

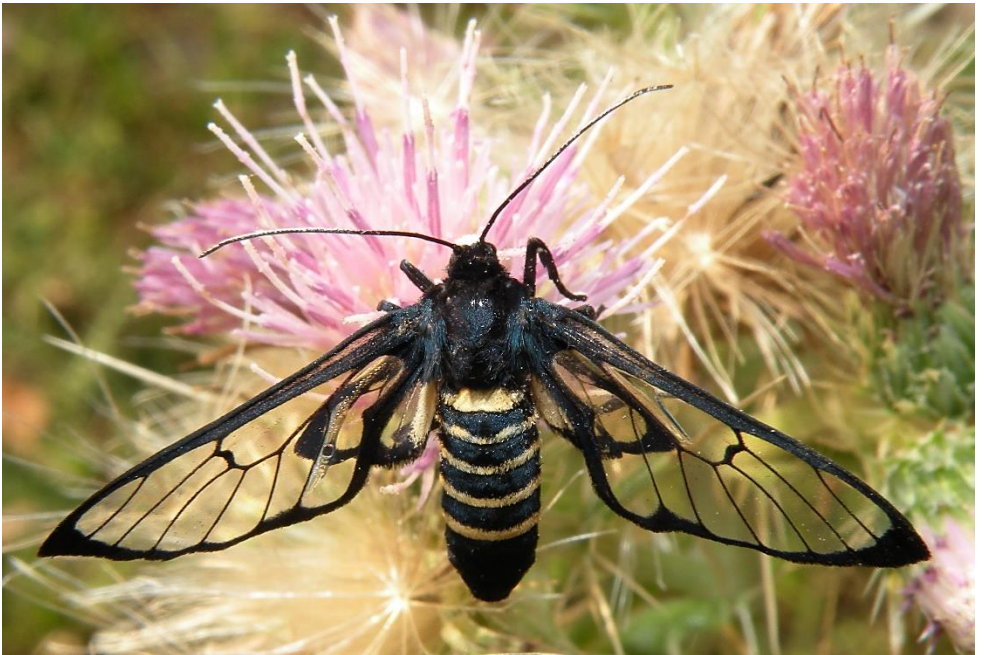
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On Any Aspect Related to Life Forms**

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DISTRIBUTIONAL REPORT OF *GOMPHIDIA T-NIGRUM* SELYS, 1854 (INSECTA: ODONATA) ALONG WITH ITS FIRST RECORD FROM WEST BENGAL, INDIA

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ABSTRACT

This paper presents the first sighting report and breeding ecology of *Gomphidia t-nigrum* Selys, 1854, from West Bengal, India. This study encompasses the brief identification, habitat preferences and distribution of this elusive species.

KEYWORDS

New record, West Bengal, Odonata, *Gomphidia t-nigrum*, ecology

Gomphidia t-nigrum Selys, 1854 commonly known as Indian Tiger, is a large and robust dragonfly belonging to the family Gomphidae Rambur, 1842. In India, the genus *Gomphidia* Selys, 1854 is represented by seven species (Subramanian & Babu, 2017) and in West Bengal, only two species viz., *Gomphidia leonora* Mitra, 1994 and *Gomphidia williamsoni* Fraser, 1923 were found till date (Dawn, 2021). *G. t-nigrum* is reported from India, Pakistan and Nepal (Kalkman *et al.*, 2020). In India, it has been reported from Andaman and Nicobar Island, Assam, Himachal Pradesh, Maharashtra,

Odisha, Rajasthan, Tamil Nadu and Uttar Pradesh (Singh, 2022). There is no previous record of the occurrence of this species from West Bengal (Dawn, 2021; Roy *et al.*, 2022). Hence this present report is the first record from the state of West Bengal, India.

During an opportunistic survey, on 1 June 2023, the author AS found a large adult dragonfly of Gomphidae family while it was resting; the next day, AS found a better view of an individual teneral of the same species (Figs. 1-2). The first observation was made on the river bank of Silabati River (22°59'22.2" N, 86°59'56.0" E; 76m asl) (study site S1) and the teneral of the same species was observed inside the village of Kadma (22°59'09.7" N, 87°00'22.8" E; 95m asl), Bankura district, West Bengal, India (study site S2). Photographs were taken by using Nikon D5300 and Nikkor Af-P 70-300mm lens. The study site S1 is a riverine habitat with rocky riverbed and the flow of the river is slow in summer and study site S2 is a rural village habitat with agricultural fields,

mixed vegetation along with ponds and an irrigation canal.

With the help of Fraser (1934) and the members of the 'iNaturalist' web portal, authors concluded from the images of the adult and teneral that it was a *Gomphidia t-nigrum* dragonfly. *G. t-nigrum* is a large dragonfly with abdominal size 53 mm (both the sexes), male hindwing 38 mm and female hindwing 43 mm (Fraser, 1934). Field characteristics for male include bluish eyes with bright yellow lips, face and frons, upper surface of the frons marked with a black line which forms a 'T'; vertex black and occiput yellow; black thorax with a broad yellow bar interrupted at the mid-dorsal part; sides yellow with broad black stripes; legs black; wings transparent with a pale yellowish brown spot, pterostigma yellow bordered with black; abdomen black, broadly marked with yellow as follows – segment 4 to 6 with broad yellow dorsal spots, segments 7 and 8 largely yellow, segments 9 and 10 are unmarked, segments 7 to 9 without leaf-like dilations as in Tigertails (Fraser, 1934; Singh, 2022). Females are similar to males in colouration and markings (Singh, 2022). *G. t-nigrum* prefers slow-moving river habitats, where it is usually found perched on vegetation along the riverbanks, lakes or dam and is known to patrol the borders of water bodies for long distances (Subramanian *et al.*, 2018).

The present communication not only reports a new species for the state of West Bengal, but also reports an observation of teneral of the same, from the nearby area indicates its breeding distribution in the region.

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Fig 1: Adult female *Gomphidia t-nigrum* from Study site S1 on 1st June 2023



Fig 2: Teneral *Gomphidia t-nigrum* from Study site S2 on 2nd June 2023

DIVERSITY OF MANTIDS (MANTODEA: INSECTA) IN AND AROUND SELOO CITY, MAHARASHTRA, WITH A SYNOPSIS OF THE RECORDED MANTID FAUNA OF THE VIDARBHA REGION IN INDIA

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ABSTRACT

The present study was carried out to document the mantid diversity in Seloo city and its surrounding area in Maharashtra, central India. During the study period of 2015 to 2022, a total of 23 species of mantids belonging to 18 genera and 8 families, with 11 subfamilies were recorded. Out of these, the species *Gonypteryllis semuncialis*, *Odontomantis pulchra*, *Didymocorypha lanceolata*, *Dysaules himalayanus*, *Dysaules longicollis*, *Mantis religiosa religiosa*, *Hierodula membranacea*, *Hierodula coarctata*, *Hierodula ventralis*, *Deiphobe infuscata*, *Deiphobe mesomelas*, *Toxoderopsis taurus*, *Aethalochroa ashmoliana*, *Empusa guttula* and *Gongylus gongyloides* are reported for the first time from Vidarbha region of Maharashtra. The Family Mantidae is represented by the greatest number of species. Mantidae is represented by 6 species, Gonyptetidae (2 species), Hymenopodidae (3 species), Eremiaphilidae (4 species), Nanomantidae

(1 species), Rivetinidae (2 species), Toxoderidae (3 species) and Empusidae (2 species). The present study also includes an updated list of mantid species from Vidarbha region of Maharashtra. This list includes 32 species belonging to 22 genera, 14 subfamilies and 8 families. The mantid fauna of the Vidarbha region is comparatively less studied than that of the northern Western Ghats in Maharashtra. The study supports the value of an urban area in providing suitable habitat for mantids.

Key words: Mantodea, Mantid, Diversity, Vidarbha, Central India

INTRODUCTION

Mantids are predatory insects known as "Praying mantids" that play an important role in terrestrial ecosystems. Praying mantids are a fascinating group of raptoria or snatchers. Mantids have been around since the Paleocene period (Roy, 1996).

The name praying mantis is derived from the habit of holding the front legs up in a praying posture while waiting for the prey. They keep a close eye on and stalk their prey. They are carnivorous and feed almost entirely on insects, which can range from moths to caterpillars, flies, grasshoppers, and aphids. Their triangular head swivels freely atop, with large compound eyes and chewing mouthparts, and an array of spines on the forelegs. Their cryptically coloured body adds to their resemblance to bark, twigs, leaves, or flowers. To summarize, these highly evolved ambush predators, with specific prey capture, camouflage, and reproductive habits, play an important role in the natural control of insect pests. They are found in almost all tropical and semitropical habitats, but are less common in colder climates (Mukherjee *et al.*, 1995). Mantids exhibit intriguing behavioural patterns. They groom themselves frequently, wiping their eyes and heads with their forelegs and cleaning their forelegs with their mouths. When threatened, most species attempt to run or fly away. They are good fliers, but movement is restricted in species with reduced wing venation and awkward body structure.

Mantids are generalist feeders that can catch and eat arthropods of equal or smaller size. Mantid nymphs typically feed on sedentary insects such as aphids that are easily accessible. Mantids can remain motionless for hours on end, only moving their heads to observe flying insects that serve as food. They have a neck that allows them to rotate their heads 180° while waiting for a meal to pass by. Mantid's camouflage colouring allows

them to blend in with the environment as they sit on twigs and stems waiting to ambush prey. They use their front legs to attack and capture their prey. Long, sharp spines on the insides of their legs allow them to grip their prey tightly. While being eaten, the impaled prey is held firmly in place. Mantids are cannibals and will consume each other if given the chance.

India has a diverse mantid fauna, with 169 species of mantids under 69 genera in 13 families and 7 superfamilies known from the entire country (Kamila & Sureshan, 2022). There are over 2500 species of mantids worldwide, classified into 436 genera and 31 families (Otte *et al.*, 2021). Ghate *et al.* (2012) reported 56 species of mantids belonging to 18 genera and 13 families from Maharashtra. Moreover, mantid fauna of Maharashtra part of Western Ghats are fairly well studied (Chaturvedi & Hegde, 2000; Chaturvedi *et al.*, 2005; Ghate & Ranade, 2002; Jadhav, 2008, 2009; Mukherjee & Ghate, 2007, 2010; Sureshan *et al.*, 2006a) as compared to Vidarbha region of Maharashtra (Sureshan *et al.*, 2004 a, b, 2006 b; Jadhav *et al.* 2006). The present study was undertaken to understand the diversity of mantids in and around Seloo city, since there was no known published work on mantids of the Seloo, Wardha district of Maharashtra. The research is based on collections made between 2015 to 2022. This resulted in the identification of 23 species from 18 genera, 11 subfamilies, and 8 families. In addition, a list of mantid species known from the Vidarbha region is provided.

MATERIAL AND METHOD

Seloo city (20083°73"N; 78070°70"E; 265 m) is located close to the Bor Wildlife Sanctuary on the bank of the river Bor. There is dense natural vegetation and the insects feeding on this vegetation attract the mantis species. Seloo has a tropical dry climate with an average annual rainfall of 1,205 mm (June to September); summertime highs can reach 48.9°C, and wintertime lows can reach 10°C to 6.9°C. The range of the annual relative humidity is 22% to 80% (Tiple, 2011; Tiple *et al.*, 2013).

The collection was made from 2015 to 2022 using insect net or specimens were captured by hand. Species preferring dense shrubby, bushes in plains were collected during late evening and at night. The collected specimens were preserved by dry preservation method. The specimens were measured in mm and identified according to Mukherjee *et al.* (1995) and Vyjayandi (2007). The material studied is kept in the Department of Zoology at Dr. R.G. Bhojar ASC College Seloo, District Wardha, Maharashtra (Registration Numbers VBCS, DZ/ 30 to 53; 01.V.2018). The total length of the body is measured from the tip of the vertex to the end of the abdomen, pronotum, metazona, width of the pronotum, fore wing and hind wing; fore legs - length of coxa, femur, and tibia; vertex protuberance, if present, is also measured; and the spines on the femora and tibia were counted. All scientific names follow by Ehrmann & Roy (2002), Ehrmann (2002) and Roy (2004).

RESULT AND DISCUSSIONS

A total of 23 species of mantids belonging to 18 genera and 8 families with including 11 subfamilies were recorded (Fig.1, 2). The greatest number of mantids belong to the families Mantidae (6 species), followed by Eremiaphilidae (4 species), Hymenopodidae (3 species), Toxoderidae (3 species), Gonypetidae (2 species), Rivetinidae (2 species), Empusidae (2 species) and Nanomantidae (1 species). Out of these, the species *Gonypetyllis semuncialis* Wood-Mason, 1891, *Odontomantis pulchra* (Fabricius, 1787), *Didymocorypha lanceolata* (Fabricius, 1798), *Dysaules himalayanus* Wood-Mason, 1889, *Dysaules longicollis* Stål, 1877, *Mantis religiosa religiosa* (Linne, 1758), *Hierodula membranacea* Burmeister, 1838, *Hierodula coarctata* Saussure, 1869, *Hierodula ventralis* Giglio-Tos, 1912, *Deiphobe infuscata* (Saussure, 1870), *Deiphobe mesomelas* Olivier, 1792, *Toxoderopsis taurus* Wood-Mason, 1889, *Aethalochroa ashmoliiana* (Westwood, 1841), *Empusa guttula* (Thunberg, 1815) and *Gongylus gongylodes* (Linne, 1758) are reported for the first time from Vidarbha region of Maharashtra (See Table 1 and Fig.2).

Members of the genera *Hierodula* Burmeister, 1838 and *Statilia* Stål, 1877 are most abundant during monsoon and post-monsoon periods as a result of mass emergence. The bark-dwelling species of *Humbertiella* Saussure, 1869 and some species of *Odontomantis* Saussure, 1871 are widely distributed (Mukherjee *et al.*, 1995). Preference to specific ecological niches may help grouping of mantids. For example, species of *Schizocephala*

Serville, 1831 are restricted to the plains or grassy meadows or sometimes to the adjoining field crops and herbaceous vegetation. The small and medium size mantis *Statilia* Stål, 1877 and *Creobroter* Audinet- Serville, 1839 prefer dense shrubby bushes on plains and hillsides. The larger species prefer trees and densely forested areas. The bark-dwellers live on or underneath the bark.

Records of 23 species of mantids from Seloo, Wardha district of Maharashtra, belonging to 18 genera, 8 families, and 11 subfamilies. 14 species and one subspecies of the *Mantis religiosa* species, out of the 23 reported species from the Seloo region, were recorded for the first time in Vidarbha region of Maharashtra. *Gonypteryllis semuncialis* Wood-Mason, 1891 is one of the smallest species of praying mantis. According to the characteristics listed by Mukherjee *et al.* in 1995, we have determined the species to be *Cheddikulama straminea* Henry, 1932, but Mukherjee *et al.* in 2014 misidentified it as *Heterochaetula fissispinis* Wood-Mason, 1889. According to the characteristics listed by Mukherjee *et al.* in 1995, we had treated the species as *Euantissa pulchra* (Fabricius, 1787), but the species has recently been treated as *Odontomantis pulchra* (Fabricius, 1787) (Svenson *et al.*, 2015). According to the characteristics listed by Mukherjee *et al.* in 1995, we have named the species *Deiphobe incisa* Werner, 1933 as *Deiphobe mesomelas* Olivier, 1792 (Schwarz *et al.*, 2018). According to the characteristics listed by Mukherjee *et al.* in 1995, we have named the species *Ephestiasula pictipes* (Wood-Mason, 1879), but (Schwarz *et al.*, 2018) have

synonymized it with *Ephestiasula rogenhoferi* (Saussure, 1872).

Updated list of mantid species from Vidarbha region of Maharashtra is also included. 9 species of mantids were reported from Pench National Park by Sureshan *et al.* (2004). Following that, Sureshan *et al.* (2006) reported 10 species of mantids from the Tadoba Andhari Tiger Reserve. In addition, Jadhav *et al.* (2006) reported 5 species of mantids from Pench National Park. The compilation of all these studies in Vidarbha region and stray records resulted in the enumeration of 32 species belonging to 22 genera representing 8 families. The highest number of mantids recorded belonged to the family Mantidae (8), followed by Hymenopodidae (6), Gonypteryllidae (5), Eremiaphilidae (4), Toxoderidae (3), Rivetiniidae (3), Empusidae (2) and Nanomantidae (1)

Chapekar *et al.* (2021) reported 9 species from Gorewada reserve forest, Nagpur, Vidarbha region. The paper incorrectly identifies the genus *Paraoxypilus* Saussure, 1870 actually not found in India. Since it appeared that these reports could possibly be based on a misidentified mantis, it was thought better to not include these in the checklist of Vidarbha.

The list of Mantids so far known from Vidarbha region of Maharashtra
SYSTEMATIC ACCOUNT
 (Classification after Schwarz and Roy, 2019)

Class INSECTA
 Order MANTODEA Latreille, 1802

Superfamily GONYPETOIDEA

Westwood, 1889

Family Gonypetidae Westwood, 1889**Subfamily Gonypetinae** Westwood, 1889**Tribe Gonypetini** Westwood, 1889**Subtribe Gonypetyllina**Genus *Gonypetyllis* Wood-Mason, 18911. *Gonypetyllis semuncialis* Wood-Mason, 1891**Subtribe Humbertiellina** Brunner de Wattenwyl, 1893Genus *Humbertiella* Saussure, 18692. *Humbertiella indica* Saussure, 18693. *Humbertiella ceylonica* Saussure, 18694. *Humbertiella affinis* Giglio-Tos, 1917**Subfamily Iridopteryginae** Giglio-Tos, 1915**Tribe Amantini**Genus *Amantis* Giglio-Tos, 19155. *Amantis saussurei* (Bolivar, 1897)**Superfamily HYMENOPOIDEA** Giglio-Tos, 1915**Family Empusidae** Burmeister, 1838**Subfamily Empusinae** Burmeister, 1838**Tribe Empusini** Burmeister, 1838**Subtribe Empusina** Burmeister, 1838Genus *Empusa* Illiger, 17986. *Empusa guttula* (Thunberg, 1815)Genus *Gongylus* Thunberg, 18157. *Gongylus gongylodes* (Linne, 1758)**Family Hymenopodidae** Giglio-Tos, 1915**Subfamily Oxypilinae** Saussure, 1871**Tribe Hestiasulini** Giglio-Tos, 1915Genus *Hestiasula* Saussure, 18718. *Hestiasula brunneriana* Saussure, 1871Genus *Ephestiasula* Giglio-Tos, 19159. *Ephestiasula rogenhoferi* (Saussure, 1872)**Subfamily Hymenopodinae** Giglio-Tos, 1915**Tribe Anaxarchini** Giglio-Tos 1919Genus *Odontomantis* Saussure, 187110. *Odontomantis pulchra* (Fabricius, 1787)**Tribe Hymenopodini** Giglio-Tos, 1915**Subtribe Pseudocreobotrina** Brunner de Wattenwyl, 1893Genus *Creobroter* Audinet- Serville, 183911. *Creobroter apicalis* Saussure, 186912. *Creobroter laevicollis* (Saussure, 1870)**Subfamily Phyllothelyinae** Brunner de Wattenwyl, 1893**Tribe Phyllothelyini** Brunner de Wattenwyl, 1893Genus *Phyllothelys* Wood-Mason, 187713. *Phyllothelys westwoodi* (Wood-Mason, 1876)**Superfamily EREMIAPHILOIDEA** Saussure, 1869**Family Eremiaphilidae** Saussure, 1869**Subfamily Iridinae** (Westwood, 1889)**Tribe Didymocoryphini**

Genus *Didymocorypha* Wood-Mason, 1877

14. *Didymocorypha lanceolata* (Fabricius, 1798)

Tribe Dysaulini (Giglio-Tos, 1919)

Genus *Dysaules* Stål, 1877

15. *Dysaules himalayanus* Wood-Mason, 1889

16. *Dysaules longicollis* Stål, 1877

Tribe Schizocephalini Saussure, 1869

Genus *Schizocephala* Serville, 1831

17. *Schizocephala bicornis* (Linne, 1758)

Family Rivetiniidae Ehrmann & Roy, 2002

Subfamily Deiphobinae

Tribe Deiphobini

Genus *Deiphobe* Stål, 1877

18. *Deiphobe infuscata* (Saussure, 1870)

19. *Deiphobe mesomelas* (Olivier, 1792)

20. *Deiphobe indica* Giglio-Tos, 1916

Family Toxoderidae Saussure, 1869

Subfamily Toxoderinae Saussure, 1869

Tribe Toxoderopsini Ehrmann & Roy, 2002

Genus *Toxoderopsis* Wood-Mason, 1889

21. *Toxoderopsis taurus* Wood-Mason, 1889

Tribe Aethalochroini Giglio-Tos, 1914

Genus *Aethalochroa* Wood-Mason, 1877

22. *Aethalochroa ashmoliana* (Westwood, 1841)

Subfamily Oxyothespinae Giglio-Tos, 1916

Tribe Heterochaetulini n. trib.

Genus *Heterochaetula* Wood-Mason, 1889

23. *Heterochaetula fissispinis* Wood-Mason, 1889

Superfamily NANOMANTOIDEA

Brunner de Wattenwyl, 1893

Family Nanomantidae Brunner de Wattenwyl, 1893

Subfamily Trepidomantinae Giglio-Tos, 1915

Tribe Trepidomantini Giglio-Tos, 1915

Genus *Eomantis* Giglio-Tos, 1915

24. *Eomantis guttatipennis* (Stål, 1877)

Superfamily MANTOIDEA Latreille, 1802

Family Mantidae Latreille, 1802

Subfamily Mantinae Latreille, 1802

Genus *Statilia* Stål, 1877

25. *Statilia maculata* (Thunberg, 1784)

26. *Statilia nemoralis* (Saussure, 1870)

Genus *Mantis* Linne, 1758

27. *Mantis religiosa* Linne, 1758

Sub-species *Mantis religiosa religiosa* (Linne, 1758)

Sub-species *Mantis religiosa inornata* Werner, 1930

Subfamily Hierodulinae Brunner de Wattenwyl, 1893

Tribe Hierodulini Brunner de Wattenwyl, 1893

- Genus *Hierodula* Burmeister, 1838
 28. *Hierodula tenuidentata* Saussure, 1869
 29. *Hierodula coarctata* Saussure, 1869
 30. *Hierodula membranacea* Burmeister, 1838
 31. *Hierodula ventralis* Giglio-Tos, 1912

Subfamily Tenoderinae Brunner de Wattenwyl, 1893

Tribe Tenoderini Brunner de Wattenwyl, 1893

Subtribe Tenoderina

- Genus *Tenodera* Burmeister, 1838
 32. *Tenodera* sp. Burmeister, 1838

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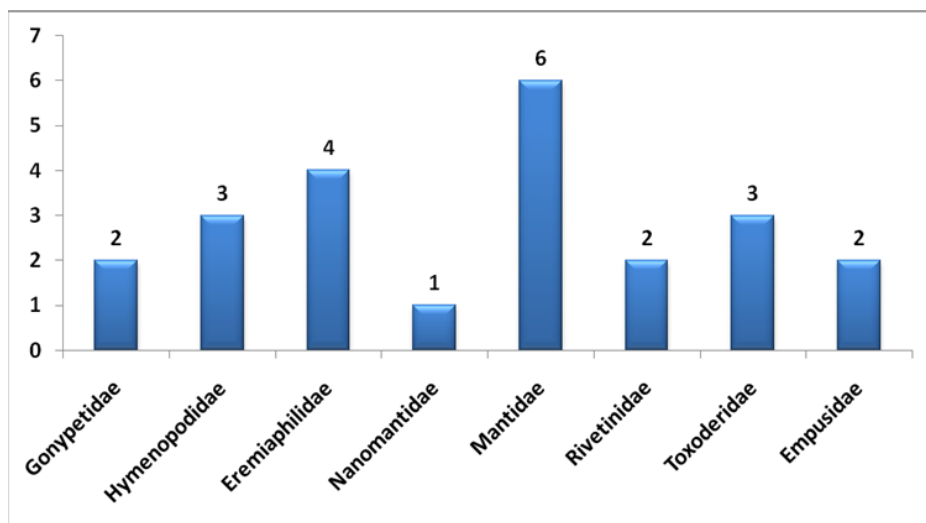
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Table 1: Mantis species of Seloo city and surroundings

Sr. No.	Scientific Name
Family: Gonypetidae	
1.	<i>Humbertiella indica</i> Saussure, 1869
2.	<i>Gonypetyllis semuncialis</i> Wood-Mason, 1891
Family: Hymenopodidae	
3.	<i>Hestiasula brunneriana</i> Saussure, 1871
4.	<i>Ephestiasula rogenhoferi</i> (Saussure, 1872)
5.	<i>Odontomantis pulchra</i> (Fabricius, 1787)
Family: Eremiaphilidae	
6.	<i>Didymocorypha lanceolata</i> (Fabricius, 1798)
7.	<i>Dysaules himalayanus</i> Wood-Mason, 1889
8.	<i>Dysaules longicollis</i> Stål, 1877
9.	<i>Schizocephala bicornis</i> (Linne, 1758)
Family: Nanomantidae	
10.	<i>Eomantis guttatipennis</i> (Stål, 1877)
Family: Mantidae	
11.	<i>Statilia maculata</i> (Thunberg, 1784)
12.	<i>Mantis religiosa religiosa</i> (Linne, 1758)
13.	<i>Hierodula tenuidentata</i> Saussure, 1869
14.	<i>Hierodula coarctata</i> Saussure, 1869

15.	<i>Hierodula membranacea</i> Burmeister, 1838
16.	<i>Hierodula ventralis</i> Giglio-Tos, 1912
Family: Rivetiniidae	
17.	<i>Deiphobe infuscata</i> (Saussure, 1870)
18.	<i>Deiphobe mesomelas</i> (Olivier, 1792)
Family: Toxoderidae	
19.	<i>Toxoderopsis taurus</i> Wood-Mason, 1889
20.	<i>Aethalochroa ashmoliana</i> Westwood, 1841
21.	<i>Heterochaetula fissispinis</i> Wood-Mason, 1889
Family: Empusidae	
22.	<i>Empusa guttula</i> (Thunberg, 1815)
23.	<i>Gongylus gongyloides</i> (Linne, 1758)

Figure 1: Family wise distribution of species





Humbertiella indica



Schizocephala bicornis



Mantis religiosa



Hierodula tenuidentata



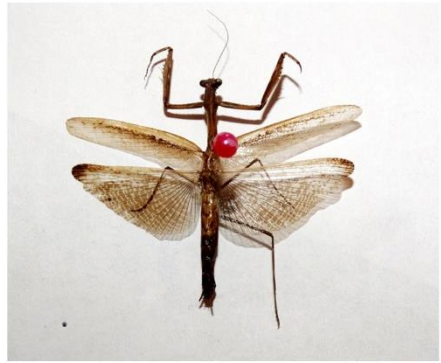
Hierodula ventralis



Deiphobe infusata



Eomantis guttatipennis



Statilia maculata



Hierodula coarctata



Hierodula membranacea



Deiphobe mesomelas



Gonypetyllis semuncialis



Toxoderopsis taurus



Aethalochroa ashmoliana



Gongylus gongylodes



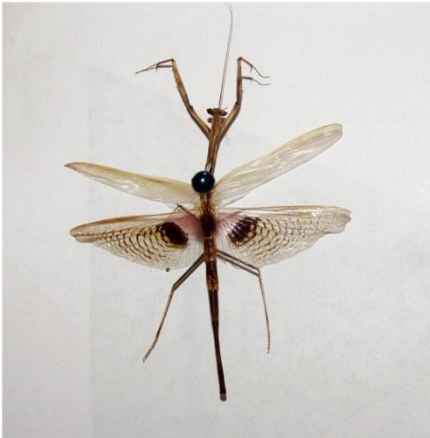
Hestiasula brunneriana



Didymocorypha lanceolata



Dysaules himalayanus



Heterochaetula fissispinis



Empusa guttula



Ephestiasula rogenhoferi



Odontomantis pulchra



Dysaules longicollis



Schizocephala bicornis

**CONFIRMATION OF CONTINUED PRESENCE OF THE PAINTED
COURTESAN BUTTERFLY *EURIPUS CONSIMILIS* WESTWOOD,
1850 (LEPIDOPTERA: NYMPHALIDAE) IN DEHRA DUN,
UTTARAKHAND**

TEJASWINI PRAMOD MANKAR

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Reviewer: Peter Smetacek

Mackinnon & de Nicéville (1899) were the first to mention the presence of *Euripus consimilis* (Westwood, 1850) as a very rare sighting (two males and six females) from Dehradun, Uttarakhand. Subsequently, Ollenbach (1930) studied the butterflies of Mussoorie town, which is part of Dehradun district, but he did not include Dehradun valley, and did not record this butterfly among the 149 species reported. Singh & Bhandari (2003) mentioned *E. consimilis* among those 28 species which were observed previously by Mackinnon & de Nicéville (1899) but were not observed during their survey in the Dehra Dun valley.

Singh & Sondhi (2016) reported the presence of *E. consimilis* in Dehra Dun valley, however, *E. consimilis* was again missing from Singh (1999) and Singh (2022), documenting 155 and 148 species of butterflies respectively, from New Forest spread over 450 hectares in the Dehra Dun valley.

Recently, I observed a single male of *E. consimilis* on April 6, 2022 inside the Central Academy for State Forest Service

campus, New Forest, at an elevation of around 670 m. This sighting confirms its continued presence in the Dun valley. The butterfly was observed for over a minute and photographed (Figures 1 & 2).

The butterfly was identified with the help of Kehimkar (2016), Smetacek (2018) and Sondhi *et al.*, (2018). The study area is as per the map of the New Forest (Singh, 2022). Although my observations on butterflies were carried out during all seasons of the year from August 2021 to July 2023, *E. consimilis* was only sighted once.

The known western limit of the distribution of *E. consimilis* is Dehradun, with its range extending eastwards to Assam and Myanmar (Wynter-Blyth, 1957); and in South India in Western Ghats and Eastern Ghats (Kehimkar, 2016). It has never been reported in numbers and this might be because the female appears to be a Batesian mimic of a generic Danaine model, perhaps *Parantica* Moore, [1883].

The recent observation of this butterfly in Dehradun confirms its continued presence at the western extremity of its distribution.

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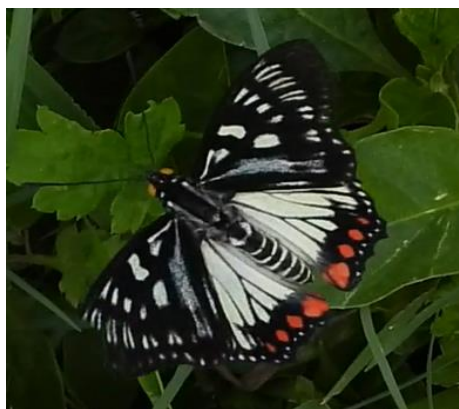


Fig 1: Painted Courtesan UN Male **Fig 2:** Painted Courtesan UP Male

**PASIPHILA PALPATA (WALKER, 1862) (LEPIDOPTERA:
GEOMETRIDAE: LARENTIINAE) FEEDS ON FLOWERS OF
RHODODENDRON ARBOREUM IN THE LARVAL STAGE**

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Reviewer: *Jatishwor S. Irungbam*

Pasiphila palpata (Walker, 1862) is a widespread Geometrid moth, recorded from northern India, southern India, Sri Lanka (Hampson, 1895), to western China, Taiwan, Java and Borneo (Holloway, 1997). Holloway (1997) noted in the generic account of *Pasiphila* Meyrick, 1883 that the larvae of European species feed on the flower of shrubs in Rosaceae and Ericaceae in Britain and Japan, where Theaceae are also involved, with a record of *Pasiphyla viridescens* (Warren, 1895) feeding on *Rhododendron* (Ericaceae) in New Guinea.

On January 1, 2024, the second author noted that *Rhododendron arboreum* was flowering near Gagar, Nainital district, Uttarakhand at around 2200 m elevation. On January 3, 2024, both authors visited the flowering trees and collected some flowers for analysis. Some of the flowers contained greenish larvae which were bred (Figures 1-7).

The 3 larvae discovered fed on the petals of *Rhododendron* flowers, with only one stamen of one floret being presumably eaten by them, since that floret did not

contain the usual number of stamens when examined.

The larvae were of different sizes when found and pupated on 14.i.2024 x 2 and 16.i.2024 x 1.

The pupae were initially green (Figure 8) but later turned brownish. The pupae were not attached to any surface and presumably the larvae would burrow under the soil to pupate. Three moths emerged around 14.ii.2024 (exact date of emergence was not recorded because it was not expected that they would emerge so soon in the cold weather) (Figure 9).

Specimens figured in Figure 9 are deposited in the collection of the Butterfly Research Centre, Bhimtal, Uttarakhand.

Remarks: The moth has been recorded from Dharamsala (1457 m), the Nilgiris and Sri Lanka (Hampson, 1895) which are known localities for *R. arboreum*. Similarly, it has been reported in Nepal from Godavari (1600 m) and Basantapur (2200 m), also with *R. arboreum* trees (Yazaki, 1995). The present record is also

from *Rhododendron* flowers. Although the larval hostplant of *P. palpata* was not reported earlier, it seems likely that it is restricted to habitats with *R. arboreum* in India, Nepal and Sri Lanka.

In the Himalaya, *R. arboreum* grows at altitudes where winter snow is a regular phenomenon; however, there is no snow in southern India and Sri Lanka, although the tree grows on the highest mountains in those areas.

It was reported by Yazaki (1995) as on the wing in March and April in Nepal, which coincides with the flowering of *R. arboreum*. The present record was from a remarkably early flowering tree of *R. arboreum*. Three flowers were collected, and three larvae were found, one in each flower, but only one floret of each flower was infected. Therefore, infestation is relatively high. It is not known if there are later generations of the moth during the

year, but it seems unlikely, since *R. arboreum* only flowers from December to June in the Himalaya (Osmaston, 1927).

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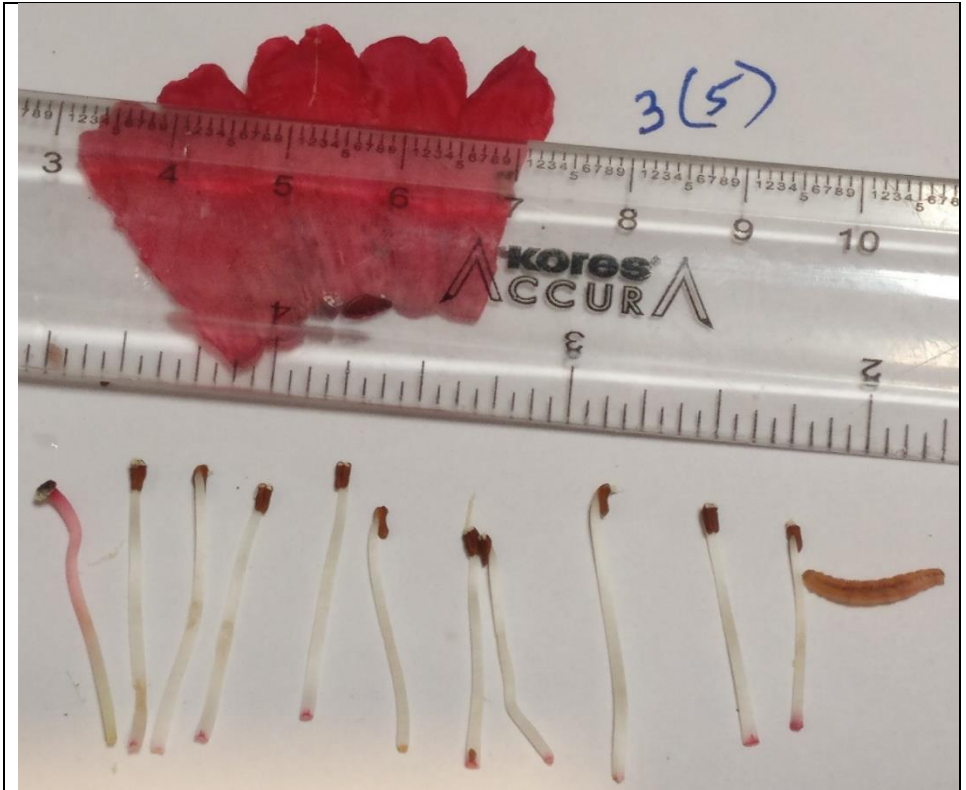


Fig 1: *Rhododendron arboreum* flower, with larva on extreme right.



Figure 2 & 3. Dorsal and lateral view of mature larva 1



Figure 4 & 5. Dorsal and lateral view of larva 2



Figure 6 & 7. Dorsal and ventral view of larva 3.



Figure 8. Pupa.



Figure 9. Adult *P. palpata* that emerged from the larvae

GEOMETRIDAE (ENNOMINAE) LEPIDOPTERA FROM MIZORAM, INDIA

PART-II

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Reviewer: Peter Smetacek

INTRODUCTION

With reference to the previous report on 30 species of Geometrid moths under subfamily Ennominae from Mizoram (Lalngahpuii *et al.*, 2022) the current study deals with the addition of 20 species referring to 13 genera under Ennominae with their original references, distinctive characters and short remarks for each species. The reported species are enumerated as follows:

I. Genus *Biston* Leach [1815] 1830

Biston Leach, [1815]; in Brewster, *Edinburgh Ency.* 9:134

1. *Biston panterinaria* (Bremer & Grey, 1853)

Biston panterinaria (Bremer & Grey, 1853), *Descr. new Indian Lepid Insects Colln late Mr W.S. Atkinson* (3): 266

Forewing: Male: 74mm

Material examined: 1♂: 13.x.2020, Tamdil, Saitual district, 767m; 1♂:

15.vii.2020, Hmuifang, Aizawl district, 1485m

Distribution: Arunachal Pradesh, Meghalaya

Distinctive features: This species differs from its congeners as it mimics species of the genus *Abraxas* Leach. It is of robust build similar to its congeners. Adult with both wings ground color white irrorated with pale grey markings. Antennae bipectinated, forewing costa speckled with grey, apex slightly produced, base of costa with brown patch, base of forewing grey with a prominent brown patch. Both wings with a grey rounded discal patch. Underside of both wings with grey discal cell patch with a central brown patch.

Remarks: This species is recorded at an elevation above 700m. The current study reports this species for the first time from Mizoram.

II. Genus *Cleora* Curtis, 1825

Curtis, 1825, *Br. Ent.*, 2: 88

2. *Cleora fraterna* (Moore, 1888)

Cleora fraterna (Moore, 1888), *Descr. new Indian Lepid Insects Colln late Mr W.S. Atkinson* (3): 245

Forewing: Male: 40mm

Material examined: 1♂: 29.x.2019, Hmuifang, Aizawl district, 1485m; 1♂: 13.iv.2021, Rahum, Kolasib district, 143m

Distribution: Assam, Uttarakhand, Karnataka, West Bengal, Tripura

Distinctive features: Adult wings ground color pale brown irrorated with grey. Both wings with ante and post medial crenulated lines and a prominent discal cell spot.

Remarks: Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

III. Genus *Corymica* Walker, 1860

Walker, 1860, *List Specimens lepid. Insects Colln Br. Mus.*, 20: 230

3. *Corymica vesicularia* Walker, 1866

Caprilia vesicularia Walker, 1866, *List Specimens lepid. Insects Colln Br. Mus.* 35: 1569

Forewing: Male: 36-38mm

Material examined: 1♂: 15.x.2019, Siaha, Siaha district, 1003m; 1♂: 30.x.2019, Hmuifang, Aizawl district, 1485m.

Distribution: Dharamsala, Sikkim, Nilgiris, Ceylon

Distinctive features: Wings ground color yellow, broken an oblique mark on forewing dorsum; a clear and transparent vesicle on base of forewing. Female lacks vesicle on forewing dorsum.

Remarks: This species is recorded only above an altitude of 1000m. Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

IV. Genus *Eilicrinia* Hubner, [1823]

Eilicrinia Hubner, [1823]; *Verz.bek. Schmett* (18): 287

4. *Eilicrinia flava* (Moore, 1888)

Noreia flava Moore, 1888; *Descr. Indian lep. Atkinson* (3): 233

Eilicrinia flava (Moore, 1888)

Forewing: Male: 34mm

Material examined: 1♂: 4.viii.2021, West Phaileng, Mamit district, 776m; 2♂: 1.xi.2019, Hmuifang, Aizawl district, 1485m; 1♂: 15.vii.2020, Hmuifang, Aizawl district, 1485m; 1♂: 6.ix.2021, Palak dil, Siaha district, 273m

Distribution: Chekiang, China, Sikkim, Khasis, Nagas.

Distinctive features: Adult with wings ground color yellow with prominent irregular brown spot on forewing discal area. Small dark patch below forewing apex, both wings with single reddish postmedial line.

Remarks: This is the first report of this species from Mizoram.

V. Genus *Hypomecis* Hubner, 1821

Hubner, 1821, *Index exot. Lepid.*, 1821: 7

5. *Hypomecis cineracea* (Moore, 1888)

Astacuda cineracea Moore, 1888; *Descr. Indian lep. Atkinson* (3): 244

Forewing: Male: 54-58 mm

Material examined: 1♂: 25.xi.2020, Hmuifang, Aizawl district, 1485m; 2♂: 5.xii.2019, MZU Campus, Aizawl district, 804 m

Distribution: Sikkim, Khasis (Meghalaya).

Distinctive features: Adult wings ground color pale brown with uniform warm grey, both wings with dark brown fasciation and discal marks.

Remarks: Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

6. *Hypomecis lioptilaria* Swinhoe, 1903

Boarmia lioptilaria Swinhoe, 1903; in Annandale & Robinson, *Fasc. Malay Zool.* 1: 91

Forewing: Male: 37-38 mm

Material examined: 1♂: 15.vii.2022, North Hlimen, Kolasib district, 671m; 1♂: 2.viii.2021, West Phaileng, Mamit district, 776m

Distribution: NE Himalaya, Thailand, Sundaland.

Distinctive features: Adult scales uniformly darkish brown on both wings

which is diagnostic feature of this species from its congeners. Forewing with discal spot below costa; postmedial line crenulated. Hindwing with prominent discal spot.

Remarks: The study reported this species for the first time from Mizoram

7. *Hypomecis separata* Walker, 1860

Boarmia separata Walker, 1860, *List Specimens lepid. Insects Colln. Br. Mus.*, 21: 381

Forewing: Male: 46-48 mm

Material examined: 2♂: 15.x.2020, MZU Campus, Aizawl district, 804m; 2♂: 5.x.2022, Tamdil, Saitual district, 767m

Distribution: Sikkim, Khasis, Ceylon, Java, Borneo

Distinctive features: Adult ground color dark brown with pale broad brown zones along forewing costa, marginal area of both wings wavy, discal spots on pale brown area of forewing. Hindwing brown groundcolour irrorated with black, two small discal spots near inner margin.

Remarks: This species is reported here for the first time from Mizoram

8. *Hypomecis transcissa* (Walker, 1860)

Boarmia transcissa Walker, 1860 *List Specimens lepid. Insects Colln Br. Mus.*, 21: 380

Forewing: Male: 36-38 mm

Material examined: 1♂: 14.x.2020, Tamdil, Saitual district, 767m; 1♂: 5.xii.2019, MZU Campus, Aizawl district, 804m

Distribution: Sikkim, Dharamsala, Bhutan, Assam, Nilgiris, Ceylon, Burma, Java, Mumbai, N.E. Himalaya to Taiwan and Sundaland.

Distinctive features: Ground colour cineraceous, tinged with fawn, thickly and minutely speckled with brown spots. Wings moderately broad, subbasal, medial, postmedial and submarginal lines brown, submarginal line shaded with pale brown.

Remarks: Ghosh (2007) reported a single male specimen from Aibawk, Mizoram under the name *Boarmia transcissa*.

VI. Genus *Hypochrosis* Guenee in Boisduval & Guenee, 1857

Hypochrosis Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.* 10: 536

9. *Hypochrosis iris* (Butler, 1880)

Phoenix iris Butler, 1880; *Ann. Mag. nat. Hist.* (5) 6 (32): 122

Forewing: Male 33-34mm

Material examined: 1♂: 25.viii.2022, Serchhip, Serchhip district, 546m; 1♂: 13.x.2020, Tamdil, Saitual district, 767m

Distribution: Assam, Uttarakhand, Sumatra.

Distinctive features: Adult wings dark grey traverse by green bands medially, that of the forewing bounded distally by an

oblique postmedial, extending at the dorsum to antemedial but narrowing anteriorly. A prominent discal mark on forewing.

Remarks: This species is reported here for the first time from Mizoram.

VII. Genus *Hyposidra* Guenee in Boisduval & Guenee, 1857

Hyposidra Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.* 10: 150

10. *Hyposidra infixaria* (Walker, 1860)

Lagyra infixaria Walker, 1860; *List Spec. Lepid. Insects Colln Br. Mus.* 20: 60

Forewing: Male: 34mm

Material examined: 1♂: 23.viii.2022, Serchhip, Serchhip district, 546m; 1♂: 1.iv.2021, MZU Campus, Aizawl district, 804m; 1♂: 13.x.2020, Tamdil, Saitual district, 767 m

Distribution: Khasis, Moulmein, Rangoon, Sumatra, Java, Borneo.

Distinctive features: Adult with wings ground color ochreous irrorated densely with black specks, wings slightly falcate. Antennae bipectinate, head and frons brown. Forewing with fuscous fasciae on basal costal area, a distinctive oblique rufous streak from apex often appearing to join costal area. A postmedial rufous line angled below costa, with indistinct sinuous line beyond it. A submarginal sinuous line with white lunules on it towards costa. Hindwing with small speck at end of cell; an indistinct medial and postmedial line, subapical areas with white specks.

Underside with prominent postmedial line on both wings.

Remarks: Ghosh (2007) reported a single male specimen from Aibawk, reporting it for the first time from Mizoram.

VIII. Genus *Krananda* Moore, 1868

Krananda Moore, [1868]; *Proc. zool. Soc. Lond.* 1867: 648

11. *Krananda lucidaria* Leech, 1897

Krananda lucidaria Leech, 1897; *Ann. Mag. Nat. Hist.* (6) 19: 305

Forewing: Male: 48mm

Material examined: 1♂: 28.x.2019, Hmuifang, Aizawl district, 1485m; 1♂: 1.xi.2022, Reiek, Mamit district, 1220m

Distribution: W. and S China, N. Thailand, Peninsular Malaysia, Sumatra, Borneo, Nagaland, Meghalaya

Distinctive features: Adult with forewing antemedial pale; delineated with black on either side, a complex blackish zone on the forewing dorsum just interior to brown border; hindwing has small discal spot and an entire antemedial band.

Remarks: Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

12. *Krananda semihyalina* Moore, 1868

Krananda semihyalina Moore, [1868]; *Proc. zool. Soc. Lond.* 1867: 648

Forewing: Male: 52-54 mm

Material examined: 1♂: 2.xii.2022, Reiek, Mamit district, 1220 m; 3♂: 28.x.2019, Hmuifang, Aizawl district, 1485 m; 1♂: 23.vii.2019, Champhai, Champhai district, 1458 m

Distribution: Uttarakhand, Sikkim, Meghalaya, Arunachal Pradesh.

Distinctive features: Adult brownish grey, both wings crenulated, hyaline; veins, costa and outer third of wings grey brown, irrorated with black.

Remarks: Ghosh (2007) reported both male and female specimens from Aibawk, while the current study reported only the male specimen.

IX. Genus *Plutodes* Guenee, 1857

Plutodes Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.* 10: 117

13. *Plutodes costatus* (Butler, 1886)

Garaeus costatus Butler, 1886; *Ill. typical Spec. Lep. Het. Colln Br. Mus.* 6: 53

Forewing: Male: 24-26 mm

Material examined: 1♂: 15.x.2020, MZU Campus, Aizawl district, 825m; 2♂♂: 29.x.2019, 1485 m, Aizawl district.

Distribution: Arunachal Pradesh, Sikkim, Himachal Pradesh, Meghalaya.

Distinctive features: Wings almost entirely covered with rufous suffusion. Forewing with costal margin yellow with three irregular spurs, yellow patch on tornus. Hindwing fasciae similar to forewing but

rufous patch covering entire surface with a small yellowish patch on costa.

Remarks: Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

14. *Plutodes discigera* Butler, 1880

Plutodes discigera Butler, 1880; *Ann. Mag. nat. Hist.* (5) 6 (33): 223

Forewing: Female: 15-17mm

Material examined: 2♀♀: 3.x.2019, Hmuifang, Aizawl district, 1485m; 1♀: 9.iv.2019, Ngopa, Saitual district, 1195m.

Distribution: Sikkim, Arunachal Pradesh, Assam.

Distinctive features: Wings ground color yellow. Forewing with costa yellow with a small rufous patch with silvery outline. A large rounded rufous patch with a brown zig-zag line in the centre. Hindwing with basal rufous patch more triangular than rounded with crenulated zig-zag line in the centre.

Remarks: Lalnghahpuii *et al.*, (2023) reported this species for the first time from Mizoram.

15. *Plutodes exquisita* Butler, 1880

Plutodes exquisita Butler, 1880, *Ann. Mag.nat.Hist.* (5) 6: 223

Forewing: Female: 24-25mm

Material examined: 1♀: 13.x.2020, Tamdil, Saitual district, 767m; 1♀:

23.vii.2019, Champhai, Champhai district, 1458m

Distribution: Sikkim, Assam

Distinctive features: Forewing with rufous triangular basal patch except at costal area, an oval rufous patch on marginal area with silvery boundaries having a zig-zag line on it. Hindwing having a rufous band from base to tornus. Female genitalia with corpus bursae oval, traces of weak sclerotization, ductus bursae long.

Remarks: The current study reported only female specimen while Ghosh (2007) reported a single male specimen from Aibawk, Aizawl district, Mizoram.

16. *Plutodes subcaudata* Butler, 1880

Plutodes subcaudata Butler, 1880, *Ann. Mag. nat. Hist.*, (5) 6: 224

Forewing: Male: 17 mm

Material examined: 1♂: 30.x.2019, Hmuifang, Aizawl district, 1485 m.

Distribution: Sikkim, Assam.

Distinctive features: Wings ground color yellowish. Forewing costa slightly arched with a broad rufous patch at base extending as rufous band on inner margin. Hindwing with fasciae similar to forewing with a basal rufous patch forming narrow band along inner area. Underside of wings white.

Remarks: Saxena (2014) reported two females from Hmuifang, Aizawl district while the current study reported only male specimen.

X. Genus *Psilalcis* Warren, 1893

Psilalcis Warren, 1893; *Proc. zool. Soc. Lond.* 1893 (2): 430

17. *Psilalcis pallidaria* (Moore, 1888)

Boarmia pallidaria Moore, 1888; *Descr. Indian lep. Atkinson* (3): 237

Forewing: Female: 40 mm; Male: 38 mm

Material examined: 1♂: 15.x.2019, Siaha, Siaha district, 1003 m; 1♀: 18.x.2019, Lawngtlai, Lawngtlai district, 930 m; 1♀: 16.iv.2019, Ngopa, Saitual district, 1195 m

Distribution: Sikkim, Khasis (Meghalaya).

Distinctive features: Adult wings dark fawn color with a clear patch on forewing, antemedial and medial area lined with two prominent crenulated lines, post medial band broad.

Remarks: The current study reported this species for the first time from Mizoram.

XI. Genus: *Phthonandria* Warren, 1894

Phthonandria Warren, 1894; *Novit. zool.* 1 (2): 434

18. *Phthonandria atrilineata* Butler, 1881

Hemerophila atrilineata Butler, 1881; *Trans. Ent. Soc. London* 1881 (3): 405

Forewing: Male: 52 mm

Material examined: 1♂: 15.x.2020, MZU Campus, Aizawl district, 804 m

Distribution: Dharamsala, Sikkim, Japan.

Distinctive features: Ground color darkish brown on dorsal but lighter on thoracic region. A medial black line dentate from costa to lower angle of cell and slightly sinuous to inner margin. Hindwing with fuscous striations.

Remarks: The species is reported here for the first time from Mizoram.

XII. Genus *Ruttellerona* Swinhoe, 1894

Ruttellerona Swinhoe, 1894; *Trans. ent. Soc. Lond.* 1894 (1): 220

19. *Ruttellerona pallicostaria* (Moore, 1868)

Angerona pallicostaria Moore, [1868]; *Proc. zool. Soc. Lond.* 1867: 620

Forewing: Male: 52 mm

Material examined: 1♂: 15.x.2020, MZU Campus, Aizawl district, 804 m

Distribution: NE Himalaya, Peninsular Malaysia.

Distinctive features: Forewing discal spot amidst the pale rufous zone along the costa in males. Hindwing medial line crenulated, a light fawn patch on submarginal and marginal area. Underside with distinct black spots on forewing antemedial, a dark band on medial and postmedial.

Remarks: Only a single individual of this species was encountered during the study period. The current record is the first for Mizoram.

XIII. Genus *Xenoplia* Warren, 1894

Xenoplia Warren, 1894; *Novit. zool.* 1 (2): 415

20. *Xenoplia foraria* (Guenee, 1857)

Percnia foraria Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.* 10: 217

Forewing: Male: 44 mm

Material examined: 1♂: 13.x.2020, Tamdil, Saitual district, 767 m

Distribution: Uttarakhand, Arunachal Pradesh

Distinctive features: Adult with ground color white speckled with black dots entirely. Head and frons white, dorsal part of abdomen white with black spots, antennae pectinated. Forewing with costa white irrorated with black, six spots at regular intervals. Antemedial, medial, postmedial, submarginal lines replaced with dots. Marginal area white, crenulated. Hindwing with similar fasciae, a single prominent spot near inner area.

Remarks: This species is reported for the first time from Mizoram

ACKNOWLEDGEMENT

We extend our sincere gratitude to Isaac Zosangliana and K. Lalhmangaiha for their invaluable assistance during fieldwork; additionally, we thank the Chief Wildlife Warden, Environment, Forest and Climate Change Department, Government of Mizoram, for providing a research and collecting permit (A.33011/5/2011-CWLW/Vol.- II/2) for entomofauna in Mizoram. We acknowledge that BL was

able to conduct this research under the EEQ (North Eastern Region Empowerment and Equity Opportunities for Excellence in Science) number EEQ/2017/000805 thanks to the financial support and fellowship provided by the Science and Engineering Research Board (SERB), Department of Science & Technology, Government of India. We would like to express our gratitude to the Department of Biotechnology, Government of India, New Delhi, for funding LR's laboratory facilities and fellowship under the DBT-NER/AAB/64/2017 NER-BPMC (North Eastern Region-Biotechnology Programme Management Cell) number.

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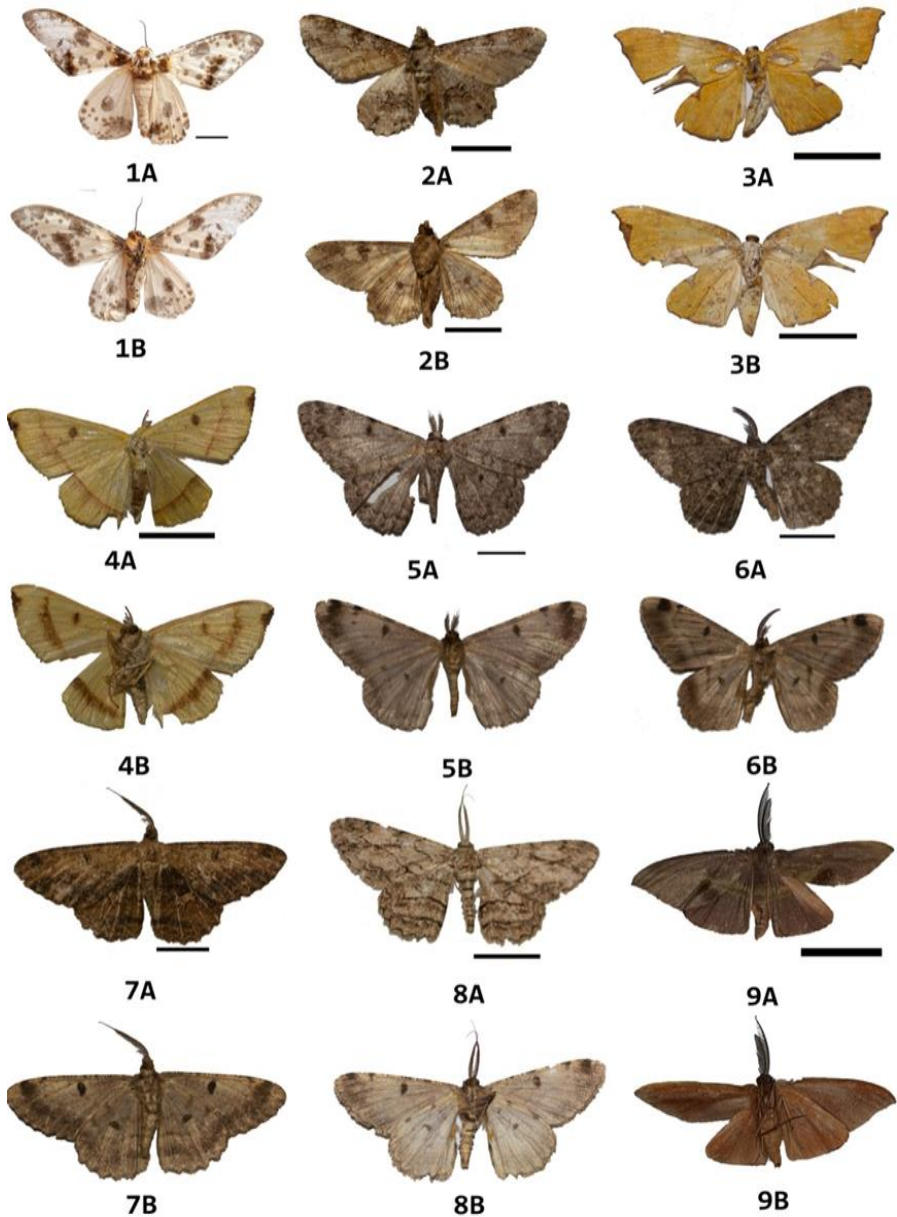


Fig: 1-9: Geometridae (Ennominae), A- Upperside; B- Underside. 1. *Biston panterinaria* 2. *Cleora fraterna* 3. *Corymica vesicularia* 4. *Eilicrinia flava* 5. *Hypomecis cineracea* 6. *Hypomecis lioptilaria* 7. *Hypomecis separata* 8. *Hypomecis transcissa* 9. *Hypochrosis iris*.

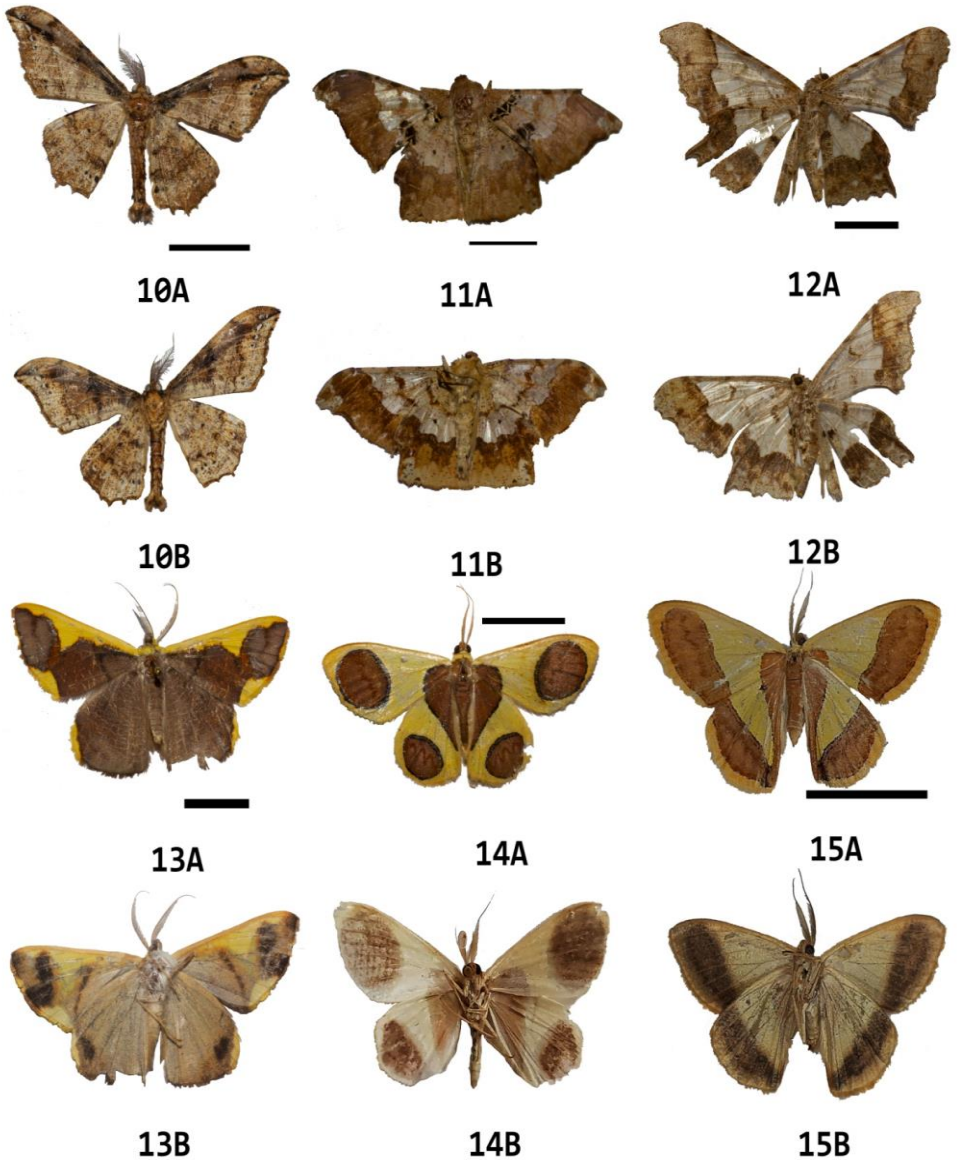


Fig: 10-15: Geometridae (Ennominae), A- Upperside; B- Underside. 10. *Hyposidra infixaria* 11. *Krananda lucidaria* 12. *Krananda semihyalina* 13. *Plutodes costatus* 14. *Plutodes discigera* 15. *Plutodes exquisita*.

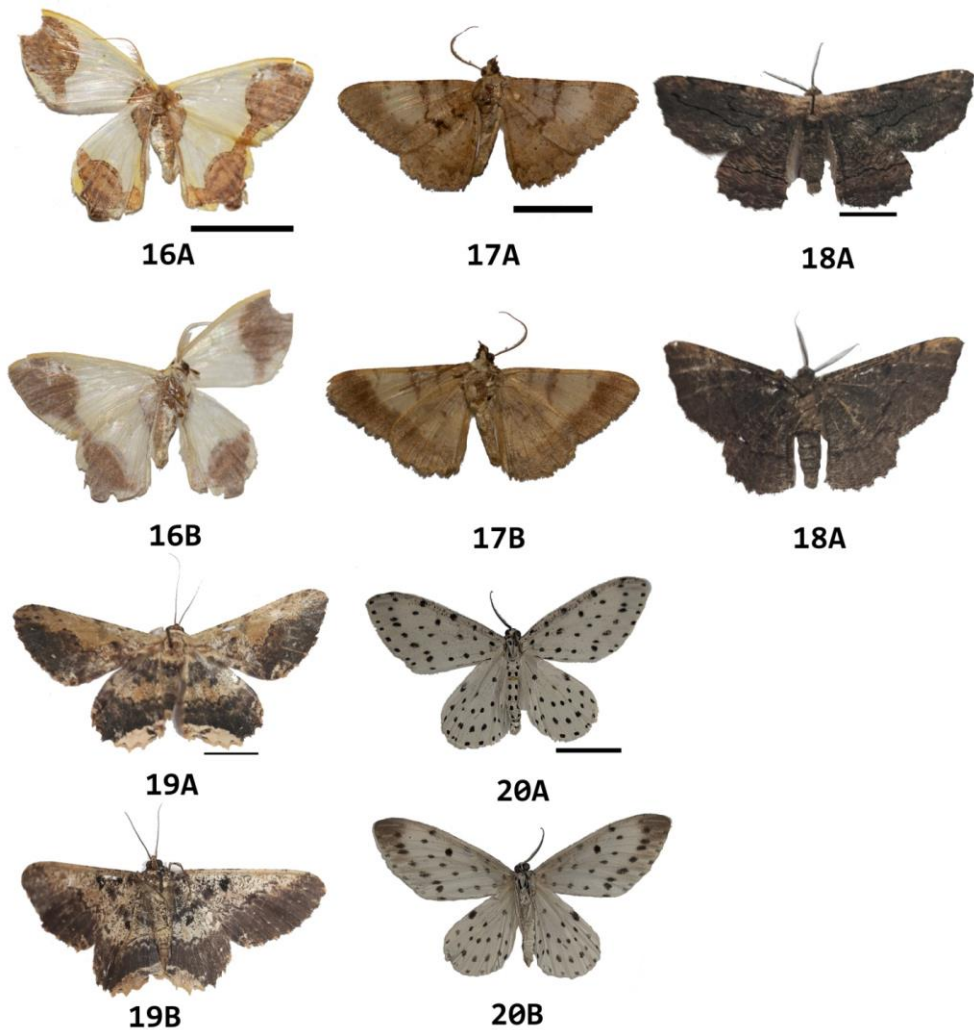


Fig: 16-20: Geometridae (Ennominae), A- Upperside; B- Underside. 16. *Plutodes subcaudata* 17. *Psilalcis pallidaria* 18. *Phthonandria atrilineata* 19. *Ruttellerona pallicostaria* 20. *Xenoplia foraria*

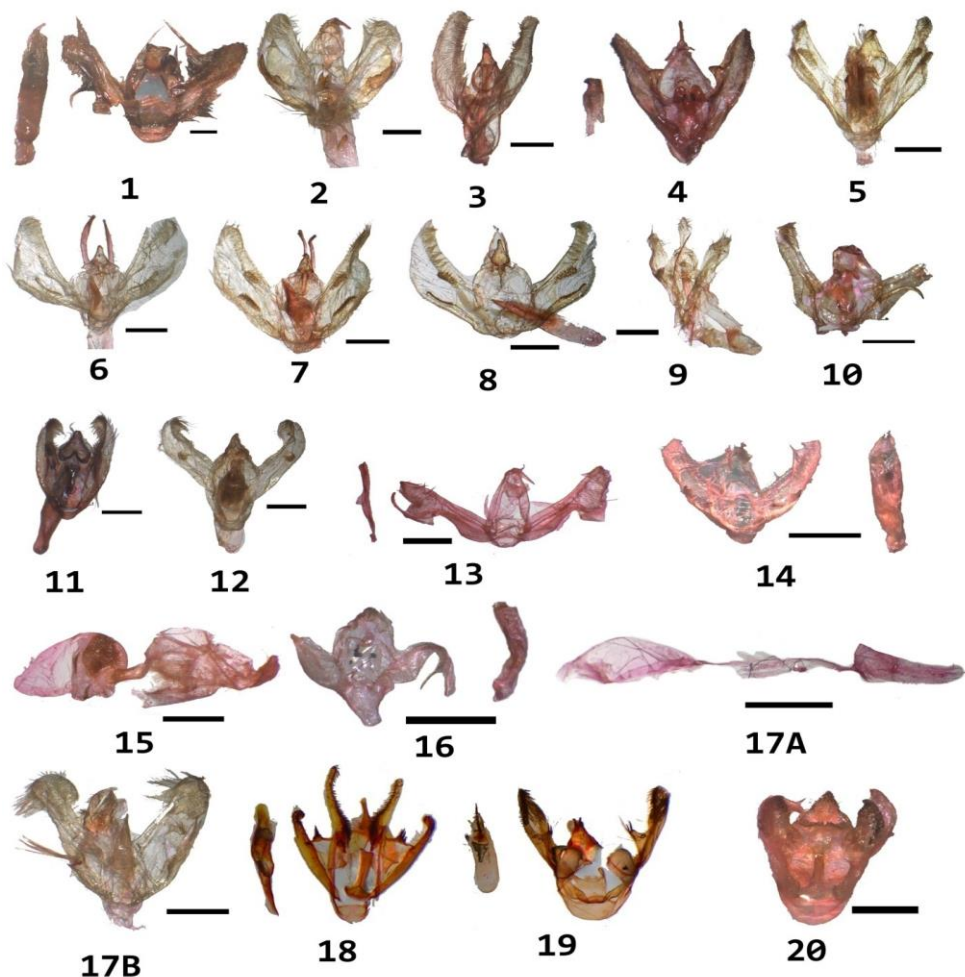


Fig: Genitalia of reported specimens, one scale bar=0.1mm:

1. *Biston panterinaria* (♂) 2. *Cleora fraterna* (♂) 3. *Corymica vesicularia* (♂) 4. *Eilicrinia flava* (♂) 5. *Hypomecis cineracea* (♂) 6. *Hypomecis lioptilaria* (♂) 7. *Hypomecis separata* (♂)
8. *Hypomecis transcissa* (♂) 9. *Hypochrosis iris* (♂) 10. *Hyposidra infixaria* (♂)
11. *Krananda lucidaria* (♂) 12. *Krananda semihyalina* (♂) 13. *Plutodes costatus* (♂)
14. *Plutodes discigera* (♂) 15. *Plutodes exquisita* (♂) 16. *Plutodes subcaudata* (♂)
- 17 (A). *Psilalcis pallidaria* (♂) 17 (B). *Psilalcis pallidaria* (♀) 18. *Phthonandria atrilineata* (♂) 19. *Ruttellerona pallicostaria* (♂) 20. *Xenoplia foraria* (♂).

FIRST RECORD OF *PONTIA DAPLIDICE MOOREI* ROBER, 1907 (LEPIDOPTERA: PIERIDAE) FROM BIHAR, INDIA

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Reviewer: Peter Smetacek

INTRODUCTION

Within India, *Pontia daplidice* has a known distribution range from Jammu and Kashmir to Uttarakhand (Kehimkar 2008; Singh 2010); Kehimkar (2016) reported it from Arunachal Pradesh; Naro & Sondhi (2013) recorded it from Nagaland and Arunachal Pradesh; Singh & Gogoi (2013) reported it from Assam and Manipur. Smetacek (2002) found this as a very common species in the Himalayan foothills of Kumaon (Uttarakhand) and mentioned that this species can be observed on the wing from March to July.

In Bihar, we observed this species in February 2024 for the first time and photographed it successfully on 02 March 2024, while it was nectaring on flowers of *Coriandrum sativum* near Sirsa village (Block Motihari and district East Champaran).

DISCUSSION

The present observation is significant since the species has been mostly recorded at

high elevations, while we recorded *P. daplidice* at 65m elevation (26.61177483°N 84.98377036°E. Subsequently a total of four individuals of *P. daplidice* were observed in two different localities, namely Sirsa and Madhubanighat (Block Motihari and district East Champaran). The species has been recorded throughout Nepal at all months except January, from 140 -3700 m elevation (Poel & Smetacek, 2022). Its appearance in East Champaran district is therefore not surprising, since this district borders Nepal to the north and it is possible that the specimens recorded descended to the plains of Bihar from Nepal.

ACKNOWLEDGEMENT

We are thankful to Peter Smetacek (Butterfly Research Centre, Bhimtal) for his regular guidance and support in butterfly documentation and conservation.

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Fig 1: *Pontia daplidice* nectaring on *Coriandrum sativum*.

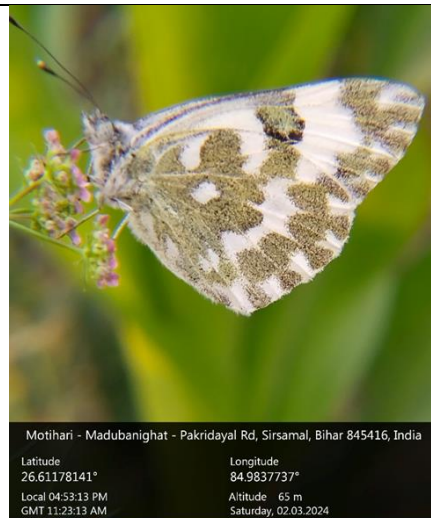


Fig 2: GPS tagged photograph of *Pontia daplidice*.

NEW DISTRIBUTION RANGE FOR *TRYPANOPHORA SEMIHYALINA* KOLLAR, [1844] (INSECTA: LEPIDOPTERA: ZYGAENIDAE: CHALCOSINAE) FROM MAHARASHTRA, INDIA

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Reviewer: Peter Smetacek

Trypanophora semihyalina Kollar, [1844] has been reported from Southwest India to Northwest India and Northeast India (Ahmed *et al.*, 2015). In December, 2023, I encountered a caterpillar of *T. semihyalina* for the first time in Thane district, Maharashtra, followed by a second observation in Gadchiroli district of the same state in February, 2024 (see Fig. 1). The caterpillar found in Doddhi S. in Gadchiroli was feeding on Tendu *Diospyros melanoxylon* (Ebenaceae) (see Fig. 2) and the one that was found in Ambivli Biodiversity Park, Kalyan (Fig.3) was recorded feeding on Tamarind *Tamarindus indica* (Fabaceae). I tried rearing the caterpillar from Ambivli site; however, it was unsuccessful as the caterpillar escaped after feeding for two weeks. The caterpillar has been identified from Sheikh *et al.* (2021). This observation marks the initial recording of *T. semihyalina* in Maharashtra, representing a range extension from Central India towards Western India.

Bank Ltd., and Lloyds Metals and Energy Ltd. in my research at Ambivli Biodiversity Park and Gadchiroli. Special thanks to the State Forest Department for permission. I am grateful to volunteers Vishaka Chandramore and V. Mohinish Reddy for their help in sighting caterpillars.

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I appreciate the support of Kalyan-Dombivli Municipal Corporation, DCB

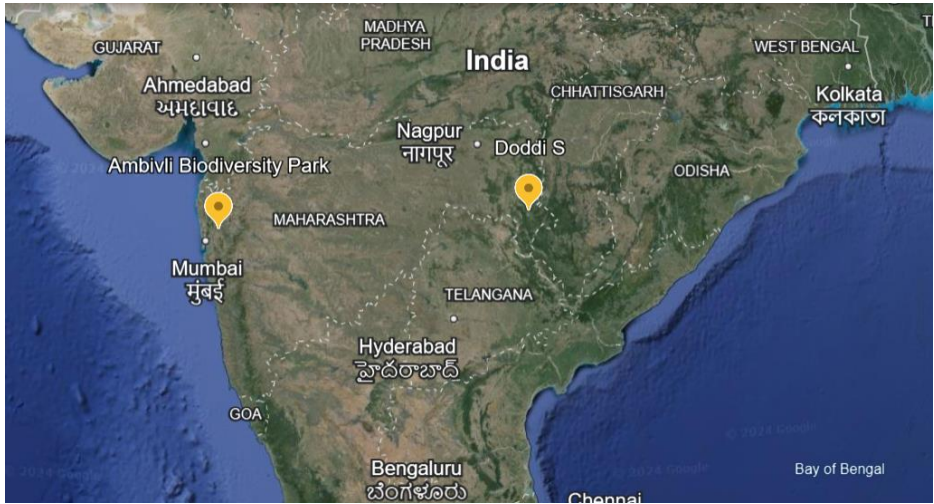


Fig 1: Study area map

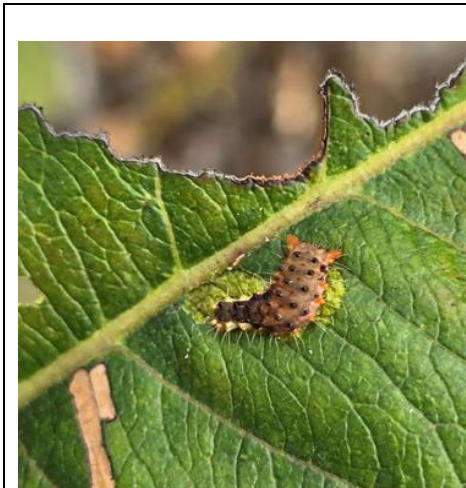


Fig 2: Caterpillar feeding on Tendu in Doddi S



Fig 3: Caterpillar feeding on Tamarind in Ambivli Biodiversity Park

**FIRST RECORD OF *CERYX HYALINA* (MOORE, 1879)
(LEPIDOPTERA: EREBIDAE) FROM THE WEST HIMALAYA**

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Reviewer: Jatishwor S. Irungbam

The moth *Ceryx hyalina* was reported from Sikkim and Nagaland in India (Hampson, 1892). However, Fletcher (1925) modified this distribution to Meghalaya and West Bengal; it is also reported from the Karen Hills in Myanmar (Hampson, 1892) as *Syntomoides volans* (Swinhoe, 1890) and Yunnan (China) (Lu *et al.*, 2012)

Following are the data for the single specimen recorded from the western Himalaya in the present study.

Ceryx hyalina (Moore, 1879) Figures 1 & 2

Syntomis hyalina Moore, 1879, Lep. Atkins.: 13.

Syntomis volans Swinhoe, 1890, Trans. ent. Soc. Lond., 1890: 173, pl. 6, fig. 6.

Ceryx hyalina (Moore): Zerny, 1912, Lepidopteror. Cat., 7: 7.

Material examined: 1 ex.: 28.v.2012 Didihat, Pithoragarh district, Uttarakhand, 1725 m. *Leg.* Peter Smetacek *Coll.* Butterfly Research Centre, Bhimtal.

Forewing length: 11 mm

Wingspan: 25 mm

Distribution: Uttarakhand, West Bengal (Darjeeling), Meghalaya, ?Nagaland (India), Myanmar and Yunnan (China) (Lu *et al.*, 2012)

Remarks: A single specimen of this species was observed feeding on a thistle (*Cirsium* sp.) flower on a meadow near the edge of a forest of Himalayan Oak (*Quercus leucotrichophora*) and collected for identification (Figure 3). The species has not been reported from Nepal and was hitherto only known from Darjeeling eastwards.

Since the type locality is Darjeeling and there appear to be no records from modern day Sikkim, I follow Fletcher (1925), who modified the known distribution of this species.

The only illustration for this species appears to be by Swinhoe (1890), who illustrated the type of *C. volans* from the Karen Hills, Myanmar (Figure 4), which is currently considered a synonym of *C.*

hyalina. *C. hyalina* appears not to have been illustrated earlier.

ACKNOWLEDGEMENT

I am grateful to Manoj Chandran, IFS, at the time DFO (Working Plan) under whom this survey was carried out.

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Fig 1: *Ceryx hyalina* upperside



Fig 2: *Ceryx hyalina* underside



Fig 3: *Ceryx hyalina* on thistle flowers

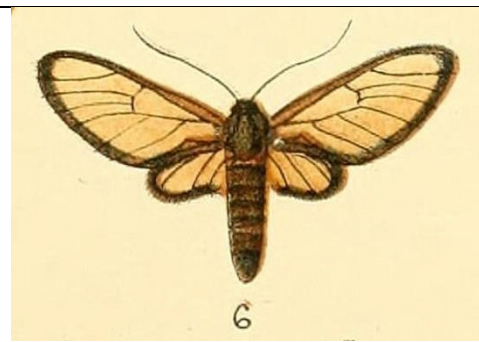


Fig 4: *Ceryx volans* in Swinhoe (1890)

BUTTERFLY (LEPIDOPTERA: RHOPALOCERA) FAUNA OF PENCH TIGER RESERVE, NAGPUR, MAHARASHTRA, CENTRAL INDIA

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Reviewer: Peter Smetacek

ABSTRACT

The diversity of butterfly species was studied in the Pench Tiger Reserve, Nagpur district, in an area of 741 sq. km. from 2008 to 2022. A total of 124 species were recorded, with an addition of 60 new species for Pench Tiger Reserve, Nagpur. Most of the butterflies recorded belong to the family Nymphalidae (43 species) with 17 new records, followed by Lycaenidae with 34 species including 20 new records, Pieridae 18 species with 06 new records, Hesperidae 18 species with 12 new records; 10 species were recorded from the Papilionidae with 05 new records and one species recorded from the family Riodinidae. The observations support the value of the Tiger Reserve area in providing valuable habitats for butterflies.

INTRODUCTION

In Central India, the butterfly diversity was reported earlier by Forsayeth (1884); Swinhoe (1886); Betham (1890, 1891) & Witt (1909). Subsequent works include

reports of several species from Madhya Pradesh and Chhattisgarh (Evans, 1932; Talbot, 1939, 1947; Wynter-Blyth, 1957). D'Abreu (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). In the recent past, several workers have studied butterflies from urban, rural and protected areas of Vidarbha. Singh (2004) reported 45 species of butterfly; later on, 65 species were reported by Sharma & Radhakrishnan (2004) from Pench Tiger Reserve, Maharashtra. The butterfly fauna of Vidharbha, Maharashtra is well-documented with 167 species (reviewed in Tiple, 2011), but a few spatial gaps still remain. Some additions had been made to the fauna of Vidarbha region recently by Deokar & Shukla, 2015; Tiple, 2018; Tiple, 2019; Tiple, 2020; Tiple & Bhagwat, 2023. The present study is an attempt to document the diversity of butterflies from Pench National Park (reserve forest) in Nagpur district.

MATERIALS AND METHODS

Butterflies were photographed and identified in different regions of the Pench National Park, Nagpur between 2008 to 2022. Butterflies were surveyed in the Reserve Forest areas, buffer zone, lake shores, river banks and surrounding area during the monsoon and post monsoon period. Butterflies were primarily identified in the field, following photography. Photographs of the specimens were taken in the field from various angles and identified with the help of field identification guide (Wynter-Blyth, 1957; Kunte, 2000).

The species were categorized on the basis of their abundance in Pench National Park. The butterflies were categorized as VC—Very common (> 100 sightings), C—Common (51–100 sightings), FC—Frequent common (16–50 sightings), R—Rare (2–15 sightings), VR—Very rare (< 2 sightings) (Tiple *et.al* 2006; Tiple, 2018).

Study area

The Pench National Park and Tiger Reserve extends over an area of 741 sq.km in the lower southern reaches of the Satpura hill ranges, along the northern boundary of Nagpur District and located at 21°47'N 79°19'E. The temperature ranges from 12–45°C with a relative humidity between 10% to 95%. The Pench River, divides the park in half and gives it its name. Pench is a significant ecosystem that supports an abundance of flora and fauna, including a rich variety of aquatic life. Pench is rich in biodiversity and has a terrain that is characterised by hills,

valleys, and the occasional precipitous slope (Fig. 1 & 2).

The vegetation of the area falls into two major categories: Tropical Dry Deciduous and Tropical Moist Deciduous type (Champion & Seth, 1968). These forest types, for the present study, were further sub-divided as Teak dominant forest (*Tectona grandis* with associated species like *Madhuca indica*, *Diospyros melanoxylon*, *Terminalia tomentosa*, *Buchanania lanzan*, *Lagerstroemia parviflora*, *Miliusa velutina* and *Lannea coromandelica*), Miscellaneous forest (Teak mixed *Anogeissus latifolia*-*Bosewellia serrata* mixed stands, hill forest and *Zizyphus-Butea* mixed woodland), bamboo-dominant (*Dendrocalamus strictus*) forest, *Cleistanthus collinus* woodland, grassland–savanna, open scrub jungle (Dominated by *Lantana camara*) and wetlands (river, streams, ponds and reservoir).

RESULTS AND DISCUSSION

During the course of study 124 species of butterflies belonging to six families were recorded. This study added 60 species as new records for Pench Tiger Reserve, Nagpur (Fig. 4 to 8). Out of the recorded families, Nymphalidae (43 species) with 17 new records was the richest family, followed by Lycaenidae with 34 species with 20 new records, Pieridae with 18 species with 06 new records, Hesperidae with 18 species with 12 new records, Papilionidae with 10 species with 05 new records and one species recorded from Riodinidae (see Fig. 3 & Table 1).

Among the 124 species of butterflies about 48% (60) were very common, 26% (32) species were common, 6% (08) were frequent common, 15% (18) were rare and 5% (06) were very rare. The observed and identified species, their status in Pench Tiger Reserve are listed in Table 1.

Among the 124 species of butterflies, 29 species were found throughout the year (January–December), whereas the remaining 95 species of butterflies were prominently observed only after June–July till the beginning of summer (April–May). Increasing species abundance from beginning of monsoon (June–July) till the early winter (August–November) and decline in species abundance from late winter (January–February) up to the end of summer have also been reported by Tiple *et al.*, (2007) and Tiple & Khurad (2009) in similar climatic conditions in this region of central India.

Tiple *et al.*, (2007) and Tiple & Khurad (2009) similarly demonstrated that the majority of species were conspicuously absent from sites that had been disturbed and impacted by human activity. Additionally, they found that rare species were completely absent from environments that were comparable to less-disturbed wild areas. Human activity consistently disturbs and stresses the Pench Tiger Reserve's buffer area, which may be the cause of the unique species' overall decline from human-disturbed sites relative to the other sites. The absence of nectar and larval host plants, water scarcity, and grazing land clearing may be the causes of this decline (Tiple *et al.*, 2007).

The results of this study highlight the significance of the Pench Tiger Reserve as a preferred butterfly habitat. If the plantation is thoughtfully planned, the variety of butterflies in Pench Tiger Reserve may increase, creating a rich environment for butterfly conservation and research. This research will also advance our understanding of the complex mutualistic interactions between butterflies and flowering plants, which are crucial to the sustainability of ecosystem services. The current checklist of butterfly species is not exhaustive or conclusive, and further research will be done to update it. This inventory on butterfly fauna contributes as a baseline for future study on various aspects; especially in the central India region and will help in the conservation of these Teak forests.

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Table 1: Butterfly species of Pench National Park, Nagpur and surroundings together with common names. The species recorded for the first time from the PTR are marked with pound sign/ hash (#).

Sr. No.	Common Name	Scientific Name	Status	IUCN
		Papilionidae (10)		
1.	Tailed Jay	<i>Graphium agamemnon</i> (Linnaeus, 1758) #	VC	NE
2.	Common Jay	<i>Graphium doson</i> (C. & R. Felder, 1864) #	C	NE
3.	Spot Swordtail	<i>Graphium nomius</i> (Esper, 1799)	VC	NE
4.	Common Rose	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	VC	LC
5.	Crimson Rose	<i>Pachliopta hector</i> (Linnaeus, 1758) #	C	LC
6.	Common Mime	<i>Papilio clytia</i> Linnaeus, 1758	VR	NE
7.	Common Banded Peacock	<i>Papilio crino</i> Fabricius, 1793#	R	NE
8.	Lime Butterfly	<i>Papilio demoleus</i> Linnaeus, 1758	VC	NA
9.	Blue Mormon	<i>Papilio polymnestor</i> Cramer, [1775] #	FC	NE
10.	Common Mormon	<i>Papilio polytes</i> Linnaeus, 1758	VC	NE
		Pieridae (18)		

11.	Common Albatross	<i>Appias albina</i> (Boisduval, 1836)	VR	NE
12.	Striped Albatross	<i>Appias libythea</i> (Fabricius, 1775) #	R	NE
13.	Pioneer	<i>Belenois aurota</i> (Fabricius, 1793)	VC	NE
14.	Common or Lemon Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	VC	NE
15.	Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	VC	NE
16.	Common Gull	<i>Cepora nerissa</i> (Fabricius, 1775)	VC	NE
17.	Crimson Tip	<i>Colotis danae</i> (Fabricius, 1775) #	C	NE
18.	Small Orange Tip	<i>Colotis etrida</i> (Boisduval, 1836)	VC	NE
19.	Large Salmon Arab	<i>Colotis fausta</i> (Olivier, 1804) #	R	LC
20.	Common Jezabel	<i>Delias eucharis</i> (Drury, 1773)	VC	NE
21.	Small Grass Yellow	<i>Eurema brigitta</i> (Stoll, [1780])	C	LC
22.	Common Grass Yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	VC	NE
23.	Spotless Grass Yellow	<i>Eurema laeta</i> (Boisduval, 1836)	VC	NE
24.	Three-Spot Grass Yellow	<i>Eurema blanda</i> (Boisduval, 1836)	R	NE
25.	White Orange Tip	<i>Ixias marianne</i> (Cramer, [1779])	VC	NE
26.	Yellow Orange Tip	<i>Ixias pyrene</i> (Linnaeus, 1764) #	C	NE
27.	Psyche	<i>Leptosia nina</i> (Fabricius, 1793) #	C	NE
28.	Common Wanderer	<i>Pareronia anais</i> (Lesson, 1837) #1	VC	NE
		Nymphalidae (43)		
29.	Tawny Coster	<i>Acraea violae</i> (Fabricius, 1793)	VC	NE
30.	Angled Castor	<i>Ariadne ariadne</i> (Linnaeus, 1763)	VC	NE
31.	Common Castor	<i>Ariadne merione</i> (Cramer, [1777]) #	VC	NE
32.	Common Sergeant	<i>Athyma perius</i> (Linnaeus, 1758) #	R	NE
33.	Joker	<i>Byblia ilithyia</i> (Drury, [1773]) #	VC	NE
34.	Plain Rajah	<i>Charaxes psaphon</i> Westwood, 1847#	FC	NE
35.	Black Rajah	<i>Charaxes solon</i> (Fabricius, 1793)	FC	NE
36.	Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	VC	LC
37.	Common Tiger	<i>Danaus genutia</i> (Cramer, [1779])	VC	NE
38.	Common Palmfly	<i>Elymnias hypermnestra</i> (Linnaeus, 1763) #	C	NE
39.	Common Indian Crow	<i>Euploea core</i> (Cramer, [1780])	VC	LC

40.	Common Baron	<i>Euthalia aconthea</i> (Cramer, [1777]) #	VC	NE
41.	Gaudy Baron	<i>Euthalia lubentina</i> (Cramer, [1777])	VR	NE
42.	Great Eggfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	VC	NE
43.	Danaid Eggfly	<i>Hypolimnas misippus</i> (Linnaeus, 1764)	VC	NA
44.	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	VC	LC
45.	Grey Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	VC	NE
46.	Yellow Pansy	<i>Junonia hierta</i> (Fabricius, 1798)	C	LC
47.	Chocolate Pansy	<i>Junonia iphita</i> (Cramer, [1779])	VC	NE
48.	Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758)	VC	NE
49.	Blue Pansy	<i>Junonia orithya</i> (Linnaeus, 1758)	VC	NA
50.	Bamboo Treebrown	<i>Lethe europa</i> (Fabricius, 1775) #	C	NE
51.	Common Treebrown	<i>Lethe rohria</i> (Fabricius, 1787)	R	NE
52.	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus, 1758)	VC	NE
53.	Commander	<i>Moduza procris</i> (Cramer, [1777])	C	NE
54.	Intermediate Bushbrown	<i>Mycalesis intermedia</i> (Moore, [1892]) #	R	NE
55.	Dark-brand Bushbrown	<i>Mycalesis mineus</i> (Linnaeus, 1758)	C	NE
56.	Common Bushbrown	<i>Mycalesis perseus</i> (Fabricius, 1775) #	VC	NE
57.	Long-brand Bushbrown	<i>Mycalesis visala</i> Moore, [1858] #	C	NE
58.	Common Sailer	<i>Neptis hylas</i> (Linnaeus, 1758)	VC	NE
59.	Chestnut-Streaked Sailer	<i>Neptis jumbah</i> Moore, [1858] #	C	NE
60.	Glassy Tiger	<i>Parantica aglea</i> (Stoll, [1782]) #	VR	NE
61.	Short-banded Sailer	<i>Phaedyma columella</i> (Cramer, [1780]) #	C	NE
62.	Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	VC	NE
63.	Anomalous Nawab	<i>Polyura agraria</i> (Swinhoe, 1887) #	VC	NE
64.	Common Nawab	<i>Polyura athamas</i> (Drury, [1773]) #	C	NE
65.	Baronet	<i>Symphaedra nais</i> (Forster, 1771)	VC	NE
66.	Blue Tiger	<i>Tirumala limniace</i> (Cramer, [1775])	VC	NE
67.	Painted Lady	<i>Vanessa cardui</i> (Linnaeus, 1758)	R	LC
68.	Common Threering	<i>Ypthima asterope</i> (Klug, 1832)	VC	LC
69.	Common Fourring	<i>Ypthima huebneri</i> Kirby, 1871	R	NE

70.	Common Fivering	<i>Ypthima baldus</i> (Fabricius, 1775) #	FC	NE
71.	Lesser Threering	<i>Ypthima inica</i> Hewitson, 1865#	VC	NE
		Riodinidae (1)		
72.	Two-spot Plum Judy	<i>Abisara bifasciata</i> Moore, 1877#	C	NE
		Lycaenidae (34)		
73.	Common Hedge Blue	<i>Acytolepis puspa</i> (Horsfield, [1828]) #	VC	NE
74.	Plain Hedge Blue	<i>Celastrina lavendularis</i> (Moore, 1877)	VR	
75.	Pointed Ciliate Blue	<i>Anthene lycaenina</i> (Felder, 1868) #	FC	NE
76.	Large Oakblue	<i>Arhopala amantes</i> (Hewitson, 1862) #	FC	NE
77.	African Babul Blue	<i>Azanus jesous</i> (Guérin-Méneville, 1849) #	C	NE
78.	Bright Babul Blue	<i>Azanus ubaldus</i> (Stoll, [1782]) #	C	NE
79.	Common Pierrot	<i>Castalius rosimon</i> (Fabricius, 1775)	VC	NE
80.	Forget-Me-Not	<i>Catochrysops strabo</i> (Fabricius, 1793)	VC	NE
81.	Lime Blue	<i>Chilades lajus</i> (Stoll, [1780]) #	VC	NE
82.	Small Cupid	<i>Chilades parrhasius</i> (Fabricius, 1793) #	R	NE
83.	Gram Blue	<i>Euchrysops cnejus</i> (Fabricius, 1798)	VC	NE
84.	Indian Cupid	<i>Everes lacturnus</i> (Godart, [1824]) #	R	NE
85.	Eastern Grass Jewel	<i>Freyeria putli</i> (Kollar, [1844])	VC	NE
86.	Dark Cerulean	<i>Jamides bochus</i> (Stoll, [1782])	C	NE
87.	Common Cerulean	<i>Jamides celeno</i> (Cramer, [1775])	VC	NE
88.	Pea Blue	<i>Lampides boeticus</i> (Linnaeus, 1767)	VC	NE
89.	Zebra Blue	<i>Leptotes plinius</i> (Fabricius, 1793)	VC	NE
90.	Plains Cupid	<i>Luthrodes pandava</i> (Horsfield, [1829]) #	VC	NE
91.	Tailless Lineblue	<i>Prosotas dubiosa</i> (Semper, [1879]) #	C	NE
92.	Common Lineblue	<i>Prosotas nora</i> (C. Felder, 1860) #	C	NE
93.	Pale Grass Blue	<i>Pseudozizeeria maha</i> (Kollar, [1844])	C	NE
94.	Common Red Flash	<i>Rapala iarbus</i> (Fabricius, 1787) #	C	NE
95.	Slate Flash	<i>Rapala manea</i> (Hewitson, 1863) #	R	NE

96.	Scarce Shot Silverline	<i>Spindasis elima</i> (Moore, 1877) #	R	NE
97.	Common Shot Silverline	<i>Spindasis ictis</i> (Hewitson, 1865) #	C	NE
98.	Plumbeous Silverline	<i>Spindasis schistacea</i> (Moore, 1881) #	R	NE
99.	Common Silverline	<i>Spindasis vulcanus</i> (Fabricius, 1775)	VC	NE
100.	Red Pierrot	<i>Talicada nyseus</i> (Guérin- Menéville, 1843) #	C	NE
101.	Spotted Pierrot	<i>Tarucus callinara</i> Butler, 1886 #	C	NE
102.	Striped Pierrot	<i>Tarucus nara</i> (Kollar, 1848)	VC	NE
103.	Common Guava Blue	<i>Virachola isocrates</i> (Fabricius, 1793) #	C	NE
104.	Dark Grass Blue	<i>Zizeeria karsandra</i> (Moore, 1865) #	VC	NE
105.	Lesser Grass Blue	<i>Zizina otis</i> (Fabricius, 1787)	VC	NE
106.	Tiny Grass Blue	<i>Zizula hylax</i> (Fabricius, 1775)	VC	NE
		Hesperiidae (18)		
107.	Brown Awl	<i>Badamia exclamationis</i> (Fabricius, 1775)	VC	NE
108.	Paintbrush Swift	<i>Baoris farri</i> (Moore, 1878) #	C	NE
109.	Rice Swift	<i>Borbo cinnara</i> (Wallace, 1866) #	VC	NE
110.	Blank Swift	<i>Caltoris kumara</i> (Moore, 1878) #	FC	NE
111.	Golden Angle	<i>Caprona ransonnetii</i> (Felder, 1868) #	R	NE
112.	Spotted Angle	<i>Caprona agama</i> (Moore, [1858]) #	VR	NE
113.	Tricolour Pied Flat	<i>Coladenia indrani</i> (Moore, [1866])	R	NE
114.	Moore's Ace	<i>Halpe porus</i> (Mabille, [1877]) #	R	NE
115.	Common Banded Awl	<i>Hasora chromus</i> (Cramer, [1780])	VC	NE
116.	Chestnut Bob	<i>Iambrix salsala</i> (Moore, [1866]) #	FC	NE
117.	Common Redeye	<i>Matapa aria</i> (Moore, [1866]) #	C	NE
118.	Small Branded Swift/Variable swift	<i>Pelopidas mathias</i> (Fabricius, 1798) #	VC	NE
119.	Large Branded Swift/Moore's Swift	<i>Pelopidas subochracea</i> (Moore, 1878)	R	NE
120.	Indian Skipper	<i>Spialia galba</i> (Fabricius, 1793)	VC	NE
121.	Indian Palm Bob	<i>Suastus gremius</i> (Fabricius, 1798) #	C	NE
122.	Dark Palm Dart	<i>Telicota bambusae</i> (Moore, 1878)	VC	NE
123.	Pale Palm Dart	<i>Telicota colon</i> (Fabricius, 1775) #	C	NE

124.	Grass Demon	<i>Udaspes folus</i> (Cramer, [1775]) #	C	NE
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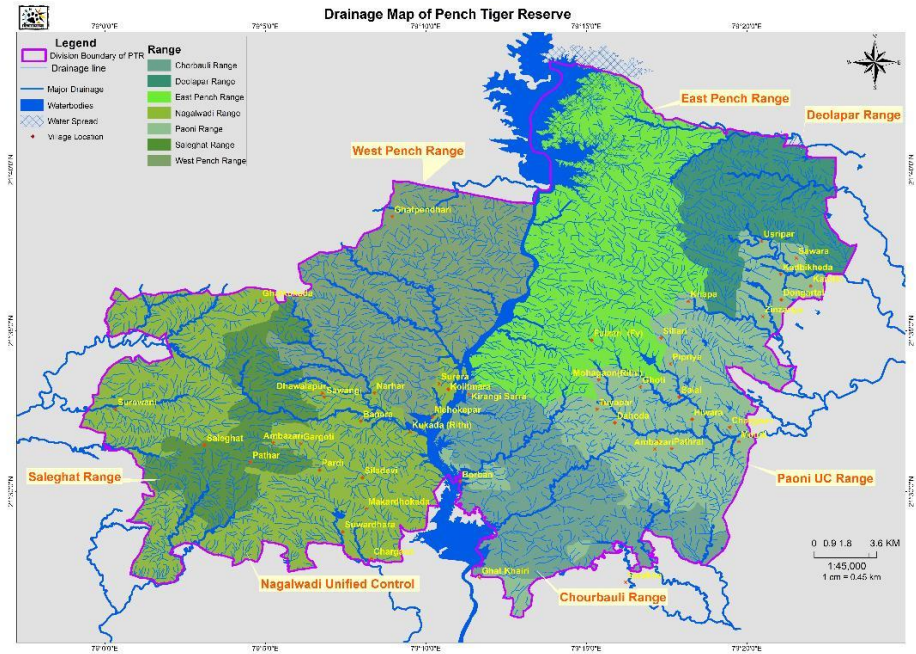


Figure 1. Location map of Pench Tiger Reserve in district Nagpur, Maharashtra, Central India



Figure 2. Natural habitats of Pench Tiger Reserve, Nagpur.

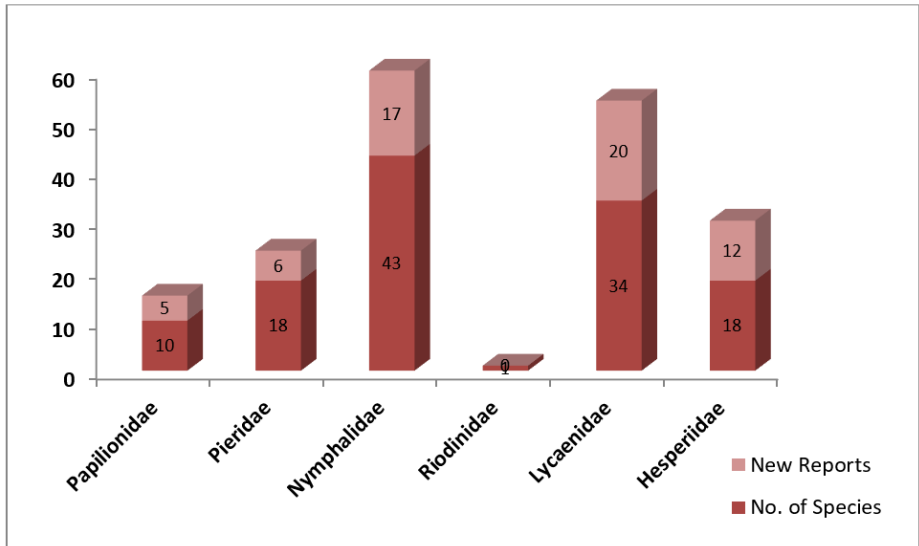


Figure 3. The number of butterfly species encountered with new reports in different families in the PENCH TIGER RESERVE, NAGPUR.

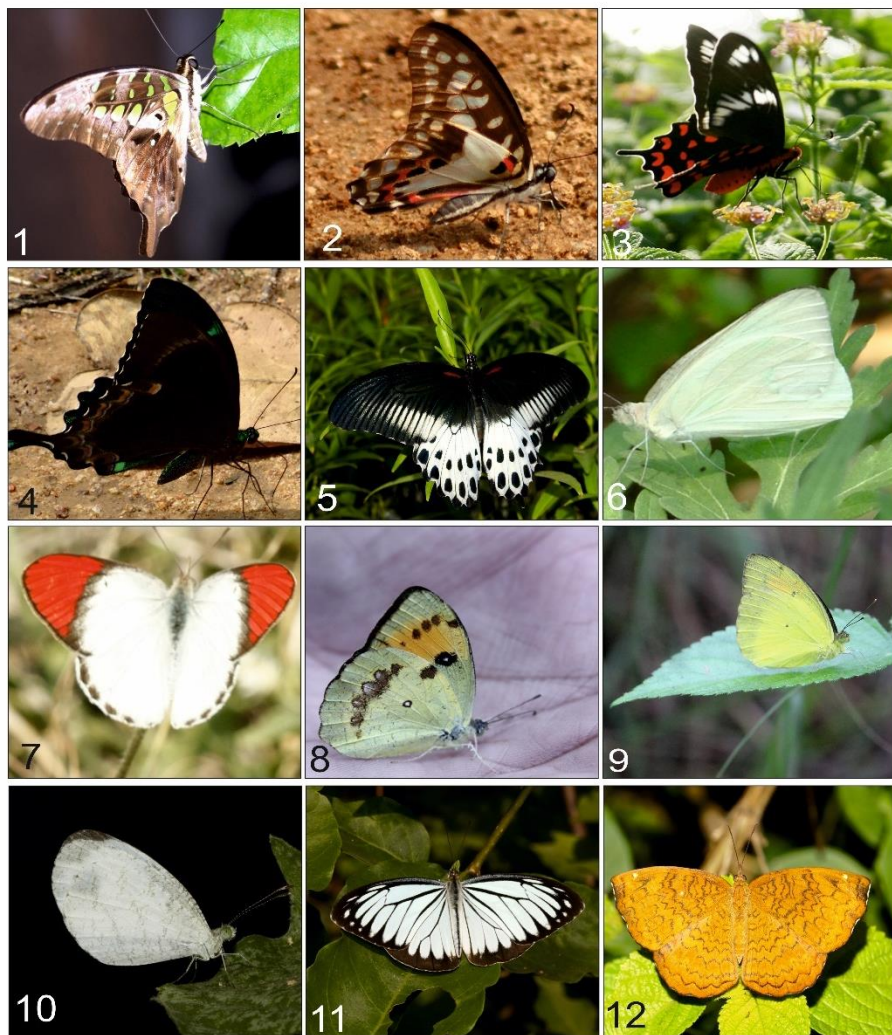


Figure 4. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. 1. *Graphium agamemnon* (Linnaeus, 1758); 2. *Graphium doson* (C. & R. Felder, 1864); 3. *Pachliopta hector* (Linnaeus, 1758); 4. *Papilio crino* Fabricius, 1793; 5. *Papilio polymnestor* Cramer, [1775]; 6. *Appias libythea* (Fabricius, 1775); 7. *Colotis danae* (Fabricius, 1775); 8. *Colotis fausta* (Olivier, 1804); 9. *Ixias pyrene* (Linnaeus, 1764); 10. *Leptosia nina* (Fabricius, 1793); 11. *Pareronia anais* (Lesson, 1837); 12. *Ariadne merione* (Cramer, [1777])

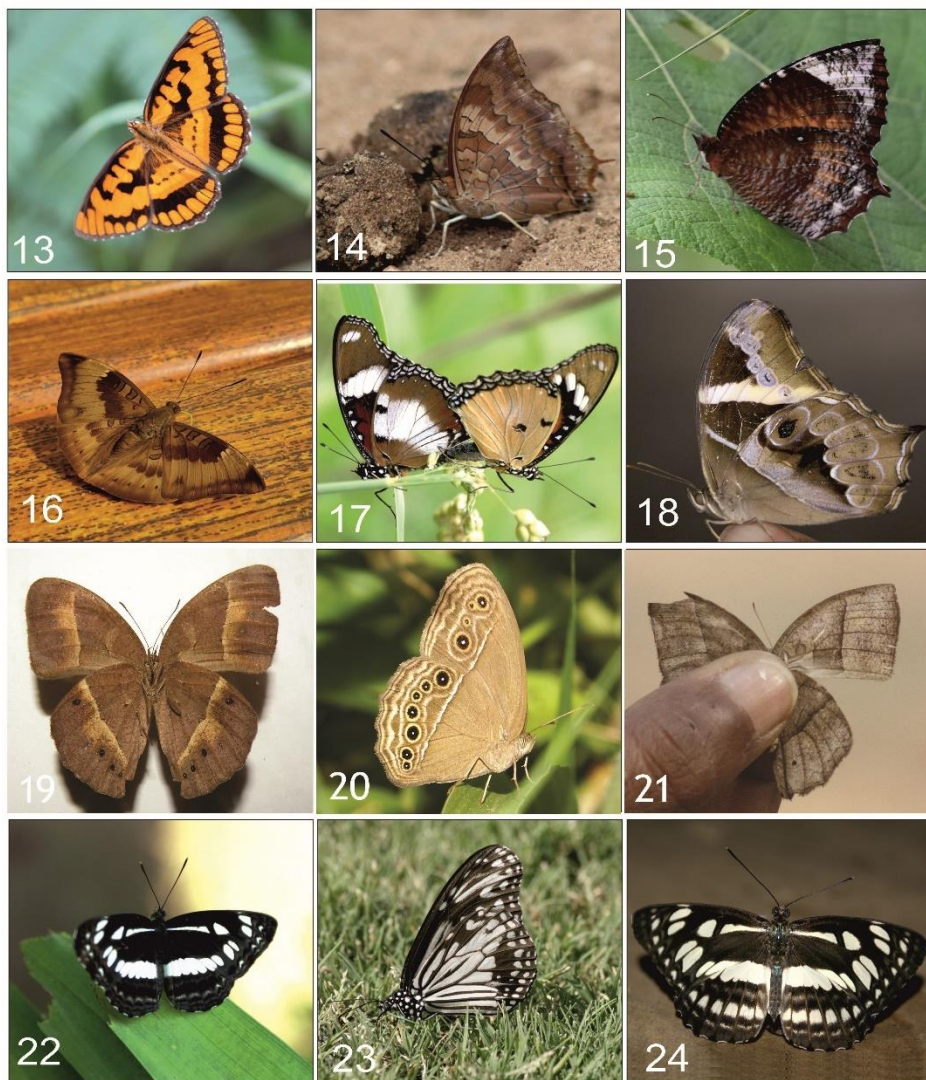


Figure 5. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **13.***Byblia ilithyia* (Drury, [1773]); **14.***Charaxes psaphon* Westwood, 1847; **15.***Elymnias hypermnestra* (Linnaeus, 1763); **16.***Euthalia aconthea* (Cramer, [1777]); **17.** *Hypolimnas misippus* (Linnaeus, 1764); **18.** *Lethe europa* (Fabricius, 1775) **19.***Mycalesis intermedia*(Moore, [1892]); **20.***Mycalesis perseus*(Fabricius, 1775); **21.** *Mycalesis visala* Moore, [1858]; **22.** *Neptis jumbah* Moore, [1858]; **23.** *Parantica aglea* (Stoll, [1782]); **24.***Phaedyma columella* (Cramer, [1780])



Figure 6. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **25.***Polyura agraria* (Swinhoe, 1887); **26.***Polyura athamas* (Drury, [1773]); **27.***Ypthima baldus* (Fabricius, 1775); **28.***Ypthima inica* Hewitson, 1865;**29.** *Abisara bifasciata* Moore, 1877; **30.** *Acyrolepis puspa* (Horsfield, [1828]);**31.***Anthene lycaenina* (Felder, 1868); **32.***Arhopala amantes* (Hewitson, 1862);**33.** *Azanus jesous* (Guérin-Méneville, 1849); **34.** *Azanus ubaldus* (Stoll, [1782]);**35.** *Chilades lajus* (Stoll, [1780]); **36.***Chilades parrhasius* (Fabricius, 1793)

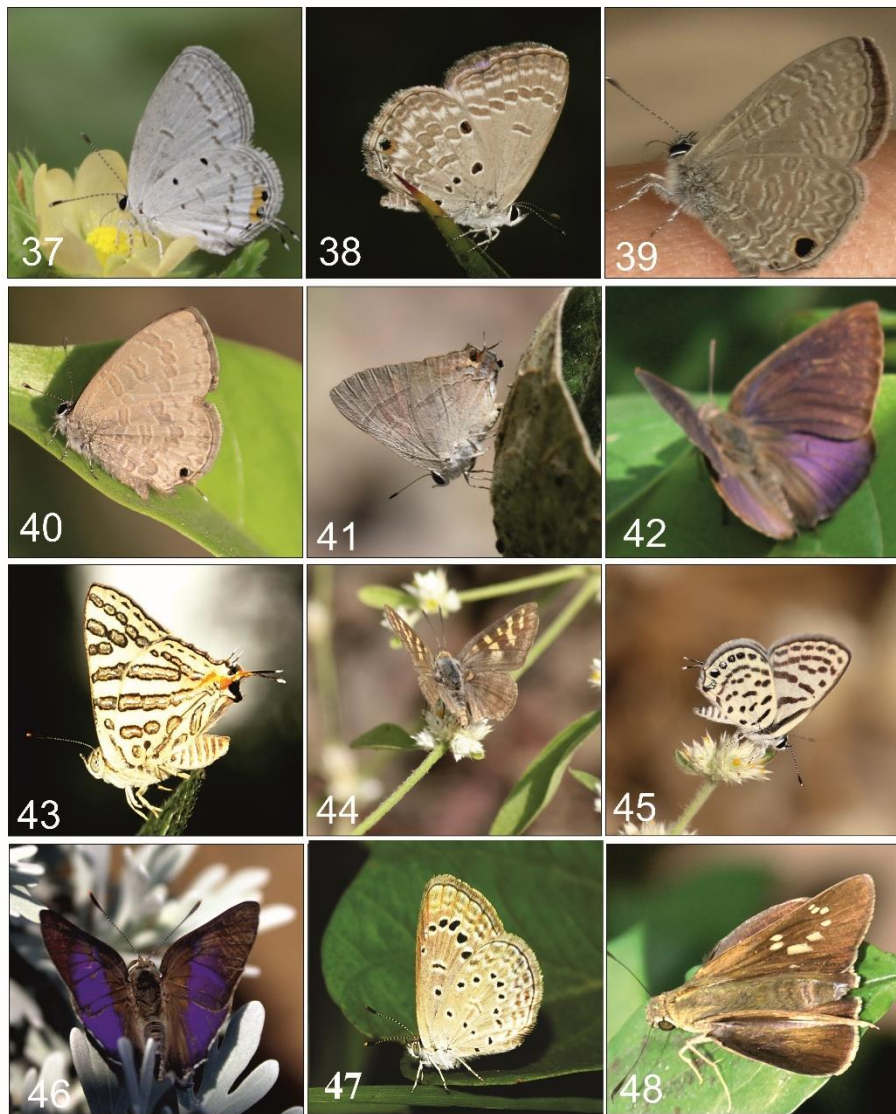


Figure 7. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **37.***Everes lacturnus* (Godart, [1824]); **38.***Luthrodes pandava* (Horsfield, [1829]); **39.***Prosotas dubiosa* (Semper, [1879]); **40.** *Prosotas nora* (C. Felder, 1860); **41.** *Rapala iarbus* (Fabricius, 1787); **42.** *Rapala manea* (Hewitson, 1863); **43.***Spindasis elima* (Moore, 1877); **44.***Spindasis schistacea* (Moore, 1881); **45.** *Tarucus callinara* Butler, 1886; **46.** *Virachola isocrates* (Fabricius, 1793); **47.** *Zizeeria karsandra* (Moore, 1865); **48.***Baoris farri* (Moore, 1878)



Figure 8. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **49.***Borbo cinnara*(Wallace, 1866); **50.***Caltoris kumara*(Moore, 1878); **51.** *Caprona iransonnetii* (Felder, 1868); **52.** *Caprona agama* (Moore, [1858]);**53.** *Coladenia indran*(Moore, [1866]); **54.** *Halpe porus* (Mabille, [1877]);**55.***Jambrix salsala* (Moore, [1866]); **56.***Matapa aria* (Moore, [1866]); **57.** *Pelopidas mathias*(Fabricius, 1798); **58.** *Suastus gremius* (Fabricius, 1798);**59.** *Telicota colon*(Fabricius, 1775); **60.***Udaspes folus* (Cramer, [1775])

**BUTTERFLIES WITH THE WESTERNMOST KNOWN GLOBAL
DISTRIBUTION IN NAINITAL DISTRICT, UTTARAKHAND
(PAPILIONIDAE & PIERIDAE)**

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The Indian state of Uttarakhand comprises a section of the Himalayan range west of Nepal and east of Himachal Pradesh. It is divided into two administrative divisions, Kumaon in the east and Garhwal to the west. The state is mountainous and largely forested.

Evans (1932) in describing the fauna of different parts of India, described this part of the Himalaya as a bastard zone where eastern Palaearctic and Indo-Malayan elements meet. As a result, it is a highly bio-diverse state, with more than 450 species of butterflies recorded so far (Smetacek, 2016). Comparing this figure to the total of 346 species recorded from the Western Ghats and peninsular India (Bhakare & Ogale, 2018) it is evident that Uttarakhand supports an unusual concentration of species in a small geographical area.

The present study focusses on those butterflies whose western limit of their global distribution is in Nainital district of

Uttarakhand. All these butterflies have an eastern Himalayan distribution, often extending to China, Vietnam, the Philippines and Indonesia.

Nainital district is biologically diverse because it extends from 400 m to 2600 m elevation, the highest point of the Gagar range, within a short span. It therefore supports insects that typically inhabit three altitudinal belts, i.e., insects found on the plains, up to an elevation of around 500 m. These include *Graphium doson* (C. & R. Felder, 1864), *Apharitus lilacinus* (Moore, 1884), *Tajuria cippus* (Fabricius, 1798), etc.; species that occupy the belt between 800 m and 1800 m, such as *Papilio polycctor* Boisduval, 1836, and those that are only found above 1600 m, e.g. *Graphium eurous* (Leech, [1893]), *Aporia soracta* Moore, 1857, *Gonepteryx mahaguru* Gistel, 1857, etc. A large proportion of the butterfly community occur as stragglers or seasonal migrants above or below their chosen belt.

The locations which have been monitored intermittently for over a century include Nainital (29.3924°N, 79.4534°E; 1800 m), Bhowali (29.3823°N 79.5196°E; 1600 m); Jeolikote (29.3428 °N; 79.4837° E; 1219 m), Bhujjaghat (29.1845°N 79.3141°E; 624 m), Ranibagh (29.2861° N 79.5470° E; 443 m), Bhimtal (29.3461° N 79.5519° E; 1500 m), Pantnagar (29.0222°N 79.4908°E; 243 m) and Haldwani (29.2183° N; 79.5130° E; 424 m).

From the discussion under each species listed in the present paper, it will be noted that each species has an unusual history in Nainital district, either having been recorded long ago or else having moved into the area recently. This is because at the extremity of their distribution, conditions for colonisation by the species are not ideal: in years when conditions change, the population either thrives or goes extinct, depending on the direction of the change.

In Hawkmoths (Sphingidae) (Smetacek, 1994), it was pointed out how dry winters prevent the colonisation in the western Himalaya by typically east Himalayan species; similarly, Smetacek & Agnihotri (2023) pointed out how the decimation of butterfly populations in the Himalaya was a normal phenomenon when faced with a dry winter in El Nino years.

The intention of this note is to draw attention to the fact that these butterflies are likely to occur even further west in the coming years, or else the Kumaon populations might disappear. In either event, it will be useful if a watch is kept on these species in the area to generate data

that might help analyse ongoing climatic trends in the future.

Papilionidae

1. *Atrophaneura varuna* (White, 1842) Common Batwing

Distribution within India and Nepal: Uttarakhand, Nepal, Bhutan to N.E. India (Varshney & Smetacek, 2015).

Extra-Indian distribution: Myanmar, southern China, to Vietnam and the Malay peninsula (Racheli & Cotton, 2010)

Remarks: rare at Nainital in May and September at 7000 feet (Hannington, 1910). There appears to be no record of this species from Kumaon after Hannington (1910). It has not been recorded from any other location west of Nepal. It is likely that the population in Nainital reported by Hannington (1910) died out subsequently. However, Nainital is the westernmost recorded limit for the species, even though the species does not occur there at present.

Hannington (1910) did not report *A. aidoneus* (Doubleday, 1845) from Kumaon, but stated that it was rare in the interior of Garhwal in May. We have recorded *A. aidoneus* in numerous locations in Kumaon, eg. Nainital, Ramgarh, Maheshkhan, Bhimtal, Mukteshwar, etc. between 1970 and 2023. Therefore, it is likely that *A. aidoneus* replaced *A. varuna* in this area, although the two species occur sympatrically in N.E. India according to the personal experience of the junior author.

2. *Papilio alcmenor* C. & R. Felder, [1864] Redbreast (Figure 1)

Distribution within India and Nepal: Uttarakhand, Nepal, Bhutan to N.E. India (Varshney & Smetacek, 2015).

Extra-Indian distribution: Occurs in northern Myanmar (Condamine *et al.*, 2023), N.Thailand (Nan), Laos, Vietnam.

Remarks: Occurs sparingly in May and September up to 7,000 ft (Hannyngton, 1910). Although the species had not been recorded between its last report in 1910 and its re-discovery by Butalia *et al.* (2020), it is of interest that the species has re-colonised Nainital district after a gap of over a century. It has not been recorded west of Nainital. We have recorded the species in Bhimtal and Bhowali and it has also been reported from Ranikhet and Mukteshwar (Butalia *et al.*, 2020).

3. *Graphium doson axionides* (Page & Treadaway, 2014) Common Jay (Figure 2)

Distribution (*G. doson axionides*): Pakistan, Nepal, India (Sikkim, Assam, Reported also from Saitu, Manipur (Irungbam *et al.* 2020)), China (Yunnan), Hong Kong, Bangladesh, Myanmar, Thailand (N. W. Prov.), N. W. Vietnam (Ha Giang Province) (Page & Treadaway, 2014).

Extra-Indian distribution: (for *G. doson*): Japan, China, Taiwan, Pakistan, Nepal, India, Sri Lanka, Bangladesh, Myanmar, Thailand, Laos, Vietnam, Cambodia, Malaysia, Singapore, Brunei, Indonesia, Philippines (Page & Treadaway, 2014).

Remarks: Rare on eastern border at 2 to 5,000 ft., July and August (Hannyngton,

1910). By 1986, Haldwani and nearby Pantnagar were the westernmost known point from which this species and subspecies had been recorded. During the early years of this century, the subspecies *G. doson eleius* Fruhstorfer, 1907) expanded its distribution north-westwards from southern India across the Gangetic plain until it colonised Jammu (Sharma *et al.*, 2019) and Pakistan (Akram & Babar, 2019). However, the subspecies *axionides* did not expand its distribution during this period and Haldwani remains the westernmost known locality for this subspecies, despite the southern Indian subspecies colonising northern India. Also, the two subspecies have not been recorded sympatrically and it remains to be seen what develops when *G. d. eleius* expands into the habitat of *G. d. axionides*.

Pieridae

4. *Delias acalis* (Godart, 1819) Red-breast Jezabel (Figure 3)

Distribution within India and Nepal: *D. a. pyramus* (Wallace, 1867): Uttarakhand to Nepal, Bhutan and N.E. India; *D. a. kandha* Doherty, 1886: Andhra Pradesh, ? Odisha (Varshney & Smetacek, 2015).

Extra-Indian distribution: Myanmar to Hainan, Indo-China and Perak (Fruhstorfer, 1910).

Remarks: Wynter-Blyth (1957) recorded this species from Shimla (Himachal Pradesh) with an interrogation mark; there is no explanation for this uncertainty over the presence of this species in Shimla.

This species was first reliably recorded from Uttarakhand in 2001 (Smetacek, 2001) and subsequently has established itself in the area, with regular broods in some years (Panthee, 2019). Almost certainly it is a new entrant since it is very conspicuous and not recorded from the area by previous workers. It has been recorded from Jeolikote (Ambica Agnihotri, *pers. comm.* 2024), which may be considered its westernmost limit at present.

5. *Appias lynxida* (Cramer, [1777])
Chocolate Albatross

Distribution within India and Nepal: ssp. *eleonora* (Boisduval, 1836): Ranibagh (Uttarakhand) through Nepal to N.E. India; ssp. *latifascia* Moore, 1881: Maharashtra to Kerala; other subspecies in the Nicobar Is. (Varshney & Smetacek, 2015)

Extra-Indian distribution: Myanmar to Taiwan, Hainan, Japan to Thailand and Malaysia, the Philippines. Java, Bali, Lombok, the Fores, the Solomons (Fruhstorfer, 1910).

Remarks: 1 male from Ranibagh 1000 feet in September (Hannington, 1910). The species has not been recorded in Uttarakhand since the abovementioned record. Members of this genus are strong migrants over most of their range.

6. *Gandaca harina* (Horsfield, [1829])
Tree Yellow (Figure 4)

Distribution within India and Nepal: Kumaon (Uttarakhand) (Agnihotri, 2022; Sondhi, 2017) through Nepal to Bhutan

and N.E. India. Andaman & Nicobar Is. (Varshney & Smetacek, 2015)

Extra-Indian distribution: Myanmar to Hainan, Thailand, Malaysia, Indonesia, Borneo, Philippines, Lombok, Aru Is. (Fruhstorfer, 1910)

Remarks: This species was not recorded from Uttarakhand by Hannington (1910). It was first reported from Chorgaliya by Sondhi (2017) and later by Agnihotri (2022) from Bhujjaghat near Ranibagh, the furthest western record so far. It has almost certainly moved into the area recently.

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Fig 1: *Papilio alcmenor*



Fig 2: *Graphium doson axionides*

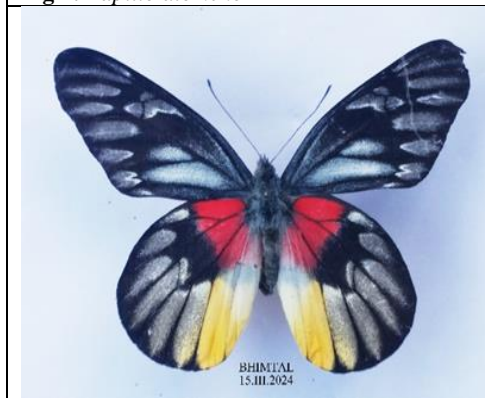


Fig 3: *Delias acalis*



Fig 4: *Gandaca harina*

**CAMPYLOTES SPLENDIDA ELWES, 1890 (LEPIDOPTERA:
ZYGAENIDAE) – FIRST DOCUMENTATION FROM ARUNACHAL
PRADESH, INDIA**

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INTRODUCTION

The species *Campylotes splendida* Elwes, 1890 was described from the Naga Hills. In the original description, Elwes (1890) noted that Charles Oberthur informed him that a similar moth occurred in Yunnan, China. The size of this species is much greater than that of other *Campylotes* species known from India (Hampson, 1892).

RESULT AND DISCUSSION

The current record is from an opportunistic survey conducted at Vijaynagar, Changlang district of Arunachal Pradesh on September 21, 2023. The authors observed two individuals of the species and photographed them while the moths were basking in the sun. The habitat, where the individuals were sighted consists of riparian fringing habitat located

at coordinates 27°11'26"N and 96°59'37"E.

This is a new record for Arunachal Pradesh and extends the known distribution of the species northwards.

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Legends to Figures



Fig 1: *Campylotes splendida*, recorded in this study.



Fig 2: Habitat of *Campylotes splendida*, where the species was sighted.