ZOO'S PRINT

Communicating Science for Conservation

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

ISSN 0971-6378 (Print); 0973-2543 (Online)
Vol. XXXVII, No. 2, February 2022

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Vol. XXXVII, No. 2, February 2022 ISSN 0971-6378 (Print); 0973-2543 (Online)

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Cover photo: Green Marsh Hawk feeding on the Common Gull. © N. Gopinath.

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

First record of variable Tawny Rajah from Purulia, West Bengal, India

The butterfly Variable Tawny Rajah *Charaxes bernardus hierax* has a localized distribution with records from Meghalaya, Assam, Mizoram, Arunachal Pradesh, Tripura, Nagaland, Sikkim, Odisha, Chattishgarh, and northern most part of West Bengal (Kunte et al. 2021).

Variable Tawny Rajah, a butterfly usually reported from low elevation can fly up to 1,500 m. They are mainly confined to forests. They never visit flowers and depend mainly on animal dung, urine, dead crabs and overripe fruits (Kehimkar 2016).

The butterfly commonly called Tawny Rajah (brush-footed butterflies) belongs to subfamily Charaxinae under the family Nymphalidae. The species *Charaxes bernardus* was first reported

Variable Tawny Rajah photographed from Garh Panchkot Hills, Purulia, West Bengal.

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Distribution of Variable Tawny Rajah in the Indian subcontinent including the present report from Purulia, West Bengal. Captured on 8 August 2020 from the Butterflies of India website.

by Fabricius (1793). Later, Felder and Felder (1867) first reported the subspecies *Charaxes bernardus hierax*. The Himalayan subspecies/ synonym is legally protected in India under the Schedule II of the Wildlife (Protection) Act, 1972 (Das et al. 2018; Kunte et al. 2021).

During the field survey on 8 August 2020, one specimen of *Charaxes Bernardus hierax* was recorded from Garh Panchkot Hill area located in Purulia District of southern part of West Bengal. The specimen was not captured and thus not collected.

The butterfly was photographed using Nikon Coolpix P600. The female butterfly specimen was identified on the basis of chestnut colour and presence of broad white bands on the underside of the wings, the terminal black border of the forewing traversed inwardly by a row of yellowish-white lunules (Evans 1932; Wynter-Blyth 1957; Kehimkar 2016). The image was uploaded in Butterflies of India website with media code fa300. The coordinates (86.752E & 23.614N) from where the specimen was found in puddling belongs to the area of Chota Nagpur Plateau.

Based on present observation, the updated geographic distribution of *Charaxes Bernardus hierax* ranges from central India (Chattisgarh), eastern India (northern part of West Bengal, Odisha) and northeastern India (Arunachal Pradesh, Tripura, Nagaland, Sikkim).

Apart from the northern most part of West Bengal that is actually the foot hills of the Himalaya, the specimen is also being reported for the first time in writing from southern part of West Bengal in a different ecoregion that

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is important for selection of conservation strategy for this species (Das 2018).

References

Das, D. (2018). Butterfly (Lepidoptera: Rhopalocera) diversity in relation to habitat utilization at Jagannath Kishore College, Purulia, West Bengal (India). *Journal of Insect Biodiversity* 7(1): 1–16.

Das, G.N., S. Gayen, M. Ali, R.K. Jaiswal, E.A. Lenin & K. Chandra (2018). Insecta : Lepidoptera (Butterflies). In. *Faunal Diversity of Indian Himalaya*: 611–650. Zoological Survey of India, Kolkata.

Evans, J.H. (1932). *Identification of Indian Butterflies*. Bombay Natural History Society, Mumbai, 454pp.

Felder, C. & R. Felder (1867). Reise der österreichischenFregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. von Wüllerstorf-Urbair. Zoologischer Theil. Zweiter Band. ZweiteAbtheilung: Lepidoptera. Wien, Carl Gerold's Sohn. (3): [2] + 379–536, pls. 48–74 ([25 April] 1867).

Kehimkar, I. (2016). *Butterflies of India*. Bombay Natural History Society, Mumbai, 348pp.

Kunte, K., S. Baidya & P. Gosai (2021). *Charaxes bernardus* (Fabricius, 1793) – Tawny Rajah. Kunte, K., S. Sondhi, & P. Roy (Chief Editors). *Butterflies of India*, v. 3.15. Indian Foundation for Butterflies. http://www.ifoundbutterflies.org/sp/543/Charaxes-bernardus.

Wynter-Blyth, M.A. (1957). *Butterflies of the Indian Region*. Bombay Natural History Society, New Delhi, India, 523 pp.

Acknowledgement: SSM acknowledges financial assistance from UGC, Govt. of India, in the form of JRF.

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Citation: Mukherjee, S.S., D. Goswami & A. Hossain (2022). First record of variable Tawny Rajah from Purulia, West Bengal, India. Bugs R All #227, In: *Zoo's Print* 37(2): 01–03.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) published with the financial support of Zoological Society of London.
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Additions to the larval host plants of the Indian Moon Moth from Chiplun, Maharashtra

The Indian Moon Moth *Actias selene* (Hübner, 1806) belongs to the family Saturniidae, which contains some of the largest moths in the world. The typical characteristic of the genus *Actias* (Leach, 1815) is the presence of long tails on their hindwings. The adults of *Actias* lack functional mouthparts and their lifespan ranges from a few days to a week. The *Actias selene* is distributed in India, Nepal, Bhutan, Bangladesh, Sri Lanka, and China (Hampson 1892; Shubhalaxmi 2018). It's known to be widely distributed in the Western Ghats of India.

The moth is unmistakable due to its whitish-green wings with brown or pink margin of the forewing and a long tail on the hindwing. The polyphagous larvae of *Actias selene* is known to feed on a variety of host plants (Robinson et al. 2010; Chutia et al. 2016; Shubhalaxmi 2018). In this small note, we report some more host plants of this species from Chiplun, Ratnagiri District, Maharashtra, India.

On 21 November 2006, an *Actias selene* female was seen while laying eggs on a paper box, in Chiplun, Ratnagiri District, Maharashtra, India (17.523N, 73.528E; elevation 16 m). After the female had laid all the eggs, the eggs were kept in a closed container to keep them safe. A literature search was carried out to know about the larval host plants of the *Actias selene*. In 2006, due to paucity of published literature and limited access to the internet, the literature search did not result in finding any familiar host plants in the area. On 28 November 2006, the larvae hatched in a closed container. Hence, after hatching, the larvae were given the tender leaves of 10 plant species in the area. The larvae were seen feeding on three species. Every day fresh tender leaves of these plants were provided to the larvae. The old remnants of the leaves and the larval frass were taken out daily to keep the container clean. The plants upon which larvae fed were identified. Early stages were photographed with the help of Nikon D50 camera and 18–55 lens.

The larvae were seen feeding on the *Ficus rumphii* Bl., *Lagerstroemia speciosa* (L.) Pers., and *Syzygium cumini* (L.) Skeels (Table 1). A literature search for the larval host plants of *Actias selene* was carried out again

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Table 1. All plant species given to the caterpillars

Caterpillars fed on		Caterpillars did not feed on	
Family	**Species**	**Family**	**Species**
Moraceae	*Ficus rumphii*	Anacardiaceae	*Anacardium occidentale*
Lythraceae	*Lagerstroemia speciosa*	Moraceae	*Artocarpus heterophyllus*
Myrtaceae	*Syzygium cumini*	Malvaceae	*Hibiscus sp.*
		Rubiaceae	*Neolamarckia cadamba*
		Myrtaceae	*Psidium sp.*
		Lamiaceae	*Tectona grandis*
		Combretaceae	*Terminalia tomentosa*

Early stages of *Actias selene*: 1 – Eggs | 2 – Hatched larvae | 3 – 1st instar larva feeding on *Lagerstroemia speciosa* | 4 – 2nd instar larvae feeding on *Syzygium cumini*. © Sachin Palkar.

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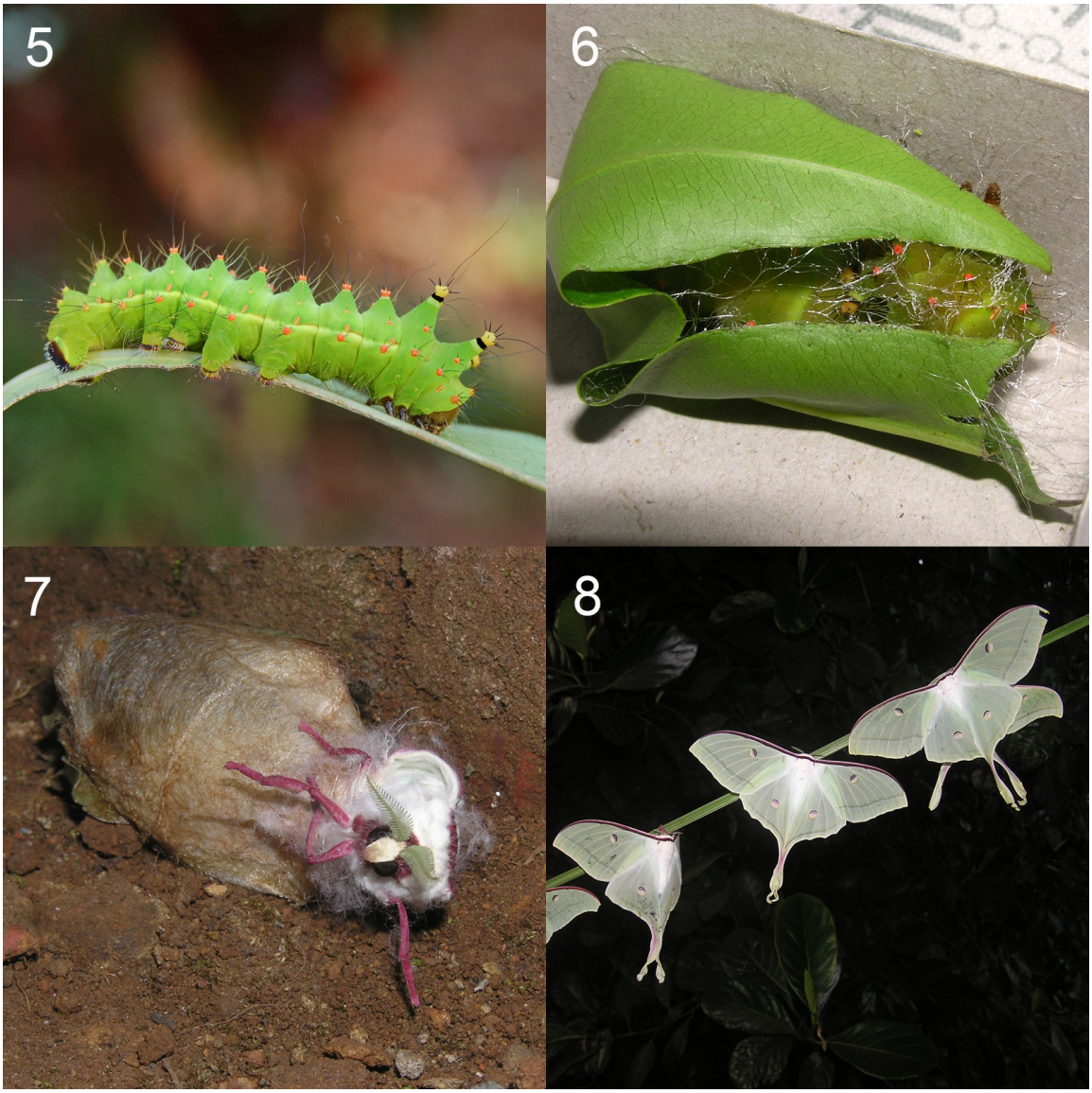

Early stages of Actias selene: 5 – 5th instar caterpillar| 6 – Spinning a cocoon | 7 – Eclosion| 8 –Adult moth. © Sachin Palkar.

later on 20 July 2020 in which we did not see these three plants reported. These new larval host plants are added in the appendix with an asterisk mark (*), which becomes a compilation of all reported host plants of this species (Robinson et al. 2010; Chutia et al. 2016; Shubhalaxmi 2018). Our study reports three new host plants of *Actias selene* (Hübner 1806) and highlights the wide range of food preference by the caterpillars. More work is needed to discover more host plants which will help us in conservation and understanding the biology of the species.

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Appendix: Host plants of Actias selene (Hübner, 1806) from Oriental region

	Family	Species	Reference
1	Betulaceae	*Alnus cremastogyne*	Robinson et al. 2010
2	Betulaceae	*Alnus formosana*	Robinson et al. 2010
3	Betulaceae	*Alnus glutinosa*	Robinson et al. 2010
4	Betulaceae	*Alnus nepalensis*	Chutia et al. 2016
5	Ericaceae	*Andromeda ovalifolia*	Shubhalaxmi 2018
6	Ericaceae	*Andromeda polifolia*	Robinson et al. 2010
7	Meliaceae	*Azadirachta indica*	Robinson et al. 2010, Shubhalaxmi 2018
8	Betulaceae	*Betula alnoides*	Robinson et al. 2010, Shubhalaxmi 2018
9	Fagaceae	*Castanea mollissima*	Robinson et al. 2010
10	Meliaceae	*Cedrela paniculata*	Robinson et al. 2010,
11	Lauraceae	*Cinnamomum camphora*	Robinson et al. 2010
12	Coriariaceae	*Coriaria nepalensis*	Robinson et al. 2010, Shubhalaxmi 2018
13	Betulaceae	*Corylus colurna*	Robinson et al. 2010, Shubhalaxmi 2018
14	Rosaceae	*Crataegus sp.*	Robinson et al. 2010, Shubhalaxmi 2018
15	Moraceae	**Ficus rumphii*	This study
16	Rhamnaceae	*Frangula alnus*	Robinson et al. 2010, Shubhalaxmi 2018
17	Malvaceae	*Hibiscus syriacus*	Robinson et al. 2010
18	Juglandaceae	*Juglans regia*	Robinson et al. 2010, Shubhalaxmi 2018
19	Lythraceae	*Lagerstroemia calyculata*	Robinson et al. 2010
20	Lythraceae	*Lagerstroemia indica*	Robinson et al. 2010
21	Lythraceae	*Lagerstroemia lanceolata*	Shubhalaxmi 2018
22	Lythraceae	*Lagerstroemia microcarpa*	Robinson et al. 2010
23	Lythraceae	**Lagerstroemia speciosa*	This study
24	Lythraceae	*Lagerstroemia subcostata*	Robinson et al. 2010
25	Anacardiaceae	*Lannea coromandelica*	Robinson et al. 2010, Shubhalaxmi 2018
26	Lythraceae	*Lawsonia inermis*	Robinson et al. 2010, Shubhalaxmi 2018
27	Oleaceae	*Ligustrum robustum*	Shubhalaxmi 2018
28	Hamamelidaceae	*Liquidambar formosana*	Robinson et al. 2010
29	Hamamelidaceae	*Liquidambar styraciflua*	Robinson et al. 2010
30	Ericaceae	*Lyonia ovalifolia*	Robinson et al. 2010
31	Anacardiaceae	*Malosma laurina*	Robinson et al. 2010
32	Rosaceae	*Malus asiatica*	Robinson et al. 2010
33	Rosaceae	*Malus pumila*	Robinson et al. 2010
34	Rosaceae	*Malus sylvestris*	Robinson et al. 2010
35	Anacardiaceae	*Mangifera indica*	Robinson et al. 2010
36	Moringaceae	*Moringa oleifera*	Robinson et al. 2010,

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	Family	Species	Reference
37	Moringaceae	*Moringa pterygosperma*	Robinson et al. 2010, Shubhalaxmi 2018
38	Rosaceae	*Prunus armeniaca*	Robinson et al. 2010
39	Rosaceae	*Prunus cerasus*	Robinson et al. 2010,
40	Rosaceae	*Prunus dulcis*	Robinson et al. 2010
41	Rosaceae	*Prunus padus*	Robinson et al. 2010
42	Rosaceae	*Prunus pseudocerasus*	Robinson et al. 2010
43	Juglandaceae	*Pterocarya stenoptera*	Robinson et al. 2010
44	Rosaceae	*Pyrus communis*	Robinson et al. 2010
45	Fagaceae	*Quercus ilex.*	Robinson et al. 2010
46	Ericaceae	*Rhododendron sp.*	Robinson et al. 2010
47	Anacardiaceae	*Rhus javonica*	Chutia et al. 2016
48	Salicaceae	*Salix babylonica*	Robinson et al. 2010
49	Salicaceae	*Salix fragilis*	Robinson et al. 2010
50	Euphorbiaceae	*Sapium sebiferum*	Robinson et al. 2010
51	Anacardiaceae	*Schinus terebinthifolius*	Robinson et al. 2010
52	Symplocaceae	*Symplocos paniculata*	Robinson et al. 2010
53	Oleaceae	*Syringa vulgaris*	Robinson et al. 2010
54	Myrtaceae	**Syzygium cumini*	This study
55	Combretaceae	*Terminalia crenulata*	Robinson et al. 2010
56	Combretaceae	*Terminalia paniculata*	Robinson et al. 2010, Shubhalaxmi 2018

References

Chutia, B.C., C. Nath & L.N. Kakati (2016). Conservation strategies of *Actias selene* Hubner: A wild silk moth in Nagaland, India. *Environment Conservation Journal* 17(1&2): 41–45.

Hampson, G.F. (1892). *The Fauna of British India, Including Ceylon and Burma: Moths Volume I*. Taylor and Francis, London.

Robinson, G.S., P.R. Ackery, I.J. Kitching, G.W. Beccaloni & L.M. Hernández, (2010). HOSTS - A Database of the World's Lepidopteran Hostplants. Natural History Museum, London. http://www.nhm.ac.uk/hosts. (Accessed: 30 December 2021).

Shubhalaxmi, V. (2018). *Birdwing Field Guide to Indian Moths*. Birdwing Publishers, Navi Mumbai, Maharashtra, 474pp.

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Citation: Palkar, S.B. & Gokhale, P. (2022). Additions to the larval host plants of the Indian Moon Moth from Chiplun, Maharashtra. Bugs R All #228, In: *Zoo's Print* 37(2): 04–08.

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) published with the financial support of Zoological Society of London.
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Observations of dragonflies and damselflies from an urban backyard in central Kerala

Odonates (dragonflies and damselflies) are freshwater insects with an amphibiotic, hemimetabolous life cycle. They are predatory both as aquatic nymphs and adult flies and have been used widely as indicators of ecological change. Urban ecosystems which are becoming increasingly common can play important ecological roles. This may include protection of local biodiversity and rare or imperilled species, either directly for organisms that reside in urban areas or via creation of corridors or stepping stone patches for individuals moving through cities (Gibb & Hochuli 2002).

Urban sites with a variety of vegetation composition, along with a proper management to minimise water pollution can host diverse communities of dragonflies and damselflies. Urban ecosystems offer a vast diversity of water bodies, ranging from ornamental ponds to drainage systems, each of these being subjected to different management plans. This heterogeneity of habitat types provides different hydrological and ecological conditions which may promote a higher diversity of odonates (Hassall 2014).

In India, Koparde (2016) studied odonates of selected wetlands in the city of Pune and identified the loss of green spaces as one of the major threats faced by tropical urban odonates. Larvae of many odonate species were found to be tolerant of moderately polluted waters of the Mula River that flows through Pune city. It has been recommended that for conserving odonates and rivers in cities, restoring original river-side habitats and reducing the disturbance at highly urbanized sites needs to be done on an urgent basis (Jere et al. 2020). This study is an attempt to document the odonate species that use a typical wooded home yard in an urban setting as adult habitat.

Poonkunnam is a rapidly urbanizing small town under Thrissur Municipal Corporation in central Kerala, India. It is mainly a residential area with apartments and small homesteads. The study was carried out in the author's homestead and surroundings

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(10.5332°N 76.2066°E), in an area less than 1,000 m^2. *Caesalpinnia pulcherrima*, *Psidium guajava*, *Moringa oleifera*, *Artocarpus heterophyllus*, and *Averrhoa bilimbi* are the main plants present at the site. There are no permanent water bodies present at the site except two uncovered synthetic water tanks, each of 1,000 litres capacity. The closest permanent water body is a pond located at an aerial distance of about 400 m, which has an area of approximately 2,100 m^2. Other water bodies in the vicinity are an open drainage canal (aerial distance: 500 m) and paddy fields (aerial distance: 800 m).

The study was conducted from 01 May 2019 to 30 April 2020. At least two casual observations were made in each month, where the observer walked throughout the site and recorded the odonate species and their numbers seen. Odonates spotted at the site were observed using Celestron 8 x 40 binoculars and photographed using a Nikon Coolpix P900 camera with Raynox DCR-250 macro lens. Individuals encountered were counted and identified to the species level referring to taxonomic monographs (Fraser 1933, 1934, 1936) and field guides (Subramanian 2009; Kiran & Raju 2013).

A total of 131 individual odonates belonging to 22 species and three families were recorded from 78 observations (Table 1). Odonate sightings showed a peak in the month of October. No odonate could be observed in the months of July, January, and February. While *Pantala flavescens* and *Rhyothemis variegata* were the most abundant species and could be observed in five months, 10 of the 22 species reported were seen only once during the study. Out of the 80 individuals that could be sexed, 50 were males and 30 females. Among the males, eight individuals could be identified as immature from their pigmentation.

This included three individuals of *Orthetrum chrysis* and one individual each of *Diplacodes trivialis*, *Aethriamanta brevipennis*, *Pseudagrion malabaricum*, *Urothemis signata*, and *Brachydiplax sobrina*. *Bradinopyga geminata* was the only species that displayed sexual behaviour at the study site, a pair of which was seen mating and egg laying in one of the synthetic tanks during the month of April. Three exuviae and five nymphs were seen in the tank.

The study recorded 12% of the total odonate species recorded from Kerala till date (Society for Odonate Studies 2020). It can be assumed that except for

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Table 1. List of odonates recorded from the urban backyard

	Order Odonata	Common name
	Suborder Zygoptera	
	Family Coenagrionidae	
1	*Ischnura rubilio* Selys, 1876	Western Golden Dartlet
2	*Pseudagrion malabaricum* Fraser, 1924	Jungle Grass Dart
3	*Pseudagrion microcephalum* (Rambur, 1842)	Blue Grass Dart
	Suborder Anisoptera	
	Family Gomphidae	
4	*Ictinogomphus rapax* (Rambur, 1842)	Common Clubtail
5	*Paragomphus lineatus* (Selys, 1850)	Common Hooktail
	Family Libellulidae	
6	*Aethriamanta brevipennis* (Rambur, 1842)	Scarlet Marsh Hawk
7	*Brachydipax sobrina* (Rambur, 1842)	Little Blue Marsh Hawk
8	*Brachythemis contaminata* (Fabricius, 1793)	Ditch Jewel
9	*Bradinopyga geminata* (Rambur, 1842)	Granite Ghost
10	*Crocothemis servilia* (Drury, 1773)	Ruddy Marsh Skimmer
11	*Diplacodes trivialis* (Rambur, 1842)	Ground Skimmer
12	*Lathrecista asiatica* (Fabricius, 1798)	Asiatic Bloodtail
13	*Neurothemis tullia* (Drury, 1773)	Pied Paddy Skimmer
14	*Orthetrum chrysis* (Selys, 1891)	Brown-backed Red Marsh Hawk
15	*Orthetrum sabina* (Drury, 1770)	Green Marsh Hawk
16	*Pantala flavescens* (Fabricius, 1798)	Wandering Glider
17	*Potamarcha congener* (Rambur, 1842)	Yellow-tailed Ashy Skimmer
18	*Rhodothemis rufa* (Rambur, 1842)	Rufous Marsh Glider
19	*Rhyothemis variegata* (Linnaeus, 1763)	Common Picturewing
20	*Tramea limbata* (Desjardins, 1832)	Black Marsh Trotter
21	*Trithemis aurora* (Burmeister, 1839)	Crimson Marsh Glider
22	*Urothemis signata* (Rambur, 1842)	Greater Crimson Glider

Bradinopyga geminata which was observed to complete its life cycle at the site, most other odonates visited the site in their pre-reproductive adult stage when their primary activity is foraging. Observations of males with incomplete adult pigmentation and absence of post-reproductive adults (old individuals with pruinescence/ broken wings) support to this assumption. Maximum number of individuals was detected in October. This is mostly due to the influx of large numbers of the migratory

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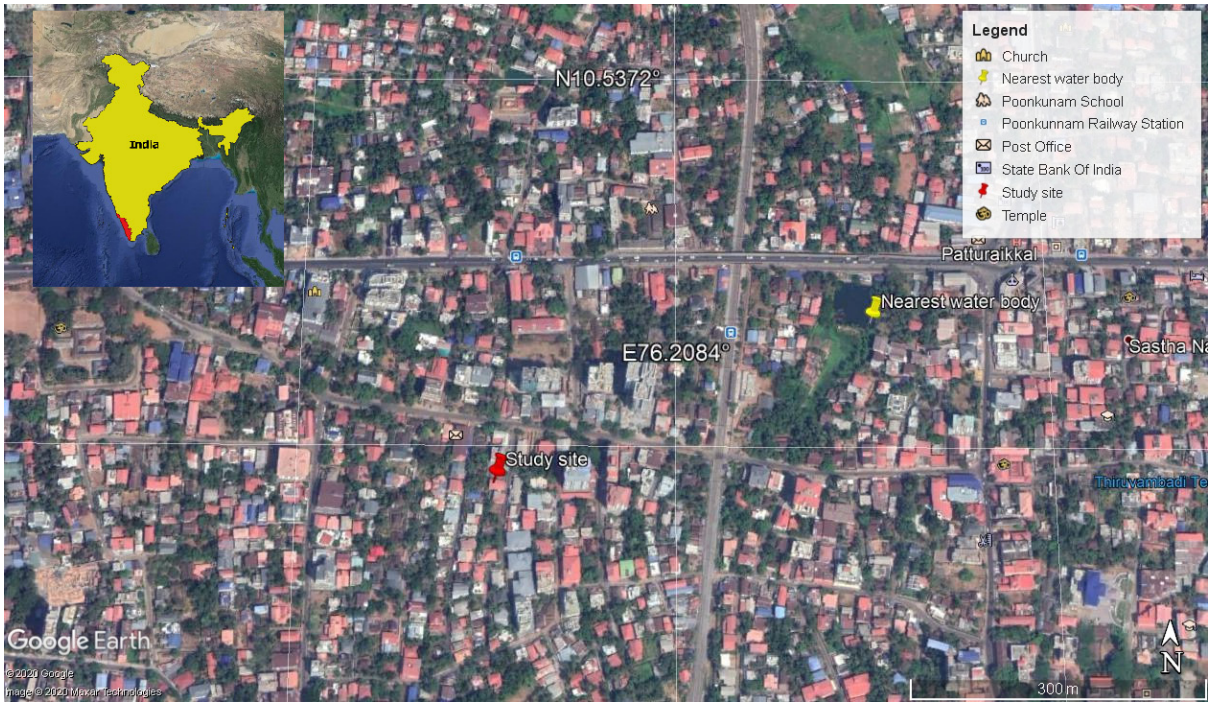
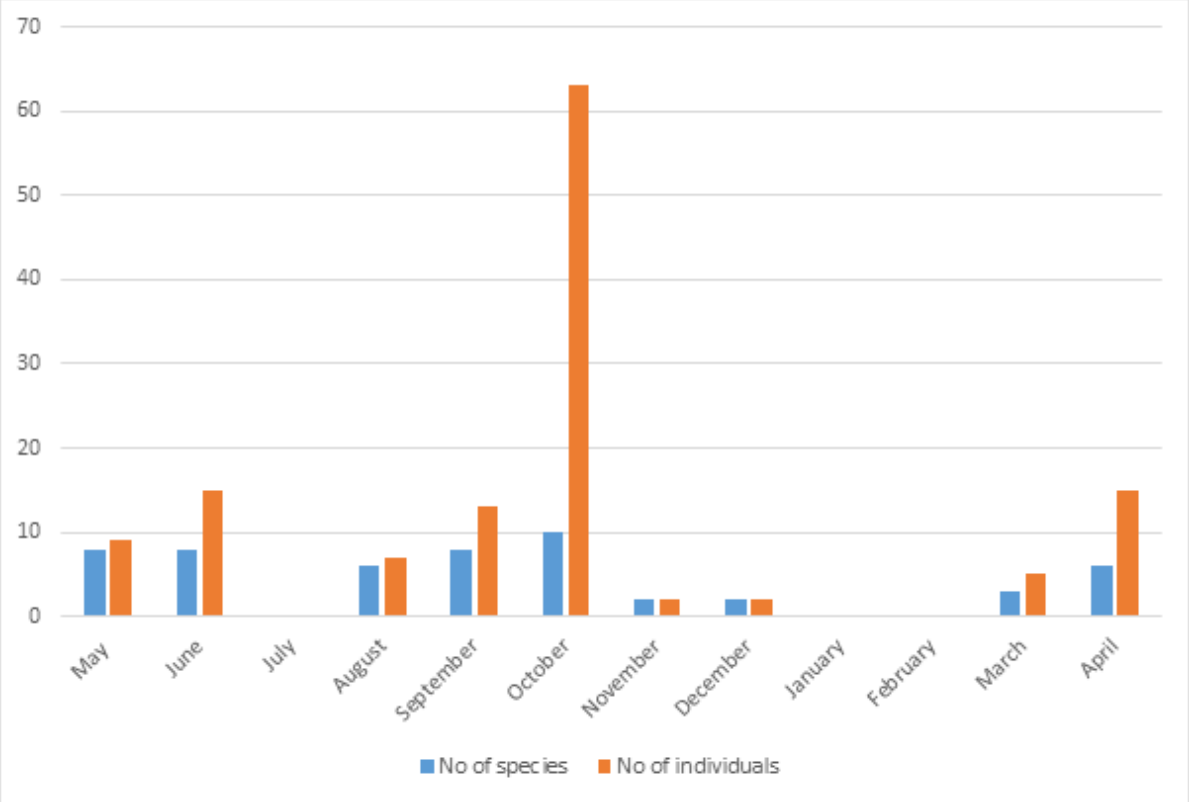


Map showing the study site.



Number of odonate species and individuals recorded in each month of the study.

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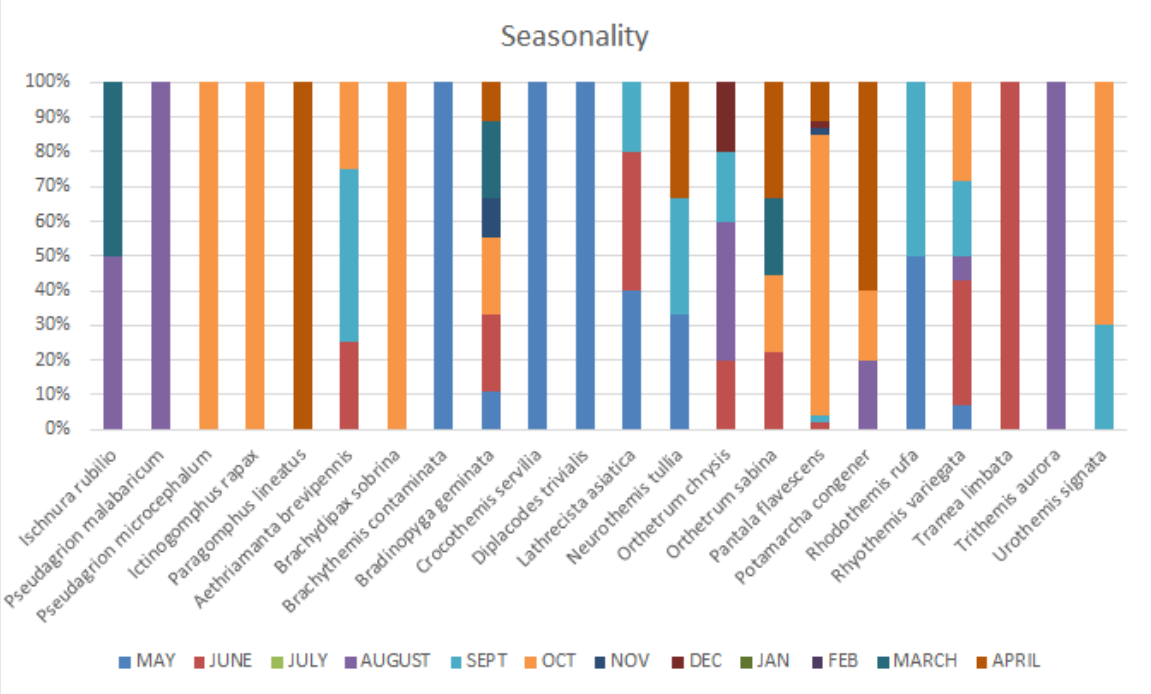

Seasonal occurrence of odonate species in the study site.

A juvenile male Orthetrum Chrysis. © Vivek Chandran A.

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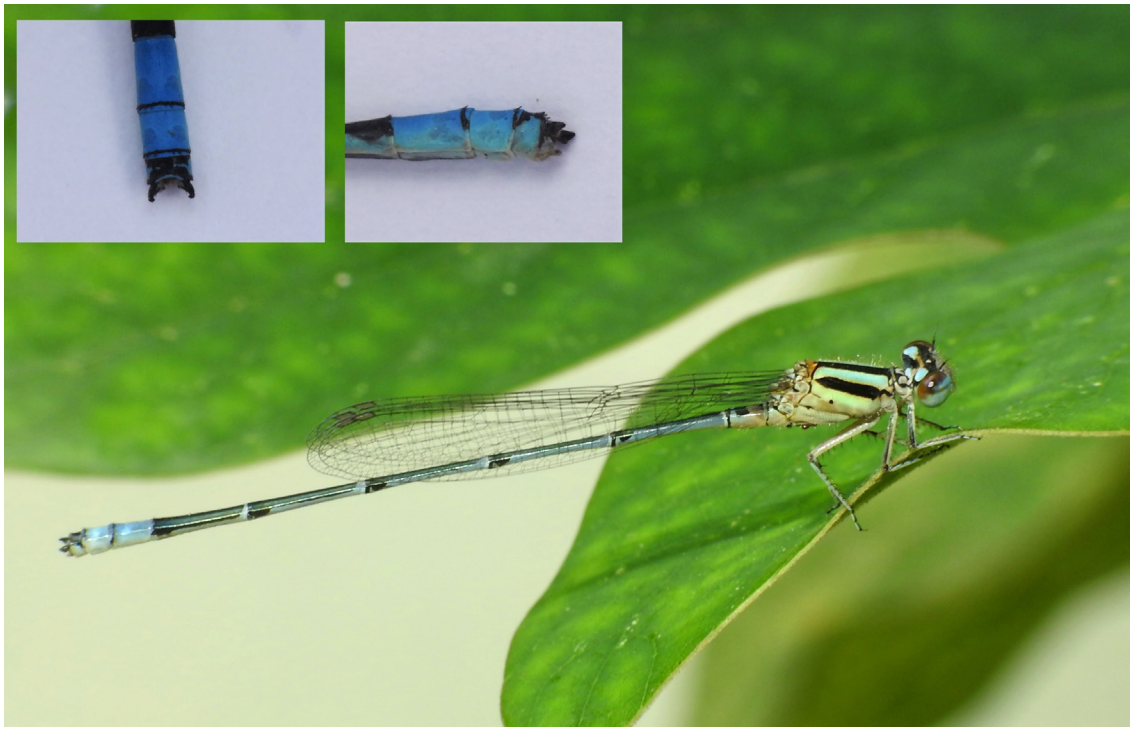
***Bradinopyga geminata*; an exuvia and a larva shown in insets. © Vivek Chandran A.**



***Pseudagrion malabaricum*; structure of caudal appendages that help in identification shown in insets. © Vivek Chandran A.**

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dragonfly, *Pantala flavescens* in this month. Number of species recorded was also maximum (10) in October, consistent with earlier studies that show detection of maximum number of odonate species in the post monsoon period (Kulkarni & Subramanian 2013). Since the behaviour of adult males and females differs greatly, it can be nearly impossible to obtain precise measures of sex ratio during the adult stage. The excess number of males detected (62.5% of the sexed individuals) in this study could be because of variability in dispersal of the sexes or their differential detectability, most female odonates being cryptic and males more colourful.

Although urban sites host an abundance of generalist species of odonates, there are some specialist species that can also find refuge in urban habitats. *Pseudagrion malabaricum* (Image 3) is a species known to breed in small lakes in submontane and montane areas (Fraser 1933). Sighting of such species deserves special mention as it highlights the importance of the freshwater-woodland matrices in urban areas in the conservation of odonates.

References

Fraser, F.C. (1933). *The Fauna of British-India including Ceylon and Burma, Odonata.* Vol. I. Taylor and Francis Ltd., London, 436 pp.

Fraser, F.C. (1934). *The Fauna of British-India including Ceylon and Burma, Odonata.* Vol. II. Taylor and Francis Ltd., London, 442 pp.

Fraser, F.C. (1936). *The Fauna of British-India including Ceylon and Burma, Odonata.* Vol. III. Taylor and Francis Ltd., London, 461 pp.

Gibb, H. & D.F. Hochuli (2002). Habitat fragmentation in an urban environment: large and small fragments support different arthropod assemblages. *Biological Conservation* 106: 91–100.

Hassall, C. (2014). The ecology and biodiversity of urban ponds. *Wiley Interdisciplinary Reviews: Water* 1(2): 187–206.

Jere, A., A. Darshetkar, A. Patwardhan & P. Koparde (2020). Assessing the response of odonates (dragonflies and damselflies) to a tropical urbanization gradient. *Journal of Urban Ecology* 6(1): 1–7.

Kiran, C.G. & D.V. Raju (2013). *Dragonflies and Damselflies of Kerala* (Keralathile Thumbikal). Tropical Institute of Ecological Sciences, 156 pp.

Koparde, P. (2016). Damsels in Distress–Seasons, Habitat Structure and Water Pollution Changes Damselfly Diversity and Assemblage in Urban Wetlands. *Animal Biology* 66: 305–19.

Kulkarni, A. & K.A. Subramanian (2013). Habitat and seasonal distribution of Odonata (Insecta) of Mula and Mutha river basins, Maharashtra, India. *Journal of Threatened Taxa* 5(7): 4084–4095.

Society for Odonate Studies (2020). List of odonates of Kerala. https://odonatesociety.org/list-of-odonates-of-kerala/. Accessed on 27.xii.2020.

Subramanian, K.A. (2009). *Dragonflies and Damselflies of Peninsular India - A Field Guide*. Vigyan Prasar, Noida, India, 168 pp.

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

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Invertebrate Conservation & Information Network of South Asia (ICINSA)

First record of the Ornamental Cockroach from Barabar Hills, Bihar

Cockroaches of the order Blattodea with 181 species under 72 genera belonging to 17 subfamilies and 89 species are endemic to India and account to only 3.8% of the global species diversity of which family Corydiidae have three subfamilies and 17 species in India (Gupta & Chandra 2019).

The subfamily Corydiinae (Saussure, 1864) genus *Eucorydia* (Hebard, 1929) represents only four known species *Eucorydia ornata* (Saussure, 1864), *Eucorydia westwoodi* (Gerstaecker, 1861), *Eucorydia aenea aenea* (Brunervon Wattenwyl, 1865), and *Eucorydia aenea plagiata* (Walker, 1871) in India.

Eucorydia is one of the most remarkable genera in order Blattodea for its bright orange color pattern on abdomen and tegmina which make its appearance more attractive.

***Eucorydia ornata* resting on the leaf of *Ziziphus jujuba plant* in Barabar Hill area.**

Eucorydia ornata (Saussure 1864) is commonly known for bright orange color with black spots. This cockroach is a rarely observed forest cockroach with round black mark on its tegmina and it is known to occur in Mumbai. We observed *Eucorydia ornata* in Barabar Hills area situated in Jehanabad District in Bihar for the first time during our field survey in September 2021. The study of related literatures revealed that *E. ornata* is not

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known to occur in Bihar. Further, we search for said species on citizen science platforms but no image was available from Bihar. In the context of Bihar, only seven species were known to occur in the order Blattodea (Gupta & Chandra 2019).

Synonyms

Melestora ornata Saussure, 1864: 341 (Bombay, India); Walker 1868: 60.
Corydia ornata: Saussure 1869: 280; Walker 1870: 9; Kirby 1904: 167.
Eucorydia ornata: Hebard 1929: 98; Princis 1963: 83.
Corydia plagiata Walker, 1868: 58; Kirby 1904: 167; Hanitsch 1927: 41.
Eucorydia plagiata: Princis 1950: 203; Princis 1957: 90; Princis 1963: 83.
Corydia elegans Brunner von Wattenwyl, 1893: 39

Distribution: Mumbai, Bihar (25.0105^0 N, 85.0130^0 E; first record).

E. ornata is more identical to *E. westwoodi* but the yellow elongate spots laterally on both the sides of pronotum differ from the *E. westwoodi.*

Qiu et al. (2017) mentioned *E. ornata* as a species but commented that "*E. ornata* may be one variation of *E. westwoodi* or a subspecies". Due to lack of information, specimen and genitalia details, authors were unable to solve the problem. Gupta & Chandra (2019) mention *E. ornata* as a species in the checklist. On the basis of available literature, we are also considering it as a *E. ornata* and reporting it for the first time from Bihar. A detailed study will be needed to understand the bio-ecology and distribution dynamics of *E. ornata* in a new habitat. Present study will surely be helpful in future scientific work of the said species.

References

von Wattenwyl, C.B. (1893). Révision du système des Orthoptères et description des espèces rapportées par M. Leonardo Fea de Birmanie. *Annali del Museo Civico di Storia Naturale di Genova*, Series 2(13): 5–230.

Gupta, S.K. & K. Chandra (2019). An annotated checklist of cockroaches (Blattodea) from India. *Zootaxa* 4614 (3): 461–497.**Hanitsch, R. (1927).** On a collection of Blattidae from southern Annam. *Journal of the Siam Society*, *Natural History Supplement* 7(1): 7–48.

Hebard, M. (1929). Studies in Malayan Blattidae (Orthoptera). *Proceedings of the Academy of Natural Sciences of Philadelphia* 81: 1–109.

Kirby, W.F. (1904). *A Synonymic Catalogue of Orthoptera. Vol. I. Orthoptera Euplexoptera, Cursoria, et Gressoria. (Forficulidæ, Hemimeridæ, Blattidæ, Mantidæ, Phasmidæ.).* British Museum, London, 501 pp.

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Invertebrate Conservation & Information Network of South Asia (ICINSA)

Princis, K. (1950). Entomological results from the Swedish Expedition 1934 to Burma and British India, Blattaria. *Arkiv för Zoologi* 1: 203–222.

Princis, K. (1957). Revision der Walker'schen und Kirby'schen Blattarientyen in British Museum of Natural History, London. *Opuscula Entomologica* 22: 87–116.

Princis, K. (1963). Blattariae: Suborde Polyphagoidea: Fam.: Homoeogamiidae, Euthyrrhaphidae, Latindiidae, Anacompsidae, Atticolidae, Attaphilidae; Subordo Blaberoidea: Fam. Blaberidae, pp. 77–172. In: Beier, M. (Ed.) *Orthopterorum Catalogus*. Pars 4. Uitgeverij Dr. W. Junk's- Gravenhage.

Qiu, L., Y. Che & Z. Wang (2017). Revision of *Eucorydia* Hebard, 1929 from China, with notes on the genus and species worldwide (Blattodea, Corydioidea, Corydiidae). *ZooKeys* 709: 17–56.

Walker, F. (1868). *Catalogue of the Specimens of Blattariæ in the Collection of the British Museum.* British Museum, London, 239 pp.

Walker, F. (1870). *Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum, Part V.* British Museum, London, 34 pp.

Acknowledgement
We are highly grateful to prof. Dr. S.N.P. Yadav, "DEEN" (Head, P.G. Department of Zoology, Magadh University) and DFO Gaya Forest Division, for his generosity to support us during the survey.

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Citation: Masroor, M.D. & Z. Masrror (2022). First record of *Macrosiagon ferruginea* from Barabar Hills, Bihar, India. Bugs R All #230, In: *Zoo's Print* 37(2): 16–18.

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

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

Observation of Green Marsh Hawk Dragonfly hunt the Common Gull Butterfly

Green Marsh Hawk hunt the Common Gull. © N. Gopinath.

Dragonflies have acute eyesight, agile flight using wings to hunt the prey. They are carnivorous, eat small midges, mosquitoes, butterflies, moths, damselflies, and small dragonflies (www.british-dragonflies.org). Dragonflies are the most efficient hunters, catching up to 95% of the prey they pursue (Combes et al. 2012). According to Powell (1999), a dragonfly may consume as much as a fifth of its body weight in prey per day. The nymphs are voracious predators, eating most living things that are smaller than they are.

During the birding in Kottathur Village, Tiruchirappalli District, I observed a Green Marsh Hawk hunt a butterfly species while in flight. The Green Marsh Hawk dragonfly caught its prey and fed on it within a few minutes while halting on the small dried plant branch. It was the first time that I observed this lively hunt in the environment. Using our field photographs, we identified the species with the help of field guides, Dragonfly (Subramanian et al. 2018), Butterfly (Kehimkar 2016).

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Invertebrate Conservation & Information Network of South Asia (ICINSA)

References

Combes, S.A., D.E. Rundle, J.M. Iwasaki & J.D. Crall (2012). Linking biomechanics and ecology through predator–prey interactions: flight performance of dragonflies and their prey. *Journal of Experimental Biology 215(6): 903–913.*

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

Powell, D. (1999). *A Guide to the Dragonflies of Great Britain. Arlequin Press,* Essex, United Kingdom, 136 pp.

Subramanian, K.A., K.G. Emiliyamma, R. Babu, C. Radhakrishnan & S.S. Talmale (2018). *Atlas of Odonata (Insecta) of the Western Ghats*. Zoological Survey of India, Kolkata, 417 pp.

Acknowledgements
I would like to thank my bird enthusiast friends, Mr. N Gopinath, Mr. A. Muthusamy, and Mr. G. Lakshmanan for accompanying me during the bird watching trip.

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Citation: Siva, T. (2022). Observation of Green Marsh Hawk Dragonfly hunt the Common Gull Butterfly. Bugs R All #231, In: *Zoo's Print* 37(2): 19–20.

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

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

First record of *Macrosiagon ferruginea* from Barabar Hills, Bihar, India

Macrosiagon ferruginea (Fabricius, 1775) is reported here for the first time from Bihar, northeastern part of India. *M. ferruginea* is previously known to occur in the Himalayan Range (Kashmir, Gilgit, 35.920834 N, 74.308334 E).

Macrosiagon Hentz 1830 is the genus belongs to Ripiphoridae (Coleoptera: Tenebrionoidea) and is widely distributed in the Palaearctic region contributing to 16 recognized taxa worldwide (Batleka 2011a). Batleka (2008) previously reported seven species of *Macrosiagon* Hentz, 1830 including *M. bimaculata* (Fabricius, 1787), *M. ferruginea* (Fabricius, 1755), *M. fortieri* (Chobaut, 1893), *M. meridionalis* (A.Costa, 1859), *M. obertherii* (Fairmaire, 1879), *M. praeusta* (Gebler, 1829), and

Female of *M. ferruginea* on *Ziziphus jujuba* plant in Barabar Hill area.

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M. terminata (Laporte, 1840) from different countries.

In old India, *M. ferruginea* was only known to occur in the Himalayan Range but now it has expanded its distribution range from the Himalayan Range to plains of Bihar and authors have observed and photographed this species during a nature walk in Barabar Hills area during morning hours on 23 August.

Due to diverse host preferences and parasitic lifecycles, Ripiphorid beetles are one of the most interesting families for researchers worldwide. The subfamily Ripiphorinae is restricted to hymenopteran hosts including Apidae, Hlictidae, Scoliidae, Crabronidae, Sphecidae, Pompilidae, Vespidae, and Tiphiidae (Selander 1991; Falin 2002; Batelka & Hoehn 2007).

In India, the biology, ecology, and biogeography are poorly studied and not more data is available about Macrosiagon.

Synonyms

1. *Mordella ferruginea* (Fabricius, 1775)
2. *Macrosiagon ferruginea* (Bedel, 1895)
3. *Ripiphorus indicus* Hope, 1831

Distribution

Kashmir (Gilgit), Bihar (25.0055^0 N, 85.0680^0 E; first record).

Diagnostic Features

1. Elytra as long as abdomen.
2. Median lobe of pronotum without a short-elevated process at apex, uncoloured elytra without marking or black spots.
3. Eyes black, head dorsally orange, thorax black.
4. Femur black, tibia orange, tarsus orange and black at joints.
5. Hind wings black at the tip and the last abdominal segments also black.
6. Base of antennae orange rest black.

The adult female of *M. ferruginea* was observed on flowers of *Ziziphus jujuba* (Rhamnaceae) in the grasslands of Barabar Hill near Nagarjuni Museum. No mud wasp nest was observed on nearest plant for confirmation of host preferences and larval development. The female was observed resting on flowers in morning hours. Further studies will be needed to confirm host preferences and larval development in the new flora and fauna as compared to the Himalayan Range.

References

Batelka, J. (2004). Contribution on the synonymy of Palaearctic and Oriental species of *Macrosiagon* (Coleoptera: Ripiphoridae). Part II. *Acta Societatis Zoologicae Bohemicae* 68: 9–13.

Batelka, J. (2011). Contribution to the synonymies, distributions, and bionomics of the Old-World

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#232
21 February 2022
Bugs R All
Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)

species of *Macrosiagon* (Coleoptera: Ripiphoridae). *Acta Entomologica Musei Nationalis Pragae* 51(2): 587–626.

Batelka, J. & P. Hoehn (2007). Report on the host associations of the genus *Macrosiagon* (Coleoptera: Ripiphoridae) in Sulawesi (Indonesia). *Acta Entomologica Musei Nationalis Pragae* 47: 143–152.

Bedel, E.M.L. (1895). II. - Synopsis des Macrosiagon méditerranéens, pp. 184–192. In: Chobaut A. & E.M.L. Bedel (eds): *Étude sur les Macrosiagon Hentz (Emenadia Lap. -Cast.) de la région méditerranéenne. L'Abeille, Journal d'Entomologie* 28: 181–192.

Falin, Z.H. (2002). Ripiphoridae Gemminger & Harold 1870 (1853), pp. 431–444. In: Arnet. R.H., M.C. Thomas, P.E. Skelley & J.H. Frank (eds) *American beetles*, *Volume 2: Polyphaga: Scarabaeoidea through Curculionoidea*. CRC Press, Boca Raton, FL, USA.

Schilder, F.A. (1923). Sauter's Formosa-Ausbeute Rhipiphoridae (Col.), (Zugleich: Rhipiphoriden-Studien III). *Entomologische Mitteilungen* 12: 202–204.

Selander, R.B. (1991). Rhipiphoridae (Tenebionidea), pp. 509–512. In: Stehr, F.W. (eds) *Immature Insects Volume 2*. Kendall/Hunt Publishing Company, Iowa.

Waterhouse, C.O. (1883). Descriptions of new species of Coleoptera belonging to the Rhipiphoridae. *Annals and Magazine of Natural History, Series* 5(11): 279–281.

Acknowledgements: We are highly grateful to Dr. S.N.P. Yadav "DEEN" (Head, P.G. Department of Zoology, Magadh University) and Dr. Kumari Aditi for supporting and motivating us for field observation and documentation. We are also very thankful to DFO, Gaya Forest Division for his generosity to support us during survey.

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Citation: Masroor, M.D. & Z. Masrror (2022). First record of *Macrosiagon ferruginea* from Barabar Hills, Bihar, India. Bugs R All #232, In: *Zoo's Print* 37(2): 21–23.

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Roadkill sightings of Madurai Shieldtail and Palani Mountain Burrowing Snake in Kodaikanal Hills

Kodaikanal is situated on a plateau above the southern escarpment of the upper Palani Hills, an eastward spur of the Western Ghats on the western side of south India. On 29 August 2019, a dead uropeltid snake was sighted and identified as Madurai Shieldtail *Platyplectrurus madurensis* based on the morphological characters given by Smith (1943), Murthy (1990), and Whitaker & Captain (2004).

It was 17.8 cm in length. The next day, another uropeltid snake was sighted and identified as Palni Mountain Burrowing Snake *Teretrurus rhodogaster*. It was 16.2 cm in length. Both the snakes were sighted near

***Platyplectrurus madurensis* in Kodaikanal Hills, Tamil Nadu, India.**

Teretrurus rhodogaster in Kodaikanal Hills, Tamil Nadu, India.

Kurinji Andavar Temple (10.242^{0}N, 77.504^{0}E, 1,963m) at Kodaikanal, Tamil Nadu, India.

Both the uropeltids were found dead on the road and assumed to have been killed by vehicular traffic.

Teretrurus rhodogaster, listed as Least Concern, is endemic to the Western Ghats with restricted distribution (Smith 1943; Bossuyt et al. 2004; Pyron et al. 2016).

It occurs at elevations of 1,350–1,900 m. *Platyplectrurus madurensis*, listed as Endangered, is also endemic to southern India with restricted distribution (Smith 1943; Das 2002).

As both the uropeltid snakes are known only from a few records and affected by urbanization (Santhoshkumar et al. 2016), any information on its distribution would be useful for assessing their status. Hence these observations are placed here on record.

SARN
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References

Bossuyt, F., M. Meegaskumbura, N. Beenaerts, D.J. Gower, R. Pethiyagoda, K. Roelants, A. Mannaert, M. Wilkinson, M.M. Bahir, K. Ng. P.K.L. Manamendra-Arachchi, C.J. Schneider, O.V. Oommen & M.C Milinkovitch (2004). Local endemism within the Western Ghats-Sri lanka Biodiversity Hotspot. *Science* 306: 479–481 + SOM 17 pp.

Das, I. (2002). *A Photographic Guide to Snakes and Other Reptiles of India*. New Holland Publishers, London.

Murthy, T.S.N. (1990). *Illustrated Guide to the Snakes of the Western Ghats, India*. Records of the Zoological Survey of India, Occasional Paper No. 114

Pyron, R.A., S.R. Ganesh, A. Sayyed, V. Sharma, V. Wallach & R. Somaweera (2016). A catalogue and systematic overview of the shield-tailed snakes (Serpentes: Uropeltidae). Zoosystema 38(4): 453–506.

Smith, M.A. (1943). *The Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese region. Reptilia and Amphibia Vol. III. Serpentes*. Taylor and Francis, London, 583 pp.

Whitaker, R. & A. Captain (2004). *Snakes of India. The Field Guide*. Draco Books, India, 495 pp.

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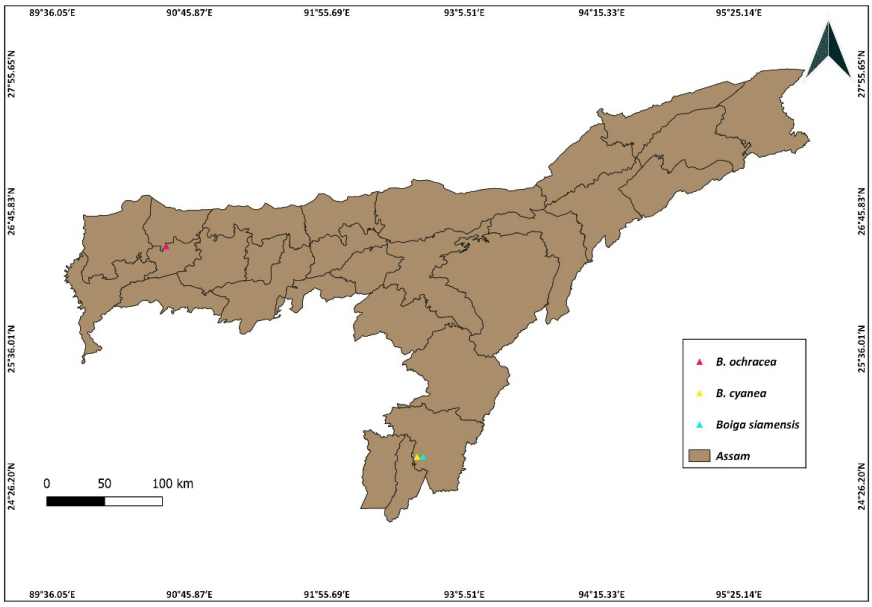
Locality record of three species *Boiga* Fitzinger 1826 (Serpentes: Colubridae) in Assam, northeastern India

Nineteen species of cat snakes under the genus *Boiga* (Colubridae) have been reported from the Indian sub-continent and among them, B. *cyanea, B. gokool, B. multifasciata, B. multomaculata, B. siamensis, B. ochracea*, and *B. quincunciata* are found in northeastern states of India (Whitaker & Captain 2008; Aengals et al. 2018; Giri et al. 2019).



Sighting locations of *Boiga ochracea*, *Boiga cyanea*, and *Boiga siamensis* in Assam, India.

The present report describes the sighting of *B. ochracea, B. cyanea,* and *B. siamensis* from the western and southern parts of Assam. Eight species of snakes were reported from the Bongaigaon municipality area (Nath et al. 2011). However, no species of the genus *Boiga* is reported so far from this place. Very limited studies on snakes have been reported from the Barak Valley districts of Assam. One study reports 45 species of reptiles represented by 25 snake species and 23 species of amphibians from Barail Wildlife Sanctuary, Assam (Das et al. 2009). About 24 species of snakes have

Tawny Cat Snake *Boiga ochracea* encountered in Bongaigaon municipality area.

Green Cat Snake *Boiga cyanea* found in Rosekandy Tea Estate of Cachar District.

Thai Cat Snake *Boiga siamensis* in the vicinity of Assam University Campus, Silchar.

been recorded from the Assam University Silchar Campus including the cat snakes like *B. ochracea* and *B. gokool* (Dutta et al. 2008). The species were identified by consulting the field guides on Indian snakes (Whitaker & Captain 2008; Ahmed et al. 2009).

On 21 December 2017 at 1130 h, we recorded Tawny Cat Snake *Boiga ochracea* at the vicinity of Bhagheswari Hill and Birjhora Tea Garden (26.472N, 90.564E, elevation 63 m) of Bongaigaon District. The snake was rescued from a drain in the municipality area clogged with garbage (Image 1). It measured 1.5 m from head to tail and later it was released in a nearby natural habitat.

Sighting locations of *Boiga ochracea, Boiga cyanea*, and *Boiga siamensis* in Assam, India.

On 15 July 2018, at 1900 h, we encountered a Green Cat Snake *Boiga cyanea* crossing a road in Rosekandy Tea Estate (24.687N, 92.692E, elevation 55 m). It measured 2.40 m in length.

On 16 April 2020 at around 1600 h after a heavy storm, a Thai Cat Snake *Boiga siamensis* was rescued (elevation 30 m) from a shop in Irongmara Village (24.689N, 92.742E) adjacent to the Assam University, Silchar. It measured 2.1 m in length. Later, the snake was released in the forested area inside the Assam University Campus which is contiguous to the Innerline Reserve Forest of the district.

In Assam *B. ochracea* has been recorded from Goalpara, Sibsagar, and Cachar (Sclater 1891a; Wall 1924; Smith 1943; Whitaker & Captain 2008; Das et al. 2010). *B. siamensis* has been recorded from Gibbon Wildlife Sanctuary, Panbari Reserve Forest, Dibrugarh, Cachar, and Naharkatiya (Sclater 1891a,b; Wall 1910a,b; Smith 1943; Kroon 1973; Das et al. 2010). Observational records on *B. cyanea* in Assam is reported from Barail Wildlife Sanctuary, Panbari Reserve Forest, Rani Reserve Forest in the districts of Cachar, Golaghat, Kamrup, respectively, and also from Bongaigaon of Assam (Sclater 1891; Wall 1924; Smith 1943; Das 2008; Das et al. 2010).

References

Aengals, R., V.M.S. Kumar, M.J. Palot & S.R. Ganesh (2018). A Checklist of Reptiles of India version 3.0. www.zsi.gov.in (Last update: May 2018), 35 pp.

Ahmed, M.F., A. Das & S.K. Dutta (2009). *Amphibians and Reptiles of North-east India- a photographic Guide*. Aaranyak, Guwahati, India, 170 pp.

Das, A. (2008). Diversity and Distribution of Herpetofauna and Evaluation of their Conservation Status in the Barail Hill Range (Including the Barail Wildlife Sanctuary) Assam, northeast India. Final Technical Report. Aaranyak, Guwahati, India, 91 pp.

Das, A., P.P. Mohapatra, J. Purakayastha, S. Sengupta, S.K. Dutta, M.F. Ahmed & F. Tillack (2010). A contribution to *Boiga gokool* (Gray 1835) (Reptilia: Squamata: Colubridae). *Russian Journal of Herpetology* 17(3): 161–178.

Das, A., U. Saikia, B.H.C.K. Murthy, S. Dey & S.K. Dutta (2009). A herpetofaunal inventory of Barail Wildlife Sanctuary and adjacent region, Assam, north-eastern India. *Hamadryad* 34(1): 117–134.

Dutta, B.K., A. Gupta, A.K. Das & A. De (2008). *Ecology and Biodiversity of Assam University Campus.* Department of Ecology and Environmental Science, Assam University, Silchar, India, 33 pp.

Giri, V.B., V. Deepak, A. Captain, S. Pawar & F. Tilak (2019). A new species of *Boiga* Fitzinger, 1826 (Serpentes: Colubridae) from the northern Western Ghats of India. *Journal of the Bombay Natural History Society* 116: 1–11.

Kroon, C. (1973). A new colubrid snake (*Boiga*) from southeastern Asia. *Copeia* 3: 580–586.

Nath, A., H. Singha & A. Das (2011). Snakes of Bongaigaon Municipality Area, Assam, India. Reptile Rap #13, In: *Zoo's Print* 13: 9–13.

Sclater, W.L. (1891a). *List of Snakes in the Indian Museum*. Baptist Mission Press, Calcutta, 74pp.

Sclater, W.L. (1891b). Notes on the collection of snakes in the Indian Museum with description of serval new species. *Journal of the Asiatic Society of Bengal* 60: 230–250.

Smith, M.A. (1943). *Fauna of British India, Ceylon and Burma, including the whole of the Indo-Chinese Sub-Region, Reptilia and Amphibia, Vol. III-Serpentes. Taylor and Francis Ltd., London*, 568 pp.

Wall, F. (1910a). Notes on snakes collected in upper Assam, Part 2. *Journal of the Bombay Natural History Society* 19(4): 825–845.

Wall, F. (1910b). Notes on snakes collected in the Jalpaiguri District. *Journal of the Bombay Natural History Society* 19(4): 897–900.

Wall, F. (1924). A hand-list of the snakes of the Indian Empire, Part III. *Journal of the Bombay Natural History Society* 29(4): 864–878.

Whitaker, R. & A. Captain (2008). *Snakes of India, The Field Guide.* Draco Books, Tamil Nadu, India, 379 pp.

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Citation: Sarkar, S., M. Dey & P. Debb (2022). Locality record of three species Boiga Fitzinger 1826 (Serpentes: Colubridae) in Assam, northeastern India. Reptile Rap #218, In: *Zoo's Print* 37(1): 27–30.

A note on the avian diversity of Satajaan Wetland, Assam

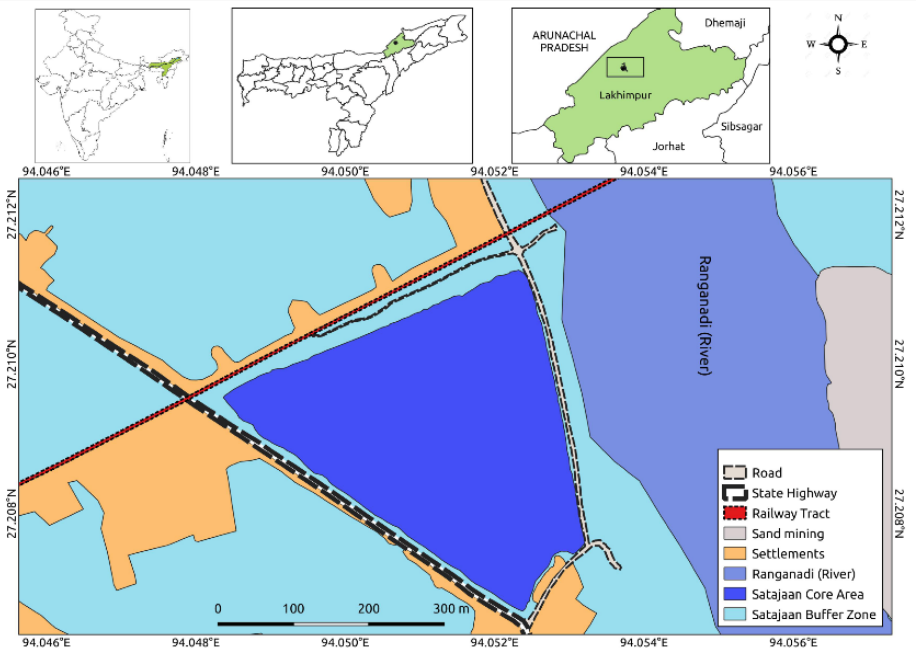
Inland wetlands are pristine water bodies inhabiting diverse species of flora and fauna. These wetlands act like reservoirs with a capacity to hold the flooded water (Acreman & Holden 2013). Wetlands also play a crucial role in groundwater recharge (Min et al. 2010), with its vegetation having the potential of bioremediation (Bhatia & Goyal 2013).

Every year, numerous species of waterfowl migrate from across the globe and most of them are accommodated in these wetlands. Satajaan, one such wetland situated in the north-Lakhimpur District of Assam, India, is at a distance of 8 km from Lakhimpur township. This wetland has remained under-research since its formation and was selected for the study of avian diversity. It is situated aside from the river Ranganadi covering an area of 39 acres. According to (Gogoi et al. 2019), the wetland is covered by rich vegetation with approximately 262 species of vascular plants. The climate of the area is mostly humid with temperatures ranging 7–31 ^{0}C (NWAA 2010). The wetland which is claimed to have got created by the earthquake of 1950, is bifurcated by the railway crossing into two halves.

One segment of the wetland is enriched with water, aquatic and semi-aquatic vegetation, whereas, the other section is poorly managed with very little scope for accommodating birds. The swamp also resides adjacent to a roadway that traverses across the plains to meet the foothills of Arunachal Pradesh. We pursued a survey of this wetland on the 22 December 2019 from 0600–1400 h and 10 January 2021 from 0700–1200 h to record the diversity of birds visiting the study site in winter.

A survey was conducted by a group of five birders. A total of 71 and 68 species were recorded during the first and second surveys respectively. Around 87 species were recorded cumulatively from both surveys (Table 1). Thirty-four winter migratory species were observed of which eight were specifically waterfowls. Some of the local non-migratory water birds such as White-breasted Waterhen *Amaurornis phoenicurus*, Bronze-winged Jacana *Metopidius indicus*, Eurasian Moorhen *Gallinula chloropus*, and Grey-headed Swamphen *Porphyrio poliocephalus* were also recorded and are suspected to be present perennially.

In addition to the resident birds, migratory terrestrial birds such as Tickell's Leaf Warbler *Phylloscopus affinis*, Pallas's Grasshopper Warbler *Locustella certhiola*, Black-faced Bunting *Emberiza spodocephala*, and aquatic birds such as Gadwall *Mareca strepera* & Ferruginous Duck *Aythya nyroca* were also recorded. Lesser Whistling-Duck *Dendrocygna javanica* was the most abundant species present with an



Map of Satajaan Wetland, northern Lakhimpur, Assam.

observation count of 1,250.

We also had a focused group discussion with the local community members residing around Satajaan which provided us insights to understand the inter-dependencies between the community and the wetland. The communities have been protecting this primeval water body for decades now with the help of local non-governmental organizations. However, currently, the health of this wetland is challenged by several anthropogenic activities. Yearly winter picnics accompanied by plastic littering, loud music, chopping down of plants for fire and fodder, and cattle grazing are some of the primary disturbances to the avifauna of this wetland. Additionally, sand mining on the adjacent river and high-tension wire over the wetland also impose a threat.

We recommend frequent documentation across different seasons to understand the temporal diversity of avifauna in the wetland. Along with birds, we also suggest the documentation of herpetofauna, the findings of which might interest researchers across the globe. Although large water bodies from the state such as Deepor Beel and Maguri Beel are well known for species diversity and eco-cultural interaction, smaller patches of swamps like Satajaan are usually overlooked.

These small-scaled wetlands aren't trivial and play important role in accommodating several species of flora and fauna, as well as in providing resources to the communities dependent on them. Thus, conservation efforts must be encouraged from a policy level, supported by a scientific study from the experts.

Table 1: Checklist of birds recorded in Satajaan Wetland from the two surveys (December 2019 and January 2021).

Common Name	Scientific Name	Migratory Status	IUCN Status
Ashy Woodswallow	*Artamus fuscus*	R	LC
Asian Barred Owlet	*Glaucidium cuculoides*	R	LC
Asian Openbill	*Anastomus oscitans*	R	LC
Asian Palm-Swift	*Cypsiurus balasiensis*	R	LC
Asian Pied Starling (Pied Myna)	*Gracupica contra*	R	LC
Bar-headed Goose	*Anser indicus*	WM	LC
Barn Swallow	*Hirundo rustica*	R / WM	LC
Baya Weaver	*Ploceus philippinus*	R	LC
Black Drongo	*Dicrurus macrocercus*	R	LC
Black Kite (Black-eared)	*Milvus migrans (lineatus/formosanus)*	WM	LC
Black Kite (Black)	*Milvus migrans migrans*	R	LC
Black-crowned Night-Heron	*Nycticorax nycticorax*	R	LC
Black-faced Bunting	*Emberiza spodocephala*	WM	LC
Black-hooded Oriole	*Oriolus xanthornus*	R	LC
Blue-throated Barbet	*Psilopogon asiaticus*	R	LC
Blyth's Reed Warbler	*Acrocephalus dumetorum*	WM	LC
Bronze-winged Jacana	*Metopidius indicus*	R	LC
Brown Shrike	*Lanius cristatus*	WM	LC
Cattle Egret	*Bubulcus ibis*	R	LC
Chestnut-tailed Starling	*Sturnia malabarica*	R	LC
Cinereous Tit	*Parus cinereus*	R	LC
Cinnamon Bittern	*Ixobrychus cinnamomeus*	R	LC
Citrine Wagtail	*Motacilla citreola*	WM	LC
Clamorous Reed Warbler (Indian Great Reed Warbler)	*Acrocephalus stentoreus*	WM	LC
Common Greenshank	*Tringa nebularia*	WM	LC
Common Iora	*Aegithina tiphia*	R	LC
Common Myna	*Acridotheres tristis*	R	LC
Common Sandpiper	*Actitis hypoleucos*	WM	LC
Common Tailorbird	*Orthotomus sutorius*	R	LC
Dusky Warbler	*Phylloscopus fuscatus*	WM	LC
Eurasian Coot	*Fulica atra*	WM	LC
Eurasian Moorhen	*Gallinula chloropus*	R	LC
Eurasian Tree Sparrow	*Passer montanus*	R	LC
Ferruginous Duck (Ferruginous Pochard)	*Aythya nyroca*	WM	LC
Fulvous Whistling-Duck	*Dendrocygna bicolor*	WM	LC
Gadwall	*Mareca strepera*	WM	LC

Common Name	Scientific Name	Migratory Status	IUCN Status
Great Myna	*Acridotheres grandis*	R	LC
Green-winged Teal (Common Teal)	*Anas crecca*	WM	LC
Grey-backed Shrike	*Lanius tephronotus*	WM	LC
Grey-headed Swamphen (Purple Swamphen)	*Porphyrio poliocephalus*	R	LC
Grey-sided Bush Warbler	*Cettia brunnifrons*	WM	LC
House Crow	*Corvus splendens*	R	LC
House Swift (Nepal House Swift)	*Apus nipalensis*	R	LC
Indian Pond-Heron	*Ardeola grayii*	R	LC
Indian Spot-billed Duck	*Anas poecilorhyncha*	R	LC
Intermediate Egret	*Ardea intermedia*	R	LC
Jungle Myna	*Acridotheres fuscus*	R	LC
Large-billed Crow	*Corvus macrorhynchos*	R	LC
Lesser Adjutant	*Leptoptilos javanicus*	R	NT
Lesser Coucal	*Centropus bengalensis*	R	LC
Lesser Whistling-Duck	*Dendrocygna javanica*	R	LC
Little Cormorant	*Microcarbo niger*	R	LC
Little Egret	*Egretta garzetta*	R	LC
Little Ringed Plover	*Charadrius dubius*	R	LC
Long-tailed Shrike	*Lanius schach*	WM	LC
Northern Shoveler	*Spatula clypeata*	WM	LC
Olive-backed Pipit	*Anthus hodgsoni*	WM	LC
Oriental Darter	*Anhinga melanogaster*	R	LC
Oriental Honey-buzzard (Crested Honey Buzzard)	*Pernis ptilorhynchus*	R	LC
Oriental Magpie-Robin	*Copsychus saularis*	R	LC
Osprey	*Pandion haliaetus*	WM	LC
Paddyfield Pipit	*Anthus rufulus*	R	LC
Pallas's Grasshopper-Warbler	*Locustella certhiola*	WM	LC
Peregrine Falcon	*Falco peregrinus*	WM	LC
Purple Heron	*Ardea purpurea*	R	LC
Red-vented Bulbul	*Pycnonotus cafer*	R	LC
Red-wattled Lapwing	*Vanellus indicus*	R	LC
Rock Pigeon (Feral Pigeon)	*Columba livia*	R	LC
Rosy Pipit	*Anthus roseatus*	WM	LC
Rufous Treepie	*Dendrocitta vagabunda*	R	LC
Scaly-breasted Munia (Spotted Munia)	*Lonchura punctulata*	R	LC
Shikra	*Accipiter badius*	R	LC
Siberian Rubythroat	*Calliope calliope*	WM	LC

Common Name	Scientific Name	Migratory Status	IUCN Status
Siberian Stonechat (Common Stonechat)	*Saxicola maurus*	WM	LC
Smoky Warbler	*Phylloscopus fuligiventer*	WM	LC
Spotted Bush Warbler	*Locustella thoracica*	WM	LC
Spotted Dove	*Streptopelia chinensis*	R	LC
Stork-billed Kingfisher	*Pelargopsis capensis*	R	LC
Striated Grassbird	*Megalurus palustris*	R	LC
Striated Heron (Little Heron)	*Butorides striata*	R	LC
Taiga Flycatcher (Red-throated Flycatcher)	*Ficedula albicilla*	WM	LC
Tickell's Leaf Warbler	*Phylloscopus affinis*	WM	LC
Tufted Duck	*Aythya fuligula*	WM	LC
White Wagtail (Hodgson's)	*Motacilla alba alboides*	WM	LC
White Wagtail (Chinese)	*Motacilla alba leucopsis*	WM	LC
White-breasted Waterhen	*Amaurornis phoenicurus*	R	LC
White-throated Kingfisher	*Halcyon smyrnensis*	R	LC
*Where R = Resident, WM = Winter Migrant, LC = Least Concern, NT = Near Threatened			

References

Acreman, M. & J. Holden (2013). How Wetlands Affect Floods. *Wetlands* 33:773–786.

Bhatia, M. & D. Goyal (2013). Analyzing Remediation Potential of Wastewater Through Wetland Plants: *A Review. Environment Progress & Sustainable Energy* 33(1): 9–27.

Gogoi, P., V.S. Ayam & A.P. Das (2019). Vascular plants diversity in Satajan Beel in the Lakhimpur District of Assam in northeast India. *Asian Journal of Conservation Biology* 8(2): 159–174.

Min, J.H., D.B. Perkins & J.W. Jawitz (2010). Wetland-Groundwater Interactions in Subtropical Depressional Wetlands. *Wetlands* 30: 997–1006.

NWAA (2010). *National Wetland Atlas: Assam*, SAC/RESA/AFEG/NWIA/ATLAS/18/2010, Indian Space Research Organisation (ISRO), Ahmedabad, India, 174 pp.

Acknowledgments: We would like to acknowledge the initiative taken by Mr. Pranjal Baruah, range forest officer in organizing and conducting the study at Satajaan. We also thank Mr. Pankaj Baruah of the Department of Forest, Govt. of Assam for his assistance during the field survey. We extend our gratitude to our other team members, Vivek Chetry of Gauhati University and Umang Rathod of Indian Institute of Technology Guwahati for their participation during the survey.

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Citation: Bhaduri, R., J. Mandal & L.M. Abraham (2022). A note on the avian diversity of Satajaan Wetland, Assam. Bird-o-soar #110, In: *Zoo's Print* 37(2): 31–35.

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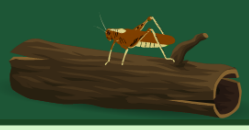

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Publication Information

ZOO'S PRINT, ISSN 0973-2543
Published at: Coimbatore
Copyright: © Zoo Outreach Organisation
Owner: Zoo Outreach Organisation, 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti, Coimbatore, Tamil Nadu 641035, India.

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