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On Any Aspect Related to Life Forms**

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A REPORT ON INTER-GENERIC MATING BETWEEN COMMON CROW *EUPLOEA CORE* AND GREAT EGGFLY *HYPOLIMNAS BOLINA* BUTTERFLIES FROM KHATRA, BANKURA, WEST BENGAL, INDIA

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Since the beginning of life on this planet inter-specific hybridization has been a primary mechanism of evolution in the plant kingdom but successful hybridization in animals has been seen with lots of scepticism (Mallet, 2007). Examples of inter-specific, inter-generic or interfamilial mating are rather rare in nature (Bhakare & Smetacek, 2010).

During a recent field visit in Khatra village of Bankura district on 29 May 2020 at 09:54 hr, the authors observed an inter-generic mating between two butterflies of different subfamilies under the family Nymphalidae. Reviewing the literature on butterfly identification and identification marks based on Evans (1932) and Kehimkar (2016) the species were identified as a Great Eggfly *Hypolimnas bolina* (Linnaeus, 1758) and a Common Crow *Euploea core* (Cramer, 1780). The male specimen was identified as Great Eggfly *H. bolina*, under the subfamily *Nymphalinae* and the female specimen was identified as Common Crow *E. core* which belongs under the subfamily *Danainae* (Kehimkar, 2016). When the authors

reached the study area, they saw the pair was already in copulation and the copulation continued for the next 8-10 minutes. This copulation behaviour was photographed using the mobile camera Redmi note 5pro.

The study area (22.97°N & 86.84°E, with 125m elevation) is a small forest surrounded by large amount of Palash (*Butea monosperma*) & Mahua (*Madhusa longifolia*) trees along with other tree species. It is home to lots of bird, butterfly and plant species.

It is believed that hybridization in the animal kingdom is generally an evolutionary dead end or short-lived mistake (Rhymer & Simberloff, 1996). Though a similar case has been reported by Mahato (2022), where he reported inter-generic mating between Pea Blue *Lampides boeticus* (Linnaeus) & Forget-me-not *Catochrysops strabo* (Fabricius) from a village of Purulia, West Bengal, in that report both of the species were from the same subfamily (Mahato, 2022). In the present case, authors report inter-generic

mating of a Great Eggfly *Hypolimnas bolina* and Common Crow *Euploea core*. Both of the butterflies are not only from different genera but are also from different subfamilies where Great Eggfly *Hypolimnas bolina* belongs to the Nymphalinae and Common Crow *Euploea core* belongs to the Danainae.

This type of mating behaviour is often rare in nature. Such observations on breakdown of species reproductive barriers offer important insights into the subject, giving a tough time to taxonomists and evolutionary biologists (Jiggins, 2008). Previously one research on butterfly diversity was published from Bankura which reported 117 species of butterflies under 78 genera from different habitats of Bankura. The species to genera ratio was 1.5 (Mukherjee & Mondal, 2020) which indicates strong intra-generic competition (Elton, 1946). Therefore, our present study is an addition to the existing literature on inter-generic mating behaviour from the district of Bankura, West Bengal.

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Image: Inter-generic mating between Great Eggfly *Hypolimnys bolina* (Linnaeus) of Nymphalinae subfamily and Common Crow *Euploea core* (Cramer) of Danainae subfamily.
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PARASITOIDS OF THE GALL-INDUCER INSECT FROM *GARUGA PINNATA* ROXB.: A REPORT FROM SOUTHERN KARNATAKA

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ABSTRACT

Galls are botanical curiosities and represent a two-way interaction between the insect and the host plant. Galls have been reported from several tree taxa from the temperate zone as well as the tropics. In this research communication, we report the occurrence of saccular galls for the first time on the leaves of *Garuga pinnata* Roxb., an ethno-medicinal tree from the Mysore district of Karnataka state. The gall-maker and the parasitoids have been identified for the first time from this region. Studies implicate the distribution of gall insect and parasitoids in southern India.

INTRODUCTION

Gall insects incite abnormal growths as extensions from the host plant, which benefits the insect to complete its life cycle. Galls are most frequently found on leaves. The formation of a distinctive gall structure is often triggered by the feeding behavior of larvae or egg inserted into

plant tissues. Galls are produced by three major groups of insects viz., aphids, gall midges and gall wasps. Among the aphids, Phylloxerans and Psyllids are the major gall forming insect families (Royer & Rebek *et al.*, 2016). Gall-hosting plants employ varied strategies to mitigate and neutralize stress arising sequel to gall induction (Raman, 2012).

The multipurpose tree species *Garuga pinnata* Roxb. (Burseraceae) is found in eastern and southern parts of Asia. The tree bark in the form of decoction is ethno-medicinally used in Nepal by Tharu tribal community to enhance memory (Bhandari *et al.*, 2021). Ethno-pharmacologically, the plant has diuretic, aphrodisiac and astringent properties. The tree is used in the treatment of anaemia, leprosy and ulcers. The leaf paste is used to relieve fever (Chavan *et al.*, 2021). Significant amounts of phenolic compounds are present in the leaves of the plant, while stem bark contains terpenoids, steroids, alkaloids, flavonoids and saponins (Ramaraju *et al.*, 2013).

The gall-producing psyllid, *Phacopteron lentiginosum* Buckton (Hemiptera: Psyllidae), frequently produces galls on *G. pinnata* leaves by ovipositing in the monsoon and post-monsoon seasons (Singh & Singh, 2011). Further, a sac-like gall develops from the leaf with the development of *P. lentiginosum* (Raman *et al.*, 2012). Gall inducing *P. lentiginosum* on *G. pinnata* host has been reported from various states of the Indian subcontinent viz., Karnataka (Mathur, 1975), Kerala (Hayat *et al.*, 2012), Maharashtra (Buckton, 1896); Tamil Nadu (Kieffer, 1906; Mani, 1948; Kandaswamy, 1986; Raman, 1987); Nepal and Pakistan (Hodkinson, 1986), Uttarakhand (Mani, 1948; Mathur, 1975; Hayat *et al.*, 2012); and West Bengal (Mathur, 1975). The gall inducer, *P. lentiginosum* has been reported by many researchers from different regions. Herein we report for the first time the Braconid wasps *Bracon garugaphagae* (Ranjith *et al.*, 2016), *Psyllaephagus garuga* (Singh & Singh, 2011) as parasitizers of gall-inducer *P. lentiginosum* from the host plant *G. pinnata* from southern Karnataka.

During a field study in the Karighatta hill range (12° 25' 40" N; 76 ° 43' 43" E) in the month of January 2022, the leaf galls from *G. pinnata* of various sizes were collected (Fig. 1) and stored in 70% alcohol. The galls were dissected and the insects were collected. The scanning electron microscopy images of the insects along with the insect specimens were sent to Department of Zoology, University of Mysore for identification. The insects were identified as the gall-inducer *Phacopteron lentiginosum* and parasitoids: *Bracon garugaphagae*, *Psyllaephagus garuga*

parasitizing the gall inducer. In subtropical peninsular India, *P. lentiginosum* induces two-tier saccular galls on *G. pinnata* (Mathur, 1975; Raman, 1987; Mani, 2000). The developmental stages such as nymphs, pupae and adults were observed from the dissected galls under stereomicroscope (Fig. 2).

The braconid wasp, *B. garugaphagae* with its developmental stages was found inside the dissected galls and identified based on the already published description (Ranjith *et al.*, 2016). The larvae target psyllid nymphs and kill with a single bite. The abdominal segments of the larvae have distinctive dorsal abdominal tubercles with extendible tips that are employed to maintain larval posture when feeding (Fig. 3.). The larvae continue to feed on gall tissue after they have finished all of the available prey until they are old enough to spin cocoons and pupate (Ranjith *et al.*, 2016). In the present study, another parasitoid, *P. garuga* with few developmental stages was located in the dissected galls (Fig. 4.) and identified based on the descriptions of Singh & Singh (2011). This is known to parasitize the gall-former of *G. pinnata*, *P. lentiginosum*.

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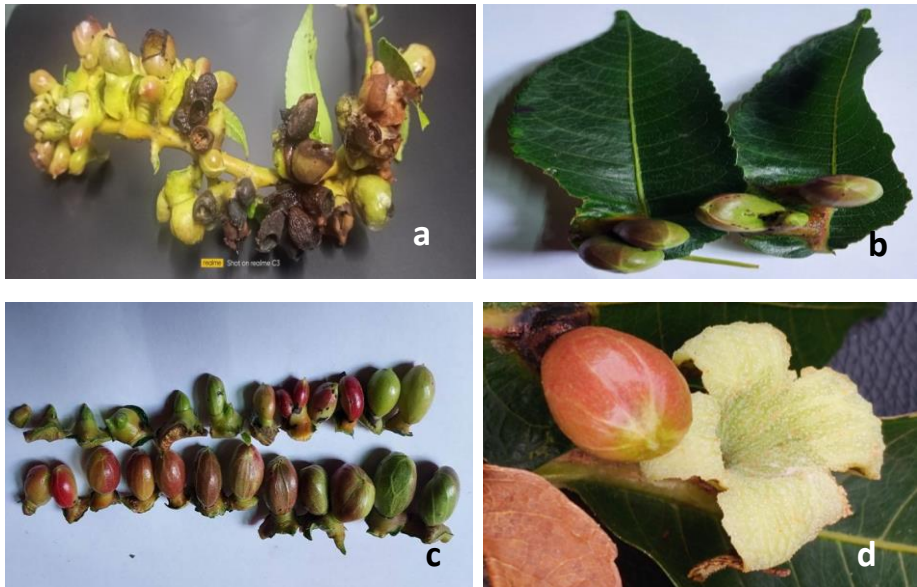


Fig. 1. Leaf galls associated with the host plant *G. pinnata*. a. Photograph showing the whole twig and leaves modified into galls, b. Leaf gall of *G. pinnata*, c. Different stages of galls isolated from the host plant, d. Opened mature gall.

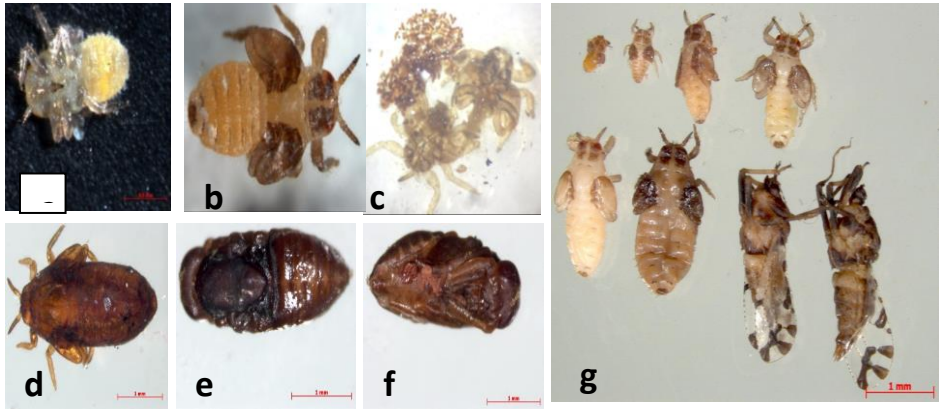


Fig. 2. Stereomicroscopic images of the developmental stages of gall inducer- *P. lentiginosum*. a. Dorsal view of nymph, b. Ventral view, c. Nymph exhibiting parental care, d. Pupa, e. & f. Dorsal and ventral view of pupa, g. Stages in the adult development.

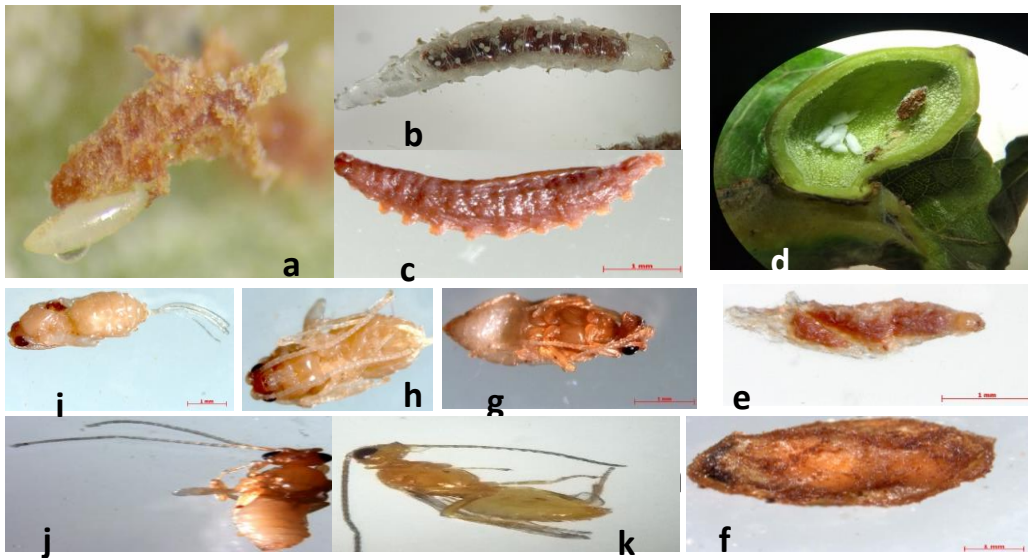


Fig. 3. Stereomicroscopic images of different developmental stages of the parasitoid wasp, *Bracon garugaphagae*. a. Braconid egg, b. & c. Different larval stages, d. Stereomicroscopic image of *Bracon* pupa and its cocoon, e. & f. Pupa, g-k. Stereomicroscopic images of different stages of adult development.

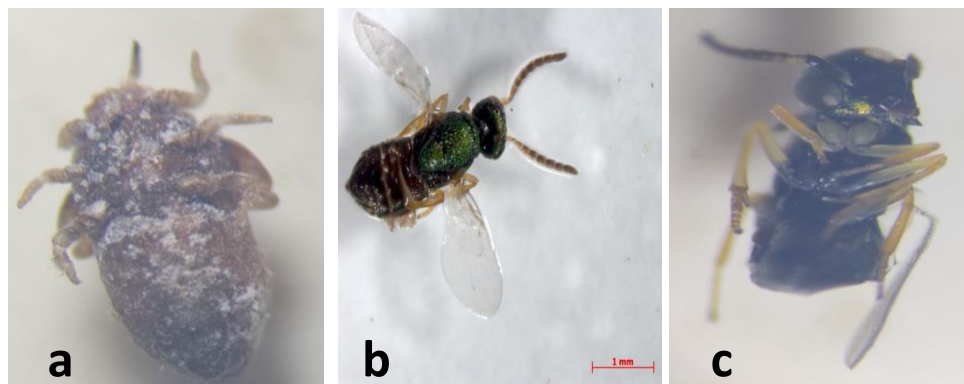


Fig. 4. Stereomicroscopic images of pupa and adults of *Psyllaephagus garuga*- the parasitoid of *Garuga* gall-former. a. Pupa, b.& c. Adults.

FIRST RECORD OF RINGED CASCADER ZYGONYX TORRIDUS KIRBY, 1889 DRAGONFLY FROM WEST BENGAL, INDIA

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Only two species under the genus *Zygonyx* Hagen, 1867 are present in India. One species is *Zygonyx iris* Selys, 1869 and another species is *Zygonyx torridus* Kirby, 1889 (Subramanian & Babu, 2017). *Zygonyx torridus* is commonly known as Ringed Cascader and it can be distinguished from *Zygonyx iris* through its appearance. *Z. torridus* is a medium sized black & yellow dragonfly which can be found near the edges of fast flowing stream in the foothills (Nair, 2011).

During an opportunistic survey on 24 October 2022, the authors photographed an adult *Z. torridus* (Fig. 1 & 2) at around 11:14 a.m. from the Ajodhya Hills of Purulia district, West Bengal, India. During the period of observation, the specimen was flying rapidly & tirelessly 100–200 m away from a river surrounded by streams, rocks and sand banks. The authors didn't observe the specimen in a

resting position during the 10–15 minutes when the dragonfly was observed.

The species was identified based on the key provided by Fraser (1936) and Nair (2011), namely, thorax with complete humeral stripes, colourless hind-wing base, dark metallic green thorax, black abdomen marked with bright yellow paired spots & abdominal segments 2 to 8 with large yellow spots on each side.

The study area, (Fig. 3) Ajodhya Hill (23.10°N, 86.06°E; 270m asl) where the species was sighted, is a dry, deciduous type of forest with some moist patches. Average annual rainfall of the area ranges from 1100 mm to 1500 mm and vegetation of the area is predominantly Sal (*Shorea robusta*) forest mixed with other species such as Palash (*Butea monosperma*), Kusum (*Schleichera oleosa*), Mahua (*Madhuca longifolia*), Neem (*Azadirachta*

indica) and Kendu (*Diospyros melanoxylon*) (Das, 2016).

The species *Z. torridus* was previously reported in India from Peninsular India, East India, Karnataka, Punjab, Uttarakhand, Himachal Pradesh, Uttar Pradesh, Madhya Pradesh & Orissa (Prasad & Varshney, 1995; Prasad & Sinha, 2010; Nair, 2011; Subramanian *et al.*, 2018). There are no known records of this species from the study area Ajodhya Hills (Samanta *et al.*, 2022). Though Prasad & Varshney (1995) reported *Z. torridus* from East India but there are no confirmed reports of this species from the state West Bengal (Dawn, 2021). So our report confirms presence of *Z. torridus* in the state West Bengal and it can be concluded that this is the first report of this species from the state.

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Figure 1&2: Images of *Zygonyx torridus* Kirby, 1889 from Ajodhya Hills, West Bengal, India.

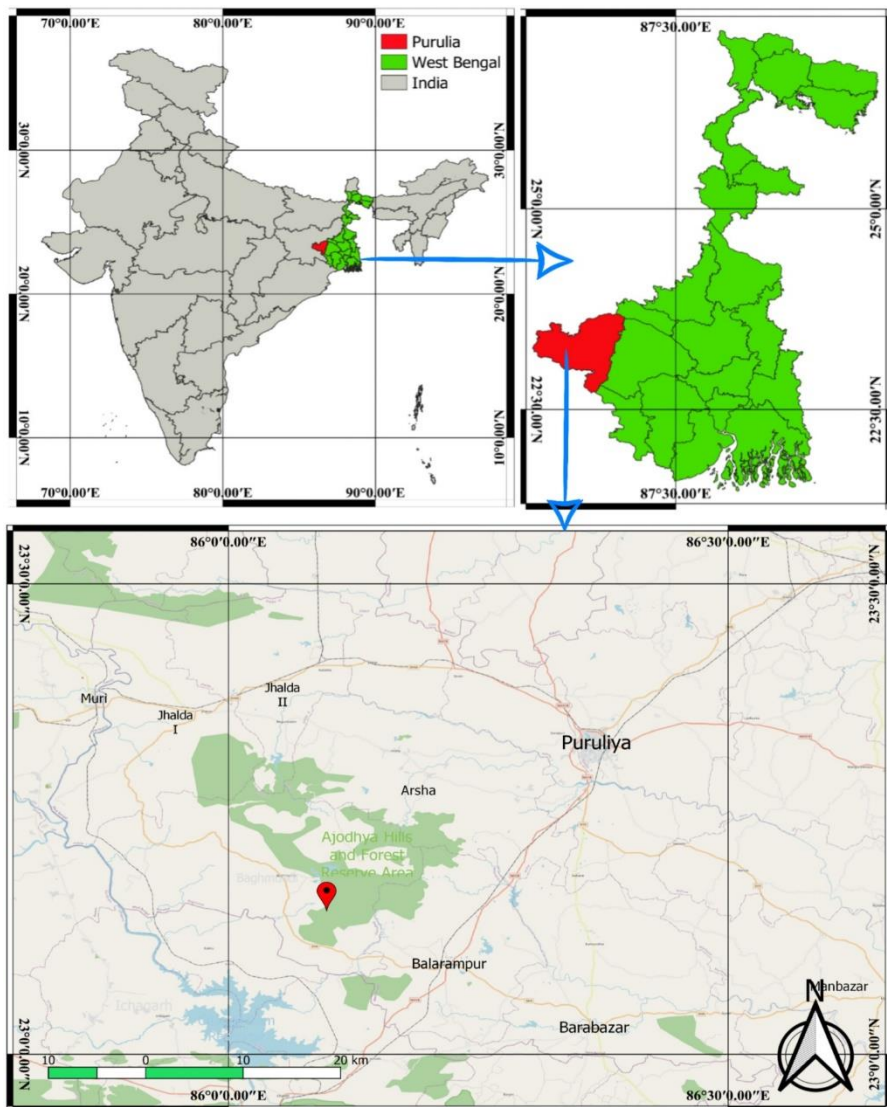


Figure 3: The study area where Ringed Cascader *Zygonyx torridus* Kirby, 1889 was sighted.

FIRST RECORD OF SOLIFUGAE (RHAGODIDAE AND GALEODIDAE) FROM DELHI, INDIA

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ABSTRACT

The Solifugae have not been well studied apart from work during the British era in India. Even the recorded distribution is still patchy and needs proper understanding of different species found across the country. In this paper, we report the first record of the Solifugae families Galeodidae and Rhagodidae from Delhi.

KEYWORDS Solifugae, Delhi, Wind-spider, Camel-spider, Galeodidae, Rhagodidae, Biodiversity Parks

INTRODUCTION

Solifugae are commonly known as Sun spiders, Camel Spiders, Wind Scorpions, Desert Archnids or Solifuges. They are small to moderately large spider-like

nocturnal, cursorial and hunting creatures found across the dry, arid and semi-arid habitats worldwide (Bano & Roy, 2016).

In India, Galeodidae is represented by a single genus *Galeodes* Olivier, 1791 which includes 13 species. Initially, Pocock (1897) included Rhagodids under subfamily Rhagodinae in family Solpugidae (Koc *et al.*, 2015); later the status of Rhagodidae was elevated by Roewer (1933). There are twenty-eight species of *Rhagodes* Pocock, 1897 distributed across central and south-east Asia. In India, Order Solifugae have been recorded from Bilaspur (Pocock, 1900); Pimpalner, Maharashtra (Pocock, 1900); Secunderabad, Andhra Pradesh (Pocock, 1900); Kurnool, Andhra Pradesh (Rao *et al.*, 2005); Nagarkurnool, Telangana (Pravalika *et al.*, 2014); Alirajpur, Madhya

Pradesh (Pandram & Sharma, 2015); Jaisalmer, Rajasthan (Bano & Roy, 2016) (Map 3).

Rhagodes have been recorded from India in Kurnool, Andhra Pradesh (Rao *et al.*, 2005), Aruchami & Rajulu (1978) described its poison glands from specimen collected from Kurnool, Andhra Pradesh and Vellore, Tamil Nadu by Pocock (1900) (Map 3).

MATERIAL AND METHODS

The specimen of Rhagodidae [Fig. 2a)] was collected during one of our field surveys from location (28°31'9.02"N, 77°16'38.17"E) on 5th June 2017 and another specimen of Galeodidae [Fig. 1a)] was collected during a birding session on 13th June 2018 at Delhi, India (28°30'51.70"N, 77°16'35.25"E). Both the locations are part of Delhi Development Authority's Tughlaqabad Biodiversity Park (Map 2). Both the specimens were collected and kept for 2 days without food to become less active, photographed using Canon 600D with 18-55 mm lens and extension tube of 35mm. Thereafter the specimens were fed with ants and after they were active, they were released at the site of original capture.

STUDY AREA

The District Park at Tughlaqabad Tekhand Phase II located in the southern ridge, the last spur of Aravali hills, has been declared as Tughlaqabad Biodiversity Park by Delhi Development Authority (DDA), in January 2016. The action plan for the development and management is being implemented by DDA in collaboration with CEMDE (University of Delhi). It is spread over an

area of 500 acres and includes the eastern gentle slope of the Tughlaqabad Fort area. The terrain is undulating with ridges and depressions; most of the ridges are flat and are either barren or with scattered bushes of *Prosopis juliflora*. Few patches have native vegetation of *Ziziphus mauritiana*, *Prosopis cineraria*, *Balanites aegyptica*, *Acacia nilotica*, *Acacia leucophloae*, and shrubby vegetation of *Caparis decidua*, *Caparis seiparia* and *Ziziphus nummularia*. Several shallow depressions are present across the landscape and these are recharging zones of rainwater along with raw sewage. The terrain is rocky and the climate semi-arid.

DESCRIPTION OF SPECIMEN

The specimen was identified by using identification keys provided by Wharton (1987) and Punzo (1998) helped to easily identify families and family-level identification. Identification to the species level is difficult based on photographs and lack of literature on the Order in India.

The specimen of Galeodidae was identified by the presence of a pair of flagella and a dark brown head, mandibles dark with brown spines, a pedipalp with dark brown adhesive organ, yellowish-brown legs with spines, fine microsetae on the tarsal claws of legs 2 through 4, Fan-shaped sensory organs called malleoli or racquet organ on the undersides of coxae and trochanters of fourth leg.

Anal somite: Flattened

Anus: terminal

Tarsal segmentation on legs: 1-2-2-3

Chelicerae: Multidentate

Flagellum (male): paraxially movable

Punzo (1998) described the Rhagodidae as having the following characteristic features: hemispherical anal somite of abdomen; anus located ventrally on last abdominal segment; tarsal segmentation: 1 - 1 - 1 - 1; tarsi of leg I with a basitarsus and 2 claws; metatarsi with dense ventral clothing of short, spine-like setae; heavy-bodied; short-legged; male cheliceral flagellum paraxially immovable and consists of 2 flattened, curled setae that form a curved, truncate, horn-like tube on the mesial surface; female genital opercula not differentiated from other abdominal sternites; chelicerae powerfully toothed (dentate), fixed digit with 3 teeth anterior to the large main tooth; 5 lateral and 2 median cheek teeth.

According to Koç *et al.* (2015), Rhagodidae species are medium-sized, short-legged, and vary in colour from tawny, yellowish-white or reddish to dark taupe or brown. The specimen recorded from the site had a dark brown body, with reddish legs. A study by Aruchami & Rajulu (1978) found the presence of venom glands in *Rhagodes nigrocinctus* (Rhagodidae) from India.

RESULT AND DISCUSSION

Galeodidae (Figure 1) and Rhagodidae (Figure 2) specimen has been photographically recorded from Delhi for the first time. The entire Order of Solifugae is not well known in Indian faunal studies, making it difficult to identify the specimens photographed and thereby compare distribution of the species. Further research on the Order can highlight the detailed distribution and ecology of the species. The specimen of Galeodidae recorded was 3cm and the

specimen of Rhagodidae was 2.2 cm. The Rhagodidae specimen was found hunting on ants and was aggressive; when disturbed it sped away furiously. The habitat was mainly sandstone and scrubland. Our observation emphasizes that both the families of Solifugae are well distributed in southern Delhi and active in summers during morning and evening. A further search for specimens and scientific documentation of behaviour and distribution in the area can give better understanding and ecology of the Order Solifugae.

ACKNOWLEDGEMENT

The team wholeheartedly thanks Delhi Development Authority, Delhi and Centre for Environmental Management of Degraded Ecosystems, University of Delhi, Delhi, particularly Professor C.R. Babu for supporting the research and scientific documentations of different aspects of biodiversity in Biodiversity Parks.

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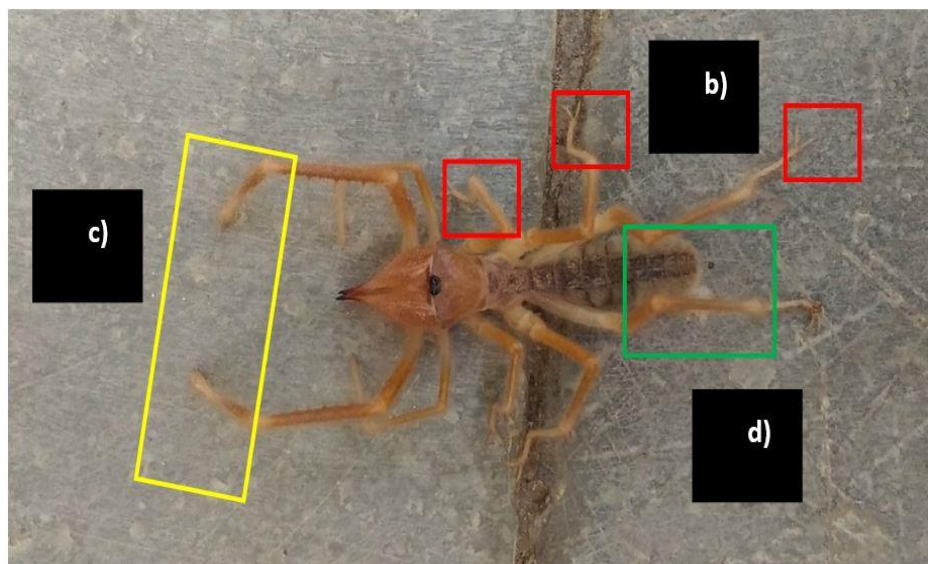




Fig 1: Morphological Characters of identifying Galeodidae

- a) Dark brown thorax and abdomen with light brown legs
- b) Microsetae on the tarsal claws of legs 2 through 4.
- c) A pair of pedipalp with adhesive organ
- d) The flattened anal somite.
- e) Pair of flagellae of male (family Galeodidae).

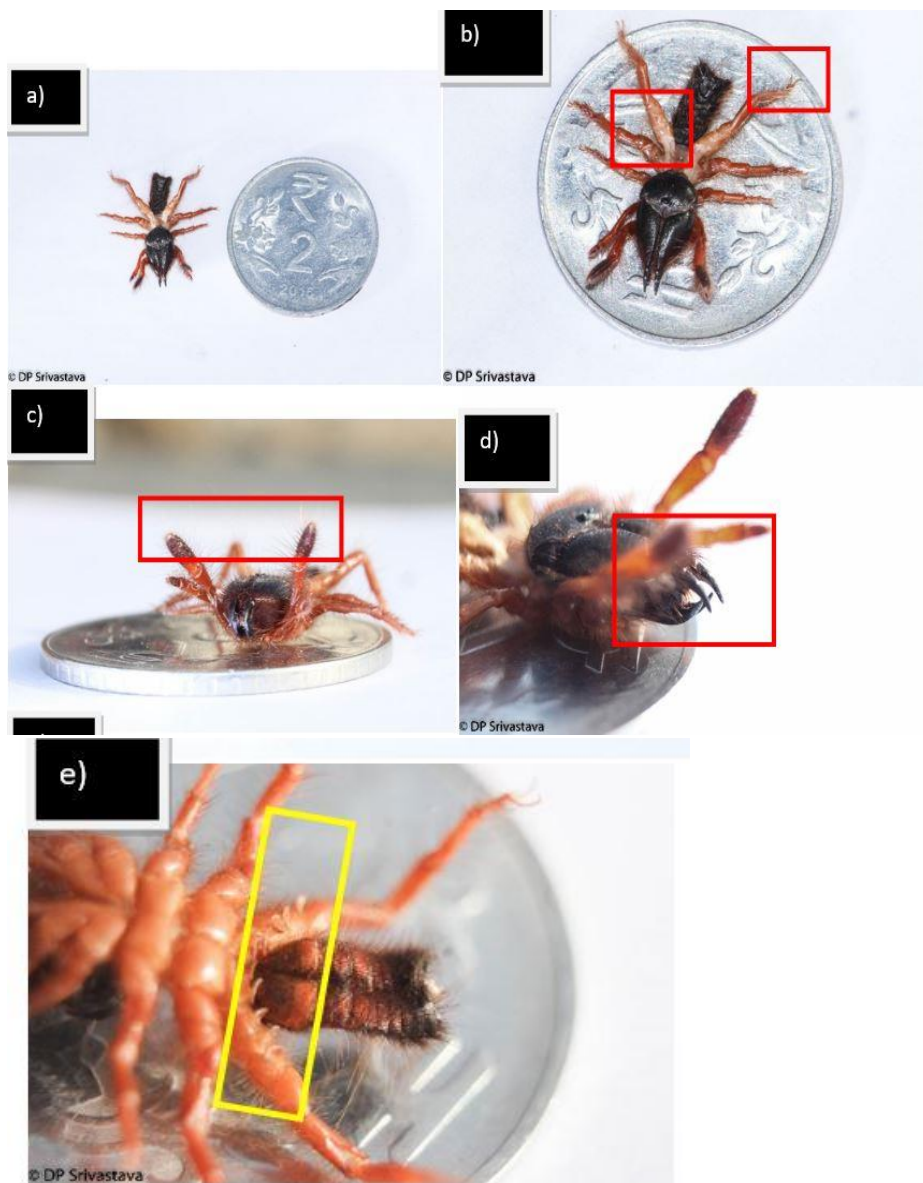
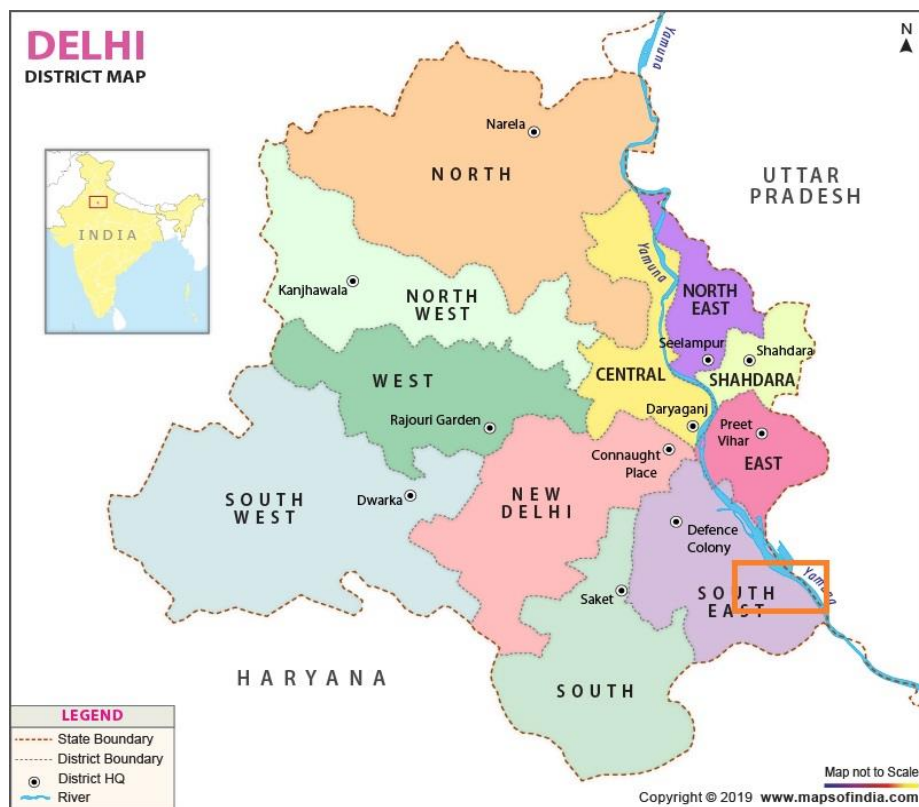


Fig 2: Morphological characters for identifying Rhagodidae

- Dark brown thorax and abdomen with light brown legs
- Tarsi of leg with a basitarsus and 2 claws
- A pair of Pedipalps with adhesive organ
- Pair of Flagellae of male
- Fan-shaped Malleoli on ventral side of fourth leg

ANNEXURE

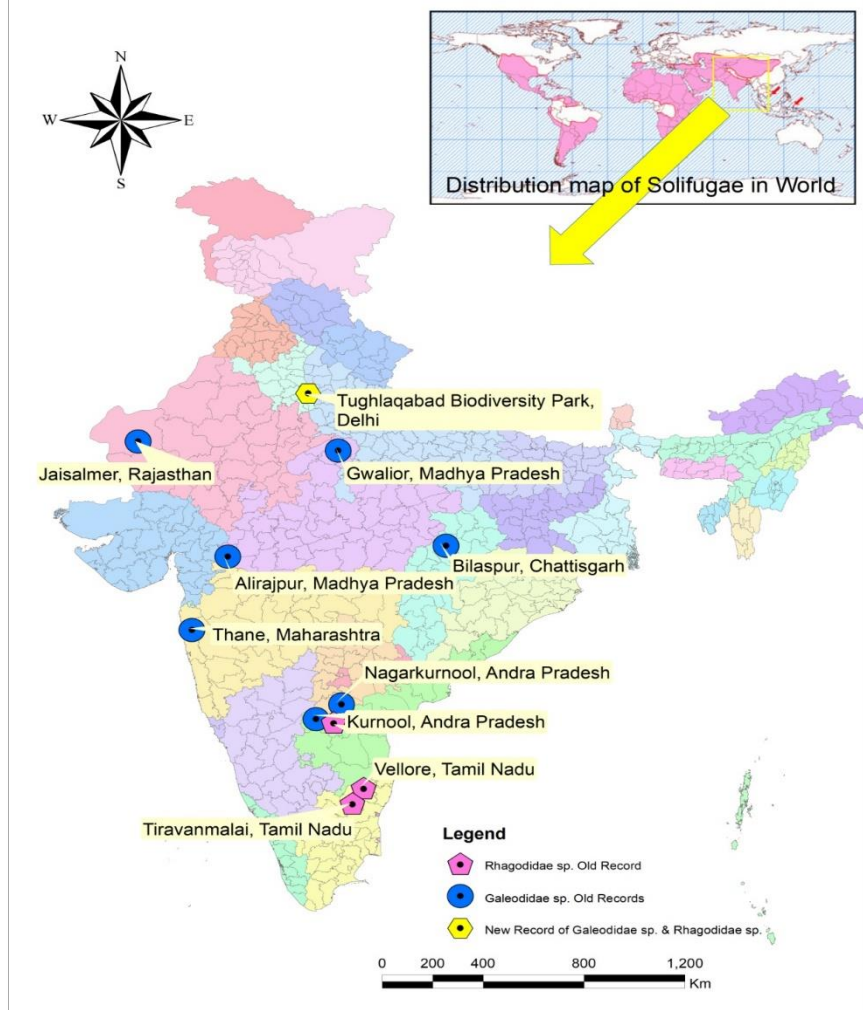


Map 1: Study Area Delhi, India



Map 2: Study Area: Tughlaqabad Biodiversity Park, Delhi, India

DISTRIBUTION OF GALEODIDAE & RHODIDAE FAMILY ORDER: SOLIFUGAE FROM INDIA



Map 3: Recorded Distribution of Solifugae Order from India

CONFIRMATION OF INDIAN OAKBLUE *ARHOPALA ATRAX* (HEWITSON, 1862) (LEPIDOPTERA: LYCAENIDAE) FROM SOUTHERN UTTAR PRADESH, INDIA

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The Indian Oakblue *Arhopala atrax* (Hewitson, 1862) occurs in peninsular India as well as from Jammu & Kashmir to North East India (Varshney & Smetacek, 2015). According to Kehimkar (2016), it is found in Nepal, Bhutan, and Myanmar in addition to West Bengal, Jharkhand, Odisha, Chattisgarh, Madhya Pradesh, and Himachal Pradesh in India. In addition to reporting this species from Maharashtra and Gujarat, Bhakare & Ogale (2018) also cited its occurrence in Karnataka and Tamil Nadu. Delhi has also reported on it. There is a gap between the populations of the species in peninsular India and the Himalayan foothills because the species had not been discovered on the Gangetic plain prior to the Delhi record. *Arhopala atrax* is mentioned in the current study for the first time coming from southern Uttar Pradesh in North India.

Arhopala atrax (Figure 1) was photographed by the author on July 28, 2022, at a height of 98 metres above sea level in the Prayagraj district of Uttar Pradesh (25.3481° N. 81.9535° E). With the use of literature, i.e. Kehimkar (2016), Bhakare & Ogale (2018), and Smetacek ([2016]), the butterfly was identified.

This is the first time *A. atrax* has been recorded from southern Uttar Pradesh. Sushmita *et al.*, (2022) reported this butterfly from Barabanki district which was the first specimen recorded for Uttar Pradesh, although Gasse (2018) had already shown its distribution in Dudhwa National Park in northern Uttar Pradesh.

Confirmation of this species in southern Uttar Pradesh suggests that the sub-Himalayan population and the continental populations are contiguous, via Lucknow and Prayagraj.

ACKNOWLEDGEMENT

Author is thankful to Mr. Sagar Sarang for the identification of this butterfly.

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Figure 1: *Arhopala atrax* in Prayagraj, Uttar Pradesh

REDISCOVERY OF THE KASHMIR MEADOWBROWN BUTTERFLY (*HYPONEPHELE CHEENA KASHMIRICA*) FROM JAMMU & KASHMIR, INDIA

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ABSTRACT

Several butterfly surveys were conducted in Baramulla district of Jammu & Kashmir between March and December, 2020.

Hyponephele cheena kashmirica, which was described in 1893 by Moore sighting from specimens obtained from Baramulla and Doda districts, has now been recorded for the second time from the type locality after a gap of almost 128 years.

INTRODUCTION

The genus *Hyponephele* Muschanmp, 1915 (Lepidoptera: Nymphalidae: Satyrine) is widely distributed in the central and southern Palaearctic Region and is represented by forty species and 102 subspecies (Eckweiler & Bozano, 2011; Lukhtanov & Pazhenkova, 2021). In India, the genus is represented by five species and five subspecies (Appendix I for checklist with type locality) (Eckweiler & Bozano, 2011). *Hyponephele*

coenonympha goolmurga (Lang, 1868), *Hyponephele cheena kashmirica* (Moore, 1893) and *Hyponephele pulchra neoza* (Lang, 1868) are reported from the territory of Jammu & Kashmir. *H. cheena kashmirica* (Moore, 1893) was raised to species rank by Tshikolovets & Pages (2016); later, Lukhtanov & Pazhenkova (2021) treated it as a subspecies.

In the present note, we report the recent sighting of *H. cheena kashmirica* (Moore, 1893) at Baramulla district, the first since F. Moore reported the butterfly from Gulmarg in 1893. The type-localities of the Kashmir Meadowbrown, *H. cheena kashmirica* were Gulmurg (Baramulla district) and Baderwah and Jora (Doda district).

MATERIALS AND METHODS

Baramulla was surveyed from March to December, 2020 to record the butterfly diversity. About 80 random surveys were carried out in the study area. Collection was carried out with the help of aerial nets

and specimens were photographed with the help of Olympus camera with supramacro feature. The specimens were killed with fumes of ethyl acetate and after killing, the specimens were relaxed and then stretched on insect stretching boards and were kept in insect cabinets which have been deposited in the Department of Zoology, Baba Ghulam Shah Badshah University, Rajouri (J&K).

RESULTS AND DISCUSSION

H. cheena kashmirica was found to be abundant in forests of Baramulla. The first sample was sighted in a forested stretch between Gowas and Gorivan villages and was photographed there (34°09'01"N; 74°17'43"E) at an altitude of 2008 m, located in the Narvaw tehsil of Baramulla. Individuals of the same species were seen perching on *Circium* flowers; a few individuals were also seen perching on *Cedrus deodara* branches. Being undisturbed habitat, this site hosted a variety of butterfly species. This sighting confirms that the *H. cheena kashmirica* is still present in Jammu and Kashmir.

CONCLUSION

H. cheena kashmirica, was found to be common in forests of the Kashmir valley. Since the habitat appears to be restricted to undisturbed forests, the taxon was not commonly observed in non forested areas. Due to deforestation and other anthropogenic activities, the habitat of this subspecies faces a challenge.

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APPENDIX I

Checklist of genus *Hyponephele* Muschanmp, 1915 in India:

1. *Hyponephele cheena cheena* (Moore, 1865) – TL: “Kunawur”

[Bashahr, Himachal Pradesh, India]

- a. *Hyponephele cheena kashmirica* (Moore, 1893) – TL: “Gulmarg” [Gulmarg, Jammu and Kashmir, India]
2. *Hyponephele coenonympha coenonympha* (Felder & Felder, 1867) – TL: (Felder & Felder, 1867) – TL: “Himalaya Occidental.: Ladakh: Suroo” [Suru valley, Jammu and Kashmir, India]
 - a. *Hyponephele coenonympha goolmurga* (Lang, 1868) – TL: “Hab. Goolmurg” [Gulmarg, Jammu and Kashmir, India]
3. *Hyponephele davendra davendra* (Moore, 1865) – TL: “Spiti and Tibet” (Spiti valley, Himachal Pradesh, N India)
 - a. *Hyponephele davendra brevistigma* (Moore, 1893) – TL: “N.-W. Himalayas (Dras Valley)” [Dras, Ladakh, India]
4. *Hyponephele pulchra pulchra* (Felder & Felder, 1867) – TL: “Himalaya Occidental.: Spiti: Losar, Dishungdeo, Kibber, Shalkar, Rupshu: Rumbog, Ladakh: Karnag: Niri Sumbo in alt. 15,500 ped., Padam: Abrang,

Marmang” [Zanskar, Ladakh; Himachal Pradesh, India]

- a. *Hyponephele pulchra neoza* (Lang, 1868) – TL: “Goolmurg” [Gulmarg, Kashmir, India]
- b. *Hyponephele pulchra astorica* (Tytler, 1926) – TL: “... in the Rupal Nullah and at Rama in Astor and also a few from Ladakh...” [Baltistan; Ladakh, India]
5. *Hyponephele pulchella pulchella* (Felder & Felder, 1867) – TL: “Himalaya Occidental.: Spiti: Losar, Dishungdeo, Kibber, Shalkar, Rupshu: Rumbog, Ladakh: Karnag: Niri Sumbo in alt. 15,500 ped., Pangchog” [Zanskar, Ladakh, India]



Fig.1: Upperside



Fig. 2: Underside



Fig. 3: *H. kashmirica* perching on *Cirsium* flowers

CYNANCHUM CALLIALATUM: A PUTATIVE NEW LARVAL FOOD PLANT OF THE PLAIN TIGER *DANAUS CHRYSIPPUS* (LEPIDOPTERA: NYMPHALIDAE) FROM AN ECO-RESTORATION SITE OF PUNE, MAHARASHTRA, INDIA

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The Plain Tiger *Danaus chrysippus* (Linnaeus, 1758) (Lepidoptera: Nymphalidae: Danainae) is a widely distributed Nymphalid butterfly occurring in Africa, Asia, Australia, and some parts of Europe (Galanos, 2017). In the Indian sub-region, the butterfly is commonly found throughout the plains, in degraded habitats, woodlands, scrublands, and open areas, but less commonly in evergreen forests and above 2500 m altitude in hilly regions (Smetacek, 2001; Kehimkar, 2016). Previously recorded larval host plants of this butterfly in India are *Asclepias curassavica* L.; *Calotropis gigantea* (L.) Dryand; *Calotropis procera* (Aiton) W.T. Aiton; *Caralluma adscendens* (Roxb.) R. Br.; *Cryptolepis dubia* (Burm. F.) M.R. Almeida; *Pergularia daemia* (Forssk.) Chiov. (Apocynaceae) (Wynter-Blyth, 1957; Kunte, 2000; Robinson *et al.*; 2010; Nitin *et al.*, 2018).

On 15th October 2022, during a field visit to the 14 Trees Foundation, an eco-restoration site at Vetale village, Pune for a biodiversity survey, we came across a single caterpillar feeding on the leaves of a climber plant (Fig. 1). The caterpillar was found feeding on the leaves of the same plant the next day. Later, the caterpillar was identified to be of Plain Tiger *Danaus chrysippus* and the climber plant was identified as *Cynanchum callialatum* Buch.-Ham. ex Wight belonging to the family Apocynaceae.

Hitherto published records show *C. callialatum* as a larval host plant for *Danaus genutia* (Cramer, [1779]) from India (Nitin *et al.*, 2018). Plants belong to the genus *Cynanchum*, such as *C. abyssinicum* Decne.; *C. acutum* L.; *C. altiscandens* K. Schum.; *C. amplexicaule* Sieb. et Zucc.; *C. carnosum* (R.Br) Schltr.; *C. floribundum* R.Br. and *C. sublancoletum* Poir. have already been reported as larval food plants of Plain

Tiger *D. chrysippus* from the Oriental Region (Robinson *et al.*, 2010). However, no records were found concerning *C. callialatum* being a larval host plant of the Plain Tiger butterfly.

Hence, *C. callialatum* could be a putative larval host plant of the Plain Tiger butterfly. However, due to time constraints, we could not carry out further observations regarding pupal formation and emergence. The place of observation is an eco-restoration site which is an attempt to restore the land and enhance the biodiversity with native plants of the Western Ghats.

ACKNOWLEDGMENT

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Fig. 1. Caterpillar of Plain Tiger butterfly *Danaus chrysippus* feeding on the leaves of *Cynanchum callialatum* at Vetale village, Pune, Maharashtra, India. (Photo: C. Bhatt)

FIRST RECORD OF *AZANUS UBALDUS* (STOLL, 1782) (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM JHARKHAND, INDIA

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ABSTRACT

This paper confirms the presence of *Azanus ubaldus* (Stoll, 1782) in Jharkhand with photographic documentation.

KEYWORDS Butterfly, First Record, Hazaribagh

INTRODUCTION

Azanus ubaldus (Stoll, 1782) also known as Bright Babul Blue, is a small species of butterfly belonging to the Lycaenidae family. It is found all over India except North East Indian States (Varshney & Smetacek, 2015). Apart from India, it has also been reported from Pakistan, Bhutan, Myanmar and Sri Lanka (Kehimkar, 2016).

It is a resident of arid and semiarid zones with larger stocks of *Acacia* (Schurian, 2016). The flight is strong and continuous, mostly during the months of March–November (Singh, 2010).

During a field study, specimens of *A. ubaldus* were photographed twice by the authors from Hazaribagh town in

Hazaribagh district, Jharkhand, India using a Samsung SM-A207F and Realme Narzo RMX2050 camera.

OBSERVATION

The species was first photographed near Hazaribagh Bypass Road (24.021786°N; 85.387961°E) of Hazaribagh town on 25.vi.2022 at 9:26 am. At the time of observation, the butterfly was hiding under a leaf on the ground. The butterfly was seen again and photographed on 1.viii.2022 at 10:35 am, 50 metres North-West from the previous sighted place. At that time, it was flying rapidly around and inside the crowns of Babul trees (*Acacia nilotica*). Specimens were not captured and thus not collected from the study area.

DISCUSSION

The butterfly was identified based on tailless hindwing, male with bright violet blue upperside and black border; female with pale blue upperside and broad brown border, lacks a spot in the cell on under forewing, underneath with two black

tornal spots, two black costal spots and a pale brown, white-edged band (Kehimkar, 2016; Singh, 2011). The study area is a dry deciduous forest that has an elevation of 592 m and was surrounded by *Shorea robusta*, *Madhuca longifera*, *Buchanania lanzan*, *Acacia nilotica*, *Senna sophora*, *Lantana camara* and *Clerodendron infortunatum*.

CONCLUSION

A. ubaldus was hitherto not reported from Jharkhand (Verma, 2009; Singh, 2010; Patra *et al.*, 2022). Although it has been recorded earlier from the neighbouring states of West Bengal (Mukherjee *et al.*, 2020), Bihar (Karthik *et al.*, 2020), Chhattisgarh (Sisodia, 2019) and Odisha (Mahata & Palita, 2022). Based on photographic evidence we confirm the presence of *A. ubaldus* in Jharkhand.

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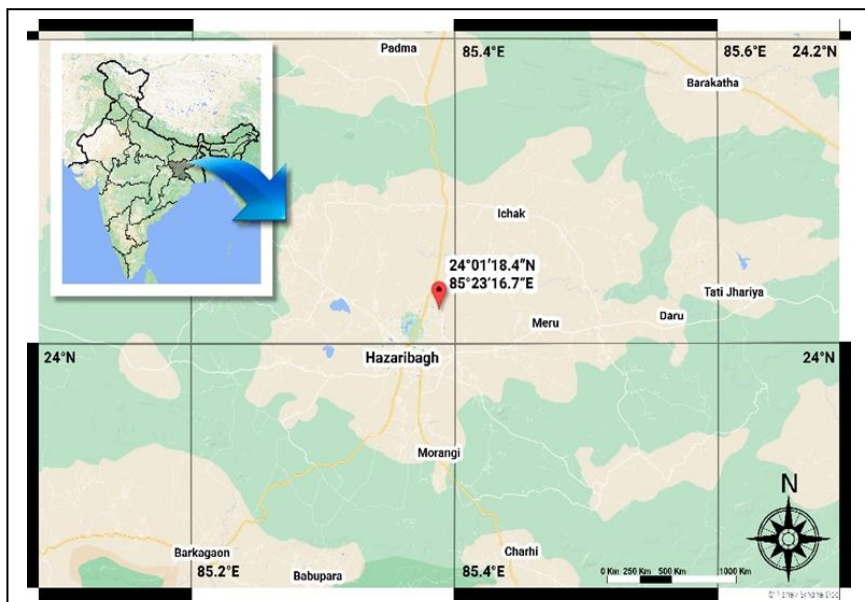


Figure 1: 1st Photograph of Bright Babul Blue taken by the Authors

Figure 2: 2nd Photograph of Bright Babul Blue

Figure 3: Map of the study area where 1st Bright Babul Blue (*Azanus ubaldus*) was sighted

ADDITION OF THE RED PIERROT BUTTERFLY *TALICADA NYSEUS NYSEUS* TO THE BUTTERFLY FAUNA OF CHHATTISGARH, INDIA

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Due to diverse habitats and its rich floral diversity, Chhattisgarh has a rich diversity of butterflies. The latter have been regularly surveyed from Surguja to Bastar divisions by the authors. The state Chhattisgarh has five revenue divisions as Surguja, Bilaspur, Durg, Raipur and Bastar, which comes under the Deccan Plateau (Rodgers *et al.*, 2002); geologically, it is a part of the Gondwana Plateau (Chandra & Singh, 2004); and climate is tropical, hot and humid in the state. Jashpur (22.8763590N, 84.1569230E) district is situated in the North-East of Chhattisgarh, bordering Orissa state and Bastar division (19.0969125N, 81.9965469E) is the South-East part, also bordering Orissa at lower Chhattisgarh.

For the present report and observation of butterflies, Saurabh Singh with Ashwini Chouhan & Rohit Kalyari visited the Jashpur District office in the morning

hours while Gulab Sahu visited Jagdalpur city and photographed the butterflies. The Red Pierrot was first photographed on 22.ii.2022, and frequently seen in the urban environment of the Jashpur District office. Gulab Sahu encountered the Red Pierrot in Jagdalpur city on 11.ii.2023 and 5.iii.2023 and frequently observed them in the same place. Photographed individuals were identified by field characters using Smetacek (2016) and Kehimkar (2016) and the species were confirmed by Evans (1932), Wynter Blyth (1957) and Haribal (1992).

Observation: These are the first recorded observations of this species from Chhattisgarh. The known distribution of the subspecies *T. n. nyseus* in India was Maharashtra to Kerala, eastward to Andhra Pradesh; Himachal Pradesh, Uttarakhand; Uttar Pradesh; Delhi (Varshney & Smetacek, 2015).

The species was first observed on 22.ii.2022, in the Government Circuit House in Gamharia, Jashpur, which has artificially created home gardens, surrounds by public building gardens. *Bryophyllum pinnatum*, the host plant of Red Pierrot (Wynter-Blyth, 1957) was widely distributed with some other plant such as Periwinkle, *Ixora*, etc. After that, sightings of several individuals occurred often. There were also sightings in the front yard, a public park, the Divisional Forest office, etc. The Red Pierrot was sighted in the same month of the following year on 11.ii.2023 by Gulab Sahu in the Green Park Colony, in front of Government Indrāvati Women transit hostel, Jagdalpur, on 11.ii.2023. It was again sighted in the same location on 05.iii.2023 and observed as common in that habitat, which has *Ixora*, *Lantana camara* and *Bryophyllum*.

The Red Pierrot *T. n. nyseus* was not documented earlier in the state (Chandra et al., 2007, 2014; Chandra & Sharma, 2009; Dubey et al., 2015; Sisodia, 2019; Tandan et al., 2020, 2021a,b; Nihalani, 2021). Hence, here with this report, the species *T. n. nyseus* is reported as a new record for the Chhattisgarh state.

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Fig. 1: Red Pierrot at Jagdalpur by Gulab Chand



Fig. 2: Red Pierrot at Jashpur by Saurabh Singh

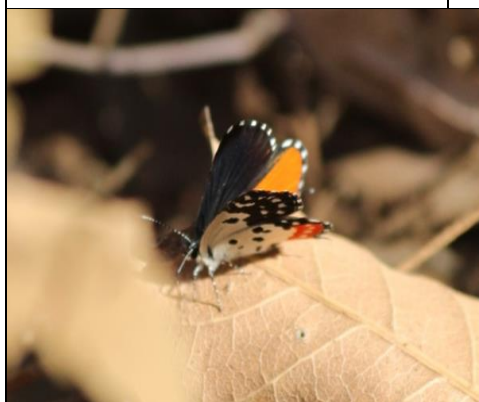


Fig 3: Red Pierrot showing upperwing, © Gulab Chand

Fig. 4: Study area. Map showing the observation sites as Site-1 Jashpur, and Site-2 Jagdalpur (Bastar)



STUDIES ON FORAGING AND POLLINATING ACTIVITY OF DWARF HONEY BEE (*APIS FLOREA* F.) ON BLOOMS OF *BRASSICA JUNCEA* LINNAEUS IN WEST BENGAL, INDIA

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ABSTRACT

Dwarf honey bee *Apis florea* F. is an economically important hymenopteran insect that pollinates a large number of flowering crops. A survey was conducted on agricultural land in and around Newtown, North 24 Parganas, W. Bengal, India, during December, 2021 to study the foraging activity of *Apis florea* and their role in pollination of mustard (*Brassica juncea* L.) flowers. Peak foraging activity of dwarf honey bee was mainly observed at 1200 hrs. and minimum foraging activity was noticed at 0800 hrs. & 1700 hrs. The present study also reported that foraging activity of *Apis florea* was maximum on sunny days and least on cloudy days.

KEYWORDS: *Apis florea*, *Brassica juncea*, foraging activity, pollination

INTRODUCTION

Hymenopteran insects, especially honey bees, are very effective in collecting pollen grains (as a protein source) and nectar (as

a carbohydrate source) or both. Red dwarf honey bee *Apis florea* Fabricius, 1787 is a very small wild bee as compared to other *Apis* Linnaeus, 1758 species. Mustard (*Brassica juncea* L.) is an economically important oil producing plant under the family Brassicaceae. *Brassica juncea* is a self incompatible crop which needs insects or other pollinating agents for their pollination. Different species of honey bees have been reported as the most frequent foragers of mustard blooms (Dalio, 2018; Nagpal *et al.*, 2020).

Foraging frequency of bees or the number of flowers visited per unit time depends upon a few factors like length of proboscis (Inouye, 1980), floral structure (Free, 1970), quality and quantity of floral rewards (Rao & Suryanarayana, 1983; Rao, 1991) etc. Foraging behavior of *Apis florea* on onion flowers (*Allium cepa* L.) was studied by Abrol (2010) and he noted that bee foraging behavior is significantly related with various environmental factors. Foraging activity of dwarf bees on blooms of *Ocimum basilicum* was studied by Dalio (2018) and it was observed that this herb is an excellent source of nectar and pollen for

Apis florea. Roy *et al.* (2014) reported that *Apis florea* is an effective pollinator for *Brassica juncea*.

A. florea shows late foraging performance and spent more time (5.9-6.4 sec) on *Brassica juncea* flowers than *A. dorsata* Fabricius, 1793 and *A. mellifera* Linnaeus, 1758 (Tanda, 1984). Sharma *et al.* (2001) and Pandey & Tripathi (2003) observed that workers of *A. florea* stay for a greater time per flower than other bee species. Foraging activities and the foraging patterns of honey bees have changed with different weather condition (Hossam *et al.*, 2012; Shwetha *et al.*, 2021). Foraging behavior of *A. florea* in different environmental conditions was studied by Layek *et al.*, 2015 and revealed that *A. florea* produces both unifloral and multifloral type of honey. The main objective of the present study was to determine the foraging span (time spent per flower) and/or foraging rate (number of flower visited per unit time) of *Apis florea* on mustard flower in different diurnal conditions.

MATERIAL AND METHODS

The field study was conducted during the flowering season of mustard, from December to January, 2021 at an agricultural area of North 24 Parganas, West Bengal. To study the diurnal abundance of *Apis florea*, five random plots were selected of 1 m² area each. Approximately 210-270 plants in each 1 m² area were counted. Observations were taken at every hour from 0700 to 1700 hrs. The number of *Apis florea* individuals present in each quadrat area (1 m²) for a period of 5 minutes at the interval of every

hour from 0700-1700 hrs was noted with the help of measuring tape and stopwatch. The numbers of pollen or volumes of nectar or both bee foragers were noted to study the foraging activity of *Apis florea*. Data were taken on both sunny and cloudy days to analyse the difference in time of commencement, cessation and also highest foraging activity period during different weather conditions.

RESULT AND DISCUSSION

The present observations revealed that the foraging activity of *Apis florea* starts between 0800-0900 hrs and it stop its foraging activity between 1600-1700 hrs on mustard flowers. It has been found that *A. florea* do not show their foraging activity before 7 am and after 5 pm, probably due to low atmospheric temperature, humidity, light intensity and other foraging factors. Maximum abundance was recorded between 1200-1300 hrs probably due to high rewards in terms of pollen and nectar etc.

The data on foraging speed (time spent per flower) of *A. florea* on *B. juncea* flowers was recorded from 0700 to 1700 hrs. The data has been presented in Table 2. In the present observation maximum time spent per flower by *A. florea* (8.26 sec - 8.13 sec) was recorded at 1300-1400 hrs and minimum foraging speed (3.13 sec) was noted at 0800 hrs. The maximum mean foraging speed was 5.77 sec and the minimum mean foraging speed was 4.00 sec. So, foraging speed was significantly low in morning and afternoon hours.

Foraging frequency of *A. florea* on *B. juncea* flowers was also noted under

different weather conditions. The data has been presented in Table 3. During sunny days the pollen foragers of *A. florea* were 1.10-1.74 bees/m²/5 min and nectar foragers were 0.98-1.34 bees/m²/5 min. During cloudy day the pollen foragers of *A. florea* were 0.87-1.34 bees/m²/5 min and nectar foragers were 0.65-1.16 bees/m²/5 min.

Foraging activity of *Apis florea* (bees/m²/5 min) inside and outside the crop field was observed and the data has been presented in Table 4. Foraging activity was greater (2.12 bees/m²/5 min) inside the crop field than along the edge (1.64 bees/m²/5 min) of the field.

Table-1: Abundance of *Apis florea on *Brassica juncea***

***Number of bees per 1 m² per 5 minutes (Average of 25 observations)**

Hrs.	Abundance of <i>Apis florea</i>
0700	0.00
0800	0.12 ±0.33
0900	0.32±0.47
1000	0.76±0.43
1100	1.08±0.40
1200	2.12±0.43
1300	2.04±0.45
1400	1.96±0.35
1500	1.24±0.43

1600	0.96±0.45
1700	0.00

Table-2: foraging speed of *Apis florea* on the flowers of *B. juncea* (Average of 15 observations)

Hrs.	Maximum time spent /Flower (sec)	Minimum time spent /Flower (sec)
0700	00	00
0800	5.13	3.13
0900	6.46	3.73
1000	7.13	5.13
1100	7.33	4.86
1200	7.26	5.73
1300	8.26	6.26
1400	8.13	6.53
1500	7.53	4.73
1600	6.33	3.93
1700	00	00
Mean	5.77	4.00

Table-3: Foraging frequency of *Apis florea* under different weather conditions

	Pollen foragers (PF)	Nectar foragers (NF)
Sunny Day	1.10-1.74 bees/m²/5 min	0.98-1.34 bees/m²/5 min
Cloudy Day	0.87-1.34 bees/m²/5 min	0.65-1.16 bees/m²/5 min

Table-4: Foraging activity of *Apis florea* (bees/m²/5 min) inside and outside the crop field (Average of 25 observations)

	Foraging activity inside the crop field	Foraging activity outside the crop field
<i>Apis florea</i> (bees/m²/5 min)	2.12	1.64

Mustard flowers are very attractive and a good source of nectar and pollen for a wide variety of insects belonging to the orders Hymenoptera, Lepidoptera, Coleoptera, Diptera and Hemiptera (Free, 1993; Abrol, 1998; Roy *et al.*, 2014). Roy *et al.* (2014) reported that honeybees are effective pollinators and they collect pollen by their specific pollen baskets

located on hind legs. Layek *et al.* (2015) mentioned that *A. florea* helps our society through their pollination services by enhancing pollination rate in agricultural and natural ecosystems. Tanda (1984) noted that foraging activity of *A. florea* on *B. juncea* flowers started later and they spent more time (5.9-6.4 sec/flower) than *A. mellifera* (3.0-3.2 sec/ flower) and *A. dorsata* (2.2-3.0 sec/ flower). Nagpal *et al.* (2020) observed that *A. florea* spent more time per flower (6.63 sec) than other *Apis* species on the blooms of *B. juncea*. The present findings also revealed that *A. florea* spent most time (8.26 sec) on the blooms of *B. juncea*. Sharma *et al.* (2001) studied *A. florea* on *B. campestris* flowers and observed the same result. On *B. campestris* flowers, *A. florea* spent 3.54 sec/flower followed by *A. dorsata* (2.18 sec/ flower) and *A. mellifera* (1.64 sec/ flower). Pollination efficiency of honey bees is determined by the foraging rate of bees or the number of flowers visited in a short time. Pollination efficiency is directly related to the foraging rate of honey bees. *A. florea* is a very effective pollinator for their very small body size (Free, 1981; Singh, 1982; Gubartalla, 1997) as compared to other *Apis* species and distributed in tropical and subtropical regions of Asia. Dalio (2018) reported that foraging rate of *A. florea* was significantly lower than other bee species on the blooms of *B. napus* L.

According to Abrol (2010), foraging behavior of *A. florea* is positively related with various environmental factors like air temperature, light intensity, solar radiation and nectar-sugar concentration of flower species and negatively related with humidity. The present study also supports

this finding. Abrol (2010) also reported that *A. florea* is an efficient pollinator for its maximum abundance; maximum foraging rate and they are able to perform their work at high temperatures on onion flowers. Shwetha *et al.* (2021) recorded that the foraging activity of *A. cerana* and *A. florea* was significantly higher in sunny weather than on cloudy days. According to Sihag & Abrol (1986) foraging activity of *A. florea* was directly related with air temperature, light intensity, solar radiation and nectar sugar concentration and inversely related with humidity. Foraging activity of *A. florea* on the bloom of *Ocimum basilicum* was observed by Dalio (2018) and he concluded that foraging activity depends on the hours of the day. Priti (1998) studied the foraging rate and forager abundance of insect visitors on onion blooms and observed that the abundance of pollen foragers were more than the nectar foragers.

CONCLUSION

The present study concludes that the hymenopteran bee *A. florea* is a very effective pollinator on mustard blooms. The foraging activity of *A. florea* depends on weather conditions. Nowadays farmers use insecticides frequently, which hamper the foraging rate of hymenopteran bees. So, farmers should ideally follow biological control methods.

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A NEW ALTITUDINAL RECORD FOR THE BLUE PANSY BUTTERFLY *JUNONIA ORITHYA* FROM BHUTAN

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The Blue Pansy *Junonia orithya* (Linnaeus, 1758) (Lepidoptera: Nymphalidae: Nymphalinae) is a widespread butterfly that occurs from tropical Africa through Asia to Australia (Smetacek, [2016]). It is found throughout the Indian subcontinent, ascending to 2,740 m in the hills (Wynter-Blyth, 1957). However, Kehimkar (2016) reported “up to 2,100 m” for the species, while van der Poel & Wangchuk (2007) reported it up to an elevation of 2500 m in Bhutan. Van der Poel & Smetacek (2022) reported it up to an elevation of 2160 m in Nepal.

A butterfly of this species was observed during recent forest fire mopping operations on 18.i.2023 at Gomchey Village, Geney Gewog under Thimphu Dzongkhag at an altitude of 2754m (N: 27.31263383; E: 89.60395730) (Fig. 1). The image of butterfly was captured between open area and Blue Pine (*Pinus wallichiana*) forest on a clear, sunny day.

This record confirms that the species occurs up to around 2750 m elevation, as reported by Wynter-Blyth (1957). That it should occur so high in January, which is the coldest part of the year, is unusual.

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Figure: *Junonia orithya* on 18.i.2023 at Gomchey Village

GREAT EGGFLY BUTTERFLIES *HYPOLIMNAS BOLINA* (LINNAEUS, 1758) (LEPIDOPTERA: NYMPHALIDAE) FEEDING ON PUMPKIN FRUIT IN NEPAL

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While most larvae of Lepidoptera feed on leaves of their hostplants, feeding habits of adults vary. The Micropterygidae have chewing mouth parts; many Bombycoidea lack functional mouth parts and some moths bear specialized mouth parts to pollinate specific flowers. All butterflies have probocides and are capable of imbibing liquid food, especially sugary fluids. There are two major sources of sugary fluids: flower nectar and a second group comprising fruit juice, alcohol, tree sap, etc.

Butterflies that are known to visit flowers usually do not visit over ripe fruit, tree sap etc. and *vice versa*. Nyphalinae includes several genera and species that exclusively visit flowers such as *Melitaea* Fabricius, 1807; *Aglais* Dalman, 1816 as well as genera that feed on both flower nectar and other sugar sources such as *Symbrenthia* Huebner, 1819; *Nymphalis* Kluk, 1780; *Vanessa* Fabricius, 1807; *Junonia* Huebner, [1819] and *Doleschallia* C. & R. Felder, 1860 and thirdly those that never visit flowers such as *Kallima* Doubleday, [1849] and *Rhinopalpa* C. & R. Felder, 1860.

Adults of the genus *Hypolimnas* Huebner, [1819] were believed to obtain sugars exclusively from flowers (Wynter-Blyth, 1957; Bhakare & Ogale, 2018) but three females and a male individual of *H. bolina* were recorded feeding on rotten pumpkin (*Cucurbita pepo*) in a backyard compost heap near Bhairahawa (Omsatiya Rural Municipality-1, Nepal) on October 22, 2019. They were observed feeding on the pumpkin for 10 minutes. During this period, they were photographed (Figure 1).

Bhuyan *et al.* (2014) and Bhuyan *et al.* (2020) reported 9 species of typically sap and fruit feeding nyphalid butterflies shifting to flower nectar. In the present case, we report a typically flower nectar feeding butterfly shifting to over ripe fruit.

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Figure 1: *H. bolina* on pumpkin



Figure 2: *H. bolina* on pumpkin

NEW ALTITUDE RANGE OF *CLELEA DISCRIMINIS* SWINHOE, 1891 (LEPIDOPTERA: ZYGAEINIDAE) IN ASSAM, INDIA

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ABSTRACT

The current observation extends the known distributional range of the genus *Clelea* Walker, 1854 to Assam, India, and records a new low altitudinal range for *C. discriminis*.

KEYWORDS *Clelea discriminis*, New altitudinal range, New Record, Garbhanga Reserve Forest, Assam

INTRODUCTION

The Northeast region of India is a diverse and captivating area that encompasses the Eastern Himalayas, the rugged Northeast hills comprising the Patkai-Naga Hills and Lushai Hills, as well as the vast plains of the Brahmaputra and Barak Valley (Chatterjee *et al.*, 2006). Among its remarkable features, Assam stands out as one of the most extraordinary biodiversity zones in the world. This distinction can be attributed to Assam's strategic location within the transitional zone that merges the Indian, Indo-Malayan, and Indo-Chinese bio-geographical regions. In Assam, a total

of 1,365 species of moths have been recorded (Joshi *et al.*, 2021) and many more to come. Recently, *Padenia acutifascia* de Joannis, 1928 was reported from Assam (Thapa, 2021) and *Clanis hyperion bhutana* Brechlin, 2014 was reported from Dimapur, Nagaland (Thapa *et al.*, 2022), which borders Assam.

Clelea discriminis Swinhoe, 1891

The genus *Clelea* Walker, 1854 consists of 8 species, which are found in the northeastern region of India (Joshi *et al.*, 2021). *Clelea discriminis* and *C. sapphirina* Walker, 1854 are nearly identical in appearance, but *discriminis* differs from *sapphirina* in the streaks from the base of the fore wing being green, and the lower one being along the median nervure; the subapical markings more parallel; the marginal line and blue on hind wing absent (Hampson, 1892).

Distribution: Sikkim; Naga Hills, 3000 feet (Hampson 1892); Meghalaya; Nagaland (Joshi *et al.*, 2021)

RESULT

On May 14, 2023, at 11:32 hr, three individuals of *C. discriminis* were observed in Garbhanga Reserve Forest, Kamrup, Assam. The specimens were resting on leaves near a stream within a dense forest habitat. The present record confirms its presence in Assam. Previous records of *C. discriminis* indicated its presence at an altitude of 914 m (3000 feet). However, this paper reports the species at altitudes ranging from 80 m (244 feet) to 670 m (2042 feet) above mean sea level.

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Figure: *Clelea discriminis* from Garbhanga Reserve Forest

NEW REPORT OF *SCROBIGERA ALBOMARGINATA* (MOORE, 1867) (LEPIDOPTERA: NOCTUIDAE) FROM SOUTHERN MYANMAR

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ABSTRACT

The present work confirms the presence of *Scrobiger a albomarginata* (Moore, 1867) in Kawkareik, Kayin State, Myanmar.

KEYWORDS: Noctuidae, Agaristinae, Kawkareik, Kayin.

The Noctuid subfamily Agaristinae (Lepidoptera: Noctuidae) contains brightly coloured, diurnal moths with stout bodies, simple antennae dilated distally and the terminal joint of the palpi naked.

An unusual diurnal moth was opportunistically recorded at 11:20 hrs on 29.ix.2022 at Kawkareik Township of Kayin State (16° 33' 20"N , 98° 14 ' 24 "E). The individual was fluttering around shrubs and bushes, ovipositing on the leaves of *Cyphostemma auriculatum* (Roxb.) P. Singh & B. V. Shetty (Vitaceae). The specimen was only photographed and not collected. The eggs were not collected, either.

Later it was identified, using Hampson (1894) and Kononenko & Pinratana

(2005). The present report confirms the presence of this species in Kawkareik, Kayin State, Myanmar. *S. albomarginata* is known from Myanmar, Thailand, Laos, India, Nepal, China, Philippines and Cambodia (Kononenko & Pinratana, 2005).

Figure 2 shows the moth laying eggs on a leaf of an ?*Ipomoea* species (Convolvulaceae). However, Convolvulaceae has not been recorded as a larval hostplant for the family, including general like *Episteme* Huebner, [1818] and *Sarbanissa* Walker, 1875, while hostplants belonging to Vitaceae for *Sarbanissa* are reported by Robinson *et al.*, (2001). Since the larval hostplant of *S. albomarginata* does not seem to have been reported in the literature, we suggest that *C. auriculatum* is probably the plant which the larvae feed on and the moth was laying her eggs on nearby plants, as often happens in nature.

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Figure: *Scrobiger albomarginata* in Southern Myanmar

EARLY EMERGENCE OF *CYPA DECOLOR* (LEPIDOPTERA: SPHINGIDAE) IN THE KUMAON HIMALAYA

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The emergence of hawkmoths from their pupae is determined by soil humidity and temperature. In the western Himalaya, Smetacek (2011) suggested that the failure of the winter rains in the outermost range of the Kumaon Himalaya was responsible for the absence of nearly half the butterfly species known from Maheshkhan Reserve Forest during the following summer.

Smetacek (1994) reported the presence of *Cypa decolor* (Walker, 1856) from the Kumaon Himalaya. On the basis of 15 specimens examined, the flying time of the species was ascertained to be between May 15 and August 27. In two different years (1979, 1990) the species was recorded between May 15 and 17, suggesting that this was a normal emergence period for the species in the area.

On April 26, 2023, two male specimens were recorded at light at the same site as the previous specimens. The data is as follows:

2 males: Forewing length: 24mm. 26 iv.2023. Leg. Vishal Potdar & Surendra

Pariyar; Coll. Butterfly Research Centre, Bhimtal.

Of the two specimens, one is in good condition and the second is worn, suggesting that it had emerged earlier.

Although the rains failed during the winter of 2022-23, with no rain between mid-November and March, there was substantial rain during March and part of April, 2023.

The present records extend the known flying time of the species in the western Himalaya from the last week of April to the end of August.

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Figure: *Cyba decolor* specimens recorded in Bhimtal on April 26, 2023

BLUE GLASSY TIGER *IDEOPSIS SIMILIS PERSIMILIS* (MOORE 1879) (LEPIDOPTERA: NYMPHALIDAE)- FIRST RECORD FROM DEHING PATKAI NATIONAL PARK, ASSAM

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ABSTRACT

The present note reports the first confirmed record of *Ideopsis similis persimilis* from the Dehing Patkai National Park, Assam. Possibly, this report is the second record for India.

KEYWORDS: Danainae, Blue Glassy Tiger, New Record, Dehing Patkai, Assam

INTRODUCTION

The Blue Glassy Tiger *Ideopsis similis persimilis* (Moore 1879) is common throughout its range. It is widespread across Myanmar, southern China, Thailand, Laos, Cambodia, Vietnam, Malaysia, Sumatra (Yutaka, 2015) and Sri Lanka (Evans, 1932). The genus *Ideopsis* (Horsfield, 1829) includes two species found in India (Varshney & Smetacek, 2015). Out of these two species *Ideopsis similis* is the only species reported from Northeast India, specifically Arunachal Pradesh (Thombre & Kehimkar, 2015). The other species, *Ideopsis juvena nicobarica*, is found in the Nicobar Islands (Varshney & Smetacek, 2015).

There are no recent records of *I. similis* from India after Thombre and Kehimkar (2015). Das *et al.* (2017) prepared an updated list of butterflies of Dibru-Saikhuwa National Park, Assam but they did not find *I. similis* in the area. Singh (2017), who studied and reviewed the butterflies of Eastern Assam, which includes Dehing Patkai National Park (DPNP), did not record this species. Recently, Gogoi *et al.* (2023) studied the diversity and specific richness of butterfly in DPNP, but did not report this species.

RESULT

The current record is from an opportunistic survey conducted at Soraipung Division, Dehing Patkai National Park, Assam on April 30, 2023, at around 10:24 hrs. We observed more than four individuals of the species and photographed one while the butterfly was basking in the sun. The habitat, where the butterflies were sighted consists of evergreen shrubs located at coordinates 27.356009 N and 95.539782 E.

I. similis was recorded by Thombre & Kehimkar (2015) from Namdapha National Park, Arunachal Pradesh and that was the first and only record for India so far. Therefore, probably this record will be the second record for India and first report from Assam.

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Figure 1: Underside of *Ideopsis similis persimilis* recorded in this study.



Figure 2: Upperside of *Ideopsis similis persimilis* as above.

NEW DISTRIBUTION RECORD OF *EUASPA MILIONIA* HEWITSON, 1869 (LEPIDOPTERA: LYCAENIDAE: THECLINAE) FROM SIKKIM, INDIA

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ABSTRACT

This note extends the known geographical distribution of *Euaspa milionia* to Sikkim.

KEYWORDS distribution range, *Euaspa milionia*, new locality, Sikkim

INTRODUCTION

Euaspa Moore, 1884 comprises an Asian genus of 14 species (Das *et al.*, 2019). Sidhu (2007) discovered *E. milionia* from Uttarakhand and Himachal Pradesh. Within the *Euaspa* genus, Koiwaya (2002) acknowledged the existence of 12 species, while more recent studies by Koiwaya (2014) unveiled the discovery of *E. uedai* Koiwaya, 2014 in China. Additionally, Huang (2016) contributed to the expanding knowledge by describing *E. zhengi* Huang, 2016 as a novel species also found in China, taking the total to 14 species.

There is one more subspecies of *Euaspa milionia formosana* Nomura, 1931, which is described from Taiwan. In India, only five species of *Euaspa* have been reported. They are: *Euaspa milionia milionia* (Hewitson, 1869), *E. pavo* (de Nicéville, 1887), *E. mikamii* Koiwaya, 2002, *E. miyashitai* Koiwaya, 2002 (Varshney & Smetacek, 2015) and *E. motokii* Koiwaya 2002 (Das *et al.*, 2019). Recently, Das *et al.*, (2019) reported the first record of *E. motokii* Koiwaya 2002 from India and a new distribution record of *E. mikamii* Koiwaya, 2002 from Dihing-Dibang Biosphere Reserve of Arunachal Pradesh, India. More recently, Lepcha *et al.*, (2021) reported *E. pavo* from Sikkim, India.

RESULT

On 22.v.2023, two individuals of *E. milionia* were photographed (Image 1) at approximately 11:15 am in Salim Pakyel (27°31'32"N - 88°31'48"E; 1137 m amsl), Upper Dzongu, Mangan District of

Sikkim, India. These individuals were observed puddling near a water stream on the roadside (Image 2).

E. milionia is commonly known as the Water Hairstreak butterfly. Earlier, *E. milionia* was known only from Khyber Pakhtunkhwa in Pakistan eastwards to Nepal (Tshikolovets & Pages, 2016) and within India from Jammu & Kashmir to Uttarakhand (Varshney & Smetacek, 2015). The present record adds Sikkim to the known global distribution of *E. milionia*.

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Figure 1: *Euaspa milionia* in Sikkim.



Figure2: Habitat of *Euaspa milionia*, where the species was recorded.

***LILIUM LONGIFLORUM* AND *LILIUM BULBIFERUM* (LILIACAE):**

NEW LARVAL HOST PLANTS FOR *KANISKA CANACE* (LEPIDOPTERA: NYMPHALDAE) FROM ARUNACHAL PRADESH, INDIA

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ABSTRACT

Lilium longiflorum and *Lilium bulbiferum* are reported as hitherto unrecorded larval host plants of *Kaniska canace* (Blue Admiral) from Arunachal Pradesh.

Key words: *Lilium longiflorum*, *Lilium bulbiferum*, Arunachal Pradesh

INTRODUCION

Kaniska Moore, 1899 is a monotypic genus of Nymphalidae, represented in India by two subspecies, *K. canace canace* (Linnaeus, 1763) distributed throughout the Himalayan region to N.E. India and *K. c. viridis* Evans, 1924, which is restricted to the Western Ghats (Varshney & Smetacek, 2015; Kehimkar, 2016). However, this species was also reported from the plain of Punjab (Singh et al., 2016) and Rajasthan (Sengupta, 2021). It is on the wing from March to December between an elevation of 1000m to 3000m in the Himalayan region and between 1,000m to 2,200m in

the southern hills of India (Kehimkar, 2016).

OBSERVATION

On 09.iv.2021, an adult female of *K. canace* was encountered laying six greenish spherical eggs on the lower surface of the leaves and stem of *Lilium longiflorum* and *Lilium bulbiferum* plants in a private garden of village Gaherigaon (27°11'53.9592" N; 96°57'49.6548" E) of Vijaynagar, district Changlang, Arunachal Pradesh. The eggs had longitudinal ribs and were laid singly.

The plants with the eggs were shifted to flower pots and placed inside the insectarium box made up of netting. The insectarium box was placed in the garden to rear the caterpillars under natural conditions. The caterpillars were monitored regularly and frass was cleaned every day. The different instars of the caterpillars were photographed using a

Canon DSLR camera with 90mm macro lens (figures 1-12).

All the six eggs hatched successfully on 16.iv.2021. The second instar caterpillars started feeding on leaves voraciously. On 16.v.2021 all the six larvae stop feeding and were observed moving away from the host plant to the bamboo branches which were kept in the insectarium to give support to the host plants; no frass was observed on that day. On 17.v.2021, all the six caterpillars were observed hanging vertically upside down on the bamboos from a silk pad and all the caterpillars pupated successfully between 12 pm to 1 pm. On 29.v.2021 all the pupae turned black and become wet. On 30.v.2021 adults of *Kaniska canace* emerged between 11am to 2 pm from all the six pupae. After expanding and drying their wings for 30 to 35 minutes each, the butterflies flew away.

Previously *Smilax* species have been reported as larval host plants of *K. canace* from India, notably *Smilax zeylanica* (Wynter-Blyth, 1957; Karmakar et al., 2018; Nitin et al., 2018). Robinson et al. (2001) recorded *Trycirtis hyrta* (Convallariaceae), *Lilium lancifolium* (Liliceae) and *Smilax china* (Smilacaceae) from China, and *Heterosmilax japonica*, *Smilax perfoliata*, *Smilax aspersa*, *S. arisanensis*, *S. aspericaulis*, *S. bracteata*, *S. lanceifolia*, and *S. riparia* (Smilacaceae) from other parts of the range of *K. canace*. Thus, the present study confirmed *Lilium longiflorum* and *Lilium bulbiferum* (Liliaceae) as previously unreported larval host plants for *K. canace*.

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Figure 1



Figure 2

Figure 1 & 2: *Lilium bulbiferum*

Figure 3 & 4: *Lilium longiflorum*Figure 5: Larval host plant
voraciously eaten by *Kaniska*
canace caterpillars

Figure 6: Egg hatching out



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11

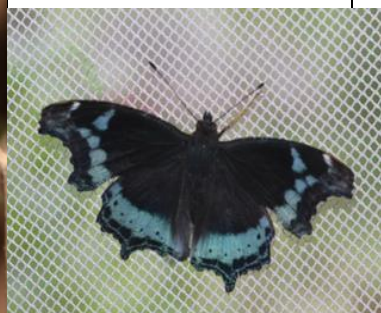


Figure 12

Figs. 7 -12: Early stages of *Kaniska canace*. 7: newly hatched larva. 8: larva resting after feeding. 9: Final instar. 10: larva pupating. 11: pupa. 12: adult ready to take flight

MALE *ARHOPALA BOISDUVAL*, 1832 (LEPIDOPTERA: LYCAENIDAE) HIBERNATE IN THE KUMAON HIMALAYA, INDIA

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Arhopala paraganesa de Niceville (1882) was sporadically reported from Kumaon (Hannington, 1910) in May and June at Nalena (4500 ft/1370 m); Nepal (Van der Poel & Smetacek, 2022) from where it was reported in the months of January and from March to November and “in hill forests between 900-1600 metres” from March to September, throughout its known distribution from Uttarakhand to N.E. India and Myanmar (Kehimkar, 2016). Unlike some members of the genus, eg. *Arhopala ganesa* (Moore, [1858]), *Arhopala rama* (Kollar, [1844]) and *Arhopala dodonea* Moore, [1858] which swarm in suitable localities (Wynter-Blyth, 1957), *A. paraganesa* is always found singly. The larval host plant is unknown and adults appear to spend most of their time in the forest canopy, descending occasionally to water or to bask.

On 2nd January 2023, a single male was recorded at the Butterfly Research Centre, Bhimtal, Uttarakhand (1500 m) when it descended to bask on a sunny lawn around 11 am. This constitutes the first record of the species from the Bhimtal valley although Hannington (1910) recorded it in

the neighbouring valley in the village of Nalena, near Jeolikote, which is west of the Bhimtal valley.

In Nepal, *A. ganesa* has been reported from February to August and November; *A. dodonea* in February and from April to August while *A. rama* has been reported throughout the year (Van der Poel & Smetacek, 2022).

Observations during subsequent days at the Butterfly Research Centre only discovered *Arhopala ganesa*, *A. rama* and *A. dodonea* visiting the lawn on sunny days. Females of *A. ganesa* are known to hibernate (Yokoyama, 1955). In the Western Himalaya *A. rama*, *A. dodonea*, *A. ganesa* are all active on sunny days throughout the year. These 3 species have been recorded on sunny days during December, January and February in the Bhimtal and Sattal valleys by P.S. since 1974. However, the current record was the first time that *A. paraganesa* was recorded during the winter in Uttarakhand, which is the western extremity of its known distribution.

Yokoyama (1955) noted that females of *A. ganesa* overwinter in Japan. Van der Poel & Smetacek (2022) record that all four *Arhopala* Boisduval, 1832 species treated here are known to overwinter as adults but do not clarify whether both sexes or only females overwinter. The present record of *A. paraganesa* is of a male, suggesting that both sexes overwinter. Similarly, both sexes of *A. rama*, *A. dodonea* and *A. ganesa* have been recorded through the winter months in Bhimtal and Sattal valleys.

Other *Arhopala* species in the area include *A. amantes* (Hewitson, 1862), *A. centaurus* (Fabricius, 1775), *A. atrax* (Hewitson, 1862), *A. bazalus* (Hewitson, 1862) and *A. aberrans* (de Niceville, [1882]). All of these are low elevation species in the area and no observations have been undertaken in their known habitat during the winter months to discover whether these species also overwinter as adults.

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CONFIRMATION OF THE COMMON EARL *TANAECIA JULII* (LEPIDOPTERA: NYMPHALIDAE) IN KUMAON, UTTARAKHAND, INDIA

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Reviewer: Peter Smetacek

The Common Earl *Tanaecia julii* (Lesson, 1837) is a widespread nymphalid butterfly which has been reported from Uttarakhand to North-East India (Varshney & Smetacek, 2015; Kehimkar, 2016), Malaysia, and Thailand (Lewis, 1973). Van der Poel & Smetacek (2022) reported the species in Central and Eastern Nepal, notably from the Eastern Terai, Gandaki, Pokhara, Bagmati and eastern Nepal, where it is very frequently met. It has so far not been recorded from western Nepal. It was reported from Uttarakhand by Hannyngham (1910) from river valleys in the extreme east, presumably the Kali river valley. Its reported range was extended westward on the basis of a single slightly damaged male specimen collected in Sattal, Bhimtal on 1. v.1963 (Figure 1) in the collection of the Butterfly Research Centre, Bhimtal.

On 10. vi.2022, at Askot, Pithoragarh (1150 m amsl), a single specimen was observed and photographed (Figure 2). It was perched on a fern and was observed for approximately three minutes. It was not identified in the field but several days later. It was not possible to revisit the site in that season to ascertain whether the specimen observed was a singleton or belonged to a breeding population. The species was reported from Uttarakhand on the basis of the single specimen depicted

in Figure 1. Despite relatively frequent observations during the past fifty years, it was never again observed in the Nainital district.

The current observation confirms the presence of the species in the Himalayas west of Nepal. However, it is uncertain whether the two specimens reported in the present paper belong to a breeding population or were stragglers. Igarashi & Fukuda (1997) report *Diploknema butyracea* as the larval host plant of this butterfly in India. This tree is indigenous and present at both the localities where *T. julii* is reported in the present paper. Thus, the possibility that both specimens recorded belong to small breeding populations of the species cannot be ruled out.

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Figure 1. Common Earl, Sattal 1.v.1963



Figure 2: *Tanaecia julii* photographed 10. vi.2022, at Askot, Pithoragarh (1150 m amsl) by Jagdish Bhatt.

NEW ADDITIONS TO THE CHECKLIST OF BUTTERFLIES OF CORBETT TIGER RESERVE, UTTARAKHAND, INDIA

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Reviewer: Peter Smetacek

Corbett Tiger Reserve (CTR) provides an undisturbed habitat for a great variety of flora and fauna to flourish (Pant, 1986; Khanna *et al.*, 2008). The Reserve holds a significant diversity of butterflies (Chaudhary *et al.*, 2020). The species diversity and abundance of butterflies has been used as an indicator of health of the ecosystem, and to monitor the effectiveness or efforts to conserve nature (Oostermeijer *et al.*, 1998; Hilty *et al.*, 2000; Ghazanfar *et al.*, 2016; Thomas, 2005). It is therefore desirable to know the diversity of butterflies in a conservation area.

Previous reports have documented a total of 143 species of butterflies inside and in the immediate vicinity of CTR (Kumar, 2008; Arya *et al.*, 2020; Chaudhary *et al.*, 2020). Here, we report sighting of 10 species of butterflies which have not been previously documented in the checklist of butterflies of CTR.

The sites and habitats in which the butterfly species were sighted in the present study have been provided in Table 1. All the sites are either located inside the administrative boundary of CTR or in villages/Forest Rest Houses located along the boundary of CTR. The butterflies sighted were photographed using digital cameras or cell phone cameras. Identification of butterflies was done according to Kehimkar (2016), Smetacek (2017), and Sondhi (2018).

The 10 butterfly species that have been reported in the present study are given in Table 1, and Figure 1. The butterfly Aberrant Bushblue (*Arhopala abseus*) has been previously reported only on one occasion from the state of Uttarakhand (Smetacek, 2011). The present sighting of *Arhopala abseus* in CTR indicates further extension of its range, westward to the known distribution of this butterfly (Smetacek, 2011). There are only three reports of sighting of *Catapaecilma major*

from the state of Uttarakhand (Sondhi *et al.*, 2018; Kumar *et al.*, 2019). The last sighting of this species was reported by Kumar *et al.* (2019) from Loharkhet (altitude 1700 m approx.) in Bageshwar district. In the present communication, two individuals of *Catapaecilma major* were sighted along a stream at an altitude of approximately 560 m. Our sighting of *Catapaecilma major* is thus the fourth report of this species from Uttarakhand. The butterfly *Parantica melaneus* considered rare with only few records from Uttarakhand (Sondhi *et al.* 2018) was sighted at least on 5-7 occasions in the present study.

Therefore with 10 additions, the number of butterfly species reported from Corbett Tiger Reserve increases to 153.

ACKNOWLEDGEMENTS

RC and VK acknowledge the Principal, Acharya Narendra Dev College and their colleagues for support and encouragement. MS wants to thank Jeewan Rautela for sharing his field observations and Sanjay Sondhi for confirming species identification.

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S. No.	Species recorded	Habitat	Geographical coordinates*	Remarks
<i>Hesperiidae</i>				
1.	<i>Coladenia indrani</i> (Moore, 1866) Tricolour Pied Flat	Dense, mixed tree plantations near human habitation.	29° 25' 17" N, 78° 59' 57" E; altitude: 330 m. approx.	Sighted once in the month of May.
2.	<i>Pelopidas assamensis</i> (de Nicéville, 1882) Great Swift	Dense, mixed tree plantations near human habitation.	29° 25' 17" N, 78° 59' 57" E; altitude: 330 m. approx.	Sighted once in the month of June.
<i>Lycaenidae</i>				
3.	<i>Arhopala abseus</i> (Hewitson, 1862) Aberrant Bushblue	Resting among foliage at the fringes of mixed Sal forest.	29° 28' 09" N, 79° 8' 51" E; altitude: 425 m. approx.	One individual was sighted in the month of January.
4.	<i>Azanus uranus</i> (Butler, 1886) Dull Babul Blue	Near human habitation on <i>Acacia</i> sp. tree.	29° 25' 17" N, 78° 59' 57" E; altitude: 330 m. approx.	One male and female were sighted in the month of September.
5.	<i>Catapaecilma major</i> (Druce, 1895) Common Tinsel	Near a spring at the fringes of dense, mixed Sal forest.	29° 41' 40.8" N 78° 46' 33.6" E; altitude: 560 m. approx.	Two individuals were sighted puddling near a stream in the month of March.

6.	<i>Iraota timoleon</i> (Stoll, 1790) Silverstreak Blue	Dense, mixed tree plantations near human habitation.	29° 25' 17" N, 78° 59' 57" E; altitude: 330 m. approx.	Sighted once resting on foliage in the month of June
7.	<i>Rapala nissa</i> (Kollar, 1844) Common Flash	Fringes of mixed Sal forest.	29° 38' 02.8" N 78° 54' 56.9" E; altitude: 1050 m. approx.	About 5-6 individuals were sighted basking on a tree, in the month of March.
8.	<i>Spindasis ictis</i> (Hewitson, 1865) Common Shot Silverline	Dense, mixed tree plantations near human habitation.	29° 25' 17" N, 78° 59' 57" E; altitude: 330 m. approx.	Sighted once in the month of April.
<i>Nymphalidae</i>				
9.	<i>Elymnias malelas</i> (Hewitson, 1863) Spotted Palmfly	Near human habitation at the fringe of dense, mixed Sal forest.	29° 40' 04" N, 78° 51' 13" E; altitude: 700 m. approx.	Sighted once in the month of March, resting on the tree trunk.
10	<i>Parantica melaneus</i> (Cramer, 1775) Chocolate Tiger	Dense, mixed Sal forest.	29° 41' 40.8" N 78° 46' 33.6" E; altitude: 560 m. approx.	A total of 5-7 individuals were sighted at different locations.

*<https://earth.google.com/web>

Table 1: Particulars of butterfly species sighted in the present study.

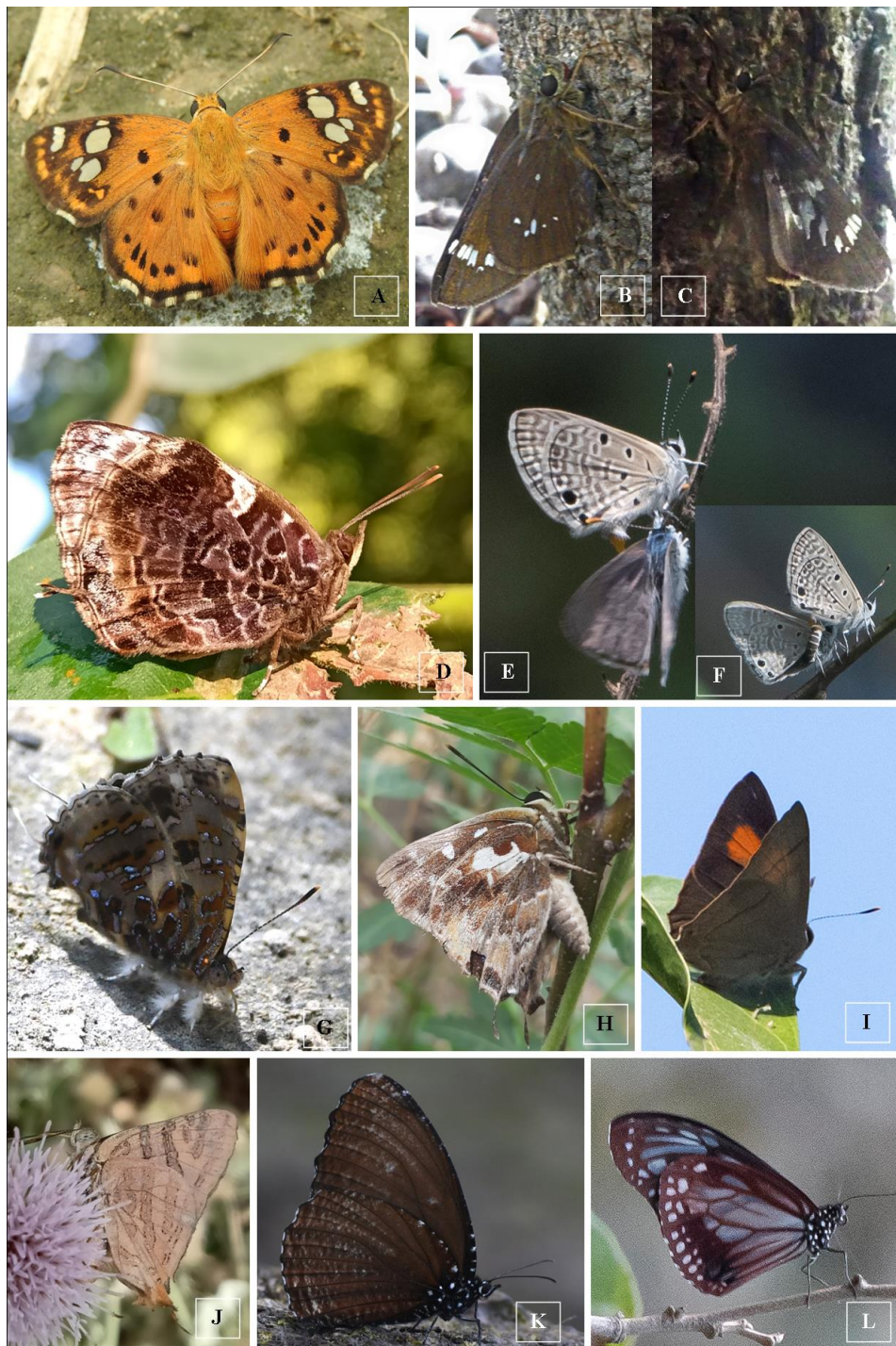


Figure 1: Butterfly species reported in the present study.

(A) *Coladenia indrani* , (B-C) *Pelopidas assamensis*, (D) *Arhopala abseus*, (E-F) *Azanus uranus*, (G) *Catapaecilma major*, (H) *Iraota timoleon*, (I) *Rapala nissa*, (J) *Spindasis ictis*, (K) *Elymnias malelas*, (L) *Parantica melaneus*.

PHOTOGRAPHIC EVIDENCE OF PUTATIVE INO FORM OF TWO HOUSE SPARROWS *PASSER DOMESTICUS* IN INDIA

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Reviewer: *Hein van Grouw*

INTRODUCTION

Five species of sparrows are found on the Indian Subcontinent. These are, House Sparrow *Passer domesticus*, Spanish Sparrow *P. hispaniolensis*, Sind Sparrow *P. pyrrhonotus*, Russet Sparrow *P. cinnamomeus* and Eurasian Tree Sparrow *P. montanus* (Abhinav, 2020). One of the commonest birds is the house sparrow *P. domesticus*. The house sparrow is usually seen to co-exist with humans, nesting close to human habitation, as the species depends on humans for food. In Himalayan villages, these sparrows are still common although in certain parts of India, populations have declined by up to 70% (Dandapat *et al.*, 2010).

Two house sparrows with very pale plumage were observed in Uttarakhand, India.

OBSERVATION

There are many, many reports in the literature of sightings of aberrant coloured birds, but the identification of the aberration involved is often incorrect (Van Grouw *et al.* 2016). Two nearly white house sparrows *P. domesticus* were

sighted, of which one was photographed at Narayan Nagar (Didihat) (29°46'21'' N and 80°17'21'' E), a small town near Ogl, on National Highway 9 (Pithoragarh to Dharchula) in Pithoragarh district of Uttarakhand, India at an altitude of 1689 m.

The unusual house sparrows were noticed at by the author with his colleagues, Rohit Pandey and Dayadhar Semwal when the birds were actively foraging for food on the ground. Also, a video of both individuals was recorded on 27th May 2023 at 03:30 pm with a mirrorless Nikon Z50 camera equipped with 50-250mm lens.

Based on the remaining pale melanin pigment in their plumage, the aberration causing the aberrantly coloured plumage is most likely to be a form of Ino (van Grouw *et. al.* 2016)

It was clearly seen that the two aberrant coloured house sparrows were searching and getting the insects or food from the soil together with other normal sparrows and a male house sparrow was feeding one of them. Based on the structure of the plumage, it would appear that these two

birds were still juvenile, and that may be why the normal male (presumably the father) was still feeding them occasionally. (Video can be viewed at the YouTube link of my channel- <https://youtu.be/rOMZ41FXATM>). The aberrant coloured house sparrows were fully accepted by their normal coloured counterparts.

This behaviour is truly different as compared in the case of an aberrant coloured (mutation Brown) Himalayan Bulbul recorded by Singh *et al.*, 2020 (recorded incorrectly as partial albinistic by the authors). In that case the pale Himalayan Bulbul was harassed by other normal coloured Bulbuls, although the presumably normal coloured partner had fully accepted it. But in the present finding both, normal sparrows and pale sparrows were interacting amicably with each other. On 28th May 2023 again, the whole flock was seen interacting harmoniously.

ACKNOWLEDGEMENT

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Figure 1: A partially albino sparrow alone



Figure 2: A partially albino sparrow with other normal sparrows



Figure 3: Narayan Nagar (Pithoragarh), Courtesy: Google Earth

SYNONYMY OF *TELCHINIA ISSORIA ISSORIA* AND *TELCHINIA ISSORIA ANOMALA* (LEPIDOPTERA: NYMPHALIDAE: ACRAEINAE)

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ABSTRACT

We report an unusually large specimen of the Yellow Coster *Telchinia issoria* along with several other specimens from the Himalaya, and recognize the synonymy of *T. i. issoria* and *T. i. anomala*.

INTRODUCTION

In butterflies, wingspan is the only measurement used in morphological studies. In the past, the wingspan of butterflies has been measured in different ways. During the 18th and 19th centuries, it was normal to set butterflies with the forewing costae almost in a straight line. At that time, wingspan was measured as the direct distance between the forewing apices. However, this method of pinning obscured some features of the hindwing costae, which in some cases, might be diagnostic. During the latter half of the 19th century, it was fashionable to raise the forewings until the forewing termen, rather than the costae, were in a straight line. Since the forewing apices were much closer together using this method, the wing

span would be reduced if measured following the older method.

Marshall & de Niceville (1882) stated that, “the expanse (=wingspan) is usually taken as twice the length of the forewing plus the breadth of the body”. For *Telchinia issoria* Huebner, 1819, they gave a wingspan of 50.6 mm – 88.6 mm (2”-3.5”) for the species, ignoring the subspecies.

Evans (1932) measured all Indian butterflies known at the time and available to him. Since some of the specimens examined were pinned using the older method and some using the newer method, he used a measurement from the centre of the thorax to the tip of a forewing apex and doubled the result, assuming the butterfly to be bilaterally symmetrical. Evans (1932) and Talbot ([1949]) gave a measurement of 45-70 mm for the three subspecies of *T. issoria* examined by them, i.e. *T. i. anomala* Kollar, 1844 (45-65 mm); *T. i. issoria* (50-70 mm) and *T. i. sordice* (Fruhstorfer, 1914) (50-70 mm). It is entirely unclear why Evans (1932) did not take the larger measurement noted by

Marshall & de Niceville (1882) into consideration.

Nymphalidae

Acraeinae: Acraeini

Telchinia issoria issoria Hübner, 1819

Telchinia issoria Hübner, 1819: Verz. bek. Schmett. (2):27. TL. not stated.

Papilio vesta Fabricius, 1787: Mantissa Insectorum 2:14. TL. China. (homonym)

Acraea anomala Kollar, 1844: in Hugel, Kaschmir und das Reich der Siek 4:425-426, pl.3, figs.3,4. TL. Himal., Massuri.

Pareba vesta, Marshall & de Niceville, 1882: Butt. India. 1: 318 (syn. *Acraea anomala* Kollar)

Pareba vesta anomala, Fruhstorfer, 1914: Seitz. Gross-schmett. Erde 9: 741; Evans, 1932: Ident. Ind. Butt.: 192.

Acraea vesta anomala, Peile, 1937: Guide Coll. Ind. Butt.: 155, pl. 15, figure 124.

Acraea issoria anomala, Talbot, [1949]: Faun. Ind. 2: 465; Varshney & Smetacek, 2015: 222.

Material examined

1 female: 19.vi.2023 Butterfly Research Centre, Bhimtal, Uttarakhand, 1500 m. Forewing length 40 mm; wingspan 84 mm. (Figure 1).

20 exs.: 56-78 mm. Butterfly Research Centre, Bhimtal, Uttarakhand, 1500 m. Males: 23.v.1981; 5.vii.1991; 2.ix.2011;

7.ix.2016 x6; females: 7.ix.2016; 4.ix.2017; 31.iii.2016 x4.

Males: 4.vi.1998 Ramgarh, Uttarakhand 2200 m; Dibrugarh, Assam 108 m vii.2019; Females: 6.iv.1982 Nainital, Uttarakhand 2000 m; 18.vi.1990 Quiti, Pithoragarh, 1600 m; 28.iv.-15.v.2021 Roing, Arunachal Pradesh 390 m.

All specimens: *Leg. et Coll.* Peter Smetacek, Butterfly Research Centre, Bhimtal.

DISCUSSION

Taxonomic note

After the description of *Acraea anomala* by Kollar in 1844, it was treated as a synonym of *Acraea issoria* by Marshall & de Niceville (1882). Eltringham (1912) treated *T. anomala* as a synonym of *T. issoria* without offering any explanation, while recognizing *T. issoria* f. *vestalina* Fruhstorfer (1906) from S. Annam ("forewing dusky with spots whitish, hindwing with broad dark border"); *T. issoria vestita* de Niceville (1895) from N.E. Sumatra ("Small. Male with broad dusky border in both wings, nervules black. female forewing dusky with pale spots, hindwing with broad dusky marginal border"); *T. issoria vestita* f. *alticola* Fruhstorfer (1906) from W. Sumatra. ("Intermediate to *issoria vestita*."); *T. issoria vestoides* Moore (1901) from W. Java ("Small. Male usually with dark spots in forewing cell and discal area. Hindwing with reddish submarginal band of underside showing through to upper surface. Marginal pale spots well marked in both wings. All

nervules black. Female forewing with dark colour predominating. Hindwing with nervules heavily marked, dark border broad, and usually with reddish ochreous internervular patches towards anal angle. Examples from E. Java are often without spots in forewing”).

According to Eltringham (1912), “Careful examination of long series might disclose the existence of other local races in addition to the Javan and Sumatran forms above described, though judging from the variability exhibited by some seventy-five examples now before me, instability of pattern would seem to be the most constant characteristic.”

The subspecies *T. i. sordice* (Fruhstorfer, 1914) was subsequently described from Myanmar, distinguished largely by its broader black border, the white areas absent on the underside and, in the female, a sub-marginal series of short red-brown arrows. In northern Myanmar, this butterfly is generally found around 1,800 m elevation based on personal observation.

Evans (1932) and Talbot ([1949]) recognized *T. i. anomala*, *T. i. issoria* and *T. i. sordice* as valid subspecies. This arrangement was followed by Varshney & Smetacek (2015). However, in the original description of *anomala*, Kollar (1848) did not distinguish it from *T. issoria*. Evans (1932) and Talbot ([1949]) distinguished *anomala* as being smaller than *issoria*, and restricted to the western Himalaya, from Kulu to Kumaon.

Van der Poel & Smetacek (2022) suggested that size might not prove a

reliable feature for distinguishing between the subspecies *issoria* and *anomala*.

The present specimen has a wingspan of 84 mm and a forewing length of 40 mm. this is considerably larger than anything measured by Evans (1932) or Talbot ([1949]), although smaller than some of the specimens measured by Marshall & de Niceville (1882).

From its location, the specimens examined in the present study clearly should be placed under *anomala*, but fail to justify the distinctive character of being smaller than *T. i. issoria*. Therefore, it is evident that the taxon *anomala* cannot be reliably distinguished from *issoria* and should therefore be treated as a synonym of *T. i. issoria*.

Altitudinal distribution

Wynter-Blyth (1957), Kehimkar (2016), Smetacek ([2016]) and Van der Poel & Smetacek (2022) give different figures for the elevation this hill species inhabits. While Wynter-Blyth (1957) recorded it from 600 – 2133 m, Smetacek ([2016]) reported it from 1200-2600 m; Kehimkar (2016) reported it from 600 – 2400 m and Van der Poel & Smetacek (2022) reported it from 120-2,470 m in Nepal. Marshall & de Niceville (1882) report it from Sibsagar (=Sivasagar) in Assam, which is at an elevation of 86 m. We have examined specimens of this species from Dibrugarh (108 m amsl) in July and Roing, Arunachal Pradesh (390 m amsl) in May.

Therefore, while it appears to be strictly a montane species in the western Himalaya and Myanmar, in Assam and Arunachal

Pradesh it descends to the plains, which are nearly at sea level.

Acknowledgement

We are indebted to the reviewer, Mr. Yutaka Inayoshi and Mr. Adam Cotton for their patient help with the manuscript.

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Figure: Yellow Coster 19.vi.2023
Butterfly Research Centre, Bhimtal,
Uttarakhand

FIRST RECORDS OF 25 SKIPPERS (LEPIDOPTERA:HESPERIIDAE) FOR BHUTAN AND CONFIRMATION OR RECENT EVIDENCE OF 25 SELDOM REPORTED SKIPPERS

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Background

Evans (1932) noted, “Lists [of butterfly species] for Nepal, Garhwal and Bhutan would be interesting.”. Apparently, no such lists had been produced until 1932, and probably no species lists of surveys conducted in Bhutan had been made or published. Yazaki & Kanmuri (1985) reported on butterflies of western Bhutan and presented a list of 265 butterfly species, apparently partly based on species in the collection of the Natural History Museum, London, U.K.. Harada (1987a, b) listed 124 species with pictures for western Bhutan, based on collection trips in April-May, 1983. Van der Poel & Wangchuk (2007) published the first guidebook of butterflies of Bhutan, covering 139 species. In 2009, Karma Wangdi rediscovered, after more than 75 years, *Bhutanitis ludlowi* Gabriel, 1942 (Ludlow’s Bhutan Glory, now Bhutan’s national butterfly) in Trashiyangtse in NE Bhutan, and described the experience in Tashi Delek magazine (Wangdi, 2010).

These last two events were the start of a growing interest in butterflies in Bhutan, leading to the publication of various reports, checklists and guidebooks. Since 2012, scientific articles, guidebooks, checklists, popular magazine, newspaper articles and internet postings reported on butterfly species for Bhutan, including new records. Around 2013, Van Gasse posted an online Portable Document File (pdf) document of an annotated checklist of the butterflies of the Indian subcontinent, including the distribution areas of the listed species. In 2015, two checklists of the butterfly species of Bhutan were published: Singh & Chib (2015) listed 670 species, and Sbordoni *et al.* (2015) listed 533 species. The main difference was in the number of reported HesperIIDae in the two reports (139 vs 73). Van Gasse (2018) posted an updated checklist with more details on the distribution areas of the butterflies of the Indian Subcontinent, which was published as a book in 2021 (Van Gasse, 2021). It listed 142 HesperIIDae species for Bhutan. One of the sources of Singh & Chib (2015) and Van Gasse (2018) was Kehimkar (2008). In that

book, Kehimkar (2008) indicated if species were found in Bhutan, mainly based on Evans (1932, 1949) and old documents in the library of the Bombay Natural History Society (BNHS), Mumbai, India (Isaac Kehimkar, *pers. comm.*, 2023).

Gyeltshen *et al.* (2018) listed hundreds of new species of plants and animals for Bhutan, discovered between 2009 and 2017. Among these, there were only four butterfly species, *Apostictopterus fuliginosus* Leech, [1893], *Euthalia amplifascia* Tytler, 1940 and *Neozephyrus suroia* (Tytler, 1915) by Wangdi *et al.* (2012, 2013) and *Una usta* (Distant, 1886) from an unpublished report by Van der Poel (2016). The authors found a few other scientific articles reporting new HesperIIDae species for Bhutan: Nidup *et al.* (2014) reported *Psoos fuligo* (Mabille, 1876) (Coon). Cheku *et al.* (2018) reported *Pintara tabrica* (Hewitson, 1873) (Crenulate Orange Flat), a species not reported from the central Himalayas for 145 years and of which many believed that the type locality (Darjeeling) had been wrongly reported. Earlier, Harada (1987a) reported the first record for Bhutan of *Coladenia hoenei* Evans, 1939, reclassified as *Coladenia pinsbukana occidentalis* Huang, 2021 following Huang (2021). Chiba *et al.* (2023) report that *Carterocephalus houangty bootia* Evans, 1949 differs from *C. h. houangty* Oberthur, 1886 in the male genitalia and in the phylogenetic distance to such a degree that it could be considered a separate species. However, they do not report it as such. Their observations include specimens that were collected in this century, although no collection date was indicated. Other reports listed new species for Bhutan with or without supporting evidence, but were apparently unaware that the species had not been reported from Bhutan before.

Many species reported for Bhutan, were reported in articles or booklets that did not get scrutinized thoroughly, nor peer-reviewed on their identifications. Other new species were reported for Bhutan on internet postings or in newspaper articles, both suffering from a lack of peer-reviewing. Many of the reports on butterflies of Bhutan included wrong or doubtful identifications, especially of the HesperIIDae. Many reports provided lists of species without any supporting evidence, such as pictures of the listed butterflies and/or of their genitalia. Some checklists contained double entries for some species and also species that were highly unlikely to be found in Bhutan. The checklist of Singh & Chib (2015) included references to the documents in which each species was reported. Some of these publications did not report the concerned species. Many provided no evidence for many or all of the listed species, and sometimes provided pictures which were wrongly identified. It appeared that Singh & Chib (2015) generally accepted the identifications in the referenced documents as reliable. The checklist of Sbordonni *et al.* (2015) was mainly based on photographs, but also on published documents. They appear to have more critically reviewed the reliability of the identifications in these documents. However, their list also includes some mis-identified species. Probably due to this more critical review, Sbordonni *et al.* (2015) reported almost 50% fewer HesperIIDae species than Singh & Chib (2015) compared to overall reporting some 20% fewer species. Van Gasse (2018) listed 142 HesperIIDae species for Bhutan. It appears that Van Gasse accepted or rejected species based on the likelihood that these species occurred in Bhutan, rather than on the evidence presented for them. He listed more species than Singh & Chib (2015), mainly due to a more thorough search in Evans (1932, 1949) and other documents. However, Van Gasse's

checklist also included species for which the sources appear to be wrongly identified species in other documents.

One of the important sources for the above checklists was Wangdi & Sherub (2014), which, unfortunately, had a fair number of wrong identifications. Also, Yazaki & Kanmuri (1985) had several pictures of HesperIIDae which were wrongly identified or wrongly labelled. Some of the wrong identifications in various reports were due to the use of guidebooks for other countries, leading to reports of species that were highly unlikely to occur in Bhutan. Moreover, wrongly identified species of some reports were listed again in other reports and checklists. Thus, what at first sight appeared to be several records of a given species, actually was based on one single source document.

When the first two authors discussed scientifically reporting new species for Bhutan and producing a new checklist of species, they realised the need to review the three published checklists and the source documents to determine which species had been reliably reported from Bhutan and which not. Understanding the amount of work involved, they decided to start with the family which probably had the most mis-identified species of all, the HesperIIDae (skippers). The first two authors, not being experts in the identification of HesperIIDae, contacted Sajan KC to help identify difficult species. Understanding how pivotal his identification skills were in determining which species had been reported reliably and in producing a new checklist, they asked him to be the third author. Some of the identification characteristics may be mentioned in the text, but these are usually not all characteristics that distinguish the species from similar species.

In this article, the authors present verifiable first records of 25 species that appear not to have been reported for Bhutan before or were reported with insufficient evidence or based on wrong identifications. In addition, we present 4 tentative species for Bhutan. We also present pictorial evidence of 25 mostly seldom seen species that have not been reported for Bhutan since Evans (1949) or were reported without supporting evidence. Information in some grey literature, in newspaper articles and on several websites was looked at but considered as not scientifically published information. The authors may mention these sources of information to acknowledge the work of the reporters.

The final result of this review of the HesperIIDae species reported from Bhutan will be an updated checklist to be published soon, which includes the species presented in this document, but will also list species that were removed from checklists due to a lack of supporting evidence.

Methods

The authors reviewed existing checklists, specifically Singh & Chib (2015), Sbordoni *et al.* (2015) and Van Gasse (2018), and reports on butterflies of Bhutan. They checked the evidence for all listed HesperIIDae species, especially those which appeared to have no or few recent

observations. This was considered necessary because many of the published lists and guidebooks contained wrong identifications and several of these were copied into some of the checklists cited above. The authors tried to ascertain if the identifications were correct, taking into account that, especially for HesperIIDae, identification of many species is very difficult or even impossible on the basis of photographs alone. Specimens and often a study of the genitalia are required for reliable identifications of many HesperIIDae species. The authors also checked on species that were reported in grey literature, in newspapers and on some websites. They also reviewed pictures which were or appeared to be of species, not yet or seldom reported for Bhutan. Many of these were taken by Bhutanese butterfly photographers over the last decade. Some were posted on websites, other sent to the authors.

Several listed species were last reported by Evans (1949) or even before that, with no reported recent observations. Evans (1949) was based on the study of specimens that often had been collected long before 1949. Most were reported or described by other authors, but Evans (1949) does not provide much information about these older reports. Some information could be found via links on the FUNET website. Many of these old documents were searched for species from Bhutan. For recent reports of species, we checked the evidence presented, starting with the oldest of the listed documents until we found a document that provided sufficient reliable evidence. In the final checklist we will list the documents that first reported on the occurrence of a species in Bhutan and the first recent report with evidence of the species.

For 25 not yet or wrongly reported species, the authors had pictorial evidence, judged sufficient to report these as first verifiable records for Bhutan. For another 25 seldom reported species, the authors report recent reliable verifiable records. For first records the authors accepted only species for which they judged the identification to have a 98-100% chance of being correct. For recent records of earlier reliably reported species and for new species to be listed as tentative they accepted species for which they judged the identification to have at least a 90-98 % chance of being correct. For many reported species, the authors found no or insufficient supporting evidence, at times because the identification was questionable or wrong. For these species the authors looked for additional evidence, mainly pictures. If none could be found, the species was removed from the checklist of HesperIIDae species of Bhutan. All identifications of which the first two authors were not very certain were checked by the third author, HesperIIDae specialist Sajan KC, who also checked all the final draft of the article and all its pictures. The authors split these species into five groups:

1. Species with reliable (98-100% chance of correct identification) pictorial evidence that, as far as we could judge, had not been reported from Bhutan or if reported, this was based on wrong identifications;
2. Species with fairly reliable (90-98% chance of correct identification) pictorial evidence that, as far as we could judge, had not been reported from Bhutan or if reported, this was based on wrong identifications;

3. Species with reliable pictorial evidence that were reported from Bhutan without or with insufficient evidence (excluding those reported by Evans (1949) or in other old documents);
4. Species with reliable or fairly reliable evidence that appeared not to have been reported from Bhutan since Evans (1949);
5. Species that were most probably wrongly reported from Bhutan, and of which we had no recent reliable evidence. These species were either wrongly identified or were reported from areas which are outside the present-day boundaries of Bhutan, such as Buxa and Kalimpong. Many were probably also outside Bhutan at the time of reporting as a large part of the Bhutan Duars became part of the British Indian Empire in the treaty of Sinchula in 1865. De Nicéville mentions in several publications “Buxa, Bhutan” and in de Niceville (1889) “Rikisum, British Bhutan”. Thus, it appears that some references to “Bhutan” should have been “Bengal” or “British Bhutan”.

The species of the first group are reported as first records for Bhutan in this document, and those in the second group as tentative species for Bhutan. The latter require additional confirmation, based on pictures of upper and undersides, a study of specimens or of the genitalia or DNA sequencing, to be accepted as a species for Bhutan. The third and fourth groups for which recent (fairly) reliable evidence was obtained by the authors are reported as recent records of seldom seen species in part two of this document. Species in the fifth group will be removed from the species list of Bhutan, but reasons for this removal will be presented in a follow-up article with a new Hesperidae species checklist for Bhutan. The species reported in checklists based on Evans (1949) or other old documents, but which have no reliable recent records, will be maintained in the checklist of Hesperidae. Four species are listed as tentative, but not counted as species occurring in Bhutan.

For scientific and common names, we follow Van der Poel & Smetacek (2022), which aimed to largely standardize the use of common and scientific names for Nepal and ultimately across the Indian subcontinent. For species that occur in Bhutan, but not in Nepal, we follow Varshney & Smetacek (2015), taking into account other recently published taxonomic changes.

Results

In the two sections that follow, we first report on 25 species for which we believe these are first verifiable records for Bhutan. Next, we present four species listed as tentative for Bhutan. In the second section, we present evidence of eight species that were reported without sufficient evidence and of sixteen species that appear not to have been reported with sufficient evidence for Bhutan since Evans (1949). We also confirm the presence in Bhutan of one species, considered as tentatively listed for Bhutan before.

First records for species

For the following species, we believe that we are the first to report on their presence in Bhutan in a scientific article. The species are presented in alphabetical order.

Aeromachus pygmaeus (Fabricius, 1775) Pigmy Scrub Hopper

A. pygmaeus was described as *Papilio pygmaeus* by Koenig in South India. Fabricius (1775) briefly reported it as brown and spotless with a white chin and a reddish antennae club. Evans (1949) indicated that *A. pygmaeus* has short and straight antennae without a pointed apiculus. The markings on the underside of the hindwing may resemble those of *A. jhora* (de Niceville, 1885), but are usually much fainter. *A. pygmaeus* was reported by Van Gasse (2018) for central Nepal, north West Bengal and N.E. India. Hence, its occurrence in Bhutan was expected.

A picture of *A. pygmaeus* was posted on the BBP (Bhutan Biodiversity Portal) website in 2018 by Tshulthrim Drukpa Wangyel. He took the picture presented here in August 2019 in Gelephu, Sarpang Dzongkhag, while it was basking in a warm broad-leaved forest area at an elevation of 200m. Karma Wangdi photographed *A. pygmaeus* on 25 July 2021 in Maukhola, Gelephu, Sarpang Dzongkhag, where it was extracting nutrients from moist soil in sub-tropical forest at 180m elevation.



Aeromachus pygmaeus © Tshulthrim Drukpa

Aeromachus pygmaeus © Karma Wangdi

Astictopterus jama C. & R. Felder, 1860

A. j. olivascens Moore, 1878 Forest Hopper

A. jama was described as a new species from “India continenti”, which on FUNET is listed as “TL: Malaysia [?Malacca]”. Subspecies *olivascens* was described from Myanmar and Darjeeling. Evans (1949) and Moore (1878) reported the wet season form upper forewing to be unmarked or uniform olive brown and the under hindwing to be uniform dark grey or brown with grey speckling. Darker brown spots on the under hindwing are visible in pictures presented as *A. j. olivascens* on the Yutaka and IFB websites (links in References section)

Elwes & Edwards (1897) reported specimens of ssp. *olivascens* from NE India, Sikkim and “Buxar, Bhutan”. Evans (1949) listed examining three specimens of ssp. *olivascens* from Sikkim and Bhutan. We assume that his specimen(s) from Bhutan were the same as those of Elwes & Edwards (1897). The listing by Van Gasse (2018) is based Evans (1949), while Singh & Chib (2015) accessed an earlier PDF version of Van Gasse’s document in 2014. Thus, there is no evidence of *A. jama* having been reported from within the present-day boundaries of Bhutan in the past.



Astictopterus jama © Piet van der Poel



Astictopterus jama © Piet van der Poel

On 12 July 2019, Piet van der Poel photographed a rather exhausted individual in the immigration office in Samdrup Jongkhar at an elevation of 170m, its habitat most likely being tropical forest, rather than government offices.

Burara anadi anadi (de Nicéville, [1884]) Plain Orange Awlet

B. anadi was described as “*Choaspes? anadi*” from specimens collected in Sikkim and Masuri (Mussoorie). De Nicéville (1884) stated that the male closely resembles the male of *B. harisa*, but differs in the forewing being much narrower, and the costal pale patch on the hindwing being more restricted. Evans (1949) distinguished it from *B. jaina* and *B. oedipodea* by having the under hindwing without cell spot, but

with a dark end-cell bar, a blurred ochreous discal area and a paler apex. He also indicated that both wings are purple-washed. Van Gasse (2018) listed *B. anadi* as



Burara anadi © Tshulthrim Drukpa Wangyel

rare in the Himalayas from Uttarakhand to Sikkim up to 2100m and from north West Bengal and south of the Brahmaputra. Varshney and Smetacek (2015) reported it from Uttarakhand to NE India. Recently, it was reported from Nepal at 850m elevation (KC, 2020). Thus, its occurrence in Bhutan was expected.

B. anadi was photographed on 7 June 2021 by Tshulthrim Drukpa Wangyel and posted on the BBP website. It was spotted along the Mo Chu in Punakha Dzongkhag, at an elevation of 1300m, near warm broadleaved forest where it was extracting minerals from moist sand.

***Caltoris aurociliata* (Elwes & Edwards, 1897) Yellow-fringed Swift**

C. aurociliata was described as *Parnara aurociliata* with its name referring to the yellow/golden fore- and hindwing cilia. The type locality was Sikkim. Evans (1949) also studied specimens from Manipur and Nagaland. Hence, its occurrence in Bhutan was expected. This was also indicated by Van Gasse (2018), who noted about it: “undoubtedly occurring in Bhutan”.

A picture of *C. aurociliata* was presented as *C. tulsii* in Wangdi & Sherub (2014). It lacks the light grey-purplish band on the underside of the



Caltoris aurociliata © Karma Wangdi

hindwing of *C. tulsii*. It was identified with an estimated certainty of 99 % to be correct as *C. aurociliata*. Thus, we report it here as a first record of the species for Bhutan. The picture was taken by Karma Wangdi on 31 August 2010 in Cheng village, Trashiyangtse Dzongkhag, at an elevation of 2330m in cool broad-leaved forest.

***Caltoris cahira* (Moore, 1877)**

***C. c. austeni* (Moore, [1884]) Colon Swift**

C. cahira was described as *Hesperia cahira* from the Andaman Islands. The Himalayan ssp. *austeni*, which was described from the Khasi Hills, differs from ssp. *cahira* in the males and females having two sub-apical spots and three discal spots. Varshney & Smetacek (2015) reported *C. cahira austeni* from Sikkim to N.E. India. Van Gasse (2018) reported this taxon from the same area including Bhutan. The source of its listing

by Van Gasse is unknown, but it could be a fairly recent report, which would explain that *C. cahira* was not listed by Singh & Chib (2015). The authors were unsuccessful in finding additional information, but found recent pictorial evidence.

The picture of *C. cahira* was taken by Karma Wangdi on 16 October 2021 in Berti, Zhemgang Dzongkhag, at 610m elevation in sub-tropical forest.



Caltoris cahira © Karma Wangdi

***Caltoris kumara* (Moore, 1878)**

***C. m. moorei* (Evans, 1926) Blank Swift**

C. kumara was described as *Hesperia kumara* from Canara/Kanara, Karnataka, India. Evans (1949) indicated that it has no forewing cell spots. In females, the under hindwing may have a small spot in space 2 and a smaller one in space 3 (Evans, 1949). It was first reported for Bhutan by Wangdi & Sherub (2014) with pictures that could not be identified, possibly being of a dry season form of *Pseudoborbo bevani* (Moore, 1878). *C. kumara* was also listed for Bhutan by Van Gasse (2018), and this listing was presumably based on the same publication. Thus, there was no evidence of *C. kumara* in Bhutan.

C. kumara was photographed by Piet van der Poel on 20 May 2016 in Lingmethang, Mongar Dzongkhag, at an elevation of 680m at the edge of a forested area. It was wrongly labelled as *C. tulsii* and consequently was not listed in Van der Poel (2016, unpublished).



Caltoris kumara © Piet van der Poel

Capila pennicillatum pennicillatum (de Nicéville, [1893]) Fringed Dawnfly

C. pennicillatum was described as *Crossiura pennicillatum* from the Kashi Hills in Meghalaya, India. The original description was based on 6 males and 2 females collected by local people in the Khasi Hills. Van Gasse (2018) listed it as very rare in the Himalaya and in the hills south of the Brahmaputra. From the Himalaya it was only known from two records in east Nepal, which date back to 1987 (Van der Poel & Smetacek, 2022).



Capila pennicillatum © Kado Rinchen

C. pennicillatum is easily distinguished from other species (Evans, 1949) by its tapering discal band not reaching the termen and costa and by four apical spots, while the male has hair tufts at the end of vein 4 of the hindwing. Evans (1949) and the FUNET website list three subspecies. Ssp. *pennicillatum* was only reported from the locations mentioned above.

No reports of recent observations of this species were found. Thus, Kado Rinchen photographing it in late December 2017 in warm broad-leaved forest at an elevation of 1250m in Adha, Wangdue-Phodrang Dzongkhag, confirms its continued presence in the Himalaya. It is also the first record for Bhutan. Its apparent rarity may be due to it being an elusive species, hiding in the undergrowth or hanging from the underside of leaves.

Cephrenes acalle (Hopffer, 1874)

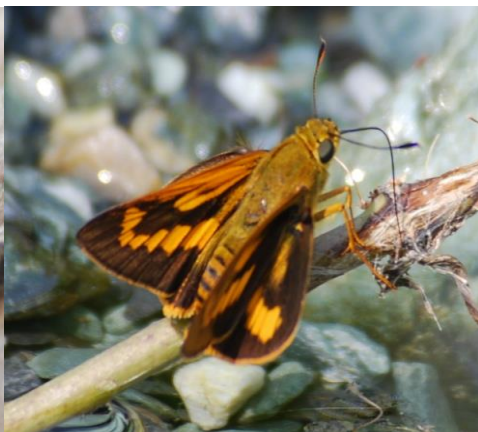
C. a. oceanica (Mabille, 1904) Plain Palm Dart

C. acalle was described as *Hesperia acalle*. Evans (1949) listed it as *Cephrenes chrysozona* (Plötz, 1883) and indicated that the males have an upper forewing central band that is solid throughout, while the underside of females often has a slaty glaze. Mabille (1904) described subspecies *oceanica* as *Telicota oceanica* from “Océanie sans localité précise”. Evans (1949) listed this as “Oceania (probably Assam)”. FUNET lists “Papua” as type locality. *C. acalle* has been reported from large parts of India, including lower elevations in the Himalaya from Sikkim to Arunachal Pradesh (Van Gasse, 2018; Varshney & Smetacek, 2015). It was also reported from central Nepal at 1500m elevation with photographic evidence of both sexes (Van der Poel, 2020). For Bhutan it was reported in Wangdi & Sherub (2014) but the accompanying picture was of a *Potanthus* Scudder, 1872 species. Hence, it appears that it was not formally reported from Bhutan before.

Cephrenes acalle was photographed by Karma Wangdi on 20 November 2022 while feeding in sub-tropical forest at 615m elevation in Bermo, Tingtibi, Zhemgang Dzongkhag.



Cephrenes acalle © Karma Wangdi



Cephrenes acalle © Karma Wangdi

***Choaspes xanthopogon* (Kollar, [1844]) Similar Awlking**

C. xanthopogon was described as *Hesperia xanthopogon* with type locality “Himalaya”. It is difficult to distinguish between the three *Choaspes* species found in Bhutan and the individuals presented as *C. xanthopogon* in Yazaki & Kanmuri (1985) and Wangdi & Sherub (2014) were both re-identified as *C. benjaminii*, having the tornal black spot on UnH broken and a wide orange area between the black spot and the tornus. Consequently, the listings of *C. xanthopogon* for Bhutan in Singh & Chib (2015) and Van Gasse (2018) had no evidence. Sbordoni *et al.* (2015) listed it from Punakha, but the source of its listing is unclear. In early 2003, Piet van der Poel took a photograph of the upperside of a specimen labelled *Choaspes xanthopogon* [sic] in the Yusipang Agricultural Research Station. Karma Wangdi photographed the underside of the same specimen in 2023, in the Museum of the Ugyen Wangchuck Institute for Conservation and Environmental Research in Lamai Goempa, Bumthang Dzongkhag. This specimen was confirmed to be *C. xanthopogon*.

The specimen was most probably collected by B. B. Chhetri from an area above Yusipang at an approximate elevation of 2750 – 2800m. Another specimen of *C. xanthopogon* was collected by Karma Wangdi in Khoma, Lhuentse Dzongkhag.

*Choaspes xanthopogon* © ARS, Yusipang*Choaspes xanthopogon* © UWICER, Bumthang

***Coladenia agni agni* (de Nicéville, [1884]) Brown Pied Flat**

C. agni was described from Sikkim. It differs from *C. agnioides* Elwes & Edwards, 1897 mainly by having the upper side of the antennae uniformly black, while the underside is whitish, and not having a white area below the club on the upper side of the antennae. *C. agni* was listed for Bhutan by Singh & Chib (2015) and Van Gasse (2018), ultimately only based on Wangdi & Sherub (2014). However, the picture in the latter publication was not of *C. agni*, but most probably of *Pseudocoladenia festa* (Evans, 1949). Hence, the species was not reliably reported from Bhutan before.

C. agni was photographed by Karma Wangdi on 10 April 2014 in Pantang, Zhemgang Dzongkhag, at an elevation

*Coladenia agni* © Karma Wangdi

of 160m in sub-tropical forest. Another picture of it, taken in Samdrup-

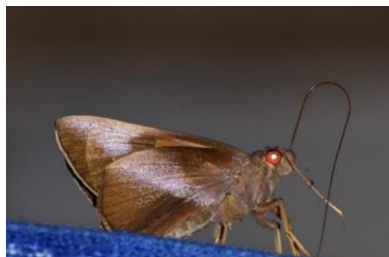
Jongkhar was posted on the BBP website by Tshulthrim Drukpa Wangyel in 2018.

***Gangara lebadea lebadea* (Hewitson, 1868) Banded Redeye**

G. lebadea was described as *Hesperia lebadea* from Borneo. It is a rather large Redeye, which is quite easy to identify. Van Gasse (2018) listed ssp. *lebadea* as very rare in the eastern Himalayas and N.E. India. Although Varshney & Smetacek (2015) listed it from Sikkim, Van

Gasse indicates that this was actually northern West Bengal. Finding it in Bhutan was not unexpected.

G. lebadea was photographed by Shyam on 21 September 2021 at Jomotsangkha, Samdrup Jongkhar Dzongkhag, at an elevation of 290m in subtropical forest and appeared to be extracting nutrients from a wet towel.



Gangara lebadea © Shyam

Gangara thyrasis thyrasis (Fabricius, 1775) Giant

Redeye

G. thyrasis was described as *Papilio thyrasis* by Fabricius, indicating “Habitat in America”. FUNET indicates that this should be Tranquebar, S. India. Van Gasse listed ssp. *thyrasis* for the Himalayan area from Himachal Pradesh to N.E. India, including an observation in the Manas National Park in Assam, near the border with Bhutan. Thus, it was expected to occur in Bhutan.



16 *Gangara thyrasis* © Shyam

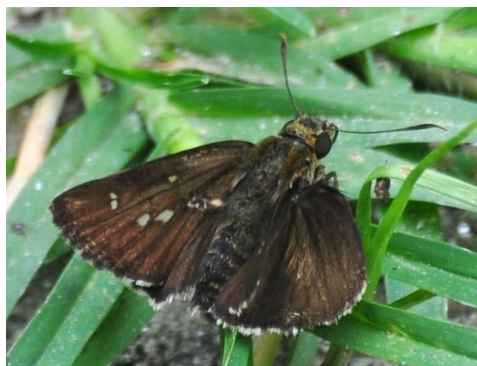
G. thyrasis was photographed by Shyam on 17 July

2020 at Jomotsangkha, Samdrup Jongkhar Dzongkhag, at an elevation of 240m. It was found in subtropical forest feeding from a *Hibiscus* flower.

Halpe aucma Swinhoe, 1893 Gold-spotted Ace

H. aucma was described as *Halpe aucma* from Shillong (Meghalaya), but Swinhoe’s single specimen may have been an exception as some of the characteristics he described appear not to be standard characteristics, such as no forewing cell spot and a tiny third apical spot above the two normal apical spots. Van Gasse (2018) and Varshney & Smetacek (2015) reported it as a ssp. of *H. homolea* (Hewitson, 1868), the former from N.E. India south of the Brahmaputra and the latter from Manipur, Meghalaya and Nagaland. It was recently reported from east Nepal by KC & Neupane (2021). *H. aucma* was raised to species rank by Huang (1998), but some doubts remain about its status (Peter Smetacek, *pers. comm.*, 2022). Van der Poel & Smetacek (2022) followed Huang (1998) and we follow Van der Poel & Smetacek (2022) and report it as a first record for Bhutan, since there appear to be no records of it from Bhutan either as a species or as a ssp. of *H. homolea*.

H. aucma was photographed by Piet van der Poel on 26 August 2016 in Masangdaza, Lingmethang, Mongar Dzongkhag, at an elevation of 840m in open area next to a creek near warm broad-leaved forest. The species was not reported in Van der Poel (2016), because it was not identified at the time.



Halpe aucma © Piet van der Poel



Halpe aucma © Piet van der Poel

***Iton semamora semamora* (Moore, [1866]) Common Wight**

I. semamora was described from “Bengal” as *Hesperia semamora*. Van Gasse (2018) listed ssp. *semamora* as occurring in the Himalaya from Sikkim and N. West Bengal to Arunachal Pradesh and as “not recorded, but undoubtedly present in Bhutan”.

A photograph of the underside of *I. semamora* was taken by JSWNP (Jigme Singye Wangchuck National Park) ranger Cheku on 20 September 2019 near the Tingtibi bridge in Zhemgang at 530m elevation in Chir pine forest. The upperside picture was taken by Shyam on 27 February 2022, in the Jomotsangkha Wildlife Sanctuary, Samdrup Jongkhar Dzongkhag, at an elevation of 520m in subtropical forest.



Iton semamora © Shyam



Iton semamora © Cheku

Matapa cresta Evans, 1949 Fringed Redeye

M. cresta was described from Sikkim by Evans (1949), who indicated: “This insect was wrongly identified as *druna* by De Nicéville (1883), when describing his *shalgrama* [now a synonym of *druna*] and subsequent authors have followed him”. Van Gasse (2018) reported *M. cresta* from east Nepal to N.E. India, thus it was expected to occur in Bhutan. *M. cresta* is also known as the Dark-brand Redeye. Its forewing apex is light grey and the basal areas of the underside of the wings are also grey.



Matapa cresta © Tandin Jamtsho

A picture of *M. cresta* was found on the BBP website, where it was posted as *M. sasivarna* (Moore, [1866]), the Black-veined Redeye. The picture was taken on 4 January 2022 by Tandin Jamtsho in Dremzeygang, Samrang, Samdrup Jongkhar Dzongkhag, at an elevation of 440m in dense sub-tropical forest.

Matapa druna (Moore, [1866]) Grey-brand Redeye

M. druna was described as *Hesperia druna* from Bengal. Van Gasse (2018) reported it from east Nepal to Arunachal Pradesh and indicated that it certainly also occurs in Bhutan. The picture labelled *M. purpurascens* in Wangdi & Sherub (2014) was re-identified as *M. druna*. Its narrowly pale orange hindwing cilia and light yellow-grey forewing cilia are indicative. *M. purpurascens* has broadly bright orange hindwing cilia.



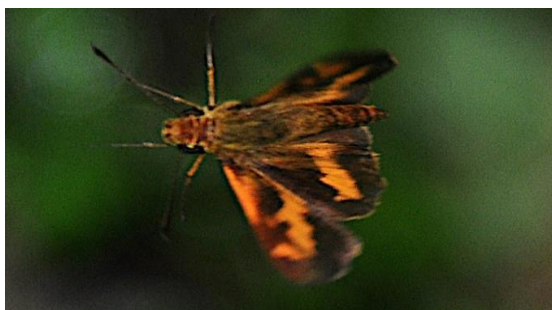
Matapa druna © Karma Wangdi

The photograph was taken by Karma Wangdi on 11 July 2012 in Phophel, Tingtibi, Zhemgang Dzongkhag, at an elevation of 900m, in sub-tropical forest.

Oriens gola (Moore, 1877)

O. g. pseudolus (Mabille, 1883)
Common Dartlet

O. gola was described as *Pamphila gola* from the Andaman Islands. It was reported for Bhutan in all 3 checklists, probably based on Yazaki



Oriens gola © Piet van der Poel

& Kanmuri (1985) and Wangdi & Sherub (2014). The former reported to have collected 28 specimens of it, but the picture labelled “*Oriens gola*” is of *Taractrocera danna* (Moore, 1865). It appears unlikely that they did not collect any *O. goloides* (Moore, [1881]), which in Lingmethang is much more common than *O. gola* (Van der Poel, 2016). The picture of *O. gola* in Wangdi & Sherub (2014) was of *O. goloides*, which has the lower cell spot and the spot in space 2 (if present) separated by a darker line. Singh (2012) also reported *Oriens gola*, but without providing photographic evidence. Van der Poel (2016) reported *Oriens gola* and *O. goloides* from Lingmethang, without pictorial evidence.

That evidence for *O. gola* is presented here. The picture was taken by Piet van der Poel on 16 June 2016 at an elevation of 660m in the area of the Mountain Hazelnut Company in Lingmethang, Mongar Dzongkhag, in secondary forest not far from the river.

***Pirdana hyela* (Hewitson, 1867)**

P. h. major Evans, 1932 Green-striped Palmer

P. hyela was described as *Hesperia hyela* from Java. Ssp. *major* was described by Evans (1932) as *Pirdana ismene major* from Sikkim.

In Evans (1949) the name was changed to *P. hyela major*, and one specimen from Sikkim and ten from Assam were studied. Van Gasse (2018) listed ssp. *major* as rare at fairly low elevations in the Himalaya, in N. West Bengal, and in Meghalaya, Manipur and Tripura. Varshney & Smetacek (2015) listed it also from Sikkim. Hence, its occurrence in Bhutan was expected.



Pyrdana hyela © Cheku

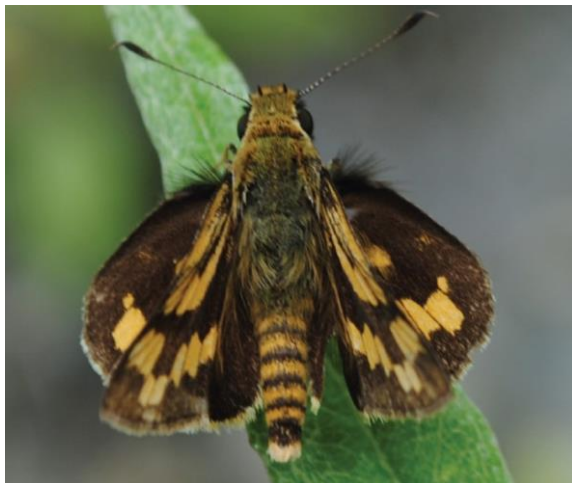
P. hyela was photographed by Cheku of Jigme Singye Wangchuk National Park on 23 January 2020 in Tingtibi (Zhemgang) at 1070m elevation in sub-tropical forest.

***Potanthus pseudomaesa* (Moore, [1881])**

P. p. clio (Evans, 1932) Indian Dart

P. pseudomaesa was described as *Padraona pseudomaesa* from “Colombo. Plains” (Sri Lanka). It is often reported as a common Himalayan species (e. g. Smith (1994) for Nepal). It also is very variable, e. g. the upper forewing discal spots in spaces 4 and 5 can be separate from those in 3 and 6, but could also be touching them and similarly the upper hindwing can have a spot in space 6 or one in space 7 or spots in both spaces 6 and 7. It was not reported for Bhutan in Evans (1932, 1949) and neither reported by Kehimkar (2008) who checked records of Bhutan

butterflies in old documents in the BNHS library. It was listed for Bhutan in the checklists of Singh & Chib (2015) and Sbordoni *et al.* (2015) based on it being reported in other publications. Some of these included pictures, e. g. Yazaki & Kanmuri (1985), Wangdi & Sherub (2014), Van der Poel & Wangchuk (2007) and Singh & Chib (2014). The first two were wrong identifications, while the last two could be *P. pseudomaesa*, but cannot really be identified beyond the genus level. There are also several pictures posted on the BBP website as *P. pseudomaesa*, most of which cannot be identified beyond the genus level. Thus, the presence of *P. pseudomaesa* in



Potanthus pseudomaesa © Karma Wangdi

Bhutan had not been established.

A picture presented as *P. nesta* in Wangdi & Sherub (2014) was considered by the authors to be 99.5% certain *P. pseudomaesa*. We present it here as a first record supported by pictorial evidence of *P. pseudomaesa* for Bhutan.

The picture was taken by Karma Wangdi on 8 August 2010 near Phangteng, Bumdeling, Trashiyangtse Dzongkhag, at an elevation of 1930m in subtropical broad-leaved forest.

Salanoemia noemi (de Nicéville, 1885) Spotted Yellow Lancer

S. noemi was described as *Plastingia noemi* from Sikkim. Van Gasse (2018) listed it for the Himalaya from Sikkim, northern West Bengal and south-eastern Arunachal Pradesh. Thus, it was expected to occur in Bhutan.

S. noemi was photographed by Cheku in early September 2016 in Nimshong, Nubji, Trongsa Dzongkhag, at 1200m elevation in an area of mixed agricultural land, pastures and forest, not far from the village of Nimshong. It was posted on the BBP website in August 2022.



Salanoemia noemi © Cheku

Scobura isota (Swinhoe, 1893) Swinhoe's Forest Bob

S. isota was described as *Isma isota* from Shillong, Meghalaya, India. Swinhoe (1893) described the underside of the hind wing to be uniformly yellowish, with the lower spot not divided by the vein, as in *S. cephalo*. Evans (1932) considered *S. isota* and *S. cephalo* to be synonyms, but Evans (1949) listed them as separate species. Van Gasse (2018) listed *S. isota* from Sikkim to NE India and *S. cephalo* from central Nepal to N.E. India, with both species not recorded from Bhutan.

S. isota was first reported for Bhutan in the Kuensel newspaper of 10 December 2016, but it was never reported in any scientific peer-reviewed journal. The picture was taken by Karma Wangdi on 19 November 2016 in Koilatar, Lhamoy Zingkhola/Kalikhola in Dagana



Scobura isota © Karma Wangdi

Dzongkhag at an elevation of 170m in sub-tropical forest. Another picture of *S. isota* was posted on the BBP website by Tshulthrim Drukpa Wangyel in 2017.

Sovia grahami grahami (Evans, 1926) Graham's Ace

S. grahami was described as *Halpe grahami* from Assam and Manipur, having upperside cilia brown and faintly chequered and a dark ochreous underside. *S. grahami* was reported for Bhutan by Van der Poel & Wangchuk (2007), showing a picture of the underside. Presumably based on this document, it was subsequently listed in all three checklists of Bhutan. Using pictures of both the upper and underside, the individual was re-identified as *Thoressa serena* (Evans, 1937). An underside picture posted as *Thoressa iana* [sic *recte aina*] on the BBP website was re-identified as *Sovia grahami*. We also found a picture of the upperside of the same individual, which makes us believe that the individual is 99% certain to be *S. grahami*. The pictures were taken by Karma Wangdi



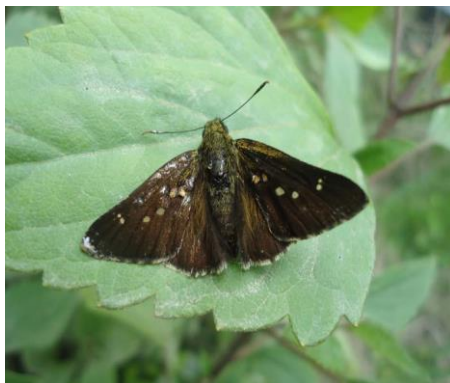
Sovia grahami © Karma Wangdi

on 23 July 2018 in Thedtsho, Wangdi-Phodrang Dzongkhag, at 1370m elevation in Chir pine forest.

Thoressa gupta gupta (de Nicéville, 1886) Olive Ace

T. gupta was described as *Halpe gupta* from Sikkim, and reported to be quite similar to *H. kumara*. The underside of *T. gupta* shows some vague spots while *H. kumara* may have a clear spot in space 2. Evans (1949) indicated that *T. gupta* has white spots and a greyish underside. *T. gupta* was reported for Bhutan by Wangdi & Sherub (2014) and presumably based on that by Singh & Chib (2015) and Van Gasse (2018). However, the picture in Wangdi & Sherub (2014) is not of *T. gupta* and probably is *Sovia separata* (Moore, 1882). Hence, the listings of it for Bhutan were incorrect.

T. gupta was photographed by Tandin Wangchuk on 28 May 2015 in Chhoekhor, Bumthang Dzongkhag at an altitude of 2150m, and posted as *Thoressa* spp. on the BBP website. The picture of the underside was taken by Piet van der Poel on 6 June 2015 near Buyang Waterfalls, Trashiyangtse Dzongkhag, in open land near broadleaved forest at 1680m.



Thoressa gupta © Tandin Wangchuk



Thoressa gupta @ Piet van der Poel

Thoressa serena (Evans, 1937) Serena Ace

T. serena was described as *Pedesta serena* from Ta Tsien Lou, Sichuan Province, China. Evans (1949) listed additional specimens from Yunnan (Tse Kou, = Cigu, in north Yunnan), Myanmar (Burma: Kambaiti, 6,000 ft, near the border with Yunnan) and north Vietnam (Tonkin). Huang (2003) reported *T. serena* from N.W. Yunnan and the Yutaka website, based on Monastyrskii & Devyatkin (2015) from Lao Cai and Sa Pa in north Vietnam. Huang & Zhan (2004) reported: “besides the type locality in Sichuan, *serena* has been recorded also from NW. Yunnan (Tsekou), NE. Burma (Kambaiti) and N. Vietnam (Tonkin). However all these records need to be

confirmed by the examination of male genitalia.” Until now, *T. serena* was not reported in any scientific document from the Indian subcontinent.

In 2022, a picture labelled *Pedesta serena*, taken on 31 May 2022 by Tshulthrim Drukpa Wangyel, was posted on the BBP website as a new species for Bhutan. The picture, of only the underside, was taken in Tashithang, Punakha Dzongkhag, West Bhutan at an elevation of 1540m, and identified by Monsoon Jyoti Gogoi. Pictures of both upper and undersides of a similar looking individual were taken by Piet van der Poel on 16 May 2003 above Thinleygang, Thimphu Dzongkhag, West Bhutan at about 2000m elevation. These latter pictures were confirmed to be *Thoressa serena* by Hao Huang (*pers. comm.*, 2023). An underside picture was wrongly presented in Van der Poel and Wangchuk (2007) as *Sovia grahami*. The common name is proposed here.



Thoressa serena © Piet van der Poel

Thoressa serena © Piet van der Poel

***Unkana ambasa* (Moore, [1858])**

***Unkana ambasa attina* (Hewitson, [1866])** Hoary Palmer

U. ambasa was listed as *Ismene ambasa* by Moore in 1857, with coloured drawings of the larva and the chrysalis. He indicated having examined two males from Java and a female from North India. Subspecies *attina* was described as *Hesperia attina* in 1865, including a coloured drawing of the butterfly. Van Gasse (2018) list ssp. *attina* for Darjeeling and Jalpaiguri in N. West Bengal. Varshney & Smetacek report it only from Sikkim (but this may actually be Darjeeling). Thus, it was not unexpected to find it in Bhutan.



Unkana ambasa © Nima Tshering

The picture of *Unkana ambasa* was taken on 22 October 2018 in Loongsilsa village of Lhamoy Zingkha/Kalikhola, Dagana Dzongkhag by Nima Tshering Tamang. It was sitting on a leaf in sub-tropical forest at an elevation of 120m. *U. ambasa* was reported as a new species for Bhutan on the BBP website in October 2018, based on the same sighting. Observations of *U. ambasa* from the Buxa Tiger Reserve (north West Bengal) were posted on the IFB website. All these were taken in October and November of 2014, indicating that it is in general seldom seen.

- **Species reported as tentative for Bhutan, requiring additional proof**

Four species are listed for Bhutan as tentative. For these species, we considered the identification as having a 90-98% chance of being correct. These species need to be confirmed with additional evidence, which may consist of pictures of the upper and undersides, specimens to check certain details, a study of the genitalia or DNA analysis.

Celaenorrhinus plagifera de Nicéville, 1889 De Nicéville's Spotted Flat

C. plagifera was described from "Sikkim, Bhutan" by de Nicéville, who reported that specimens came from his own and from Mr. Knyvett's collection. Mr. Knyvett's native collectors were known to have collected extensively from "Buxa, Bhutan". Evans (1949) also listed Bhutan, probably based on the same specimens. We assume that it is most likely that these specimens were not from within the present-day boundaries of Bhutan. Since this is not certain and the species is likely to occur or to have occurred in Bhutan, it is listed as tentative.

Potanthus ganda ganda (Fruhstorfer, 1911) Sumatran Dart

P. ganda was reported by Wangdi *et al.* (2012) from Trashiyangtse and based on that by Singh & Chib (2014), Van Gasse (2018) and Sbordonni *et al.* (2015). Otherwise, on the Indian subcontinent it was reported from Assam and Meghalaya (Van Gasse, 2018). Wangdi *et al.* (2012) did not report *P. ganda* as a new species for Bhutan. The identifying team consisted of several experienced Japanese researchers and experts, but the team only studied the specimen, not the genitalia (Saito, *pers. comm.*) Consequently, *P. ganda* is listed as tentative until studies of the genitalia confirm the identification.



Potanthus ganda - Copy from: Wangdi *et al.*, 2012

***Thoressa fusca* (Elwes, [1893]) Fuscous Ace**

T. fusca was described as *Halpe fusca* from Bernardmyo in north Burma/Myanmar and reported to resemble *T. gupta*, but being larger and with unchequered plain and paler cilia. Varshney & Smetacek (2015) and Van Gasse (2018) reported *T. fusca fusca* from Nagaland and Manipur, and *T. fusca debilis* from Meghalaya in N.E. India. Elwes & Edwards (1897) described *Halpe debilis*,



showing a male with two 38. *Thoressa fusca* © Thsulthrim Drukpa Wangyel
conjoined cell spots and a female without cell spots.

In October 2021, a picture of the upperside of *T. fusca* (with the underside of probably another *Thoressa* species) was posted by Tshulthrim Drukpa Wangyel on the BBP website as a new species for Bhutan: *Thoressa fusca*. It was observed on 17 June 2019 in Wangdigang, Trong Gewog, Zhemgang Dzongkhag, at an elevation of 930 m near sub-tropical forest. We are 95% certain that the upperside picture is of *Thoressa fusca* and report it here as a tentative first record for Bhutan.

***Zographetus ogygia ogygia* (Hewitson, [1866]) Purple-spotted Flitter**

Z. ogygia was described from Sumatra by Hewitson and reported from “Buxa, Bhutan” by De Nicéville (1885) and Elwes & Edwards (1897). Evans (1949) just listed it as “Bhutan” and Van Gasse (2018) listed it for Bhutan based on Evans (1949). As Buxa is in West Bengal and without any old records from a location within Bhutan, there appears to be



Zographetus ogygia © unknown

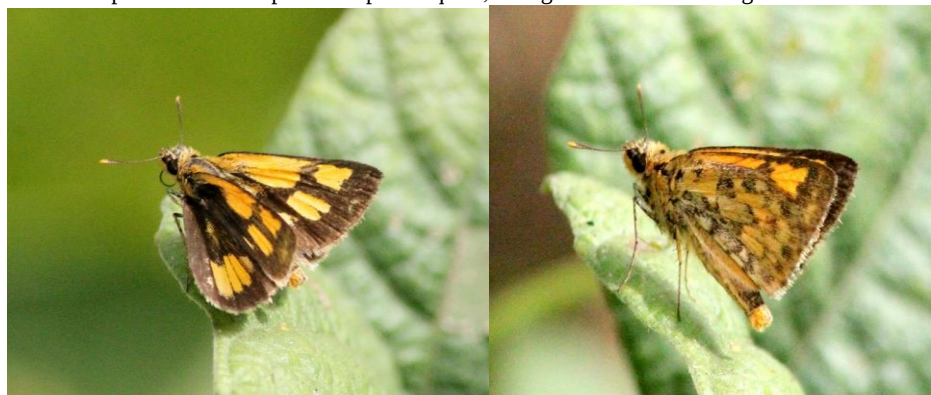
no evidence of this species having been reported from within the present boundaries of Bhutan.

A picture, taken on 6 September 2017 in Gelephu in Sarpang Dzongkhag, of the underside of what we identified as *Z. ogygia* was posted on the BBP website in 2022. As indicated on the Yutaka website for Thailand, several *Zographetus* species, including *Z. ogygia*, cannot be identified without a study of the male genitalia. However, as none of the other similar *Zographetus* species have been reported from the Indian subcontinent we are 95% certain that this is *Zographetus ogygia* and list it as tentative for Bhutan, requiring confirmation based on a picture of the upperside and probably also a study of the male genitalia of a specimen.

- Evidence of species which were reported for Bhutan without much proof or not reported for 70 or more years and confirmation of tentative species

The following species have been reported from Bhutan before, many in Evans (1932, 1949), while others were listed by Kehimkar (2008) based on old documents in the BNHS library. We provide photographic evidence of 25 of these species. Eight of these were reported as names in species checklists without supporting photographic evidence. We obtained the missing evidence, mostly from the authors, and present it here to confirm their records of the species. One species, *Potanthus trachala*, was reported earlier (Wangdi & Sherub, 2014) with evidence that we considered only sufficient for a tentative listing. Here, we provide the evidence justifying listing them as a confirmed species for Bhutan. Sixteen species are reported here as recent records of species that were only known to occur in Bhutan from old documents.

Ampittia dioscorides dioscorides (Fabricius, 1793) Bush Hopper was listed for Bhutan by Van Gasse (2018), who (*pers. comm.*) referred to Singh & Chib (2016), which unfortunately did not include a picture of the species. Upon request, Irungbam Jatishwor Singh sent two of his



Ampittia dioscorides © Irungbam Jatishwor Singh *Ampittia dioscorides* © Irungbam Jatishwor Singh

pictures, confirming his listing from Mendrelgang (Tsirang) as correct. In 2019, another picture of *A. dioscorides*, from Sarpang Dzongkhag, was posted on the BBP website by Tshulthrim Drukpa Wangyel.

Ampittia subvittatus (Moore, 1878) ***subradiatus*** (Moore, 1878) Tiger Hopper was reported for Bhutan by Wood-Mason & de Nicéville (1887) listing it from Sikkim, Bhutan and Salween. It was listed in all three checklists of Bhutan. Singh & Chib (2015) referred to Kehimkar (2008), Singh (2012) and two more recent publications. None of these publications presented photographic evidence for Bhutan. A picture of the species was posted in 2022 on the BBP website. Although the species is hard to mis-identify, we provide this evidence of its continued presence in Bhutan here. The



Ampittia subvittatus © Karma Wangdi

picture was taken by Karma Wangdi on 4 August 2016 near Phuntsholing in Chukha Dzongkhag at an elevation of 330m in subtropical forest.

Burara gomata gomata (Moore, [1866]) Pale Green Awlet was reported for Bhutan by Sbordon *et al.* (2015) and also listed by Van Gasse (2018). It was also reported in the Kuensel newspaper of 10 December 2016 as a new species for Bhutan. The photographic evidence for Sbordon *et al.* (2015) is presented here. It was taken by Tshering Nidup on 7 October 2015 in Rinchending, Chukha Dzongkhag, at an elevation of 400m, sitting on the underside of a



Burara gomata © Tshering Nidup

leaf in sub-tropical forest.

Capila jayadeva Moore, [1866] Striped Dawnfly was listed for Bhutan by Sbordon *et al.* (2015) and Singh & Chib (2015). The latter was based on its listing in JSWNP (2014) and Kehimkar (2008). Kehimkar's (2008) listing was probably based on old documents in the BNHS library. Sbordon *et al.* (2015) and JWSNP (2014) were based on the same picture of *C. jayadeva*. Thus, it appears there is only one recent record and one or more old records. Here, we present the pictorial evidence on which the listing of *C. jayadeva* in JSWNP (2014) and Sbordon *et al.* (2015) is based. The picture was taken by Kado Rinchen on 5 June



Capila jayadeva @ Kado Rinchen

2012 in Ada, Wangdue Phodrang Dzongkhag, at an

elevation of 1190m in warm broad-leaved forest.

Carterocephalus avanti (de Nicéville, 1886) Orange and Silver Hopper was listed for Bhutan in Evans (1949). It was also listed for Bhutan by Kehimkar (2008) and Van Gasse (2018), both presumably based on Evans (1949). Wangdi & Sherub (2014) listed it, but the accompanying picture was of *Carterocephalus houangti bootia* Evans, 1949. A picture of *C. avanti* was presented in Wangdi & Sherub (2014), but with the wrong name: *C. silvicola* (Meigen, 1828). Here, we present that and an underside picture with the correct name. The photographs of *C. avanti* were taken by Karma Wangdi on 12 March 2013 in Damthang, Haa Dzongkhag, at an elevation of 3070m in a grazed meadow, and by Tshulthrim Drukpa Wangyel on 14 March 2019 at Chele La (pass) on the border of Paro and Haa Dzongkhags, at an elevation of 3810m in a subalpine meadow.



Carterocephalus avanti © Karma Wangdi

Carterocephalus avanti © Tshulthrim Drukpa

Celaenorrhinus dhanada (Moore, Wangyel

[1866]) Himalayan Yellow-banded Flat was listed without picture for Bhutan by Sbordoni *et al.* (2015), Singh & Chib (2015) and Van Gasse (2018). The last two appear to be based on Evans (1949), which reported 6 specimens from “Bhutan” without detailed locations. Wangdi & Sherub (2014) presented a more recent picture of *C. dhanada* and listed it correctly as the Himalayan Yellow-banded Flat, but put the wrong scientific name below it. Thus, here we present the same picture with the correct scientific name and identifying it as ssp. *dhanada*. It was taken by Karma



Wangdi on 12 August 2013 in Tsamang,

Celaenorrhinus dhanada ssp. *dhanada* © Karma

Mongar Dzongkhag, at an elevation of 1370m in warm broad-leaved forest.

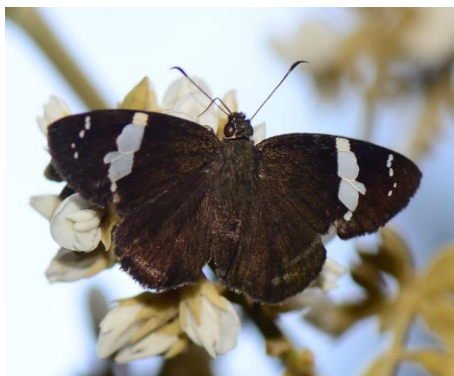
A picture taken in Yarab, Mongar Dzongkhag, and reported as “*Celaenorrhinus aurivittata* (Moore, 1866)” by Wangdi & Sherub (2014) was re-identified as *C. dhanada* ssp. *affinis* Elwes & Edwards, 1897, a new ssp. for Bhutan. Ssp. *affinis* has the spot in space 1b directed to the termen rather than to the dorsum. *C. d. affinis* was listed from N.E. India by Varshney & Smetacek (2015) and from N.E. India south of the Brahmaputra from Assam to S.E. Arunachal Pradesh by Van Gasse



Celaenorrhinus dhanada ssp. *affinis* © Karma

(2018). Evans (1932) presented them as two separate species, with *C. dhanada* from Mussoorie to Sikkim and *C. affinis*, the Burmese Yellow-banded Flat, from Assam to Burma. Evans (1949) presented them as ssp. of *C. dhanada*, reporting ssp. *dhanada* also from Bhutan. The present record represents a northward extension of the distribution area of *C. dhanada affinis* of at least some 150 km, north of the Brahmaputra River. Ssp. *dhanada* and *affinis* may be sympatric in Mongar Dzongkhag. The Yutaka website notes for *C. affinis*: “The male genitalia are slightly different from *Celaenorrhinus dhanada*, and this species is sympatric with *Celaenorrhinus dhanada* in some parts of Chiang Mai province, N. Thailand. Therefore, I treat it as a distinct species.”. The source of information for *affinis* and *dhanada* being sympatric in Chiang Mai is the website “Butterflies of Thailand”. However, there appears to be no scientific publication reporting the change of status of this taxon. Thus, although we assume that *C. affinis* is a valid species, we will leave it as a ssp. of *C. dhanada* until its status as a species is confirmed in a scientific publication. The picture was taken by Karma Wangdi in 2009 near Yarab, Mongar Dzongkhag, at an elevation of 1600m in warm broad-leaved forest.

Celaenorrhinus nigricans nigricans (de Nicéville, 1885) Small-banded Flat was listed for Bhutan based on old evidence, such as Evans (1949), by Singh & Chib (2015) and Van Gasse (2018). Sbordoni *et al.* (2015) also listed it, without a picture. Here the pictorial evidence for the listing of *C. nigricans* by Sbordoni *et al.* (2015) is presented. The picture was taken by Karma Wangdi on 2 October 2014 in Dakphel, Zhemgang Dzongkhag, at an elevation of 1050 m in warm

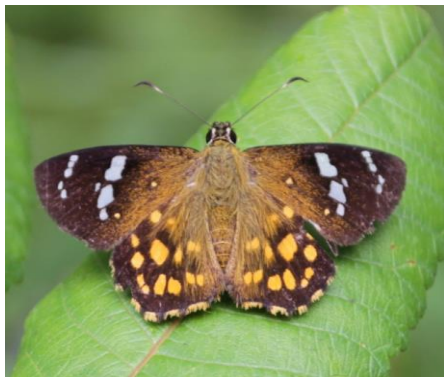


Celaenorrhinus nigricans © Karma Wangdi

broad-leaved forest, where the butterfly was

extracting nectar from flowers of *Millettia pachycarpa*.

Celaenorrhinus pulomaya pulomaya (Moore, [1866]) Multi-spotted Flat was reported by de Nicéville (1889) from Kulu (Himachal Pradesh) to Bhutan (not specifying a location). Evans (1949) also listed specimens from Bhutan, and based on this, it was listed for Bhutan by Kehimkar (2008) and Van Gasse (2018). Singh & Chib listed it based on the two sources mentioned above and on Dorji (2014), who reported it for Phobjikha. However, the latter was a mis-identification. Since Evans' listings were based on specimens, the last Bhutan record of *C. pulomaya* may have been from long before 1949.



Celaenorrhinus pulomaya © Karma Wangdi

C. pulomaya was photographed on 20 September 2012 by Karma Wangdi in Khomagang, Lhuentse Dzongkhag, at an elevation of 2020m in cool broad-leaved forest, confirming its presence in Bhutan.

Coladenia pinsbukana (Shimonoya & Murayama, 1976)

Coladenia pinsbukana occidentalis Huang, 2021 Large-spot Pied Flat was reported as *Coladenia hoenei* Evans, 1939 by Harada (1987a) as a first record for Bhutan. He collected two females on 15 May 1983, along the Mo Chhu near Tashithang, Punakha Dzongkhag, at 1600 m elevation. Evans (1939) described *C. hoenei* from type locality “Tapai Shan, Tsinling, S. Shensi” (=Shaanxi), but also listed 5 specimens from “Tien Mu Shan, Lingan, Chekiang” (=Zhejiang). Unfortunately, Evans (1949) listed *C. hoenei* only from Chekiang, while the type locality was in Shaanxi.



Coladenia pinsbukana © Karma Wangdi

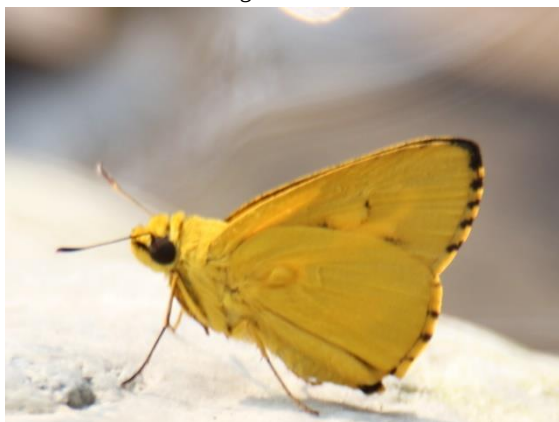
Coladenia pinsbukana (Shimonoya & Murayama, 1976) was described from Formosa (Taiwan) and at the time only known as *Pseudocoladenia pinsbukana*. The two species are very similar. Chiba *et al.* (2020) indicated that the forewings of the two species look the same, but that the discal dots on the hindwing are reduced in *pinsbukana*, while those of *hoenei* are more

prominent. They wondered why the authors of *P. pinsbukana* indicated that it was close to *Coladenia sheila* Evans, 1939 from China, but compared it in the original description with *Pseudocoladenia dan* (Fabricius, 1787) from India. Chiba *et al.* (2020) considered *pinsbukana* a good species, but placed it in *Coladenia*.

Harada's (1987a) identification of his specimens as *C. hoenei* is understandable. Huang & Xue (2004) reported the type locality of *C. hoenei* to be Zhejiang and FUNET listed it as "Chekiang", at least until 2023. *C. hoenei* was also reported from Thailand (Ek-Amnuay, 2012; Yutaka website until 2021) and India (IFB website in 2023). Huang (2021) reported that *C. hoenei* is restricted to the Chinese provinces of Shaanxi, Gansu and Henan and that *C. pinsbukana* occurs in areas further south. He described ssp. *occidentalis* from Pu'er in Yunnan, and noted that it also occurs in Laos, Thailand and Sikkim (India). Thus, the Bhutan species/ssp. should also be *Coladenia pinsbukana occidentalis*.

We found no other records for *C. hoenei/pinsbukana* in Bhutan in the literature. Karma Wangdi took pictures of *C. pinsbukana* on 5 May 2016 and 1 October 2019 in Korphu, Zhemgang Dzongkhag. Thus, also in this century the species has been observed in Bhutan. The proposed common name is the name used for this species on the Yutaka website and for *C. hoenei* on IFB website.

Cupitha purreea (Moore, 1877) Wax Dart was reported for Bhutan in Evans (1949), possibly based on the same specimen(s) as de Nicéville (1883), the latter specifying "Buxa, Bhutan), which is outside the present boundaries of Bhutan. Although it is not certain that Evans' specimens were from present-day Bhutan, we have accepted Evans (1949) as first record for Bhutan. Presumably based on Evans (1949), it was reported from Bhutan by Kehimkar (2008) and Van Gasse (2018). Singh & Chib (2015) listed it based on Kehimkar (2008). Here, we present evidence that it is still present in Bhutan. The picture was taken by Karma Wangdi on 23 February 2018 in Pantang, Zhemgang Dzongkhag, at an elevation of 200 m in sub-tropical forest.



Cupitha purreea © Karma Wangdi

Erionota torus Evans, 1941 Banana Skipper was not listed for Bhutan by Singh & Chib (2015) and neither by Sbordoni *et al.* (2015), but it was listed by Van Gasse (2018), possibly because he believed that the picture of “*Erionota thrax*” in Wangdi & Sherub (2014) was more likely to be of *E. torus*. We confirm that this was *E. torus*, which has a more curved forewing costa than *E. thrax*. The pictures of *E. torus* presented here were taken by Karma Wangdi on 20 September 2009 in Serzhong, Mongar Dzongkhag, at an elevation of 1440 m in warm broad-leaved forest and by Shyam on 2 September 2020 in Bhangter, Samdrup Jongkhar Dzongkhag, at an elevation of 340 m in sub-tropical forest.



Erionota torus © Karma Wangdi

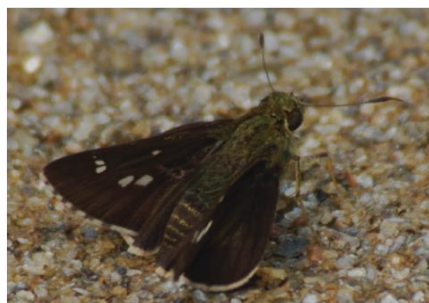


Erionota torus © Shyam

Halpe molta (Evans, 1949) *Molta* Ace. *Halpe homolea* (Hewitson, 1868), the Indian Ace, was reported from Bhutan in several publications and checklists. Most of these did not specify a ssp. and if they did it was usually ssp. *filda* (now species *H. filda*). Van Gasse (2018) reported ssp. *filda* and *molta* (now species *H. molta*) for Bhutan. The source of Van Gasse’s (2018) listing of *H. homolea molta* is not clear. The

upperside picture of *H. homolea* presented in Wangdi & Sherub (2014), which does not mention a ssp., is of *H. molta*, showing the forewing cell spot. Since Van Gasse (2018) did not present any pictures, we present a picture of *H. molta* here. It was taken by Karma Wangdi on 5 June 2012 in Dungkar, Lhuentse

Dzongkhag, at an elevation of 2030m in cool broad-leaved forest.



Halpe molta © Karma Wangdi



Halpe filda © Piet van der Poel

For comparison, we also show a picture of *Halpe filda* (Hewitson, 1868) Elwes' Ace, which has no cell spot. It was taken by Piet van der Poel on 26 August 2016 in Masangdaza, Lingmethang, Mongar Dzongkhag, near a river in broad-leaved forest at an elevation of 840 m.

Halpe porus (Mabille, [1877]) Moore's Ace was described as *Hesperilla porus* from "Himalaya", to which FUNET added: "[Assam?]". It was reported for Bhutan by Singh & Chib (2015) and Van Gasse (2018), probably both based on Kehimkar (2008). The latter was based on old documents in the library of the BNHS. Thus, apparently there were no recent



Halpe porus © Nim Tshering Tamang

reports of this species for Bhutan. Senior Forester Nim Tshering Tamang photographed *H. porus* on 25 October 2017 in Kalikhola, Dagana Dzongkhag, at an elevation of 270 m, where it was extracting nutrients from moist soil in tropical forest.

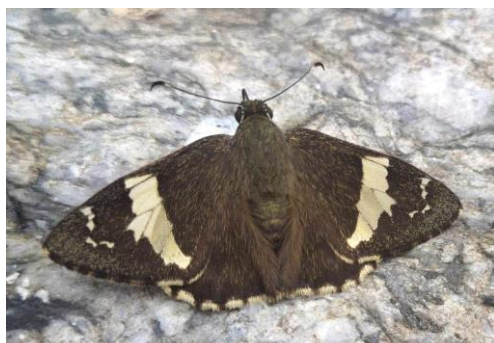
Hasora anura anura de Nicéville, 1889 Slate Awl was reported for Bhutan by Singh & Chib (2015) and Van Gasse (2018), probably both based on Kehimkar (2008). The latter was based on old documents in the library of the BNHS. Thus, apparently, there were no recent records of this species for Bhutan. Tshulthrim Drukpa Wangyel photographed *H. anura* on 12 June 2019 in Tarala, Zhemgang Dzongkhag, at an elevation of 1500m, on a lichen covered rock.



Hasora anura © Tshulthrim Drukpa Wangyel

Lobocla liliana liliana (Atkinson, 1871) Marbled Flat was reported for Bhutan by Singh & Chib (2015) and Van Gasse (2018), both presumably based on Kehimkar (2008). The latter was most probably based on old documents in the library of the BNHS. Thus, apparently, there were no recent records of this species for Bhutan.

Karma Jamtso photographed *L. liliana* on 25 May 2023 in Kangpara, Trashigang



Lobocla liliana © Karma Jamtsho

Dzongkhag, at an elevation of 1500 m in warm broad-leaved forest.

Matapa aria (Moore, [1866]) Common Redeye was reported for Bhutan by Sbordoni *et al.* (2015), Singh & Chib (2015) and Van Gasse (2018), the last two based on Kehimkar (2008) and Singh (2012). The latter, however had no picture of the species and none of the other checked recent documents mentioned *M. aria*. A picture of *Matapa aria* was posted



Matapa aria © Tshulthrim Drukpa Wangyel

on the BBP website in 2017. The picture was taken by Tshulthrim Drukpa Wangyel on 13 December 2017 along the Toorsa River in Phuntsholing, Chukha Dzongkhag at an elevation of 240m. It confirms the presence of *M. aria* in Bhutan.

Pithauria murdava (Moore, [1866]) Dark Straw Ace was mentioned by Wood-Mason & de Nicéville (1887): “We have long known of the existence of two species of the genus *Pithauria* occurring in almost equal profusion in Sikkim and Bhutan”. *P. murdava* was listed for Bhutan by Sbordoni *et al.* (2015) and Van Gasse (2018), the latter presumably considering the former as a reliable source. Since these documents do not present any pictorial evidence of their species, we present pictures of *P. murdava* here. The pictures were taken by Piet van der Poel on 26 August 2016 in Masangdaza, Lingmethang, Mongar Dzongkhag, at an elevation of 840 m. It was not included in his unpublished report on the butterflies of Lingmethang (Van der Poel, 2016), because at the time he was not sure of the identification.



Pithauria murdava © Piet van der Poel, for both pictures

Potanthus pallida (Evans, 1932) Pale Dart was described by Evans (1932) as *Padraona pseudomaesa pallida*, probably the dry season form, having broad and pale markings. Its wet season form was listed as *P. p. zatilla*. Evans (1949) listed *P. pallida* as a species, based mainly on a study of the genitalia. He described it as having the upper forewing spots in spaces 4 and 5 detached and the underside yellow with the band defined by black dots.



Potanthus pallida © Piet van der Poel

The specimens studied included one male from Bhutan. Singh & Chib (2015) listed as recent source Wangdi & Sherub (2014). However, the upperside picture in the latter document appears to be most likely of *P. pseudomaesa*, while the underside picture may be *P. pallida*. We are not sufficiently certain of its identification as it lacks any markings and the upperside is not visible. Thus, here we present a picture of *P. pallida*, of which we are 99% certain that the identification is correct. The underside appears very similar to the underside of *P. pallida* in Wangdi & Sherub (2014), with few or no black markings. The picture was taken by Piet van der Poel on 13 March 2013 along a creek lined with shrubs and small trees in Gom Kora, Trashiyangtse Dzongkhag, at 810 m elevation. The picture in Wangdi & Sherub (2014) was taken 1.5 months earlier in the same area.

Potanthus trachala (Mabille, 1878)

Potanthus trachala tyleri (Evans, 1914) Broad Bi-dent Dart was described as *Pamphila trachala* from Java. It was not reported for Bhutan in Evans (1932, 1949) and neither reported by Kehimkar (2008) who checked old records of Bhutan butterflies reported by Evans and in old documents in the BNHS library. *P. trachala* was first reported from Bhutan in Wangdi & Sherub (2014), based on which Singh & Chib (2015) and Van Gasse (2018) also listed it in their checklists for Bhutan. The pictures presented in Wangdi & Sherub (2014) were with 95% certainty, *P. trachala*. The authors consider this sufficient



Potanthus trachala © Karma Wangdi

for a tentative listing in checklists of butterflies in Bhutan. Tentatively listed species should not be counted as a species for Bhutan until they are confirmed. On the BBP website also several pictures were posted as *P. trachala*, some of which were probably correctly identified with a 90 to 98% chance.

For the picture of *P. trachala* presented here, we are 99.5% certain that it is *P. trachala*. Its upper forewing spots in 4 and 5 are detached from the spots in 3 and 6, the spots in 2 and 3 are outwardly concave, and there is no upper hindwing spot in 6 and a prominent spot in 7. We consider its identification sufficiently certain to now confirm *P. trachala* as occurring in Bhutan. The picture was taken by Karma Wangdi on 11 February 2013 in Lingmethang, Mongar Dzongkhag, at an elevation of 690 m in sub-tropical forest.

***Pseudocoladenia dan* (Fabricius, 1787)**

Pseudocoladenia dan fabia (Evans, 1949) Fulvous Pied Flat was described by Evans (1949), listing also specimens from Bhutan. It is characterized by the upper forewing discal spots being separated from each other and the upper and lower parts of the cell spot being subequal. The ssp. is presently the only ssp. of *P. dan* known to occur in Bhutan. Most of the records of *P. dan* from Bhutan concern the former ssp. *festa* (later a ssp. of *P. fatih* and now a separate species) and were often wrongly identified as the former spp. *fatih* (now species *P. fatih*). *P. fatih fatih* does not occur in Bhutan and has only been reliably reported from central Nepal and further west. A picture of *P. dan fabia* was presented as *P. dan* in Wangdi & Sherub (2014). It was taken by Sherub on 27 September 2012 in Yongkala, Mongar Dzongkhag, at an elevation of 1580 m in warm broad-leaved forest.



Pseudocoladenia dan fabia © Sherub

Pseudocoladenia fatua (Evans, 1949) Sikkim Pied Flat was described by Evans (1949) as *P. dan fatua*, reporting a specimen from Bhutan. It was also listed for Bhutan by Van Gasse (2018) and Singh & Chib (2015), both based on Evans (1949). Another picture labelled as *P. dan* in Wangdi & Sherub (2014), was of *P. fatua*. It is often bright reddish brown and the forewing spots of the male are yellowish with no such spots in space 1b. This appeared to be the only recent published evidence of the species. The



Pseudocoladenia fatua © Karma Wangdi

picture was taken by Karma Wangdi on 11 March 2012 in Phuntsholing, Chukha Dzongkhag, at an elevation of 720 m in sub-tropical forest. The species is likely to be fairly common, but often mis-identified as *P. dan*.

Because the Himalayan *Pseudocoladenia* Shirozu & Saigusa, 1962 species have recently been reorganised and a lot of old records were mis-identified, we report here also on *Pseudocoladenia festa* (Evans, 1949) Naga Pied Flat. *P. festa* was described by Evans (1949) as *P. dan festa*, including a specimen from Bhutan. *P. festa* was raised to species level by Huang & Xue (2004) and became known as Naga Pied Flat. Huang (2021) raised ssp. *fatih* of *P. dan* to species rank and declared *P.*



Pseudocoladenia festa © Piet van der Poel

festa a ssp. of *P. fatih*. Van der Poel & Smetacek (2022) proposed the name Himalayan Pied Flat, as an earlier proposed name of West Himalayan Pied Flat for *P. fatih* did not make sense since ssp. *festa* occurred in Bhutan in the eastern Himalaya. Recently, Zhu *et al.* (2023) raised *P. festa* back to the species level, based on a 2.3% genetic distance with *P. fatih*, *fatih* and *festa* “appearing” sympatric in Mochu, Sichuan, differences in the white sub-hyaline spots on the forewing and differences in their genitalia. Thus, the former English names can be re-instated: *P. fatih* is West Himalayan Pied Flat and *P. festa* Naga Pied Flat. Wangdi *et al.* (2012) reported *P. festa* as *P. dan festa*. It has the central upper forewing spots more conjoint than other Pied Flats and generally flies at higher elevations. For Bhutan, the earlier reported *P. dan festa* and *P. fatih festa* should now be listed as *P. festa* and species *P. fatih* is no longer present in Bhutan. The picture of *P. festa* was taken by Piet van der Poel on 25 August 2016 near Yadi, Mongar Dzongkhag, at an elevation of 1500m in an area with agricultural land and broad-leaved forest.

Sebastonyma dolopia (Hewitson, 1868) Tufted Ace was reported for Bhutan by Singh & Chib (2015) and Van Gasse (2018), probably both based on Kehimkar (2008). The latter was based on old documents in the BNHS library. Thus, apparently, there were no recent records from Bhutan of this species. Cheku of the Jigme Singye Wangchuck National Park photographed *S. dolopia* on 3 September 2019 in Berti, Zhemgang Dzongkhag, at an elevation of 600 m, perching on a rock in sub-tropical forest. Another picture of *S. dolopia* was



Sebastonyma dolopia © Cheku

posted on the BBP website in 2022 by Karma Jamtsho.

Seseria sambara sambara (Moore, [1866]) Sikkim White Flat was reported for Bhutan by Van Gasse (2018) and Singh & Chib (2015), both probably based on Evans (1949). A picture of *S. sambara* was posted on the BBP website in 2022 by Karma Jamtsho. A picture in Wangdi & Sherub (2014), listed as *S. dohertyi*, was re-identified as *S. sambara*. The picture, presented here, was taken by Karma Wangdi on 9 September 2012 in the riverbed near Berti, Zhemgang Dzongkhag, at an elevation of 600m.



Seseria sambara © Karma Wangdi

Suastus gremius gremius (Fabricius, 1798) Indian Palm Bob was reported for Bhutan by Singh & Chib (2015) and Van Gasse (2018), probably both based on Kehimkar (2008). The latter was most probably based on old documents in the library of the BNHS. Thus, apparently, there were no recent records of this species for Bhutan.

Karma Wangdi photographed *S. gremius* on 9 January 2014 in Kalikhola, Dagana Dzongkhag, at an elevation of 170 m in tropical forest.



Suastus gremius © Karma Wangdi

Telicota colon colon (Fabricius, 1775) Common Palm Dart was reported from Bhutan in all three checklists. Singh & Chib (2015) listed four sources of which only Wangdi & Sherub (2014) had pictures. Unfortunately, the pictures were of *Potanthus* spp. and possibly *T. bambusae*. Kehimkar (2008) listed it for Bhutan based on old records in the BNHS library. A picture of *T. colon* was posted on the BPP website in 2022. Here, we report it as the first verifiable recent record of *Telicota colon* for Bhutan. The picture was taken by Shyam on 29 September 2020, in Daifam, Samdrup-Jongkhar Dzongkhag, at an elevation of 290m, in sub-tropical forest.



Telicota colon © Shyam

DISCUSSION

This research has shown that for many, especially young and less experienced butterfly surveyors, the identification of HesperIIDae species is particularly difficult. Many checklists include mis-identified HesperIIDae species, often without any evidence, such as pictures. When these mis-identifications are published in articles or guidebooks, other surveyors and naturalists may report species based on these wrong identifications. Wangdi & Sherub (2014), which listed many new species for Bhutan, also had a large number of misidentifications, which were then also wrongly reported in subsequent species checklists of Bhutan by Singh & Chib (2015) and to a lesser degree by Van Gasse (2018) and Sbordoni *et al.* (2015). Also, the species checklists of protected areas in Bhutan (e.g. JSWNP, 2014; RMNP (Nidup, 2015); and BWS, 2013) suffer from this mis-identification problem. For example, a picture identified as *Potanthus dara* was presented in Wangdi & Sherub (2014). Presumably (at least partly) based on this publication *P. dara* was reported for Royal Manas NP (Nidup *et al.*, 2015) and Tsirang (Singh, 2014; Singh & Chib, 2016) and listed in the Bhutan checklists of Singh & Chib (2015) and Sbordoni *et al.* (2015). It was not listed by Van Gasse (2018), who probably realised that there were no reliable records of *P. dara* east of central Nepal.

Mis-identification is not just a recent problem. Wood-Mason & de Nicéville (1887) noted that Moore and Distant labelled the male of *P. stramineipennis* as female of *P. murdava*. Thus, even specialists make errors. Consequently, some records of species in old documents may actually be of other species. Another example of the need to be careful with old reports of species is de Nicéville (1885) writing about *Halpe kumara*:

"Mr. Moore places this species in the genus *Baoris*".

De Nicéville then gave reasons why it should be in the genus *Parnara*. But Moore (1878) described *Hesperia kumara*, which he moved to the genus *Baoris* in 1881 and is now *Caltoris kumara*. So, presumably de Nicéville thought that his specimen belonged to the same species as Moore's *Baoris kumara*. But his specimen belonged to a new species, now known as *Halpe kumara*. Thus, we find that the original description of *Halpe kumara* is a note without description of the characteristics of the species and without a type locality or habitat. Another example is Evans (1949) references to many figures in Moore/Swinhoe's *Lepidoptera Indica*, regularly re-identifying species that were mis-identified.

The authors also faced some identification problems. Pictures from East Bhutan originally identified as *Thoressa gupta* were at a later stage listed as *Thoressa cf. gupta*, because its upper forewing spots were yellowish rather than white, as indicated for *T. gupta* by Evans (1949). Moreover, the underside was usually ochreous brown rather than grey, which *T. gupta* should be according to Evans (1949). These yellowish spotted *T. cf. gupta* have been recorded on various occasions in Trashiyangtse Dzongkhag between



Thoressa cf. gupta © Piet van der Poel

1680 and 2200 m elevation. There are also some records from Lingmethang, Mongar Dzongkhag, at 700 to 900 m elevation. Research is required to establish if these belong to another species, another spp. or are just other forms. Also, in first instance, the authors did not question the identification of *Celaenorrhinus aurivittata* in Wangdi & Sherub (2014). Only later, they determined that this identification was incorrect.

This document reports first verifiable records of 25 HesperIIDae species for Bhutan. Some were already in one, two or in all three of the main checklists, but based on mis-identifications or lacked supporting evidence. Some were posted on websites or in articles in non-scientific non-peer-reviewed journals or papers. Furthermore, we report on 25 HesperIIDae species for which there were no evidence-based recent observations or for which we confirm earlier listings. We urge researchers and naturalists in Bhutan to keep photographing HesperIIDae species, but to be careful with identifications and not immediately believe the first person declaring which species it is. Some species can only be reliably identified by pictures of the upper as well as the underside, and other species can only be reliably identified by a study of the genitalia or DNA sequencing.

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