosai & S.P. Heighton (2025). Surviving in a changing world: A systematic review of research trends and threats to the mysterious Rusty-spotted Cat. *Research Square* 5738983/v1

Bora, J.K., N. Awasthi, U. Kumar, S. Goswami, A. Pradhan, A. Prasad, D.R. Laha, R. Shukla, S.K. Shukla, Q. Qureshi & Y.V. Jhala (2020). Assessing the habitat use, suitability and activity pattern of the Rusty-spotted Cat *Prionailurus rubiginosus* in Kanha Tiger Reserve, India. *Mammalia* 84(5): 459–468.

Chaudhary, R., N. Zehra, A. Musavi & J.A. Khan (2022). Status, activity pattern and habitat use of Rusty-Spotted Cat (*Prionailurus rubiginosus*) in Gir Protected Area, Gujarat, India. *International Journal of Ecology and Environmental Sciences* 48(6): 747–753.

Kumara, H.N. & M. Singh (2007). Small carnivores of Karnataka: distribution and sight records. *Journal of the Bombay Natural History Soc*iety 104(2): 155–160.

Menon, V. (2014). *Indian Mammals: A Field Guide.* Hachette Book Publishing India Pvt. Ltd., Gurgaon, India, 528 pp.

Mukherjee, S., J.W. Duckworth, A. Silva, A. Appel & A. Kittle (2016). *Prionailurus rubiginosus*. The IUCN Red List of Threatened Species 2016: e.T18149A50662471. https://doi.org/10.2305/IUCN.UK.2016-1.RLTS.T18149A50662471.en. Accessed on 05. viii.2025.

Nowell, K. & P. Jackson (1996). *Wild Cats. Status Survey and Conservation Action Plan*. IUCN/SSC Cat Specialist Group, Gland, Switzerland and Cambridge, UK, 382 pp.

Palei, N.C., B.P. Rath & S. Nayak (2023). Mammalian diversity of Debrigarh Wildlife Sanctuary, Odisha, India. *Journal of Threatened Taxa* 15(4): 23005–23015.

Patel, B., S. Sivaraman & P. Balakrishnan (2021). Use of tree cavities by Indian vertebrates. *Current Sci*ence 121(4): 490–501.

Prater, S.H. (1971): *The Book of Indian Animals.* Bombay Natural History Society and Oxford University Press, 347 pp.

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Citation: Patel, B. & D.H. Dhamdhere (2026). Use of tree cavity for denning by Rusty-spotted Cat in Keonjhar, Odisha. Mammal Tales #164, In: *Zoo's Print* 41(2): 37–39.

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Publication Information

ZOO'S PRINT, ISSN 0973-2543
Published at: Coimbatore

Owner: Zoo Outreach Organisation, 3A2 Varadharajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India.

Editor: Sanjay Molur
Associate Editor: R. Marimuthu
Managing Editors: Latha G. Ravikumar & B. Ravichandran
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