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Communicating science for conservation



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

First photographic documentation of Common Quaker from Purulia, West Bengal, India

The butterfly
Common Quaker
Neopithecops zalmora
(Butler, [1870]) has a
localised distribution
throughout India
from Uttarakhand to
Arunachal Pradesh,
northeastern India,
Western Ghats
(Maharashtra
southwards), West
Bengal, Jharkhand,
and Odisha
(Anonymous 2023;
Biswas et al. 2019;
Kehimkar 2008;
Mukherjee et al.

2016; Mukherjee & Mondal
2020; Patra et al. 2022;
Smetacek 2017). The present
study reports the distribution
of Common Quaker from
Purulia, West Bengal, India.

The species *Neopithecops
zalmora* belongs to the
family Lycaenidae. Authors
photographed a single
specimen during a field study



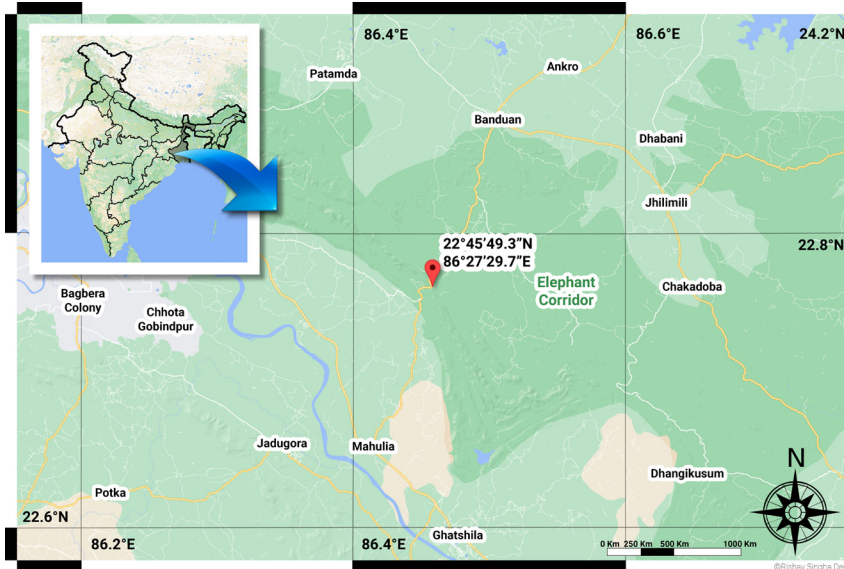
Common Quaker *Neopithecops zalmora*
from Duarsini Forest, Purulia, West
Bengal, India. © Suraj Kumar Singha Deo.

on 26 December 2021 at
1309 h from Duarsini Forest
of Bandwan in Purulia, West
Bengal using a Samsung SM-
A207F. The specimen was
not collected from the study
area. During the time of the
observation, the specimen
was basking on a green
leaf. It was identified on the
basis of HW (hindwing). It is
tailless. Forewing (FW) costa

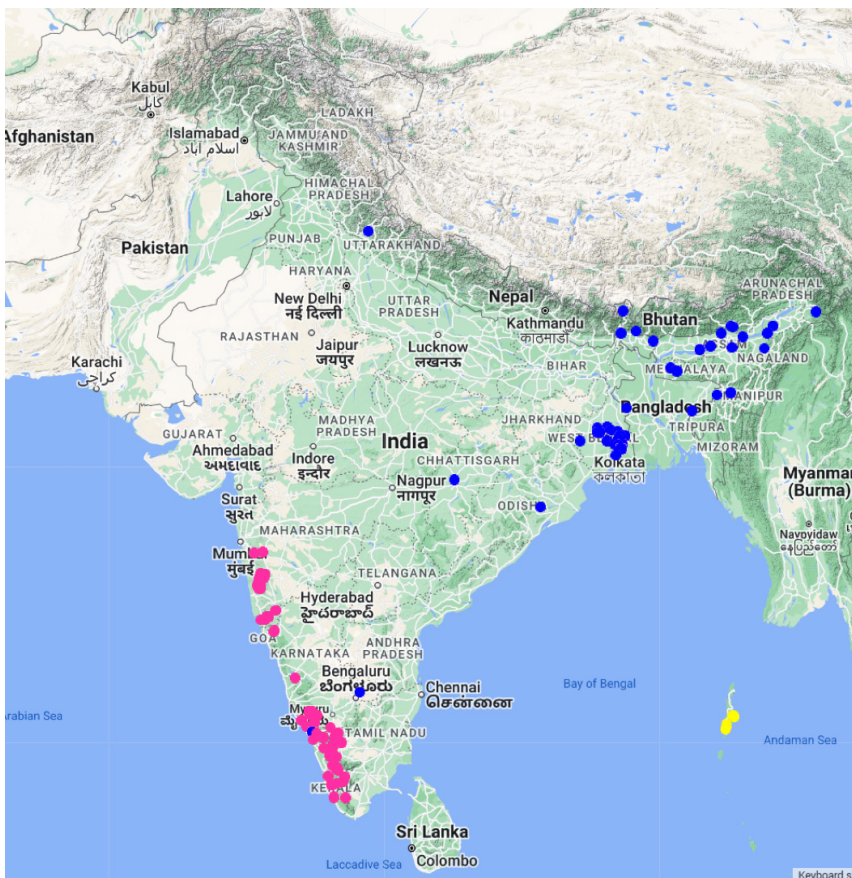
and termen are rounded.
While underside (US) with a
prominent large black spot
present near UNF (under
forewing) costa, and another
small black spot on dorsum of
UNH (under hindwing), also
there are three small basal
spots and outer discal band on
UNH. No costal spots on UNF,
except as part of outer discal
band. Broad FW is dark brown

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Common Quaker *Neopithecops zalmora* sighting location.



Distribution of Common Quaker in the Indian subcontinent (Captured on 12.iii.2023 from the Butterflies of India website; Anonymous 2023).

or black with discal areas white on UP (upperside). Markings vary from four small white discal patches on UPF (upper forewing) in WSF (wet season form), to larger white discal area on UPF (upper forewing) and white UPH in extremes DSF (dry season form) (Kehimkar 2008).

The species is usually reported from low elevation & ascends up to 1,500m (Kehimkar 2008; Smetacek 2017). This Lycaenidae butterfly is common in high humidity areas and sometimes also seen in agricultural areas. Within the forest, flight is weak and fluttering, with butterflies settling frequently on leaves, low-grounding flowers or wet mud. Males are avid mudpuddlers (Kehimkar 2008; Smetacek 2017).

The Common Quaker was sighted at 22.7636 & 86.4582, 142 m elevation. The area is a dry deciduous forest of *Sal Shorea robusta*, *Pial Buchanania lanzan*, *Teak Tectona grandis*, *Bahera Terminalia bellirica*, and *Kusum*



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Schleichera oleosa. The average annual rainfall of the area ranges 1,100–1,500 mm (Das 2016; Samanta et al. 2017). There are no past records of the species from Purulia District (Samanta et al. 2017; Das 2018).

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Suraj Kumar Singha Deo¹ & Debasish Mahato²

¹Department of Zoology, Vinoba Bhave University, Hazaribag, Jharkhand 825301, India.

²Department of Zoology, St. Xavier's College, Ranchi, Jharkhand 834001, India.

Email: ²debasishmahato2017@gmail.com (corresponding author)

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



A preliminary study on time-specific assemblage of butterflies in an undisturbed site at Serampore, Hooghly, West Bengal

Few studies have examined the variety and richness of butterflies in northern and southern West Bengal (Mukherjee et al. 2015). On the campus of Ramakrishna Mission Vivekananda Centenary College (RKMVCC), a visual encounter approach was done to document the temporal variety of butterfly fauna.

The study site was Jolkol (12, William Carey Sarani, Maniktala, Serampore (22.7495 & 88.3542) and belongs to the suburban area of Hooghly District of West Bengal, India. The Hooghly River bank is not far from this location. The area has naturally grown bushy shrubs, herbs, climbers, small grasses, and large trees.

The study area consisted of different types of shrubs, herbs, trees, and grasses. The area is mostly covered by several native and non-native/invasive herbs, shrubs,

fruit plants, and trees: *Ficus* sp., *Cassia fistula*, *Citrus lemon*, *Calotropis* sp., *Lantana camara*, *Mangifera indica*, *Areca catechu*, *Euphorbia hirta*, *Abutilon indicum*, *Cicer arietinum*, *Chrysopogon* sp., *Oxalis corniculata*, *Ricinus communis* and various types of grasses which provide habitat, resources, and breeding sites for butterfly species (Mandal & Jana 2012).

From March 2022 to June 2022, the current study was conducted during various

daytime hours. Using the modified Pollard walk technique, observed butterfly species were tallied along transects (Pollard 1977). Four hours each day were devoted to doing the general observation. The XL Miner Analysis Tool is utilized for the data analysis together with the χ^2 test (Sheskin 2000).

During the examination, 47 distinct species of butterflies (Table 1) were seen in the study region (Kehimkar 2016). The observed time was divided



Map of the study area Jolkol or 12, William Carey Sarani, Maniktala, Serampore, West Bengal, India.

Table 1. Observed butterfly species in the study area Jolkol, Serampore.

	Common name	Scientific name	Family
1	Common Mormon	<i>Papilio polytes</i>	Papilionidae
2	Tailed Jay	<i>Graphium agamemnon</i>	Papilionidae
3	Lime butterfly	<i>Papilio demoleus</i>	Papilionidae
4	Common Jay	<i>Graphium doston</i>	Papilionidae
5	Common Mime	<i>Papilio clytia</i>	Papilionidae
6	Common Crow	<i>Euploea core</i>	Nymphalidae
7	Plain Tiger	<i>Danaus chrysippus</i>	Nymphalidae
8	Blue Tiger	<i>Tirumala limniace</i>	Nymphalidae
9	Striped Tiger	<i>Danaus genutia</i>	Nymphalidae
10	Common Four Ring	<i>Ypthima huebneri</i>	Nymphalidae
11	Angled Castor	<i>Ariadne ariadne</i>	Nymphalidae
12	Tawny Castor	<i>Ariadne terpscore</i>	Nymphalidae
13	Common castor	<i>Ariadne merione</i>	Nymphalidae
14	Peacock Pansy	<i>Junonia almana</i>	Nymphalidae
15	Lemon Pansy	<i>Junonia lemonias</i>	Nymphalidae
16	Gray Pansy	<i>Junonia atlites</i>	Nymphalidae
17	Great Eggfly	<i>Hypolimnas bolina</i>	Nymphalidae
18	Dark-brand Bush Brown	<i>Mycalesis mineus</i>	Nymphalidae
19	Common Bushbrown	<i>Mycalesis perseus</i>	Nymphalidae
20	Chestnut-streaked Sailer	<i>Neptis jumbah</i>	Nymphalidae
21	Common Sailer	<i>Neptis hylas</i>	Nymphalidae
22	Common Palmfly	<i>Elymnias hypermnestra</i>	Nymphalidae
23	Common Grass Yellow	<i>Eurema hecabe</i>	Pieridae
24	Lemon Emigrant	<i>Catopsilia pomona</i>	Pieridae
25	Mottled Emigrant	<i>Catopsilia pyranthe</i>	Pieridae
26	Common Albatross	<i>Appias albina</i>	Pieridae
27	Striped Albatross	<i>Appias libythea</i>	Pieridae
28	Eastern Striped Albatross	<i>Appias olferna</i>	Pieridae
29	Indian Jezebel	<i>Delias eucharis</i>	Pieridae
30	Common Gull	<i>Cepora nerissa</i>	Pieridae
31	Psyche	<i>Leptosia nina</i>	Pieridae
32	Common Pierrot	<i>Castalius rosimon</i>	Lycaenidae
33	Rounded Pierrot	<i>Tarucus extricatus</i>	Lycaenidae
34	Common Silverline	<i>Spindasis vulcanus</i>	Lycaenidae
35	Quaker	<i>Neopithecops zalmora</i>	Lycaenidae
36	Gram Blue	<i>Euchrysops cnejus</i>	Lycaenidae
37	Pale Grass Blue	<i>Pseudozoeeria maha</i>	Lycaenidae

	Common name	Scientific name	Family
38	Dark Grass Blue	<i>Zizeeria karsandra</i>	Lycaenidae
39	Tiny Grass Blue	<i>Zizula hylax</i>	Lycaenidae
40	Monkey Puzzle	<i>Rathinda amor</i>	Lycaenidae
41	Apefly	<i>Spalgis epius</i>	Lycaenidae
42	Indian Sunbeam	<i>Curetis thetis</i>	Lycaenidae
43	Rice Swift	<i>Borbo cinnara</i>	Hesperiidae
44	Indian Grizzled skipper	<i>Spialia galba</i>	Hesperiidae
45	Chestnut Bob	<i>Iambrix salsala</i>	Hesperiidae
46	Oriental Palm Bob	<i>Suastus gremius</i>	Hesperiidae
47	Grass Demon	<i>Udaspes folus</i>	Hesperiidae

Table 2. Common and exclusive butterfly species in the different time intervals.

Total time: 0930–1500h				
	1st Interval (0930–1030 h)	2nd Interval (1100–1200 h)	3rd Interval (1230–1330 h)	4th Interval (1400–1500 h)
1	Quaker	Quaker	Quaker	Quaker
2	Common Silverline	Common Silverline	Common Silverline	Common Silverline
3	Common Pierrot	Common Pierrot	Common Pierrot	Common Pierrot
4	Common Four Ring	Common Four Ring	Common Four Ring	Common Four Ring
5	Pale Grass Blue	Pale Grass Blue	Pale Grass Blue	Pale Grass Blue
6	Tawny Coster	Tawny Coster	Tawny Coster	Tawny Coster
7	Common Mormon	Common Mormon	Common Mormon	Common Mormon
8	Common Grass Yellow	Common Grass Yellow	Common Grass Yellow	Common Grass Yellow
9	Common Jay	Common Jay	Common Jay	Common Jay
10	Tailed Jay	Tailed Jay	Tailed Jay	Tailed Jay
11	Plain Tiger	Plain Tiger	Plain Tiger	Plain Tiger
12	Dark Brand Bush Brown	Dark Brand Bush Brown	Dark Brand Bush Brown	-
13	Rounded Pierrot	Rounded Pierrot	Rounded Pierrot	-
14	Eastern Striped Albatross	Eastern Striped Albatross	Eastern Striped Albatross	-
15	Dark Grass Blue	Dark Grass Blue	Dark Grass Blue	-
16	Indian Rice Swift	Indian Rice Swift	Indian Rice Swift	-
17	Indian Jezebel	-	Indian Jezebel	Indian Jezebel
18	-	Tiny Grass Blue	Tiny Grass Blue	Tiny Grass Blue
19	-	Common Crow	Common Crow	Common Crow
20	-	Striped Tiger	Striped Tiger	Striped Tiger
21	-	Common Mime	Common Mime	Common Mime
22	-	Lime	Lime	Lime



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Total time: 0930–1500h				
	1st Interval (0930–1030 h)	2nd Interval (1100–1200 h)	3rd Interval (1230–1330 h)	4th Interval (1400–1500 h)
23	-	Lemon Emigrant	Lemon Emigrant	Lemon Emigrant
24	-	Common Sailer	Common Sailer	Common Sailer
25	-	Lemon Pansy	Lemon Pansy	Lemon Pansy
26	-	Oriental Palm Bob	Oriental Palm Bob	Oriental Palm Bob
27	Great Eggfly	Great Eggfly	-	-
28	-	Common Albatross	Common Albatross	-
29	-	Common Castor	Common Castor	-
30	-	Indian Grizzled Skipper	Indian Grizzled Skipper	-
31	-	Apefly	Apefly	-
32	-	Indian Sunbeam	Indian Sunbeam	-
33	-	Common Palmfly	Common Palmfly	-
34	-	Chestnut Bob	-	Chestnut Bob
35	-	-	Grass Demon	Grass Demon
36	-	-	Peacock Pansy	Peacock Pansy
37	-	-	Common Gull	Common Gull
38	-	-	Angled Castor	Angled Castor
39	-	-	Grey Pansy	Grey Pansy
40	Gram Blue	-	-	-
41	Psyche	-	-	-
42	-	Mottled Emigrant	-	-
43	-	Common Bushbrown	-	-
44	-	Chestnut-Streaked Sailor	-	-
45	-	-	Monkey puzzle	-
46	-	-	Blue Tiger	-

uniformly into four time slots—1st interval (0930–1030 h), 2nd interval (1100–1200 h), 3rd interval (1230–1430 h), and 4th interval (1400–1500 h).

In the case of the total study area species types were mostly encountered in the 3rd interval (33.33%) followed by the 2nd interval (26.04%), 4th interval (25.00%), and 1st interval (15.63%) ($\chi^2 = 06.08$, $df = 3$, $p < 0.05$) and significantly higher.

All observed butterfly species were not encountered at a time. Twenty butterfly species were observed in the first interval, 36 species, 39 species, and 27 species were observed in the second, third, and fourth intervals, respectively. Among all of them, only 11 butterfly species were common in all four-time intervals—Quaker, Common Silverline, Common Pierrot, Pale Grass Blue, Common Four Ring, Tawny Coster, Common Mormon, Common Jay, Tailed Jay, Common Grass Yellow, and Plain Tiger

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(Table 2). The remaining ones were only found in their respective intervals. Of those observed, 47 species were not found all day time. Some species may occur over a prolonged period of time or at different time sessions of the day but the higher number of individuals of certain species indicated the maximum utilization of ecological resources in that area (Ray & Roy 2019).

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- M. Abu Imran Mallick¹ & Debolina Banerjee²**
¹ Department of Zoology, West Bengal State University, West Bengal 700126, India.
² Department of Environmental Studies, Kidderpore College, West Bengal 700023, India.
 Email: ²debolina014@gmail.com (corresponding author)

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Butterflies of Rishijharan Waterfall, Gariaband, with three additions to the state fauna of Chhattisgarh, India

Recent studies on butterflies from Chhattisgarh list 170 species, last updated with addition of Black Spotted Pierrot (Chand et al. 2022). The major contribution has been made by Sisodia (2019) who added 19 new records and listed 159 species from Chhattisgarh based on Chandra et al. (2014) and Dubey et al. (2015). Further addition to tally 170, has been made by Sisodia & Khirsagar (2020), Tandan et al. (2020, 2021a & b,) and Nihlani et al. (2021). Here we report three butterfly species for the first time from Chhattisgarh.

Our survey area was restricted to the Rishijharan Waterfall (19.7798 & 82.5837), which is located in the Deobhog block of Gariaband District in the vicinity of Udanti-Sitanadi Tiger Reserve in Chhattisgarh, India. Rishijharan Waterfall is a small seasonal waterfall where the water flows in full force during the rainy season only, whereas a trickle of water continues throughout the year



Abisara bifasciata. ©H. N. Tandan.



Prosotas noreia. ©Gulab Chand.

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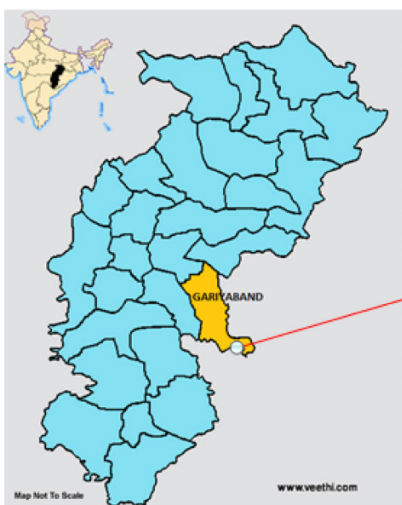
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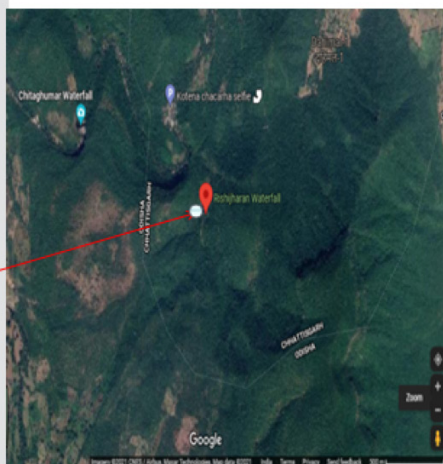
Sarangesa dasahara. ©Ramanand Agrawal.



Track of butterfly walk on 28 November 2021.



Study area Rishijharan Waterfall.



from surrounding catchment areas. This water availability provides a good habitat for various fauna like butterflies, insects, some frogs, birds, and mammals. Month-wise observations of butterflies were made during October, November, and December, 2021 in the morning hours of 0700–1100. Additional observations were made through a butterfly walk of 3 km, in five hours, organized on 28 November 2021 in which a total six members participated in the survey. The butterflies were photographed using DSLR cameras. The field identification of butterflies was made with the help of Wynter-Blyth (1957), Haribal (1992), and Kehimkar (2016). Species identities were confirmed through online help by Krushnamegh Kunte, chief editor, Butterflies of India website: www.ifoundbutterflies.org.

Family: Riodinidae

Sub Family: Nemeobiinae

***Abisara bifasciata* Moore, 1877**

Double-banded Judy

Individuals photographed: 28 November 2021, 12 July 2020, 15 July 2020, 17 September 2020. Gulab Chand Atang, and

Table 1. List of the butterflies recorded from Rishijharan Waterfall, Deobhog, Gariaband District, Chhattisgarh, India (October–December 2021).

	Order	Super Family	Family	Subfamily	Common name	Scientific name	Recorded on (0700–1100 h)		
							17.x.2021	18.xi.2021	25.xii.2021
1					Lime Swallowtail	<i>Papilio demoleus</i> (Linnaeus, 1758)	+	+	+
2			Papilionoidea	Papilioninae	Common Mormon	<i>Papilio polytes</i> (Linnaeus, 1758)	+	-	+
3					Blue Mormon	<i>Papilio polymnestor</i> (Cramer, 1775)	-	+	-
4					Common Banded Peacock	<i>Papilio crino</i> (Fabricius, 1793)	+	-	-
5			Riodinidae	Nemeobiinae	Double-banded Judy	<i>Abisara bifasciata</i> (Moore, 1877)	+	+	-
6					Common Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	+	-	+
7					Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	+	-	-
8			Pieridae	Coliadinae	Common Grass Yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	+	+	+
9		Papilionoidea			Small Grass Yellow	<i>Eurema brigitta</i> (Stoll, [1780])	-	-	+
10				Pierinae	Painted Jezebel	<i>Delias hyparete</i> (Linnaeus, 1758)	+	+	+
11					Common Pierrot	<i>Castalius rosimum</i> (Fabricius, 1775)	+	+	+
12					Lesser Grass Blue	<i>Zizina otis</i> (Fabricius, 1787)	+	+	+
13					Forget-me-not	<i>Catochrysops strabo</i> (Fabricius, 1793)	+	+	-
14			Lycaenidae	Polyommattinae	Angled Pierrot	<i>Caleta decidia</i> (Hewitson, 1876)	+	+	+
15					Common Lineblue	<i>Prosotas nora</i> (C. Felder, 1860)	+	+	+
16					Pointed Ciliate Blue	<i>Anthene lycarina</i> (R. Felder, 1868)	+	+	-
17					Tailless Lineblue	<i>Prosotas dubiosa</i> (Semper, [1879])	+	+	+

	Order	Super Family	Family	Subfamily	Common name	Scientific name	Recorded on (0700–1100 h)		
							17.x.2021	18.xi.2021	25.xii.2021
18	Lepidoptera	Papilionoidea	Lycaenidae	Polyommattinae	White-tipped Lineblue #	<i>Protoparce noreia</i> (R. Felder, 1868)	-	+	-
19					Grass Jewel	<i>Freyeria trochylus</i> (Freyer, 1845)	+	+	-
20					Orange-crowned Cupid	<i>Everes lacturnus</i> (Godart, [1824])	+	+	+
21					Small Grass Jewel	<i>Freyeria putli</i> (Kollar, [1844])	+	+	+
22					Dingy Lineblue	<i>Petrelaea adana</i> (de Nicéville, [1884])	-	+	-
23					Common Hedge Blue	<i>Acyrtodes puspa</i> (Horsfield, [1828])	+	+	+
24					Common Shot Silverline	<i>Spindasis ictis</i> (Hewitson, 1865)	+	+	+
25					Redspot	<i>Zesius chrysomallus</i> Hübner, [1819]	-	+	-
26					Indigo Flash	<i>Rapala varuna</i> (Horsfield, [1829])	-	+	-
27					Purple Leaf Blue	<i>Amblypodia anita</i> (Hewitson, 1862)	+	+	+
28					Common Banded Awl	<i>Hasora chromus</i> (Cramer, [1780])	+	-	-
29					Dark Palm-Dart	<i>Tellicota bambusae</i> (Moore, 1878)	+	+	-
30					Complete Paint-brush Swift	<i>Baoris farri</i> (Moore, 1878)	-	+	-
31					Chestnut Bob	<i>Iambrix salsala</i> (Moore, [1866])	-	+	-
32	Golden Angle	<i>Caprona ransonnetti</i> (R. Felder, 1868)	+	+	+				
33	Common Small Flat #	<i>Sarangesa dasahara</i> (Moore, [1866])	+	+	-				
34	Angled Castor	<i>Ariadne ariadne</i> (Linnaeus, 1763)	+	+	+				

	Order	Super Family	Family	Subfamily	Common name	Scientific name	Recorded on (0700–1100 h)		
							17.x.2021	18.xi.2021	25.xii.2021
35				Charaxinae	Indian Nawab	<i>Charaxes bharata</i> C. & R. Felder, [1867]	+	+	+
36				Danaeinae	Plain Tiger	<i>Danaus chryseippus</i> (Linnaeus, 1758)	+	+	+
37			Blue Tiger		<i>Tirumala limniace</i> (Cramer, [1775])	+	+	+	+
38			Striped Tiger		<i>Danaus genutia</i> (Cramer, [1779])	+	+	+	+
39				Common Crow	<i>Euploea core</i> (Cramer, [1780])	+	+	+	+
40				Common Palmfly	<i>Elymnias hypermestra</i> (Linnaeus, 1763)	+	+	+	+
41				Common Bushbrown	<i>Mycalopsis perseus</i> (Fabricius, 1775)	+	+	+	+
42				Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	+	+	+	+
43	Lepidoptera	Papilionoidea	Nymphalidae		Common Sailer	<i>Neptis hylas</i> (Linnaeus, 1758)	+	+	+
44					Short-banded Sailer	<i>Phaedyma columella</i> (Cramer, [1780])	+	+	-
45					Chestnut-streaked Sailer	<i>Neptis jumbah</i> Moore, [1858]	-	+	-
46				Limnitiinae	Common Lascar	<i>Pantoporia hordonia</i> (Stoll, [1790])	+	+	-
47					Common Baron	<i>Euthalia aconthea</i> (Cramer, [1777])	-	-	+
48					Commander	<i>Moduza procris</i> (Cramer, [1777])	+	+	+
49					Staff Sergeant	<i>Athyma selenophora</i> (Kollar, [1844])	-	+	+
50					Baronet	<i>Euthalia nais</i> (Forster, 1771)	+	+	+
51				Nymphalinae	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	+	+	+

	Order	Super Family	Family	Subfamily	Common name	Scientific name	Recorded on (0700–1100 h)		
							17.x.2021	18.xi.2021	25.xii.2021
52	Lepidoptera	Papilionoidea	Nymphalidae	Nymphalinae	Gray Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	+	+	+
53					Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758))	+	+	-
54					Chocolate Pansy	<i>Junonia iphita</i> (Cramer, [1779])	+	-	+
55					Blue Pansy	<i>Junonia orithya</i> (Linnaeus, 1758)	+	+	+
56					Great Eggfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	+	+	-
57					Tawny Coster	<i>Acraea violae</i> (Fabricius 1793)	+	+	+
								Acraeinae	

New record added to the state fauna of butterflies, Chhattisgarh in the present study.

Deobhog, H.N. Tandan at Kurud, & Ravi Naidu at KVNP & Jabeli in Bastar.

Known distribution: Andaman & Nicobar Islands (Varshney & Smetacek 2015). The distribution of this species has been updated recently that the subspecies *A. b. bifasciata* is endemic to Andaman & Nicobar, whereas *A. b. suffusa* is widely distributed from the Western Ghats to the Vindhya and Satpuda Hills, the Eastern Ghats, Himalaya, and northeastern India up to the Garo and Khasi Hills (Kunte et al. 2023).

Remarks: The species was photographed during the survey at Rishijharan Waterfall on 28 November 2021. It was observed by us earlier, outside the survey, at Government Nursery, Bhatagaon, (20.8694 & 81.6998); Atang village (20.8927 & 81.7197) and at Kanger Valley National Park, Bastar. It has been also observed from Tapkara and Jashpur by Saurabh Singh & Ashwini Chauhan; in Naya Raipur, Mainpur, Deobhog, Manjhingarh by Gulab Sahu, Gulashan Kumar Sahu; and Pratap Singh recorded it from Nagari. All these observations from different localities in Chhattisgarh have been uploaded frequently on Indian Foundation of Butterflies website <https://www.ifoundbutterflies.org/> (Kunte et al. 2020). The observed individuals had pale green eyes with reddish-brown wings, differing from *A. echerius* which has green eyes.

Family: Lycaenidae

Sub Family: Polyommatae

***Prosotas noreia* (R. Felder, 1868)**

White-tipped Lineblue

Individual photographed: 28 November 2021, Gulab Chand and Ramanand Agrawal at Deobhog.

Known distribution: Sri Lanka to Uttarakhand and northeast India onwards to Indonesia (Varshney & Smetacek 2015); India, Burma, Ceylon, and nearly all the Islands of the Malay Archipelago (Kehimkar 2016).

Remarks: *Prosotas noreia* is tailless, small sized (2.2–2.8 cm) butterfly, has white hair fringe along forewing apex (Kehimkar 2016) or white tip of forewing cilia hence its common name. The external margin is less convex in the forewing. Felder (1868) first described the species as *Lycaena noreia* (Bingham 1907). Three subspecies of *Prosotas* are *P. noreia noreia* (Tite 1963); *P. noreia cyclops* (Toxopeus 1929); and the only subspecies that has been recorded in India is *Prosotas noreia hampsonii* (de Nicéville 1885) (Smetacek 2016).

Family: HesperIIDae

Sub Family: Pyrginae

***Sarangesa dasahara* (Moore, [1866])**

Common Small Flat

Individual photographed: 18 November 2021, Gulab Chand and Ramanand Agrawal at Deobhog.

Known distribution: Rajasthan to Orissa and south to Andhra Pradesh, Himachal Pradesh to northeastern India, Gujarat to Kerala and Andaman & Nicobar Islands (Middle Andaman Is.) (Varshney & Smetacek 2015).

Remarks: This small-sized, fast, and ground flying HesperIIDae butterfly has a wingspan of around 30–35 mm, commonly found in all Chhattisgarh. It is a dull brown butterfly having semitransparent spots on wings. During present survey, we photographed the species on 18 November 2021 but earlier we observed it first on 11 February 2019 at Kanger Valley National

Park, subsequently observed from Jashpur, Kanker, Keshkal, Korba, Surajpur, and Sarguja. The present survey documented a checklist of 57 species of butterflies belonging to six families systematically placed under 17 subfamilies (Table 2). We referred to Chandra et al. (2014) and Sisodia (2019) for earlier records of butterflies from Chhattisgarh and found that the White-tipped Lineblue, Common Small Flat, and Double-banded Judy have not been recorded till now from Chhattisgarh State.

Earlier, *Abisara echerius* (Stoll, [1790]) was observed from Bastar, Dantewada, Surguja, Korea, and Raipur districts (Chandra et al. 2014). Sisodia (2019) listed *A. bifasciata* and *A. echerius* in tentative list of butterflies of Chhattisgarh and suggested for further confirmation of these taxon. Kunte et al. (2012) reported the *A. bifasciata*, *A. neophron* and *A. fylla* from northeastern India. The distribution of *A. bifasciata* shows Andaman & Nicobar Islands (Varshney & Smetacek 2015). Bora (2015) reported four species of *Abisara* as *A. fylla*, *A. bifasciata*, *A. neophron*, and *A. chela* from Meghalaya. These reports show the distribution of *A. bifasciata* in India. We also photographed it during field survey

Table 2. Family-wise number of species, recorded from Rishijharan Waterfall, Deobhog, District-Gariaband, Chhattisgarh, India (October–December 2021).

	Family	Number of species recorded
1	Nymphalidae	24
2	Lycaenidae	17
3	HesperIIDae	06
4	Pieridae	05
5	Papilionoidea	04
6	Riodinidae	01

Bugs R All

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at Chhattisgarh; hence the presence of *A. bifasciata* in Chhattisgarh has been confirmed with this report and there are already records from Surguja, Raipur, Dhamtari, Gariaband, Bastar, and Kondagaon districts of Chhattisgarh on IFB.

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Hit Narayan Tandan¹, Gulab Chand², Ravi Naidu³, Ramanand Agrawal⁴ & Jayant Biswas⁵

^{1&5} ISBM University, Chhura, District - Gariaband, Chhattisgarh 493996, India,

¹ S.G.G. Govt. P.G. College, Kurud, Chhattisgarh 493663, India; ² Govt. N. P. G. College of Science, Raipur, Chhattisgarh 492001, India; ³ C.R.O.W. Foundation, Jagdalpur, Chhattisgarh 494001, India; ⁴ Govt. Pt. S. S. M. College Deobhog, Chhattisgarh 493890, India; ⁵ National cave Research and Protection Organization, Chhattisgarh 492001, India.

Email: ¹tandanhn79@gmail.com (corresponding author)

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





#231
21 April 2023

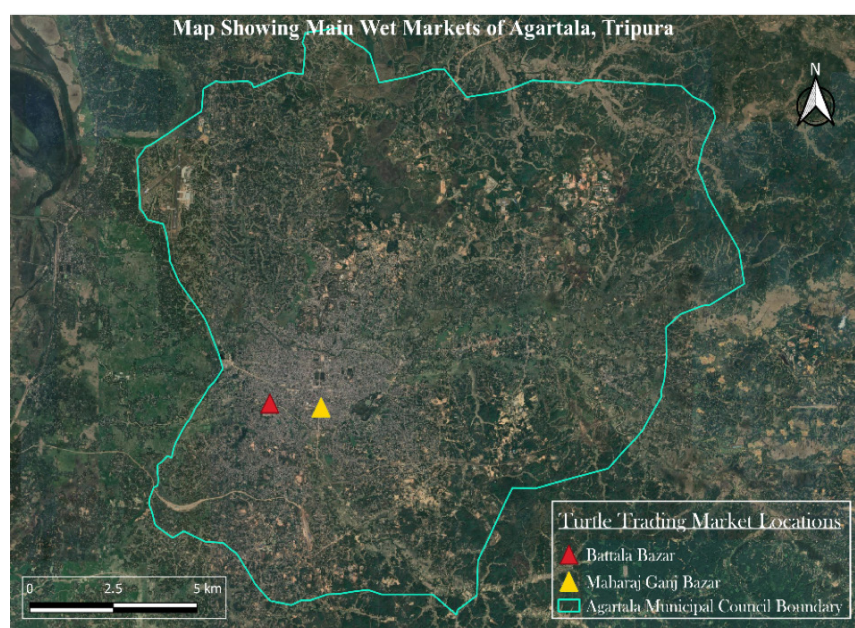
People’s perception on turtle meat consumption in Tripura

The northeastern part of India has been perceived as a significant region for conservation of freshwater turtles and tortoises. It is also known as the region of high turtle diversity.

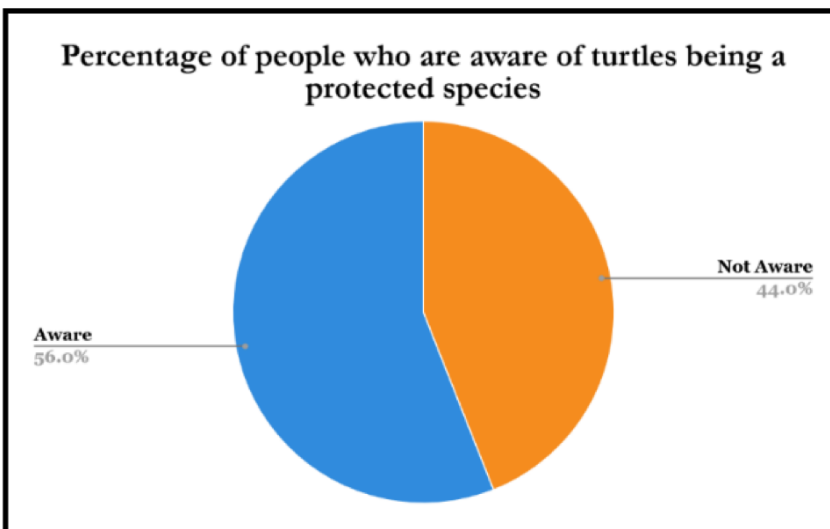
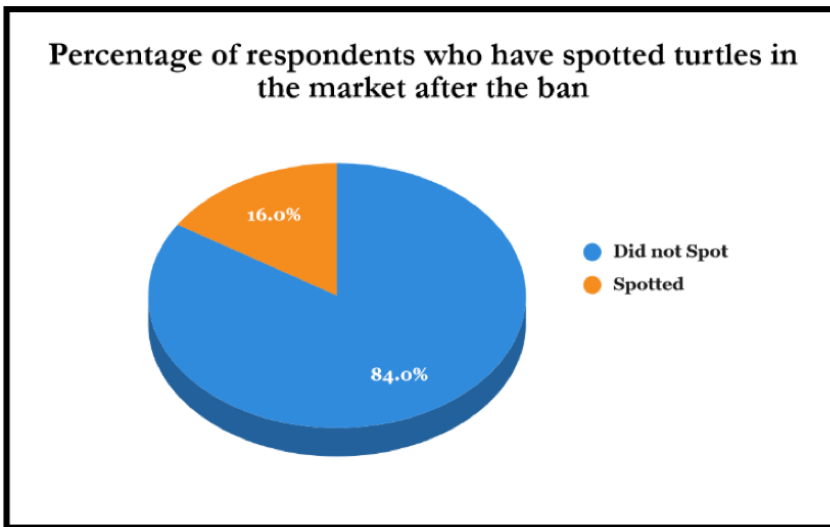
A study on people’s perception on consumption of turtle meat was carried out in Agartala, which is the state capital of Tripura, India. There are two main markets in Agartala, namely, Maharaj Ganj Bazar and Battala Bazar, where turtles such as the Indian Peacock Softshell Turtle *Nilssonina hurum* locally known as ‘Kashram’ in Kokborok River Terrapin *Batagur baska* locally known as ‘Kathar’, Indian Softshell Turtle *Nilssonina gangetica* locally known as ‘Ganga Kachim’, all belong to the Schedule 1 species listed under the Indian Wildlife

Protection Act, 1972. Black Softshell Turtle *Nilssonina nigricans* a.k.a Bostami Kachim/ Bostami Turtle locally known as ‘Kala Kachim’, were openly cut and sold until the trade ban was put in place in 2017. It is well known in the state that the turtles that are consumed are mainly brought via Bangladesh.

It is found in this study, that people are not willing to stop consuming turtle meat despite their positive response towards turtle conservation and being aware of the decline in turtle populations due to consumption of turtles. From the present observations, it is found that the ban has merely reduced their consumption



Map showing two main wet markets of Agartala, Tripura.



Percentage of respondents who have spotted turtles in the market after the ban and who are aware of their protection status.

ability, not stopped, despite being illegal. The continued presence of illegal trade suggests that the demand for turtle meat in the state is high.

Sixteen percent of the respondents have seen turtles being sold openly in the markets after the ban. Forty-four percent of the

respondents of this study remained unaware that turtle species are protected by law, i.e., under Schedule I of the Wildlife Protection Act 1972 which states that the species are granted protection from poaching, killing, trading etc. Poaching or possession of any protected wildlife species and the illegal trade of their body

parts is a criminal offence leading to imprisonment for between three to seven years.

Twenty percent of the respondents were not aware of the ban. Eighty four percent of the respondents said that it is important to conserve turtles.

Thirty-four percent of the respondents are not aware that the turtle populations are declining. Twenty-six percent of the respondents do not think that consuming turtles have any sort of effect on the environment, while 22% are unsure of such effects.

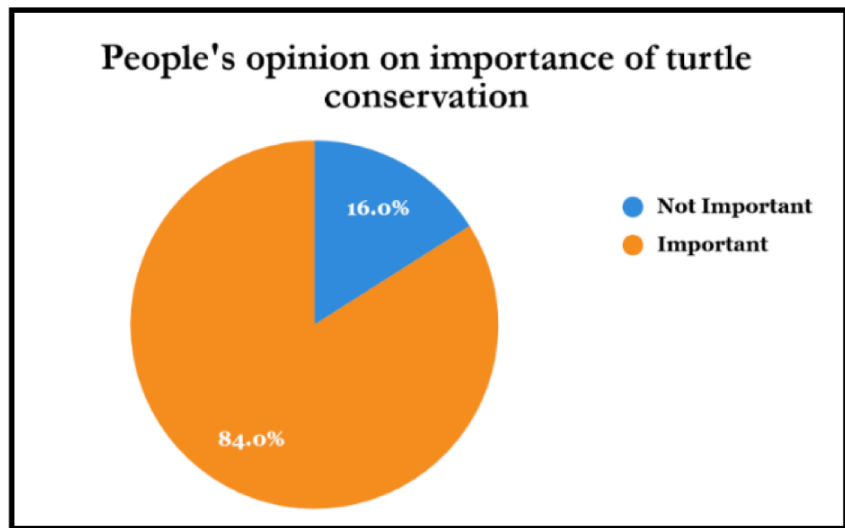
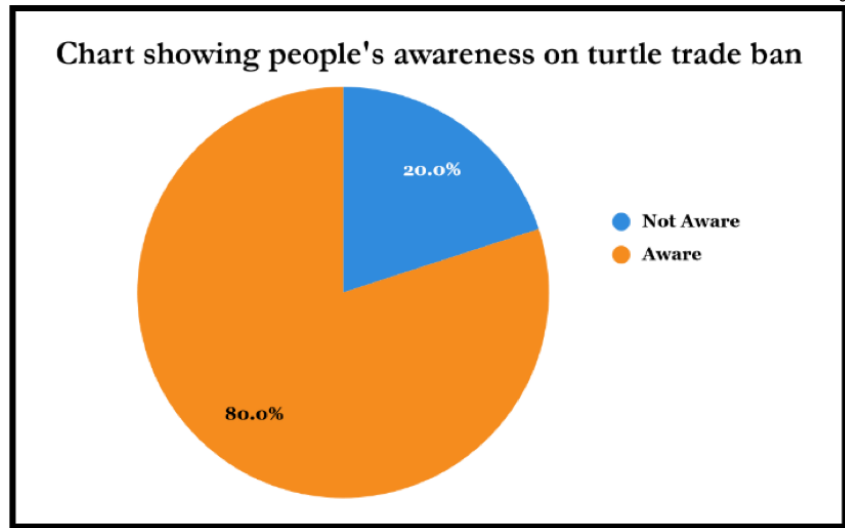
Sixty-six percent of the consumers will continue to consume turtle meat if the ban is lifted. Sixty percent of the respondents said they will not give up eating turtle meat even if the ban is in place.

Forty-two percent of the respondents (consumers) have turtle meat often. Ninety-six percent of the total respondents who consume turtle meat feel that the price of the turtle meat is not reasonable. And 79% of the total respondents who consume turtle meat say that

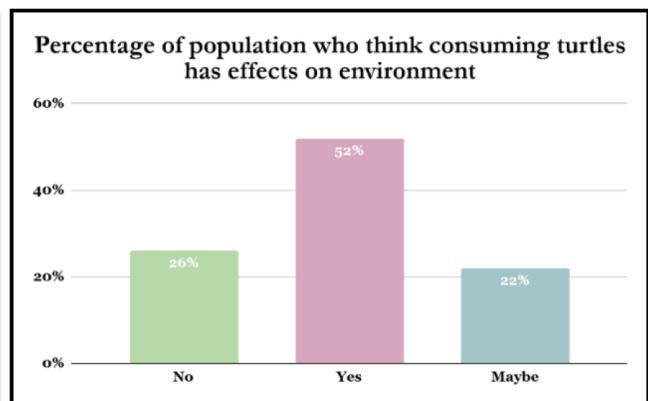
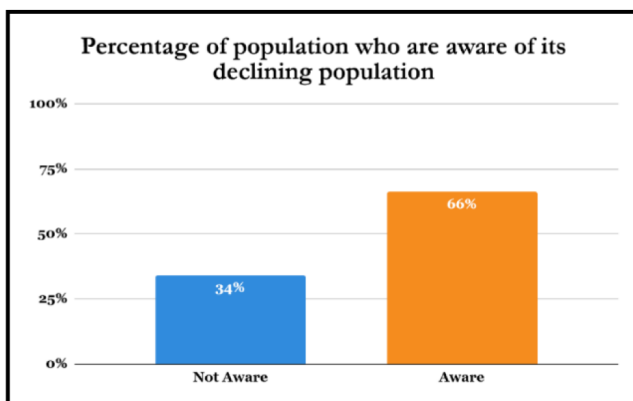
the price of the turtle meat affects their consumption.

There are number of factors that point towards why people still continue to consume turtle meat. When asked why they still consume it, the common replies included, “we have been eating for generations”, and, “It is tasty”. Many consume freshwater turtles as a protein source and for its taste. The demand for consumption of turtle meat in specific places is a huge threat for the freshwater turtles (Rakotonirina & Cooke 1994). Despite the ban, people have continued to have access to the meat even though in limited numbers.

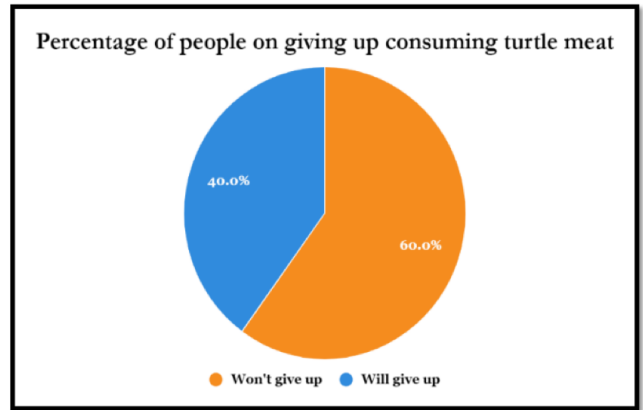
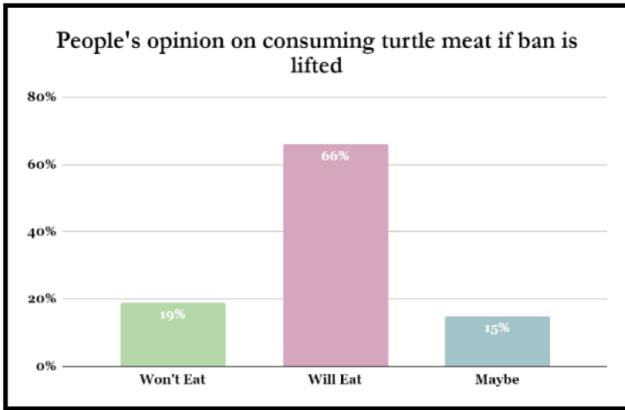
The lack of information about turtle protection status by law, decreasing population and



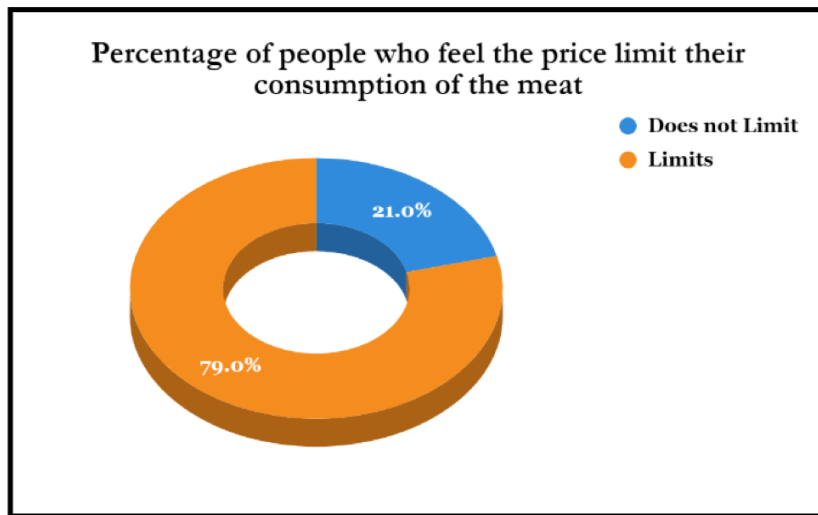
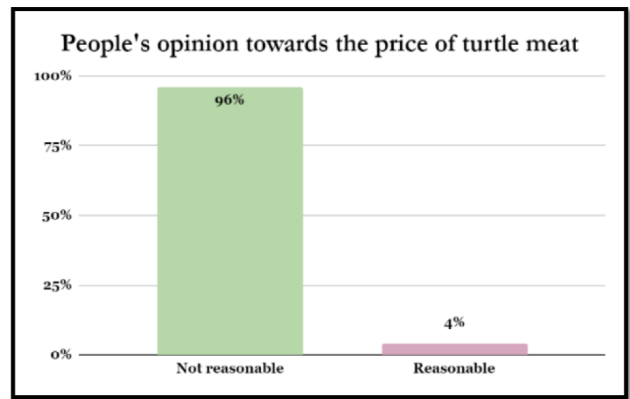
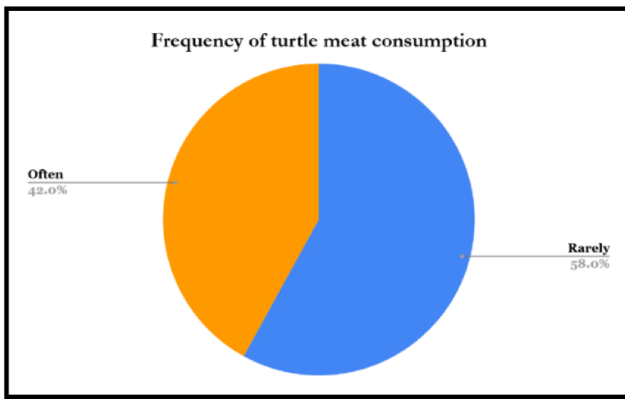
Pie chart showing people’s awareness on turtle trade ban and their opinion on conserving turtles.



Percentage of population’s awareness on the declining turtle population and the effect of consuming turtles.



Respondent's opinion on consuming turtle meat if ban is lifted and whether they will give up on eating turtle meat.



Turtle meat consumption frequency chart, people's opinion towards the high prices of turtle meat and its effect.



conservation initiatives need to be addressed. The illegal consumption of turtles in large numbers for its taste is a major threat to these animals and is a major cause for their decline in the wild overall. Its high demand directly puts pressure on the turtles thereby ultimately decreasing their population size alongside damaging the ecosystems they are present in.

Hence, to bring about changes in the consumer attitudes towards these reptilians, gradual but continuous education, awareness, and sensitisation on this subject are a must. The responses in this study have shown that major conservation efforts need to be implemented to overcome challenges like consumer behaviour, bush meat demand, and illegal trade. Further, government bodies, forest department, and civil societies must work together to bring about the necessary changes that are required to reduce

the illegal trade and consumption in the state through cooperation and engagement with communities at grassroot levels.

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Hrista Debbarman

Old Guest House Lane, Khosh Bagan, Kartar Bari, Near N.S. Road, Agartala, Tripura (west) 799001, India.
Email: hrista.db@gmail.com

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#232
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First record of Indian Black Turtle Kanger Valley National Park, India

The Indian Black Turtle *Melanochelys trijuga* (Schweigger, 1812) is found in South Asia and it is very common and widespread in India. It is a medium-sized turtle mainly inhabiting still-waters (Das & Bhupathy 2009).

The species is distributed in Bangladesh, China, India, Maldives, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand (Das & Bhupathy 2009). In India it has been recorded from Gujarat, Maharashtra, Karnataka, Tamil Nadu, Kerala, Uttar Pradesh, Bihar, West Bengal, Assam and Meghalaya (Daniel 2002).

The Chhattisgarh State accounts with seven species of turtles till date (Ahmed et al. 2021). They are: Indian Flapshell Turtle *Lissemys punctata*, Indian Softshell



Melanochelys tricarinata, Indian Roofed Turtle *Pangshura tecta*, and Indian Tent Turtle *Pangshura tentoria*.

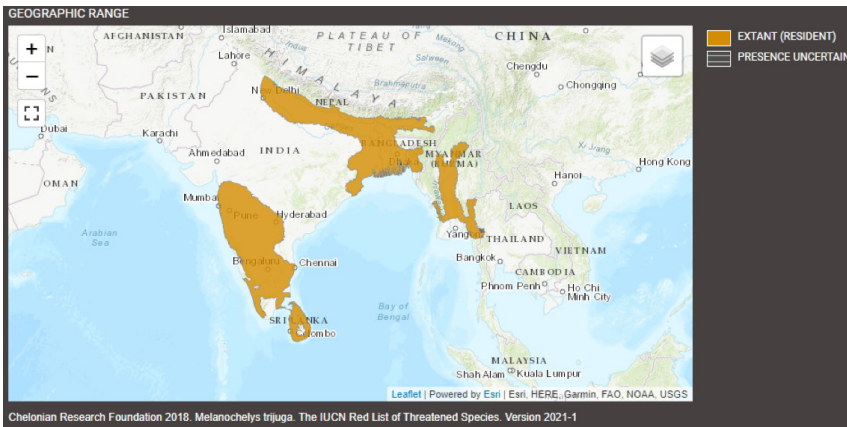
We recorded *M. trijuga* from the Kanger Valley National

Dorsal (Carapace).
© Rajneesh Panikar.

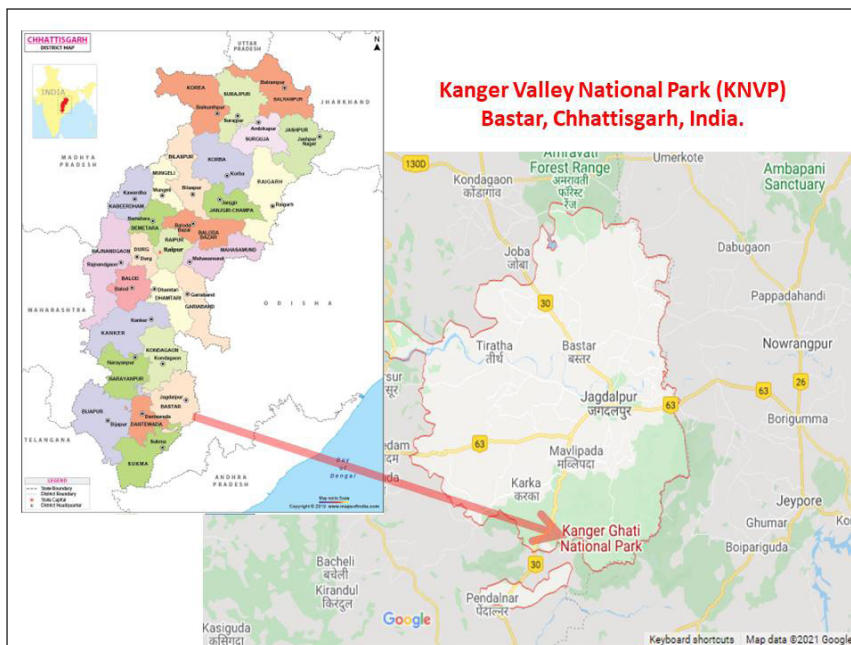
Turtle *Nilssonia gangetica*, Leith's Softshell Turtle *Nilssonia leithii*, Narrow-headed Softshell Turtle *Chitra indica*, Tricarinate Hill Turtle

Ventral (Plastron).
© Rajneesh Panikar.





Known distribution of Indian Black Turtle.
<https://www.iucnredlist.org/species/13039/511745#geographic-range>,
 Downloaded on 30 August 2021.



Site of observation, Kanger Valley National Park (KVNP) Chhattisgarh.

Park, Bastar Chhattisgarh in the mixed forest of Sal *Shorea robusta* and Teak *Tectona grandis*.

The species was considered as Near Threatened in IUCN 2009 Red List (Das & Bhupathy 2009) and now it was considered Least Concern (Ahmed et al. 2020).

The specimen reported here was rescued near Manjipal, Bastar (18.8834 & 81.9081) from being attacked by stray dogs while crossing the road. Manjipal is located on the borders of Kanger Valley National Park. The Kanger River and whole National Park (KNVP) is the

catchment of Godavari River that originates in the Western Ghats near Nasikh in Maharashtra and empties into the Bay of Bengal. As per the bio-geographic classification of India (Rodgers & Panwar 1988), KVNP and MFR lie in Zone 6C Deccan peninsula-

Eastern Highlands designated by Eastern province, which forms the boundary with the Eastern Ghats. The known distribution in India was reported only in the northeastern, northern region, and southwestern Indian states. The present observation also reveals the distribution of *M. trijuga* in Chhattisgarh state which is first record for the state.

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Rajneesh Panikar¹, H.N. Tandan², Ravi Naidu³ & Ameet Mandavia⁴

^{1,3&4} C.R.O.W. Foundation, Jagdalpur, Chhattisgarh 494001, India.

² Department of Zoology, S.G.G. Govt. P.G. College, Kurud, Chhattisgarh 493663, India.

Emails: ¹rajneeshpanikar@gmail.com, ²tandanhn79@gmail.com (corresponding author), ³ravinaidu0001@gmail.com, ⁴ameet85@gmail.com

Citation: Panikar, R., H.N. Tandan, R. Naidu & A. Mandavia (2023). First record of Indian Black Turtle Kanger Valley National Park, India. *Reptile Rap* #232, In: *Zoo's Print* 38(4): 22–24.

Dogs, a major threat to migratory birds at Mamachi Wadi Beach, India



Lesser Sand Plover *Charadrius mongolus*. © Akash Mhadgut.

Mamachi wadi is a beach located at 19.4727 & 72.7618 on the western coast of Maharashtra in Virar west. The habitat includes sandy shore, wetland, grassland, swamp, introduced Casuarina (suruchi), and mangroves. It is a well-known birding hotspot in the

Thane region of Maharashtra with annual winter visitors in large numbers.

The Lesser Sand-Plover *Charadrius mongolus* Pallas, 1776 breeds in northern Himalaya and spends winters on coasts of the Indian

subcontinent (Grimmett et al. 2011). It can be identified by the colour of its legs, which is usually greyish-black or black as compared to yellow-green or greenish-grey on Greater Sand Plover *Charadrius leschenaultii* Lesson, 1826.



Feral dogs with the injured Lesser Sand Plover. © Akash Mhadgut.

Some variation does exist, especially among young individuals, Lesser sometimes showing greenish-grey legs and Greater not infrequently have greyer legs (Hirschfeld et al. 2000). Other than that Lesser Sand Plover has a shorter bill and slight bulge at the tip (eBird.org).

On 2 January 2022 around

1500 h we had a walk to watch winter migratory birds at Mamachi Wadi beach. We observed a feral dog chasing the flock of plovers & sandpipers, unluckily one Lesser Sand Plover got caught by those feral dogs where they grabbed the bird into their jaws and started competing with each other. When they put the bird on the ground it lay still with its wings open and as the dogs lost interest the bird tried to escape. But due to the damaged wing it was unable to fly by which the dogs caught it again. After some attempts the dog left the bird and moved on. But due to internal injuries the bird was unable to fly by which it was exposed to many other predators easily.

Migratory birds need to feed as much as possible on their feeding grounds and if it's a breeding ground they need to breed and search for nests. Feral dogs are major threats to these birds as they injure or kill the birds and feed

on their eggs & young ones and pose a threat to breeding or wintering grounds of migratory birds in India.

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Jayesh Vishwakarma¹, Akash Mhadgut² & Aniket Desai³

¹ Room no. 610 H4 BMC Colony, Santosh Nagar, Goregaon (E), Mumbai, Maharashtra 400065, India.

² Shivshakti complex G-wing 107, near SV road, Dahisar (E), Mumbai, Maharashtra 400068, India.

³ A-305, Smruti Sugandh, Bolinj, Virar, Mumbai, Maharashtra 401303, India.

Emails: ¹jerryvishwakarma@gmail.com,

²naturetalks2320@gmail.com, ³aniketdesai473@gmail.com (corresponding author)

Citation: Vishwakarma, J., A. Mhadgut & A. Desai (2023). Dogs, a major threat to migratory birds at Mamachi Wadi Beach, India. *Bird-o-soar* #195, In: *Zoo's Print* 38(4): 25–26.

Biodynamism by migratory and resident birds in the Sikkim Himalaya

Biodynamism is the holistic, ecological, and ethical approach to farming having incorporated ideas of the farm as an ecological unit. In fact, the birds play pivotal roles in the agro-forestry ecosystem and Sikkim is not an exception.

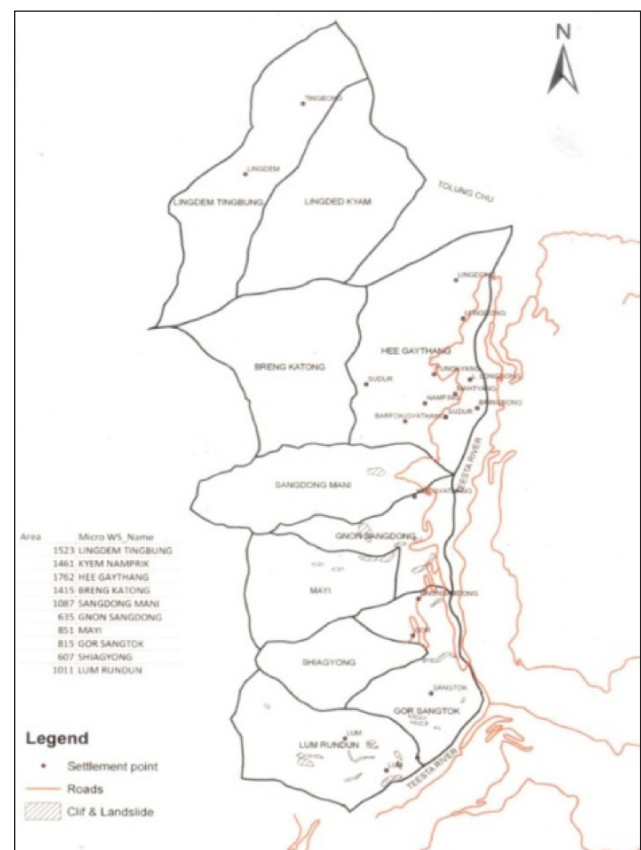
During the study, the farmers of tribal regions of Sikkim, Dzongu, were found practising farming using the signals produced by the birds. Similar studies were undertaken by several authors on biodynamic agriculture in the different parts of the world (Kirk et al. 2011, 2020; Power et al. 2013; Bavec & Bavec 2014).

In ecosystem, the migratory and resident birds are predominantly playing a role in biodynamic agriculture. This study found that the variety of bird species of the region is culturally linked with the Lepcha community of Dzongu for agriculture. Bird chirping sounds are used as the indicators for the agricultural practices, environmental change and threat.

The birds make a variety of calls, songs and sounds with a language as complex. Each type of bird's sound has different purposes such as alarm calls, begging calls, contact calls, flight call, songs, etc, which are exceptional. Besides, there are some non-vocal sounds also like bill drumming, buzzing, clapping or trilling sounds, bill snaps or clacks and scratching noises. Thus, this paper deals with the bird sounds which are used by the Lepcha tribal community for the biodynamic agriculture to determine the threat, conducive climate, sunny day, rainfall, snow, seasonal variation and so on.

The study area of Dzongu is located at 27.4666 –27.6333 & 88.3833 – 88.6333 having the altitudinal gradients of 700–6000 m. The geographical area of Dzongu is 78 km² includes the tropical to the alpine regions having the population of Lepcha community only.

In the study areas, the host plants of enumerated birds were noted, namely, *Bambusa sp.*, *Arundanaria sp.*, *Prunus sp.*, *Quercus sp.*, *Citrus sp.*, *Artemesia sp.*, *Musa sp.*, and *Arisaema sp.* Other host plants are *Prunus persica*, *Pyrus communis*, *Engelhardtia spicata*, *Alnus nepalensis*, *Juglans regia*, *Castanopsis indica*, *Castanopsis tribuloides*, *Berchemia floribunda*, *Maesa chisia*, *Ficus nemoralis*, *Rhus*



Map of Dzongu.

javanica, *Zizyphus jujuba*, *Quercus lamellosa*, *Cryptomeria japonica*, *Betula alnoides* and *Aconogonon molle*.

The Lepcha, one of the aboriginal tribes of Sikkim, practices biodynamism in agriculture. It is found that the Lepcha community utilizes the knowledge of bird sounds in agriculture, for instances, the bird chirping of *Apus melba* for rainfall in farmland, *Nisaetus nipalensis*, *Lophophorus impejanus*, *Gyps himalayensis*, *Tragopan satyra*, and *Trochalopteron affine* for snowfall in subalpine and alpine regions, *Psilopogon asiaticus* for sunny day in farmland, *Orthotomus sutorius* and *Myophonus caeruleus* for clear sky and sunny day in the region, *Ketupa zeylonensis* for favourable period or season in farmland, *Grus virgo* for sowing cucumber and pumpkin and *Cacomantis merulinus* for sowing bean, dal & legume plants.

Similarly, *Cuculus canorus* indicates spring season; *Psilopogon virens* signals probable rainfall in the farmland's and region and hints to prepare the land for farm activities; *Bubo bubo* indicates the threat in the farmland or region; *Parus monticolus* indicates the season or climate change in the farmland; *Cuculus saturates*, indicates the millet sowing period; *Eudynamys scolopaceus* indicates to prepare the farmland for sowing maize; *Strixaluco*, *Pericrocotus flammeus*, *Micropternus brachyurus*, *Psarisomus dalhousiae*, and *Garrulax leucolophus* indicate unfavourable environment condition; *Taccocuales chenaultii* indicates the recharging of the non-perennial

water sources of the region; *Cuculus poliocephalus* indicates the sowing period of buckwheat. The fundamental point is that Sikkim is the land of many migratory birds and resident birds which usually fly to these habitats for laying eggs, hatchling and growing chicks during the particular seasons (Grewal & Pfister 1998; Fleming et al. 2000). Moreover, the presence of these birds in the region is utilized for the biodynamic agriculture system by Lepcha in Sikkim Himalaya.

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Durga Kumar Pradhan¹, Norden Lepcha² & Reshma Lama³

¹ Quality Control Laboratory-HARC- Sikkim State Forest Herbarium (SSFH), Forests and Environment Department, Govt. of Sikkim, Deorali, Gangtok, Sikkim 777102, India.
^{2&3} Farm and Allied Production Management (FAPM) Melli Paiyoung, Sikkim 737128, India.
Email: ¹pradhansikkim@gmail.com (corresponding author)

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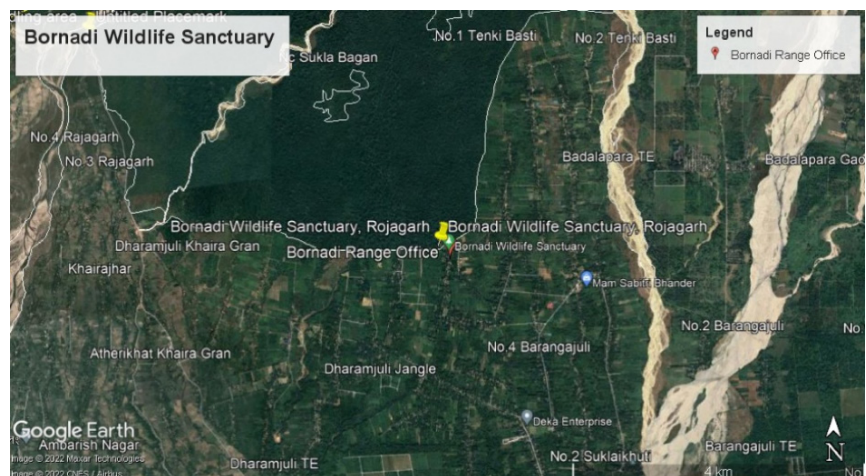
Recent sighting record of Great Hornbill at Bornadi Wildlife Sanctuary, Assam

Great Hornbills *Buceros bicornis* L., 1758 are monogamous and long-lived, exhibiting peculiar reproductive behavior (Kozłowski et al. 2015). Being around 3 kg and 120 cm in length they make their nests in large trees having enough cavities that can accommodate the mother to lay her eggs; hence they face problems in finding such big trees (James & Kannan 2009). Before laying eggs, the female seals the entrance of the cavity using faeces, mud, pulps of fruit, keeping a narrow gap for the male to pass food and this continues up to one month after the hatching of the chick (Kozłowski et al. 2015).

The bird is considered to undergo a population reduction in large number and hence it is now in 'Vulnerable' status (BirdLife International 2022). It is enlisted in Schedule I of the Wildlife Protection Act, 1972. It belongs to Bucerotidae family and is the largest of all the nine species of hornbills (Ali & Ripley 1968).



Great Hornbills *Buceros bicornis*. © Manab Jyoti Kalita.



Map showing the sighting location.

We observed a pair of Great Hornbill (one male and one female) in Rojagarh range office (26.7805 N & 91.7549 E) of Bornadi Wildlife Sanctuary on 10 May 2022 at around 06.00 am. The sexes are comparable, with the exception that females have

a completely yellow casque, a light iris, and naked pink skin surrounding the eye (BirdLife International 2022).

They can be found in tropical rain forests, both lowland and upland evergreen forests (Lekagul & Round 1991).

These vegetation offer nesting locations and wholesome food sources (Chaisuriyanun et al. 2011). It is known that Asian Hornbills breed and forage in agroforestry plantations and fragmented rainforests in human-modified landscapes adjacent to contiguous protected forests (Pawar et al. 2021). The breeding season of Great Hornbill starts once the female starts closing the cavity up to the day of fledging by the chicks and is January–May (Poonswad & Tsuji 1994).

As per study reported by Ouithavon et al. (2005) the Great Hornbill eats more figs (57.3%) compared to non-fig (42.7%) fruits like Lauraceae, Annonaceae and Myristicaceae while consumes 79.3% fruit food and 20.7% animal food.

Datta (2022) described that in the northeastern regions of India, variations in hornbill nesting over time may be linked to unseasonal rainfall, temperature increases, and changes in the peak fruiting season.

Though the major threat to *Buceros bicornis* is habitat loss brought due to deforestation, yet they are hunted for meat and body parts like casque, and feathers of tail for decorations purposes also. However, the existence of this vulnerable species in Bornadi Wildlife Sanctuary is definitely an encouraging sign. This location has the potential for additional research on the Great Hornbill.

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Sanghamitra Buragohain¹ & Manab Jyoti Kalita²

¹ Department of Zoology, Nowgong Girls' College, Nagaon, Assam 782002, India.

² Department of Zoology, Gauhati University, Guwahati, Assam 781014, India.

Email: kalitamanabzoo@gmail.com (corresponding author)

Citation: Buragohain, S. & M.J. Kalita (2023). Recent sighting record of Great Hornbill at Bornadi Wildlife Sanctuary, Assam. *Bird-o-soar* #197, In: *Zoo's Print* 38(4): 29–30.

Vilayati Tulsi: an invasive plant threatening the native biodiversity of Lunawada forest, Gujarat



Mesosphaerum suaveolens (L.) Kuntze. © Mayur Patel.

Pignut or Vilayati Tulsi
Mesosphaerum suaveolens (L.) Kuntze. (= *Hyptis suaveolens* (L.) Poit.) is a herbaceous plant native to tropical regions of Mexico and tropical America (Murthy et al. 2007; Sharma et al. 2009; Padalia et al. 2014; GBIF 2021). It is an invasive species in tropical parts of Africa, Asia, and Australia (GBIF 2021). *Mesosphaerum*

suaveolens prefers wet and warm areas for growth and spread (Padalia et al. 2014).

Furthermore, this plant can tolerate dry periods. *Mesosphaerum* was first reported in India by Hooker in 1885. He had reported its occurrence in Deccan peninsula, Cachar, and Nicobar Islands. Further studies have

also reported its invasion from different parts of the country, viz., Andaman & Nicobar Islands (Yoganarasimhan 2000), Vindhyan plateau (Sharma et al. 2009), Himalayan foothills (Padalia et al. 2013).

A recent study in the Doon Valley and Siwalik foothills has estimated that an area up to 11 km² has been invaded by

Mesosphaerum, primarily along riverine areas, forest edges, and open areas (Padalia et al. 2013). This suggests that the plant has been spreading across India. In summer season the plant's aboveground parts dry up and fall down, but they vigorously re-sprout at the beginning of the subsequent rainy season. The growth of *Mesosphaerum* is intense and it rapidly covers extensive areas after the rains (Afreen et al. 2018). In Gujarat, *Mesosphaerum* was first reported by Santapau (1953) and later by Shah (1978).

Pignut has been now vigorously growing and creating survival threat to other plant species. It inhibits growth of other ground flora by creating physical barrier as it occupies land by growing at a fast rate. It has been spreading in Gujarat as an invasive plant, occupying different types of areas like road sides, railway tracks, forest clearings, grasslands, edges of wetlands, and also in wetland areas typified by rocky and arid substrates (Murthy et al. 2007). This plant also produces some chemicals which inhibit seed germination of other native plant species (Islam & Kato-Noguchi 2017).

During a random field visit to Lunawada we found that this species has now occupied all the terrestrial habitats and it has spread across the entire dry deciduous forest. It sheds its leaves and old branches in summer season and along with other grasses and herbs occurring in dried condition speeds up the forest fire.

Furthermore, the forest is juxtaposed with surrounding villages as well as agricultural fields which experience frequent fire events. In

summer the Pignut enhances the fire spread in the forest due to its high abundance making it very difficult to control.

Due to the fire this forest has been losing its native biodiversity, especially ground flora and native trees. This forest represents tree diversity consisting of *Tectona grandis* (abundant), *Holarrhena pubescens*, *Diospyros melanoxylon*, *Pterocarpus marsupium*, *Terminalia elliptica*, *Boswellia serrata*, *Wrightia tinctoria*, *Dalbergia latifolia*, *Butea monosperma*, *Aegle marmelos*, *Terminalia anogeissiana*, *Phyllanthus emblica*, *Albizia odoratissima*, and *Holoptelea integrifolia*.

In 2020, during our field survey we visited Nani Zanzari and Mori Zanzari forests, the field-level forest officials informed us that the Vilayati Tulsi has been spreading even in the interior forest areas. Our own field work and information from the forest officials have shown that this plant is now inhibiting the growth of other species of plants. The invasion of this exotic species might be leading to loss of native and economically and ethno-medically important plant species. Besides it also enhances forest fires in dry seasons.

This species is not useful for livestock as fodder. For the humans, the odour of this plant sometime causes sneezing, coughing, and other allergies related to respiratory system. There is an immediate need of removing this alien species from the forest of Lunawada forest to save its native floristic diversity.

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Mayur Patel¹, Lamb Christian² & Raj Patel³

¹ Sheth P.T. Arts & Science College, Godhra, Gujarat 389001, India.

² Gujarat University, Ahmedabad, Gujarat 380009, India.

³ Smt. S.M. Panchal Science College, Talod, Gujarat 383215, India.

Emails: ¹patelmayur14320@gmail.com (corresponding author), ²lj.jl1517@gmail.com, ³praj7190@gmail.com

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Recollection of *Osbeckia nayarii* Giri (Melastomataceae) from Assam after 108 years



A—Habit |
B—Flowering twig |
C—Leaves and winged
stem | D—Dissected
flower.
© Dipankar Borah.

Assam the second largest state in the northeastern India, is situated south of the eastern Himalaya along the Brahmaputra & Barak river valleys, and it holds a great diversity and contributes a lot to the country's flora.

The genus *Osbeckia* L. (Melastomataceae) is represented by 23 species and four varieties under four

sections in India and the state of Assam holds a total of nine taxa under the sections *Asterostoma*, *Ceramicalyx*, & *Osbeckia* (Prashob & Thomas 2019).

Osbeckia nayarii was first described by G.S. Giri in the year 1983 based on the specimens collected by C.B. Clarke from Khasia hills of Meghalaya in the year

1886 (Giri 1983). In 1886, an additional collection was done by Dr. King's collector from Chittagong hills tracts of Bangladesh (No. 239; Acc. No. 171989) which was traced in CAL (Giri & Mandal 2001). However, our present observations revealed that it is quite a common species in both Khasi and Garo Hills of Meghalaya.

All the above mentioned and additional collections examined were made specific from the state of Meghalaya and one from Bangladesh. However, specific to current geographical boundaries of Assam, the species is rare and until date only one collection of this species was made by U.N. Kanjilal in the year 1914 from Goalpara district.

During our visit to Goalpara district, we found a peculiar *Osbeckia* (L.) in Barali Pahar of Goalpara, Assam. After going through the relevant literature (Giri 1983; Giri & Mandal 2001; Prashob & Thomas 2016), it is identified as *Osbeckia nayarii* G.S.Giri, which constitutes its rediscovery for the state after 108 years. The present article provides information on taxonomy of the species, habitat and its distribution.

Field photographs were taken for easy and better recognition of the species. Collected specimens were dried, poisoned, and mounted on herbarium sheets following Jain & Rao (1977). The herbarium sheets are deposited at Herbarium of Rajiv Gandhi University for future references. Flowers are dissected, measured for proper characterization of the species.

Osbeckia nayarii G.S.Giri, J. Econ. Taxon. Bot. 4: 609 (1983)

Type: India. Meghalaya, Khasia hills, 600 m. 14.ix.1886, C.B. Clarke 44776A (holo: CAL)
Diagnostic characters: Branched herbs, stem and branches strongly quadrangular and distinctly winged at angles, glabrous. Leaves ovate-elliptic to ovate-lanceolate, 5-nerved.

Inflorescence axillary or terminal condensed panicle; bracts ovate, calyx tubes (hypanthium), urceolate, glabrous; intersepal emergences rudimentary, as a simple hair. Petals ovate-oblong, pinkish-purple. Capsule enclosed by urceolate, glabrous calyx-tube with a distinct long neck.

Flowering & fruiting: July–November.

Habitat: Occurs in the grasslands as well as hill slopes above 200 m.

Distribution: India (Assam, Kerala, Meghalaya & Tamil Nadu), Bangladesh.

Specimens examined: India, Assam: Goalpara district, Goalpara, 1914, Upendranath Kanjilal 6914 (CAL); Goalpara, Barali Pahar, 2021, Raja Saikia & Niku Das 0082 (Herbarium of Rajiv Gandhi University).

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Niku Das¹ & Raja Saikia²

¹ Department of Botany, Rajiv Gandhi University, Rono Hills, Doimukh, Arunachal Pradesh 791112, India.

² Department of Botany, Goalpara College, Goalpara, Assam 783101, India.

Email: ¹dasniku95311@gmail.com (corresponding author)

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First Asian record of the New World species *Cyperus drummondii*

Cyperus L. is the second largest and one of the most diverse genera of the family Cyperaceae. The genus comprises of about 950 species (Ribeiro et al. 2021), and constitutes the dominant vegetation in wetlands and disturbed habitats.

As part of the taxonomic revision of the genus *Cyperus* L. in Kerala, an interesting specimen of the genus belonging to section Luzuale was collected. On critical examination with protologue and type specimen (K000950498!), it was identified as *Cyperus drummondii* Torr. & Hook.

The species has hitherto been known from relatively undisturbed wet habitats and coastal prairies of America (Bryson & Carter 1994) from the West Indies, Central America, South America and North America. Thus, the present collection represents a new record for the Asian continent and therefore a detailed description, photographs and other relevant notes are provided for easy identification.

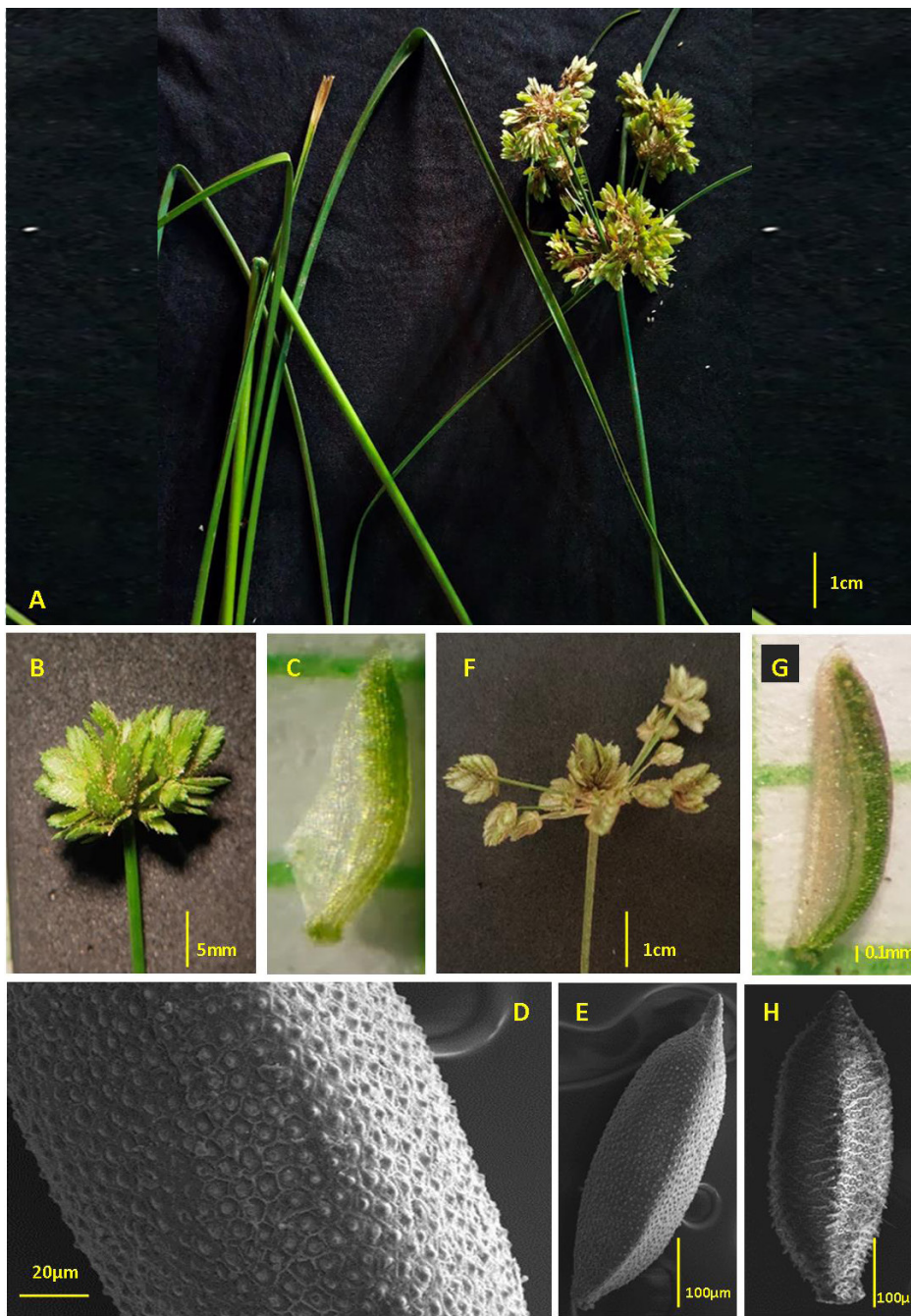
Cyperus drummondii Torr. & Hook. is a complex taxon under the subgenus *Pycnostachys* and several taxonomic changes have been proposed by various authors. The species was first described by Torrey (1836) based on specimens from Texas. Later, this species was treated as a variety by Kükenthal (1935–1936), and a subspecies of *C. virens* Michx. by Denton (1978). Tucker (1994) lowered its taxonomic level to the

synonym of *Cyperus virens*. However, the recent quantitative and numerical taxonomic studies by Carter et al. (1999) reinstated its species status.

This species is closely allied to *C. surinamensis* Rottb., readily distinguished by its nature of inflorescence, narrower and more compact spikelets, scabrid nature of culm angles, septate leaf blade and nature of nut.

Cyperus drummondii Torr. & Hook.,
Ann. Lyceum Nat. Hist. New York. 3:437, errata.
1836.
Type: USA: Texas, 1835, Drummond 449
(Lectotype—K000950498!, designated by Denton
(1978: 262))

Herbs, cespitose rhizomatous perennials. Rhizomes 0.5–2 cm diameter. Culm trigonous, 45–140 × 0.2–0.4 cm, scabrid on angles with all three types of crystalline prickles. Leaves 4–8, usually shorter than the culm, cross ribs 65, are present between the veins, V-shaped, scabrid, apex acute, 25–75 × 0.2–0.4 cm. Inflorescence compound, globose heads 0.5–1.5 cm diameter, rays 3–5, 1–6 cm long, secondary rays usually absent. Involucral bracts 3–5, 20–48 × ca. 0.3 cm, margins scabrid. Spikelets 10–35, oblong to linear-lanceolate, 1.5–3 × 1–2 mm, floral scales 18–40, pale green, turning brown when mature, 2-keeled, distinctly 1-ribbed, not distinct when mature, 1.2–1.5 × ca. 1 mm, acute, glabrous or with few spines. Stamen-1, anther ca. 0.8 mm long. Nut brown, stipitate, ca. 0.9 × 0.3 mm,



A–E. *Cyperus drummondii* Torr. & Hook.: A—Habit | B—Spike | C—Glume | D & E—SEM images of nut. F–H. *Cyperus surinamensis* Rottb.: F—Spike | G—Glume | H—SEM image of nut.

apiculate, surface puncticulate with dark brown borders.

The scanning electron microscopic studies of *C. drummondii* nuts revealed that the epidermal cells are more or less isodiametric. The periclinal cell wall is thick with conspicuously sinuous appearance. The central silica body fill the entire part of the cell.

Phenology: May to October

Ecology: Found in waterlogged areas along with *Cyperus surinamensis* Rottb., *Lipocarpa chinensis* (Osbeck) J. Kern, *Cyperus distans* L..

Specimen examined: 5011, 27.vi.22, India, Kerala, Thiruvananthapuram District, Elavattom, coll. B.S. Anakha.

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B.S. Anakha¹ & A.R Viji²

¹ PG Department of Botany, Christian College, Kattakada, Thiruvananthapuram, Kerala 695572, India.

² PG Department of Botany, Iqbal College, Peringammala, Thiruvananthapuram, Kerala 695563, India.

Emails: ¹anakhabs2013@gmail.com (corresponding author), ²vijihari1982@gmail.com

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Editor: Sanjay Molur

Associate Editor: R. Marimuthu

Managing Editors: Latha G. Ravikumar & B. Ravichandran

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Address

Zoo Outreach Organisation

3A2 Varadharajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India

Phone: +91 9385339862 & 9385339863

E-mail: zooreach@zooreach.org

Website: www.zoosprint.zooreach.org,

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