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# BIONOTES

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**On Any Aspect Related with Life Forms**

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Cover Photo of *Spialia zebra* by Mukesh Panwar

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*Reviewer: Peter Smetacek*

**Abstract**
Red Imperial butterfly *Suasa lisides* is reported for the first time from Tripura, North-eastern India.

**Introduction**
The Red Imperial butterfly *Suasa lisides (*Hewitson, 1863) (Lycaenidae) is a rare butterfly and legally protected in India under Schedule II of the Wildlife (Protection) Act, 1972. In the Indian subcontinent the butterfly has a patchy distribution and the species has so far been recorded from the states of Manipur, Meghalaya, Assam and Arunachal Pradesh (Varshney & Smetacek, 2015; Kehimkar, 2016).
The species has two tail-like outgrowths at the posterior margin of hind wings. Its distinguishing features include a wide reddish-brown band near the leading edge of under part of the fore wings and two dark spots near the leading edge of under part of white hind wings. The upper part of the fore wings is orange with dark brown or black borders (Evans, 1932; Kehimkar, 2016).

**Observation**
During a field study in the Unakoti Hills (24.3165 N,92.0672 E) situated in Kailashahar Subdivision of Unakoti District, Tripura, North-eastern India (Figure 1) a single individual of Red Imperial butterfly was observed and photographed (Figure 2) on 04.xi.2018 at about 12:30 hrs. The butterfly was observed sitting on a leaf of a wild pteridophyte. The location is a part of semi-evergreen natural forest characteristic of this region. Only one individual was sighted on that day and it was not observed during subsequent field visits in the same location indicating that it is a rare species in that area.

**Discussion**
The butterfly observed and photographed was identified as *Suasa lisides* beyond any doubt following suitable keys (Evans, 1932; Kehimkar, 2016). In figure 2, undersides of the wings are clearly visible and a wide reddish-brown band near the leading edge of the forewing is prominent. The dark spot on white hind wing is also present. The orange colour of upper forewings with a blackish-brown border can be seen which confirms the specimen as *Suasa lisides*.
As per published records 212 butterfly species have so far been reported from Tripura (Lodh & Agarwala, 2015). The present observation is the first record of *Suasa lisides* from Tripura which adds to the list of butterflies found in Tripura. The finding is significant as Red Imperial is a rare butterfly and protected under Schedule II of the Wildlife (Protection) Act, 1972. Very little information is available regarding the early stages and larval food plant of this butterfly species. Therefore, the present record should act as a stimulus for butterfly

researchers and conservationists to take up further studies in exploring the distribution, habitat preference, ecology and life cycle of this species in this eco-region.

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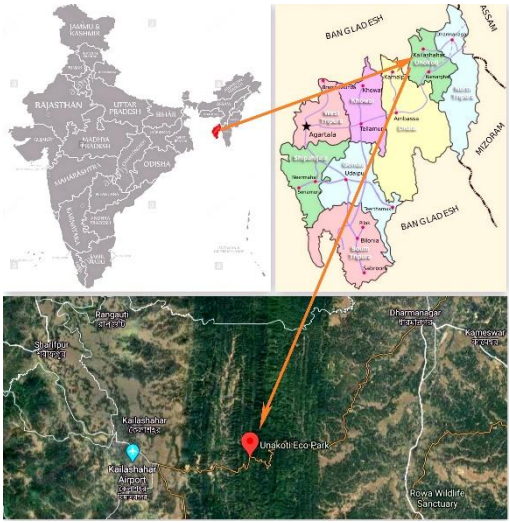


Fig.1: Google map showing the location of *Suasa lisides* in study area

Fig.2: *Suasa lisides*

# ADDITION OF THE BUTTERFLY *APPIAS GALBA* (WALLACE, 1867) TO THE FAUNA OF MANIPUR, INDIA

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## Introduction

The genus *Appias* Hübner, [1819] is represented by nine species in India, of which *Appias albina darada* (C & R Felder, [1865]), *Appias indra indra* (Moore, 1857), *Appias lalage lalage* (Doubleday, 1842), *Appias lyncida elenora* (Boisduval, 1836) and *Appias libythea olferna* Swinhoe, 1890 are reported from Manipur (Talbot, 1939; Majumdar, 2004; Singh *et al.*, 2011; Varshney & Smetacek, 2015). All these butterflies have been observed and photographed from many localities in the hills and valleys of Manipur but *Appias galba* was never encountered.

*Appias galba*, the Indian Orange Albatross is the most colorful and beautiful of the Albatrosses. This butterfly can be easily recognized by its dark orange colour above with prominent black veins on both wings, whereas the underside is a light yellowish orange, especially in males. The species occurs from north eastern India (Sikkim) to Bhutan, Myanmar, Thailand, Laos, Vietnam, S. China and Singapore. The butterfly is well established throughout the area.

## Observations

On 16.v.2020, HH photographed a specimen of this species at Khujairok (24°41'50.5"N 93°46'03.7"E, 804 m ASL) near Irengbam village, Kangpokpi District. On the same day, PSE photographed another individual about 500 m uphill on the same stream (24°41'49.6"N 93°45'52.4"E, 804 m ASL). The species was earlier spotted by HH on 13.x.2019 at Lamshilu stream, near Kwatha Khunou at Tengnoupal district but unfortunately the butterfly was not photographed. The butterfly was seen puddling on the rocky bed of the dry hill stream. Throughout its distribution, the butterfly is on the wing from March to June. The October record would suggest that there is a second annual generation, but so far there is no photographic proof for this. It has been noted mainly basking on rocks, the ground, or on dried streambeds. It can be seen flying close to the ground and is seen mostly on sunny days. Its larval food plant, *Urtica* species

(Nettles) grows abundantly in the area. The butterfly is rare according to Evans (1932) but in recent years, due to the popularity of butterfly photography, it has been observed in many localities of Arunachal Pradesh, Assam and Nagaland, for which photographs are available on various social media forums.

The present record from the Irengbam village confirms the presence of this species in Manipur. Further works in all parts of Manipur will confirm the status of this species in Manipur.

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Figure 1: Sighting locality (Blue balloons) of *Appias galba* at Manipur

Figure 2: *Appias galba*

# FIRST RECORD OF *DODONA DIPOEA* HEWITSON, [1866] (LEPIDOPTERA: RIODINIDAE: NEMEOBIINAE) FROM MEGHALAYA, NORTHEASTERN INDIA

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*Reviewer: Peter Smetacek*

**Abstract**
The Lesser Punch, *Dodona dipoea dipoea* Hewitson, [1866] is reported for the first time from Meghalaya, India during a field survey in Mawphlang Sacred Grove on 22.xi.2015.
**Key words:** *Dodona dipoea*, Lesser Punch, Meghalaya, First record, North-east

**Introduction**

The genus *Dodona* Hewitson, 1861 accounts for about 18 species worldwide, ranging from Pakistan to India, China, Thailand, Laos and Vietnam (Inayoshi & Saito, 2018). India has 7 species of *Dodona* with 6 species in North-Eastern India (Varshney & Smetacek, 2015). The butterflies under this genus are popularly known as Punches.

Mawphlang Sacred Grove is located near Mawphlang village in East Khasi Hills district, 25 km from Shillong city. The grove is also known as Law-Lyngdoh. The sacred grove is located at 25°28'00" N and 91°43'60" E, with an area of less than 100 hectares and elevation of about 1800 meters above mean sea level. In Meghalaya, the local communities have protected small areas of primary forest as sacred groves since time immemorial. The villagers believe that departed souls of ancestors abide in these forests and hence no one collects fruits, flowers, leaves and wood from these forests. The forest of Law-Lyngdoh Sacred Grove is subtropical broadleaf type, although the Khasi Pine *Pinus kesiya* dominates the surrounding areas (Hajra, 1975).

**Observation**

On 22.xi.2015, a female of *Dodona* perching on leaf litter inside the sacred grove was noticed with its wings wide open. A few photographs of the species were taken. It then flew and perched on a nearby bush, where it was possible to photograph the underside. It exactly matched the original illustration and description of *Dodona dipoea* as well as the illustration in Wynter-Blyth (1957). The lobed hindwing without tail and narrow bands of white margined by black on underside hindwing proved the identity of the species as *D. dipoea*.

**Result and Discussion**

Hewitson (1867-1871) described *Dodona dipoea* based on one specimen collected in Darjeeling (collection Atkinson). Evans (1932) described *D. dipoea* with three sub-species, i.e. *D. d. nostia* (Murree-Kumaon), *D. d. dipoea* (Sikkim-Assam) and *D. d. dracon* (which has recently been raised to a good species) (North Myanmar-Dawnas). Wynter-

Blyth (1957) later described it giving the range as "Himalayas and hills of North-East India, and Burma", with a flight period before and after rains between 4,000 and 8,000 feet (Wynter-Blyth, 1957). The summer brood of the species is relatively small, but species swarms in October and November in forests of Himalyan Oak (*Quercus*) in Nainital district, Uttarakhand (Peter Smetacek, *pers. comm*.). The species is not difficult to encounter in broadleaf forests above 1800 m in the eastern Himalaya although they are usually found singly, since males are territorial. At wet mud, both sexes tend to gather in numbers.

The major historic and taxonomic work on butterflies in Meghalaya was done in Khasi and Jaintia hills in eastern Meghalaya (Butler, 1879; Swinhoe, 1893, 1896; Parsons & Cantlie, 1948; Cantlie, 1952, 1956; Radhakrishnan *et al.*, 1989) and recently in Garo Hills (Sondhi *et al.*, 2013). In addition, more publications about faunal and butterfly diversity of the state have been published (Alfred, 1999; Hatter *et al.*, 2004; Bora *et al.*, 2014). *Dodona dipoea* has never been reported from Meghalaya and hence claiming the first record of this species for the state is justified.

We place our record under the nominotypical subspecies, since the subspecies *D. d. dracon* is distinguished by having the tornal lobe in the underside hindwing divided by an ochreous line, which is not present in the female specimen photographed.

**Acknowledgement**

The authors are grateful to Mr. Sathiyan Durai, then PCCF and Member Secretary, Meghalaya Biodiversity Board, Meghalaya Forest Department, India for his kind permission to conduct surveys in protected areas of the state. We would also like to acknowledge Mr. Isaac Kehimkar, who served as the guide of the Short-term Research Grant entitled Butterflies of Meghalaya.

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Fig.1: Habitat of *Dodona dipoea* in Mawphlang Sacred Grove, Meghalaya, India

Fig.2: Underside of *Dodona dipoea*

Fig.3: Upperside of *Dodona dipoea*

# FIRST RECORD OF *PSEUDOCATHARYLLA NIGROCILIELLA* ZELLER, 1863 (LEPIDOPTERA: CRAMBIDAE) FROM KERALA

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**Abstract**

*Pseudocatharylla nigrociliella* (Zeller, 1863) is reported for the first time from Kerala, India.

**Keywords:** *Pseudocatharylla nigrociliella,* First Record, Kerala

**Introduction**

Hampson (1896) reported a total of 1133 Pyraloid species from India. Mathew (2006) listed 1646 Pyraloid species occurring in India. Mathew & Menon (1984) reported 155 Pyraloid species from Kerala, of which 116 were recorded for the first time. Since then, no other data are available. In the present note, *P. nigrociliella* is reported for the first time in 129 years from India.

**Study Area**

Paleri (11.6196 N, 75.7575 E) is a small village situated 50 km north of Kozhikode (Calicut) city in northern Kerala, India (Fig.1). The village has a rocky hill called Bullock Hill, surrounded by a patch of deciduous forest. The private coconut garden with a thick undergrowth of grasses where the moth was observed is near the forest.

**Materials and Methods**

On 1.viii.2020, at 10 am on a sunny day, a small white moth perched on a grass blade was photographed. The image was uploaded to an online moth forum and it was identified as *Pseudocatharylla nigrociliella*. The image was compared with the images of the species available in the insect forum insecta.pro and the identity was re-confirmed from the descriptions by Zeller (1863) and Hampson (1896).

**Discussion**

This species was first described as *Catharylla nigrociliella* (Zeller, 1863) from India near Bombay. Later, it was re-described as *Argyria nigricosta*, Hampson, 1891 from the western slopes of the Nilgiris, 3000' (Tamil Nadu, India). Hampson (1896) shifted *A. nigricosta* to *Crambus* Fabricius, 1798. Bleszynski (1961) proposed *Pseudocatharylla* and placed *nigrociliella* in it. Blenszynski (1962) synonymised Hampson's *Cr. nigricosta* with *Pseudocatharylla nigrociliela*, Zeller.

Combining the known distribution of the various synonyms of *P. nigrociliela*, it is known from Dharamsala (Himachal Pradesh), the old Bombay Presidency, which could be anywhere in the modern state of Maharashtra (Hampson, 1896), and the present report extends the known distribution to Kerala. Earlier, in South India the moth was reported at 3000' above sea level. The present sighting is on the plains, 184 km west of the Nilgiris and this shows that this moth is not confined to the mountainous regions in South India.

**Acknowledgement**

We wish to thank Dr. Hideshi Naka, Tottori University, Japan and Mr. Satish Nikam for supporting to identify the species. We also thank Dr. George Mathew and Dr. Kalesh for sending references, H. Sankararaman for his

comment and Mr. Ranjith for helping in drawing the map of the study area.

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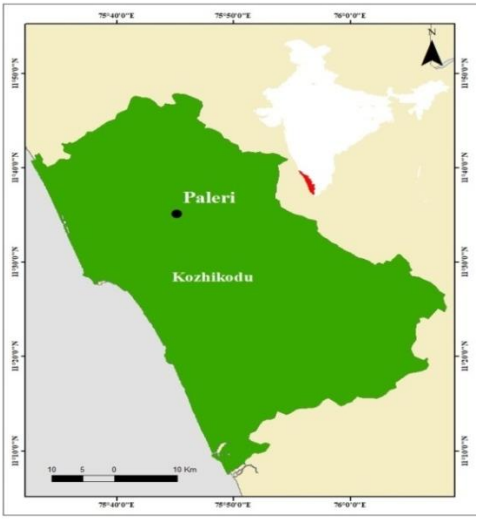


Fig.1: Map of the Study Area

Fig.2: *Pseudocatharylla nigrociliella*

# GECKO EATS ABDOMEN OF *ASOTA CARICAE* (FABRICIUS, 1775) (LEPIDOPTERA: EREBIDAE: AGANAINAE)

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*Reviewer: Peter Smetacek*

Aganainae is a relatively small subfamily of Erebidae. All members are believed to contain poisonous substances in the body in the adult stage, which protect them against predators. *Asota caricae* is widespread, ranging from the Indian subcontinent through Indo-China to the Philippines. It feeds on *Ficus* species in the larval stage and both the larva and the adult are reported to cause allergic reactions which are occasionally fatal in susceptible humans in India, since they contain a suite of poisonous chemicals including histamines, imidazole and peptides (Wills, *et al*., 2016).

On 08.viii.2020, a specimen of *A. caricae* was observed on a red palm plant (*Cyrtostachys renda*) at 0947 in a garden in Fairview, Quezon City, Philippines. It fluttered briefly and was snapped by an Asian house gecko (*Hemidactylus frenatus*). It was next observed to struggle weakly, having been caught by the wings in the jaws of the gecko. It was expected that the gecko was inexperienced and would not be able to eat the moth, once the distasteful chemicals in the moth were tasted by the gecko. At 1700 on the same day, the moth was found perched on a leaf of the same red palm plant; apparently, the moth flew off and settled nearby. Upon examining it, it was noted that though the moth was alive, it lacked an abdomen. The gecko appears to have bitten off and eaten the abdomen of the moth.

In poisonous butterflies like *Danaus plexippus*, it was believed that the poisons were stored in the abdomen and therefore these were used in experiments to determine the palatability of the butterfly with caged jays as predators (Ritland & Brower, 1991). However, in the case of *A. caricae*, when disturbed, the moth exudes an oily liquid from apertures on the thorax, both dorsally and ventrally. This appears to deter predators. In the case of the gecko, it seems that the reptile has learnt to recognise the moth and understood that although the thorax is noxious, the abdomen is edible. The gecko was not observed again on that or subsequent days.

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Fig.1: Geko eating *A. caricae*

Fig.2: Live *A. caricae* with missing abdomen, dorsal view

Fig.3: Live *A. caricae* with missing abdomen, lateral view

Fig.4: Live *A. caricae* with missing abdomen, ventral view

# RANGE EXTENSION OF PURPLE SWIFT *CALTORIS TULSI* DE NICÉVILLE (LEPIDOPTERA: HESPERIIDAE) TO THE WESTERN HIMALAYA

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*Reviewer: Peter Smetacek*

**Abstract**
The present note reports a range extension of Purple Swift *Caltoris tulsi* de Nicéville, [1884] to the Kumaon Himalaya, Uttarakhand, India.

**Introduction**

The Indian state of Uttarakhand comprises a cross section of the Himalayan range and constitutes a major portion of the western Himalaya. The butterflies of Uttarakhand have not been well studied since the colonial period. Doherty (1886) published a list of 271 species of butterflies from Kumaon region of Uttarakhand. 323 species of butterflies were reported from Mussoorie and nearby areas by Mackinnon &Nicéville (1899). Hannyngton (1910, 1911, 1915) recorded 378 species of butterflies from the Kumaon region of Uttarakhand. Ollenbach (1929) published his records of butterflies from various sites of Mussoorie. In recent years, Smetacek (2011) documented four new lycaenid from the Kumaon Himalaya. Singh &Sondhi (2016) published their records of 349 species of butterflies observed over a period of 20 years from Garhwal, Uttarakhand. Beside this, during the past 3 to 4 years, some independent researchers reported significant records related to rediscoveries and range extensions for several species of butterflies for Uttarakhand i.e. *Flos adriana* de Nicéville (Venkatesh, 2016), *Matapa sasivarna* Moore (Kumar, Singh & Joshi, 2018), *Anthene emolus* Godart and *Caltoris kumara* Moore (Kumar, Singh & Singh, 2018) etc.

The current two days survey, carried out from 14th to 17th June, 2017, is part of a larger assessment of the diversity and status of rare butterflies in the Bageshwar district of Uttarakhand. The present paper unequivocally confirms the previously unreported presence of Purple Swift *Caltoris tulsi* in Uttarakhand.

**Materials and Methods**

**Study area**

The present study was carried out in various sites of Bageshwar district in the Kumaon Himalaya of Uttarakhand, India. One of the sites, Song village (1500-2200 m) of Kapkote block (Fig. 1), lies in the northern part of Bageshwar district. It

was surveyed on 17th June, 2017. The study area contains mostly subtropical evergreen forests. This region is dominated by Oak species associated with Deodar (*Cedrus deodara)*, Bamboo (subfamily *Bambusoideae)*, Chir pine (*Pinus roxburghii*), Rhododendron (*Rhododendron arboreum*) and Yew (*Taxus baccata*). Broadly, three seasons can be recognized for the study area, viz. summer (April-June), rains (July-September) and winter (October-March). The Pindari glacier is 50 km from Song village.

**Methodology**

During the survey, Purple Swift *Caltoris tulsi* was recorded and photographed by a digital single-lens reflex (DSLR) camera using a 70–300 mm lens. The specimen of *C. tulsi* was photographed from different angles to get enough photographs to confirm the identity of the species. The identity was confirmed with the help of Evans (1932), Wynter-Blyth (1957) and Kehimkar (2016).

**Results and Discussion**

**Purple Swift *Caltoristulsi*de Nicéville, [1884]**

This is a small butterfly belonging to the Hesperiidae (Skippers) family. In India, the genus *Caltoris* Swinhoe, 1893 is represented by 12 species, out of which only Blank Swift *Caltoris kumara* is known from the western Himalaya (Kumar, Singh & Singh, 2018). *Caltoris kumara* was first recorded from Nalena, Nainital district of Uttarakhand. The species *Caltoris tulsi* has a single subspecies in India i.e. *C. t. tulsi* de Nicéville, [1884]. In Evans (1932) this species is described as *Baoris tulsi* ranging from Sikkim to Karens. Varshney& Smetacek (2015) list the distribution of this species from Sikkim to northeast India. It is listed as "*Not Rare*" by Van Gasse (2013) from central Nepal to northeast India, and Burma to Karens. A single individual of Purple Swift *Caltoris tulsi* was photographed near a motor road (fig. 2), when it was basking on a leaf of a shrub. This sighting was made at 10:30 hrs on 17th June, 2017 in Song village of Bageshwar district of Uttarakhand (30°1′57.66″ N; 9°57′16.15″ E). This record of *Caltoris tulsi* in Song village extends its range by more than 500 km westward from its previously known distribution i.e. central Nepal (Smith, 1994) and hence the possibility of this butterfly occurring between central Nepal and Uttarakhand cannot be ruled out.

**Conclusion**

The Kumaon Himalaya has been explored relatively poorly as far as insect communities are concerned. The sighting of *Caltoris tulsi* also needs to be understood in the context of the lack of past surveys in this region as it might be possible that this species was always present there. This emphasizes the need of proper and systematic surveys in this area.

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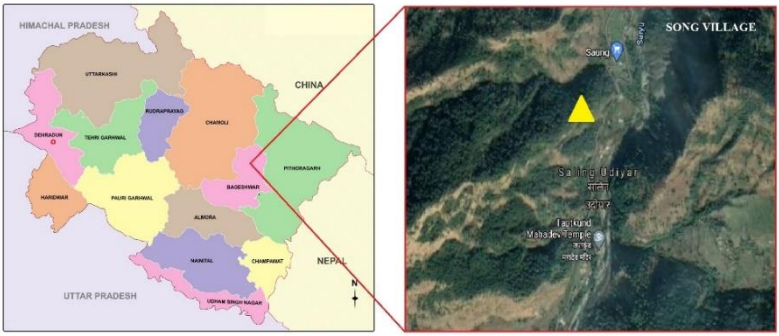

Fig.2: *Caltoris tulsi* underside view

Fig.3: *Caltoris tulsi*

# *ERANTHEMUM ROSEUM* (ACANTHACEAE) A NEW LARVAL HOST PLANT FOR THE CHOCOLATE PANSY BUTTERFLY *JUNONIA IPHITA* (LEPIDOPTERA: NYMPHALIDAE)

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The BNHS Nature Reserve is a 33-acre forested area nestled between Sanjay Gandhi National Park and Dadasaheb Phalke Chitra Nagari (aka Film City) in Goregaon, Mumbai, Maharashtra. The Conservation Education Centre (CEC) of BNHS is located here. A large dark brown caterpillar was seen on a Blue Eranthemum (*Eranthemum roseum* (Vahl) R. Br. (Acanthaceae)) plant at the BNHS Nature Reserve on 13.vii.2020 and was collected. The caterpillar was kept in a semi-transparent container for rearing along with leaves of the same plant. The caterpillar was seen feeding on the leaves of the plant and excreta was seen in the container.

The caterpillar pupated on 16.vii.2020 on a newspaper which was kept inside the container for absorbing moisture. The caterpillar and pupa were identified as that of a Chocolate Pansy *Junonia iphita* (Cramer, [1779]) using Bhakare & Ogale (2018). An adult Chocolate Pansy emerged from the pupa on 22.vii.2020, thus confirming the identification.

A literature search revealed that Jungli Aboli *Eranthemum roseum* (Family Acanthaceae) was not reported as larval host plant of the species, hence it was decided to rear a caterpillar once again to confirm the record of new host plant for *J. iphita*. The author is familiar with *E. roseum* as he had photographed it last year when it was flowering and had confirmed the identification from botanists acknowledged below. The plant seems to be common in the BNHS Nature Reserve.

On 24.vii.2020, a small dark brown caterpillar was found on an *E. roseum* plant. The caterpillar was collected along with a good stock of leaves for it to feed on. It was kept in a plastic container along with some leaves. The same afternoon it moulted and devoured the moulted skin. The leaf on which it was found had holes, leaving the main veins intact, possibly indicating its feeding method.

The container was cleaned of the excreta daily and one or two fresh leaves were added to the container for the caterpillar to feed on. The caterpillar grew in length every day.

On 01.viii.2020, however, the caterpillar stopped eating and was seen moving erratically in the container. There were no excreta in the container on that day and next day, indicating that possibly it had not eaten anything on those days. On 02.viii.2020, at 07.00 am the caterpillar was seen hanging upside down from a

leaf and had assumed a circular shape. At 11am, the caterpillar had pupated and a pupa was seen hanging on the underside of the leaf.

On 8.viii.2020, the pupa became nearly black. An adult Chocolate Pansy emerged at 11.30 hrs. from the pupa. It expanded and dried its wings in some time and flew away around 12.10 hrs. Images of each life cycle stage was taken (see images).

Robinson *et al*. (2001) mentioned *H. costata*, *H. auriculata*, *Justicia micrantha*, *J. neesi*, *J. procumbens*, *J. sphaerosperma*, *Lepidagathis formosensis*, *Strobilanthes*, *S. formosanus* and *S. callosus* as recorded larval host plants. The author has seen *J. iphita* using *S. callosus* as larval host plant in the BNHS Nature Reserve very regularly and *H. auriculata* in Thane district of Maharashtra.

Nitin *et al.* (2018) mention many larval host plants for the species, namely *Barleria cristata*, *Dipteracanthus prostratus*, *Ruellia elegans*, *R. simplex*, *R. tuberosa*, *R. tweediana*, *Achimenes grandiflora* and *Strobilanthes ciliata.* Thus, *Eranthemum roseum* has not been reported as the larval host plant for *J. iphita* butterfly and hence it is a new record.

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Thanks to botanist at BNHS, Rajdeo Singh (St. Xavier's College, Mumbai) and Kiran Thumma (Education Officer at CEC) for help in identification of the plant. Thanks to Dilip Giri (Field Assistant at CEC), Mumbai for help during the work.

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Fig.1: Caterpillar Moulting

Fig.2: Caterpillar

Fig.3: Caterpillar pupating

Fig.4: Pupa ready for eclosion

Fig.5: Freshly eclosed adult

Fig.6: Adult ready to take off

Fig.7: *Eranthemum roseum*

Fig.8: *Eranthemum roseum* flowering

# NEEM FLOWERS (*AZADIRACHTA INDICA*) AS AN ABUNDANT SOURCE OF NECTAR FOR BUTTERFLIES IN AN URBAN LANDSCAPE IN DELHI, INDIA

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**Abstract**

Most butterflies feed on floral nectar. The ability of butterflies to access nectar deep within a flower depends on the length of their proboscis. Adequate nutrition is known to maintain the reproductive potential of butterflies. In an urban context, lacking adequate parks and gardens, there is always a need of flowers that can provide nectar to butterflies. In this situation, avenue trees, bearing flowers with nectar accessible to a wide range of butterflies, could help maintain a reasonably diverse butterfly population. The Neem tree, *Azadirachta indica,* is planted along roads and in parks in urban areas of Delhi. Its small flowers were found to attract several species of butterflies belonging to all five major families present in Delhi. It is suggested that trees such as *Azadirachta indica* and other nectar trees, if planted as avenue trees, may help in the conservation of butterflies in an urban landscape.

**Key words**: Flowering tree, Food plant, Butterfly, Urban Landscape

**Introduction**

Butterflies are liquid-feeding insects; they acquire food by sucking through their long tubular proboscis (Krenn, 2010). Adult butterflies can be broadly categorised into two feeding guilds: nectar feeding (feeding on floral nectar) and non-nectar feeding (acquiring nutrition from decaying fruit, sap, honey dew, etc.). The feeding habits are associated with certain modifications in the microstructure of the proboscis, particularly at the tip (Krenn *et al*., 2001, Molleman *et al*., 2005; Krenn, 2010; Lehnert, *et al*., 2016). A vast majority of butterflies feed on floral nectar (Krenn, 2010). The profitability of feeding on floral nectar depends in part on the depth of the corolla-tube (or the depth at which nectar is seated in flowers); the amount of nectar, proboscis length and wing load (Corbet, 2000; Tiple *et al*., 2009). The shorter proboscis of small butterflies limits them from using flowers with deep seated nectar (May, 1992). Butterflies with a longer proboscis however, can harvest nectar from a broad range of flowers, including flowers with short as well as those with long corolla tubes (May, 1992; Corbet, 2000; Kunte, 2007; Sultana *et al*., 2017). Nutrition is known to maintain high fecundity in female butterflies and increase their body weight and fat storage (Hill *et al*., 1989; O'Brien *et al*., 2004; Mevi-Schutz *et al*., 2005; Geister *et al*., 2008; Karlsson *et al*., 2009). Butterflies obtain nectar from a range of flowers. The role of tree flowers as a source of nectar has not been appreciated by many researchers. Tree flowers however, can be an important source of nectar for butterflies living in or close to forested as well as urban landscapes. Here, I present an account of butterfly species which can benefit from feeding on the flowers of *Azadirachta indica* (A. Juss; Family: Meliaceae) commonly known as 'Neem tree'. The tree commonly grows in urban and rural areas in most parts of India and a few researchers have indicated

Neem flowers as a source of nectar for butterflies (Palot et. al. 2005, Vikas, 2011). The present observations were made in urbanized parts of Delhi, where *A. indica* trees are scattered along roads and in gardens. The results have been discussed in the context of the role *A. indica* plays in supporting butterfly populations in urban areas.

**Material and Methods**

The observations were made on *Azadirachta indica* growing as avenue trees in the residential area of Rohini in North-West Delhi. Three trees were observed to assess the period and duration of flowering. To determine the number of species of butterflies visiting the tree, the crown of one of the trees was observed from the fourth floor balcony (at a height of approximately 10 m) of a residential building. Observations began soon after flowers appeared on most of the branches (3rd week of April, 2020) and continued until senescence of flowers on most of the twigs and appearance of fruits (3rd week of May, 2020). The tree was observed for 25 days. On any given day, the first observation was made between 10:00 am and 10:30 am, the second between 12:00 pm and 12:15 pm and the third and last between 3:00 pm and 3:30 pm. During each of the three events the tree was observed for 10 minutes. During this time (i.e. 10:00 am to 4:00 pm) the entire tree crown was illuminated by sunlight. The decision regarding at which time of the day observations should be made was based on two days of trial observations before the actual study was started. During the trial the tree was observed for 10 minutes for every 1-1.5 hours between 9:00 am and 4:00 pm. It was found that the maximum butterfly activity on the canopy was concentrated between 10:00 am and 1:00 pm followed by a dip between 1:00 pm and 3:00 pm, possibly due to high temperature. A slight rise in activity was again seen from 3:00 pm to 4:30 pm. Butterflies were identified from a distance of 2-3 meter. Smaller butterflies such as Lycaenids or those landing far from the location of the observer were photographed using Digital SLR camera (Nikon) fitted with an 80-400 mm zoom telephoto lens. Identification of butterflies up to species level was done based on Kehimkar (2016) and Smetacek (2016).

**Results and Discussion**

*A. indica* has various beneficial properties and therefore, it has been grown in India for ages (Kumar *et al*., 2013). It has been planted along roads and in parks in Delhi. In this part of India, the peak blooming period of *A. indica* is during the months of April and May (Kumar *et al*., 1999; Vikas, 2011) and the same has been observed in the present study as well. A tree in full bloom is laden with white or pale yellow flowers (about 8-11 mm wide and 6-5 mm long) arranged in drooping panicles clustered at the end of twigs (Figures 1 & 2). The flowers emit a sweet fragrance which probably helps attracting visitors or pollinators. The peak time of visitation was observed to be between 10:00 am and 12:00 noon. This has also been reported in a previous study undertaken on reproductive biology of *A. indica* (Vikas, 2011). A total of 24 species of butterflies belonging to 22 genera of five families (viz. Pieridae, Papilionidae, Lycaenidae, Nymphalidae and Hesperiidae) were observed feeding on the flowers of *A. indica* (Table 1 & Figure 3). Three species were only identified to genus level. Of all the butterfly species visiting *A. indica* flowers (Table 1), individuals of *Belenois aurota* were most numerous. *B. aurota* is a migratory butterfly which is abundant in Delhi from March till early May (Larsen, 2002). Those species which were observed only once during the entire period of observation (Table 1) are extremely rare in Delhi (such as *Delias eucharis*); or not commonly sighted in the study area (such as *Acraea violae*, *Ixias pyrene* and *Colotis amata*). However, some butterflies commonly sighted in the area during the period of study, such as *Papilio demoleus* and *Ariadne merione*, rarely visited *A. indica*

flowers. This may indicate some level of preference of different species butterflies for *A. indica* flowers. It is evident from Table 1, that nectar present in flowers of *A. indica* is accessible to both butterflies with longer as well as shorter proboscis. The flowers were observed to be foraged upon by some of the smallest butterflies of Delhi such as *Zizeeria* sp., *Zizula hylax* and *Luthrodes pandava* with proboscis length as small as 4.4 mm (Tiple *et al*., 2009). It therefore appears that all the butterfly species of Delhi possess a suitable length of proboscis for probing Neem flowers for nectar. Further, though a single flower only contains a small amount of nectar, clustering of flowers makes foraging advantageous even to larger numbers of butterflies (Vikas, 2011; Corbet, 2000).

Flowers of trees planted along roads are a source of nectar for butterflies in urban areas jam-packed with buildings with little or no space left for gardens and parks. In this setting, flowering trees can be important refuelling stations for migrating butterflies flying several meters above the ground to avoid vehicular disturbance and other obstructions at ground level. Blooming of *A. indica* coincides with the period of the year when butterflies are abundant in Delhi. Further, the tree retains flowers for over one month providing food to a wide range of butterflies. Thus, trees such as *A. indica* and other flowering trees with a range of different flower types, especially those known to attract butterflies and flowering in the main butterfly flying and migrating periods, can play an important role in maintaining butterfly populations in urban landscapes.

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Table 1: Genera and species of butterflies visiting *Azadirachta indica* flowers. Symbol (#) represents butterfly species that visited flowers more often, and symbol (*) represents species of butterflies that were sighted only once on the flowers during the entire period of observation.

| S.N. | Family | Species Recorded |
|---|---|---|
| 1 | Pieridae | Pioneer *Belenois aurota* (Fabricius, 1793) # |
| 2 | | *Catopsilia* sp. (Huebner, 1819) |
| 3 | | Large Cabbage White *Pieris brassicae* (Linnaeus, 1758) |
| 5 | | Indian Cabbage White *Pieris canidia* (Linnaeus, 1768) |
| 6 | | Common Gull *Cepora nerissa* (Fabricius, 1775) |

| | | |
|---|---|---|
| 7 | | Small Salmon Arab *Colotis amata* (Fabricius, 1775) * |
| 8 | | Yellow Orange Tip *Ixias pyrene* (Linnaeus, 1764) * |
| 9 | | *Eurema* sp. (Huebner, 1819) |
| 10 | | Common Jezabel *Delias eucharis* (Drury, 1773) * |
| 11 | Papilionidae | Common Jay *Graphium doson* (C. & R. Felder, 1864) # |
| 12 | | Lime Butterfly *Papilio demoleus* (Linnaeus, 1758) * |
| 13 | Lycaenidae | Plains Cupid *Luthrodes pandava* (Horsfield, 1829) # |
| 14 | | Pea Blue *Lampides boeticus* (Linnaeus, 1767) # |
| 15 | | Zebra Blue *Leptotes plinius* (Fabricius, 1793) # |
| 16 | | *Zizeeria* Chapman, 1910 sp. |
| 17 | | Tiny Grass Blue *Zizula hylax* (Fabricius, 1775) |
| 18 | Nymphalidae | Plain Tiger *Danaus chrysippus* (Linnaeus, 1758) # |
| 19 | | Common Tiger *Danaus genutia* (Cramer, 1779) |
| 20 | | Blue Tiger *Tirumala limniace* (Cramer, 1775) |
| 21 | | Common Castor *Ariadne merione* (Cramer, 1777) * |
| 22 | | Painted Lady *Vanessa cardui* (Linnaeus, 1758) |
| 23 | | Tawny Coster *Acraea violae* (Fabricius, 1793) * |
| 24 | | Blue Pansy *Junonia orithya* (Linnaeus, 1758) |
| 25 | Hesperiidae | Common Banded Awl *Hasora chromus* (Cramer, 1780) |

Fig.1: Flowering branch of *Azadirachta indica* showing inflorescence.

Fig.2: Close-up of a single *Azadirachta indica* flower.

Fig.3: *Pieris canidia*

Fig.4: *Cepora nerissa*

Fig.5: *Belenois aurota*

Fig.6: *Pieris brassicae*

Fig.7: *Graphium doson*

Fig.8: *Lampides boeticus*

Fig.9: *Zizeeria* sp

Fig.10: *Luthrodes pandava*

Fig.11: *Leptotes plinius*

Fig.12: *Zizula hylax*

Fig.13: *Vanessa cardui*

Fig.14: *Acraea violae*

Fig.15: *Danaus genutia*

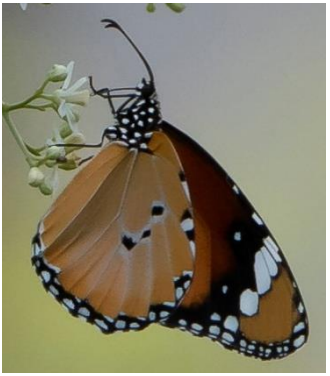

Fig.16: *Danaus chrysippus*

# REDISCOVERY OF THE ASSAM FLASH BUTTERFLY *RAPALA TARA* (LEPIDOPTERA: LYCAENIDAE) FROM UTTARAKHAND, INDIA

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**Introduction**

The type-localities of the Assam Flash *Rapala tara* de Nicéville [1889] were Sylhet (Bangladesh) and Nainital district in Uttarakhand. The specimens from Uttarakhand are two females collected by Colonel A.M. Lang. They were collected at Nainital (1524 m) and Nalena (1280 m) near Nainital in September 1887. Since the lake of Nainital is at around 1800 m, the first record was probably between Nalena and Nainital and not actually in Nainital. Hannyngton (1910) described the status of this butterfly as 'rare' at Nalena and Nainital. This was the last published record of the Assam Flash from Uttarakhand.

**Observation**

On 12.viii.2020, a female Assam Flash was sighted and photographed at Khansyun, (29°17'35.6N"; 79°45'07.7"E) (987m) a rural settlement situated in a river valley in the Okhalkanda Development Block of Nainital District. The butterfly was perched on a wild mint (*Mentha arvensis*) bush. Other butterfly species were also observed sipping nectar from wild mint florets in the same area along the river Gaula. This sighting of the Assam Flash confirms its continued presence in Uttarakhand after a century.

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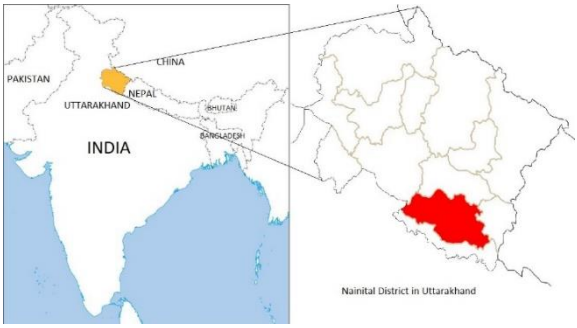


Fig.1: Map of study area

Fig.2: *Rapala tara*

# INDIAN TREE FROG *POLYPEDATES MACULATUS* CAPTURING AND SWALLOWING A LIVE GECKO

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Indian Tree Frog *Polypedates maculatus* (Gray, 1830) (Rhacophoridae) is a common arboreal and adaptable species of frog found in varied habitats like forest, shrubland, grassland, wetlands (inland), terrestrial and, artificial, aquatic habitats.

At 19.39 hours on 18.x.2019, PS observed an Indian Tree Frog *Polypedates maculatus* at the Conservation Education Centre, BNHS Nature Reserve (33 acres), which is nestled between the Sanjay Gandhi National Park and the Film City in Mumbai, Maharashtra. The frog was resting on the trunk of a tree. After some time, she returned to check whether the frog was still there. While searching, she saw the frog leaping towards a gecko. The frog caught the gecko and started swallowing it from head to tail. RK also joined in noting down observation and taking photographs. It was seen that even after the frog has swallowed the body of the gecko, the latter's tail was still quivering (see image). It took almost 5-6 minutes for the frog to swallow the gecko. The gecko was possibly a Brook's House Gecko *Hemidactylus brookii* Gray, 1845 (Gekkonidae), which is a common species in the area and based on identification of the tail. The snout to vent length of *P. maculatus* is 7–8 cm (Boulenger, 1890.) whereas the length of body and head of *H. brookii* is 58 mm plus the tail length is 60 mm.

A literature searches (Kanamadi, *et al.*, 1993; Lillywhite, *et al.*, 1997; Lillywhite, *et al.*, 1998) found no information about the diet of adult *P. maculatus*. However, a study about the diet of tadpoles of *P. maculatus* revealed phytoplankton as the main diet (Asrafuzzaman, *et al.*, 2018). However, it may be that *P. maculatus* is an opportunistic predator (Wells, 2007) and this may be a one-time observation.

When contacted, senior herpetologist Dr. Varad Giri (previously Curator at BNHS) informed that there is no previous record of a *P. maculatus* feeding on such a big prey and could be and addition to existing information about the diet of *P. maculatus*.

**Acknowledgements**

Thanks to Dr. Varad Giri, herpetologist for pointing out the importance of our observation. Thanks to the staff of CEC, Mumbai for help in organizing mothing sessions, during which this observation was made.

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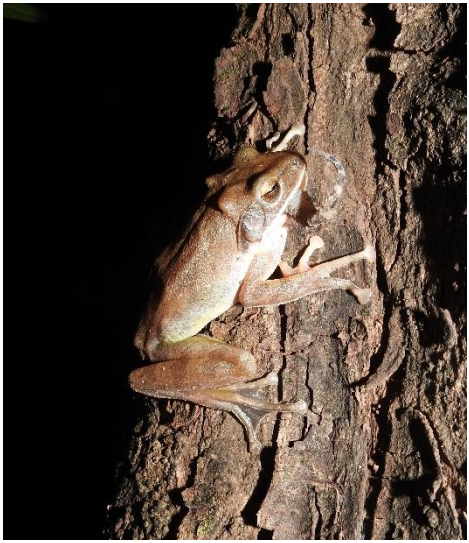

Fig.1: *Plypedatus maculatus* devouring a gecko

# NEW LARVAL HOST PLANT OF *TRYPANOPHORA SEMIHYALINA* KOLLAR [1844] (INSECTA: LEPIDOPTERA: ZYGAENIDAE: CHALCOSINAE) FROM WEST BENGAL, INDIA

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**Introduction**

*Trypanophora semihyalina* Kollar, [1844] (Zygaenidae: Chalcosiinae) occurs in South and Southeast Asia. In India it is reported from Southwest India to N.W. India and in N.E. India (Ahmed *et al.*, 2015). According to Robinson *et al.* (2010), the known larval host plants of *T. semihyalina* are *Barringtonia acutangula* (Lecythidaceae), *Carissa carandas*, *Holarrhena sp.* (Apocynaceae), *Lagerstroemia indica*, *Lagerstroemia speciosa* (Lythraceae), *Ricinus communis* (Euphorbiaceae), *Shorea robusta* (Dipterocarpaceae), *Terminalia catappa*, *Terminalia tomentosa* (Combretaceae), *Bombax ceiba* (Malvaceae), *Ziziphus mauritiana* (Rhamnaceae), *Gardenia* sp. (Rubiaceae), *Rosa* sp. (Rosaceae). This moth is also reported as a defoliator of *Gmelina arborea* (Meshram & Garg, 2000). From southern West Bengal, it has also been reported as a pest of *Mangifera indica* (Anacardiaceae) (Jha & Paul, 2002).

**Observation**

On 4.iii.2020, one final instar caterpillar of *T. semihayalina* was observed feeding on the leaves of guava (*Psidium guajava*) (Fig. 1) at the author's garden, near Bara Solemanpur Village (21°40'19.08"N, 87°34'29.75"E, 7 m a.s.l.) of Purba Medinipur District, West Bengal, India. The next day, two larvae were also observed feeding on guava leaves next to the previous plant. One larva was taken for rearing from the guava plant, but unfortunately the pupa it formed was damaged by ants. Later, between March, 2020 and July, 2020, many larvae were observed on *Mangifera indica* (Fig.2) and *Ziziphus jujuba* (Fig.*3) plants* at the same place. A few larvae were collected for rearing and only three females successfully emerged (Fig. 6). The larvae are dark chocolaty brown with lateral side of four posterior segments yellow. The pupa is enclosed in a whitish pale red cocoon (Fig. 5). The larvae were actively feeding during day time in nature as well in captivity. Like most Chalcosiinae, the larvae of *T. semihyalina* also display chemical defense (Fig. 4). They release droplets containing poisonous chemicals from the cuticle in response to physical irritation/disturbance and re-absorbed the droplets quickly when the irritation stopped. *Psidium guajava* is a well-known fruit plant of Myrtaceae family, widely distributed in tropical and subtropical regions of the world. Hitherto, available records show no plants were reported under Myrtaceae as larval host plants of *T. semihyalina*. Therefore, *Psidium guajava* is being reported here as a new larval host plant of *T. semihyalina* from India.

**Acknowledgement**

I am thankful to Ms. Kamalika Bhattacharyya for helping in identification.

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Fig.1: Final instar caterpillar of *Trypanophora semihyalina* feeding on *Psidium guajava* leaf.

Fig.2: Final instar caterpillar feeding on *Mangifera indica* leaf

Fig.3: Final instar caterpillar feeding on *Ziziphus jujuba* leaf.

Fig.4: Final instar caterpillar releases defensive droplets in response to disturbance

Fig.5: Cocoon

Fig.6: Newly emerged female *T. semihyalina*

# FIRST REPORT OF THE NORTHERN JUNGLEQUEEN BUTTERFLY (*STICHOPHTHALMA CAMADEVA*) FROM MIZORAM, INDIA

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The Northern JungleQueen (*Stichophthalma camadeva* (C. & R. Felder, 1862)) (Lepidoptera: Nymphalidae: Morphinae) occurs from Nepal through the eastern Himalaya, south to Meghalaya and Nagaland and eastwards to northern Myanmar. Although Kimura *et al*. (2016) included this species in the butterfly fauna of Thailand, they state that, "In Thailand, there are some capturing (*sic*.) records in the northern mountainous districts (from Doi Suthep by Godfray (1930) and Pinratana (1983) and Wang-Chin by Ek-Amnuay (2006; 2012))". This seems to be all that is known of the presence of this species south of India. It is not included by Yutaka Inayoshi (*online resource*; accessed on 12.viii.2020). It occurs between 700 and 1000 m and is on the wing from May to July (Kehimkar, 2016). The genus is found in hilly areas at moderate elevation both in dense forest and on open, grassy hillsides.

Although it is known from Sikkim, Arunachal Pradesh, Nagaland and Meghalaya in India, there is no record of this butterfly from Mizoram.

*S. camadeva* was first recorded and photographed in Mizoram on June 2013 at Dampa (800-1100m; 23° 34'N 92° 22'E) by Zakhuma. A days later, it was recorded at Lunglei (722m; 22° 88'N 92° 73'E) in July, 2013 by R. Zoramchhuana. The most recent record was in June, 2020 at Lunglei town by R. Zoramchhuana.

Given the uncertainty of the Thai records of this species noted above, the record from Lunglei would seem to extend the global distribution of this species southwards from Nagaland. Since the exact location of the specimens known from Nagaland are not recorded, it is safe to say that the present record from Lunglei is almost 4° of latitude south of the southernmost part of Nagaland (26°6' N).

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Fig.1: S*tichophthalma camadeva*

# *ERANTHEMUM ROSEUM* (ACANTHACEAE): A NEW LARVAL HOST PLANT FOR THE BLUE OAKLEAF BUTTERFLY *KALLIMA HORSFIELDII* KOLLAR, 1844 (LEPIDOPTERA)

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**Introduction**

The Bombay Natural History Society Nature Reserve is a forested area spread over 33 acres and is nestled between Dadasaheb Phalke Chitra Nagari (aka Film City) and Sanjay Gandhi National Park in Mumbai City of Maharashtra, India. The Reserve also has a small butterfly garden spread over an area of around quarter of an acre. The Southern Blue Oakleaf *Kallima horsfieldi* (Kollar, [1844]) (Lepidoptera: Nymphalidae) is a common butterfly species in the forests of SGNP and BNHS Nature Reserve, Mumbai.

Since August 2019, we have been seeing caterpillars of the *K. horsfieldii* on Blue Eranthemum *Eranthemum roseum* (Acanthaceae) locally called Jungli Aboli in the Reserve. The caterpillar can be differentiated from similar looking caterpillars of Pansies *Junonia* spp. The caterpillar has two horns on its black head and the spines have yellow bases which turn pink later as it grows (Bhakare & Ogale, 2018).

We reared some caterpillars in semitransparent plastic containers on a diet of leaves of this plant. Here are some dates and observations which prove that *K. horsfieldi* uses *E. roseum* as a larval host plant. On 26 August 2019, the authors saw a female *K. horsfieldi* laying eggs on *E. roseum*. One egg was collected and reared. Every day, the caterpillar was fed with fresh leaves of *E. roseum* till it pupated. However, the life cycle was not documented properly.

A *K. horsfieldi* caterpillar was found on *E. roseum* on 17 September 2019, which was collected along with a stock of leaves and kept in a semi-transparent plastic container. A few leaves of the plant were eaten by the caterpillar leaving only the main vein and half of the leaves intact, showing its feeding pattern. It was fed with leaves of *E. roseum* and frass was cleaned from the container daily. On 28 September the caterpillar pupated (see images). An adult emerged on 8 October 2019 from the pupa. It flew away. On 2 October 2019, another caterpillar pupated on a stick put inside the container. This caterpillar was also raised on leaves of *E. roseum*. There was another pupa on the same stick which had pupated on 28 September 2019. On 7 October 2019, we had two pupae with us on the same stick. On 25 September 2019, a *K. horsfieldi* was seen laying eggs singly on the upper surface of *E. roseum* leaves and was photographed. One egg was collected and photographed using a macro lens (see image).

A large caterpillar of *K. horsfieldi* was found on an *E. roseum* plant on 11 August 2020 which was collected and kept in a plastic container. The leaves of the plant were consumed, leaving the main vein intact. The caterpillar was fed with leaves of *E. roseum* and the container was cleaned of frass every

day. On 15 August 2020, the caterpillar took position for pupating under a leaf in the container. However, on 16 August 2020, it was found dead in the container in a half-pupated condition. Another large caterpillar of *K. horsfieldi* was found on an *E. roseum* plant on 22 August 2020 which was collected and kept in a plastic container. The caterpillar was fed with leaves of *E. roseum* and the container was cleaned of frass every day. The caterpillar pupated on 28 August 2020 on the underside of a leaf. The pupa became dark on 4 September 2020 and a butterfly eclosed on 5 September 2020 at 0945 hrs. It flew at around 1300 hrs. after drying its wings. Available scientific literature mentions *Pseuderanthemum malabaricum* (Wynter-Blyth, 1957; Robinson *et al.*, 2010), *Lepidagathis cuspidata* (Wynter-Blyth, 1957), *Strobilanthes callosus* (Wynter-Blyth, 1957; Robinson *et al.*, 2010) as larval host plants of *K. horsfieldi*. These are summarized by (Nitin *et al.*, 2018). It is evident that *E. roseum* has never been reported as a larval host of *K. horsfieldi*. Regular findings of eggs and caterpillars on *E. roseum* and its rearing on a diet of *E. roseum* leaves till eclosion of the adult butterfly unequivocally confirms *E. roseum* to be a native larval host plant for *K. horsfieldi*.

**Note on parasitizing by a fly species**

A pupa of *K. horsfieldi* was seen on the main stem of *E. roseum* on 2 August 2020. It was collected along with the branch and kept in a semi-transparent plastic container under observation. But on 6 August 2020 three small pupae of an unidentified fly (see image) were found in the container. On further observation, the butterfly pupa was found to be broken and empty. The three pupae were kept in the container and observed. On 14 August 2020, a fly emerged from one pupa (see image). The next day, another similar fly emerged from the second pupa. Both flew away after drying their wings. Nothing emerged from the third pupa and possibly it was dead.

**Acknowledgements**

Thanks to Dr. Rajdeo Singh (St. Xavier's College, Mumbai), botanist and Ms. Kiran Thumma (Education Officer, CEC) for help in identification of the plant. Thanks to Ms. Priyadarshini Supekar, Ms. Priyanka Jundare and Mr. Sagar Mahajan (Education Officers, CEC) for help in rearing the caterpillars.

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Fig.1: *K. horsfieldii* laying egg on *Eranthemum roseum*

Fig.2: *K. horsfieldii* egg on *Eranthemum roseum*

Fig.3: *K. horsfieldii* caterpillar

Fig.4: *K. horsfieldii* pupa

Fig.5: Freshly eclosed *K. horsfieldii*

Fig.6: Empty pupa of Blue Oakleaf and parasitic pupae of unidentified fly

Fig.7: Unidentified Fly emerged from the parasitic pupa

# CONFIRMATION OF THE REDBREAST BUTTERFLY *PAPILIO ALCMENOR* (LEPIDOPTERA: PAPILIONIDAE) IN UTTARAKHAND, INDIA

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The Redbreast (*Papilio alcmenor* C. & R. Felder, 1864) is a conspicuous butterfly that is found in the Himalaya as well as in China, Indo-China and Hainan. Although not a rare species in the eastern Himalaya, its westernmost record was from Kumaon, Uttarakhand, where Hannyngton (1910) noted that it "occurs sparingly in May and September up to 7000'".

It is not on record who collected the butterflies mentioned by Hannyngton (1910), nor where the specimens are, if they still exist. In the intervening 110 years, there were no reports of this butterfly from Kumaon. Smith (2006) recorded it from central Nepal and the Kathmandu valley eastwards. So far, it has not been reported from western Nepal.

On 2nd July 2020, a butterfly was observed in Chatola village on the periphery of Mukteshwar forest (1900 m; 29°38'47" N; 79°46'08" E), Nainital district, Kumaon, Uttarakhand. It had been captured by a flower spider. The butterfly was photographed and identified as a male *P. alcmenor*. The upper hindwing has several white markings, which places it as the form *leucocelis* Jordan, 1909.

On 26.viii.2020, a male was photographed in Bhatraunjkhan village (29°35'39" N 79°18'05" E; 1540 m), Betalghat block, Nainital district.

On 16.ix.2020, a male was collected in Bhowali market (29°23'24" N 79°30'17" E; 1650 m), Nainital district. On 22.ix.2020, a worn female was collected near the above location in Bhowali. Both the specimens are in the collection of the Butterfly Research Centre, Bhimtal.

The three males recorded are of three different forms. This suggests that the species is common, with many male individuals so that three randomly sampled males represent three different forms.

These are the first confirmed records of the species from the Himalaya west of central Nepal in over a century and confirms the continued presence of the species in the area. According to Sevastopulo ((1973), it feeds on *Citrus* sp. However, citrus is rather less common at Mukteshwar and Bhowali than at lower elevation in the area. The area around Bhimtal and Nainital has been continuously surveyed for over 70 years by the Smetacek family, but they never recorded the species (Peter Smetacek, *pers. comm*.). Perhaps the butterfly is restricted to some other, possibly wild member of the Rutaceae in the western Himalaya, which restricts its distribution, or perhaps, like *Delias acalis* (Godart, 1819) (Pieridae), it extends its distribution to this area in favourable years and is absent in other years (Panthee, 2019).

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Fig.1: *Papilio alcmenor,* Bhatraunjkhan

Fig.2: *Papilio alcmenor,* male, Bhowali

Fig.3: *Papilio alcmenor,* female, Bhowali

Fig.4: *Papilio alcmenor,* form *leucocelis,* Mukteshwor

# TWO NEW BUTTERFLY SPECIES FOR NEPAL: *EUREMA ANDERSONI* (PIERIDAE) AND *LETHE DAKWANIA* (NYMPHALIDAE)

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In the process of updating the butterfly species list of Nepal, checking of old photographs revealed several new species for Nepal. One species that has been confirmed is reported here. Another species, that was recently photographed and was also confirmed, was reported in the past but was excluded from the last official list of Lepidoptera of Nepal (Smith, 2010).

*Eurema andersoni* Moore, 1886, One-spot Grass Yellow ssp. *jordani* Corbet & Pendlebury, 1932 occurs from Uttarakhand to N.E. India (Varshney & Smetacek, 2015) and hence was always expected to fly in Nepal. The species was described from South Myanmar, while ssp. *jordani* was described from Sikkim. The species can be confused easily with some *Eurema hecabe* (Linnaeus, 1758) individuals, which may have one or no cell spot rather than the usual two spots. Apart from one zigzag spot in the under-forewing cell, Evans (1932) indicates that *E. andersoni* has no scattered black scales or rusty spots on the underside, brown markings in the under-forewing apical area and an under-hindwing costal spot end pointing to the spot in the cell.

*E. andersoni* was reported for Nepal by V. K. Thapa (1998) with the note "no data available" and no mention of its source. It was not listed in Smith (2010), which only referred to it under "Redundant names" as "Foreign not Nepal". In 2016, it was reported by Colin Smith in his unpublished Butterfly Updates, based on a picture taken by Surendra Pariyar in west Nepal. This picture and several others of Grass Yellows with one spot were sent to IFB, which indicated that all these individuals showed insufficient details for clear identification. Colin Smith agreed to remove it from the draft of his last booklet on butterflies of Nepal (in preparation).

On 7 June and 1 July 2020 I took pictures of two Grass Yellows that appeared to be *E. andersoni*, flying at the forest edge near an open grass field just above Lakeside, Pokhara at about 850m elevation (Figure 1). The identification was later confirmed by Peter Smetacek.

Common Grass Yellows with one or even no cell spots in the under-forewing cell have been regularly encountered in Nepal. Thus, the number of cell spots is an insufficient criterion for identification and the other characteristics, mentioned above, need to be checked. For comparison, pictures are added of two *E. hecabe* individuals: The Common "Zero-spot" and the Common "1-spot" Grass Yellows (figures 3 and 4). To show that variation in the number of cell spots may happen in Grass Yellows, a picture is presented of an *E. blanda* (Boisduval, 1836) aberration, the "Not-so-common Four-spot" Grass Yellow (figure 2).

***Lethe dakwania*** (Tytler, 1939) Garhwal Woodbrown.

**Background**

This species was described from specimens collected in August 1914, at about 2750 m in Dakwani in eastern Garhwal, present-day western Uttarakhand. It was only known from Uttarakhand (Varshney & Smetacek, 2015). Its upper hindwing submarginal black spots are well-defined, the under forewing postdiscal band is better defined (than in *L. sidonis* (Hewitson, 1863)) and pure white near the costa and its under hindwing discal marking are pale brown and ill-defined and the submarginal ocelli are smaller and surrounded with pale brown or very pale violet (Tytler, 1939). It differs from *Lethe sidonis* (Common Woodbrown), which has the under hindwing ocelli in 2 and 6 larger and more clearly defined (figure 8), all ocelli on an even arc and the upper hindwing spots that are black and often vague or obscure without rings (Evans, 1932, figure 7). Tytler (1939) also describes the genitalia of the male *L. dakwania* as clearly different from those of *L. sidonis*.

Fujioka (1970) reported a different form of *L. sidonis*, that was collected in August 1963 in the higher area of Godavari near Kathmandu. These individuals had subequal sized ocelli on the underside of the hindwing, subapical white spots on the upper forewing and a conspicuously wavy margin of the hindwing. Fujioka (1970) indicated that the specimens were similar to the one called *vaivalta* [sic, recte *vaivarta*], a subspecies listed by Evans (1932), but that the genitalia were not different from those of the usual form of *L. sidonis*.

**Observations**

In July-August 2013, I photographed some woodbrowns at about 3000 m near Titi Lake and on the grassy slopes below the Dhaulagiri Icefalls in Mustang in the western part of the Annapurna Conservation Area (ACA) in central Nepal (figures 5 and 6). There were a fairly large number of them visiting almost dry thistle flowers. Colin Smith was not sure and said that maybe they were all *L. sidonis*, Common Woodbrowns. Similar individuals were also photographed in September 2011 west of Pokhara and in September 2012 in Manang in the eastern part of the ACA, at elevations between 2500 and 2800 m. When checking my pictures while working on an updated species list of Nepal's butterflies, I went back to these questionable woodbrowns. My preliminary identification of *L. dakwania* was confirmed by Peter Smetacek for some of them.

**Discussion**

The clearly defined upper hindwing ocelli surrounded (in my pictures) by orange-brown rings, appear to be the easiest identification characteristic of *L. dakwania*, although Tytler (1939) does not mention the rings. Superficially, the undersides of the wet season higher elevation form of *L. sidonis* resemble those of *L. dakwania*, but this was not mentioned by Fujioka (1970). In *L. dakwania* the under-hindwing ocelli in spaces 3-4-5 are more or less in a straight line (Smetacek, *pers. communication*), while for the usual form of *L. sidonis* they are on an even arc. However, for higher elevation wet-season-form of *L. sidonis* the under-hindwing ocelli in spaces 3-4-5 are much less curved than the rest of the ocelli (figure 24-8 in Fujioka, 1970, figure 9).

Smith's (2011) booklet on Butterflies of the ACA lists only two woodbrowns: *L. sidonis* as frequently observed and *L. nicetas* (Hewitson, 1863) as occasionally seen. Among the pictures of woodbrowns that Colin Smith took, those in the southern part of the ACA appear to be the usual form of *L. sidonis*, while most of those in the somewhat higher areas further north in Manang and Mustang are the higher elevation form of *L. sidonis* or *L. dakwania*, but none can be definitely identified as the latter. Similarly, of my pictures only those

taken in the shrubby and grassy meadows below the Dhaulagiri Icefall were definitely *L. dakwania*. The woodbrowns in Manang (figure 9) and those of Titi lake could be both, while the one west of Pokhara has subequal ocelli, but they were on a more even curve, thus appearing to be somewhere in between the usual form and the high altitude form of *L. sidonis* (figure 10).

**Conclusion**

*L. dakwania* was observed locally and fairly frequently in the Annapurna area in Central Nepal in July and August between 3000 and 3100 m. Earlier records may have been identified as *Lethe sidonis*. The species has probably been in Central Nepal for a long time. This is the first record of *Lethe dakwania* for Nepal and for any area outside Uttarakhand. It represents an extension of the distribution area of this species from only Uttakhand to Uttarakhand to Central Nepal. The occurrence of the high altitude wet season form of *L. sidonis* reported by Fujioka (1970) appears not limited to the Kathmandu-Godavari area, but extends at least to the Pokhara and Annapurna area of central Nepal.

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Fig.1: *E. andersoni*

Fig.2: *E. hecabe* without cell-spot

Fig.3: *E. hecabe*

Fig.4: *E. blanda* - Three ("Four")-spot Grass Yellow

Fig.5: *Lethe dakwania*

Fig.6: *Lethe dakwania*

Fig.7: *Lethe sidonis*

Fig.8: *Lethe sidonis*, usual form

Fig.9: Probably *Lethe sidonis* high elevation wsf, Manang.

Fig.10: Probably *Lethe sidonis* high elevation wsf, W of Pokhara

# THE DRAGONFLY *ATRATOTHEMIS REELSI* WILSON, 2005 IN NAMDAPHA TIGER RESERVE, NORTHEAST INDIA- AN ADDITION TO THE INDIAN ODONATA FAUNA

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**Abstract**
A single male of Libellulid dragonfly *Atratothemis reelsi* was recorded and photographed on 19.v.2019 in Namdapha Tiger Reserve, Arunachal Pradesh, India. This record represents the western most range of the genus and species, also an addition for the Indian Odonata fauna.

**Introduction**

*Atratothemis* Wilson, 2005 is a newly described monotypic genus of Libellulidae family, represented by the type species *Atratothemis reelsi*. The type specimen was collected during 1998, in Mulun of Guangxi, China (Wilson, 2005). After that, K. Wilson recorded the species a second time from the same province during 2011 (Wilson & Reels, 2013). Later, Zhang (2011) also reported the species from Xiaoqikong Park of southern Guizhou Province, China in the month of May. One male individual was collected and four individuals were observed during the survey. H. Zhang also recorded the species from Yinggezhuei of Hainan, at about 600 m altitude (Wilson & Reels, 2013). From Lao PDR this species has also been reported (Wilson & Reels, 2013; Yokoi & Souphanthong, 2014). Yokoi (2003) first reported five males and one female as "*Camacinia* sp.?" from 50 km west of Lak Sao, central Lao PDR. Later, G. Reels considered these records as *A. reelsi* (Wilson & Reels 2013). The species has been reported by Sribal et al. (2018) from Kaeng Krachan National Park of Phetchaburi province, Thailand. They have collected 3 males between 2014to 2016, from Kaeng Krachan National Park during the month of March to June. During May 2015; *A. reelsi* also has been reported from Mau Son Mountain of Lang Son Province, in northeastern Vietnam (Kompier 2015). And most recently two male individuals were recorded during May 2017, from Tay Giang District of Quang Nam Province, represent second locality of *A. reelsi* in Vietnam (Karube 2020).

In the present note, we report the occurrence of *A. reelsi*, in Namdapha Tiger Reserve of Arunachal Pradesh, India as first record for the Indian subcontinent.

**Methods and Study Site**

On 19 May, 2019, during a regular field trip for butterflies along the Miao to Vijoynagar road at around the 12th Mile (27.507205 N & 96.328768 E) from Namdapha Tiger Reserve, the authors came across a dragonfly perched on a dry stick at about 1.5 m from the ground. The dragonfly looked unique in appearance and on close observation it was indeed different and never sighted before in Namdapha Tiger Reserve. Photographs of the species were taken but on that day, only a few photographs could be taken. To document the presence of the species from the locality, the authors went back to the same area the next day, but could not find the species. The habitat comprised of sub-tropical forest type with

*Terminalia myriocarpa* as dominant tree species. Various species of trees include *Gmelina arborea*, *Shorea assamica*, *Altingia* sp. and *Erythrina* sp., etc. and the undergrowth comprised *Cheilocostus speciosus*, *Piper* sp., etc.

**Result**

Based on photographs, the individual belonging to the Libellulidae family was identified as *Atratothemis reelsi* with the help of literature (Wilson, 2005). This observation represents the westernmost known record of the species, as well as a new record for the Indian subcontinent.

**Discussion**

According to Wilson (2005), *A. reelsi* is superficially similar to the blackish members of the genus *Rhyothemis*, but "pronounced undulation of R3, bridge with accessory cross-veins, high numbers of AX (antenodal cross-veins), and small narrow genital lobe" of *Atratothemis* can differentiate it from *Rhyothemis*. *A. reelsi* also resembles *Camacinia othello* Tillyard, 1908 in appearance, which is confined to the Australian region. The "uniform distal margin of the anal loop below the heel of *C. othello* will isolate it from *Atratothemis*". Due to limited knowledge on distribution and ecology, *A. reelsi* is at present considered as Data Deficient (Wilson & Reels 2013). Our present locality record of *A. reelsi* in Namdapha Tiger Reserve, India, lies approximately 1170 km (aerial distance) westwards from the previously known nearest locality of Xiaoqikong Park, southern Guizhou Province, China. The present record indicates, *A. reelsi* may be found in the adjacent country Myanmar, in future.

**Acknowledgement**

The authors are thankful to Mr. Antoine van der Heijden for confirming the identification.

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Fig.1 & 2: *Atratothemis reelsi, in Namdapha Tiger Reserve, Arunachal Pradesh, India*

# FIRST RECORD OF LEECH'S SWIFT *CALTORIS BROMUS* LEECH, 1894 (INSECTA: LEPIDOPTERA: HESPERIIDAE: HESPERIINAE) FROM WEST BENGAL, INDIA

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**Abstract**

*Caltoris bromus* is reported from Madhyamgram (22°42´ N; 88°27´ E), North 24 Parganas district, West Bengal, India. *Phragmites* is recorded as a new larval host plant for the species.

**Introduction**

On 16. viii.2020, a 4th instar caterpillar of an unknown Hesperiid was sighted and photographed at Madhyamgram (22°42´ N; 88°27´ E, 15m asl), North 24 Parganas district, West Bengal, India on a *Phragmites* sp. (Poaceae) plant. The observation was made in a small overgrown patch of wetland. The caterpillar had rolled the host leaf which was in a vertical position. The author could observe the caterpillar's head peeping out from the rolled leaf as it was busy feeding. The author collected the caterpillar and put it into a clay pot along with leaves of the same plant in his home garden. It grew into an adult butterfly by feeding on the leaves provided. On 2.ix.2020, the freshly eclosed butterfly (Figure: 01& 02) was photographed. The photographs were compared with Corbet *et al*. (1992) and keys enlarged by Evans (1949) were used to identify the specimen.

**Results**

The observed individual was characterised by its dark brown upperside with the spot in space 1b of the forewing (Corbet *et al*., 1992). Additionally, the mid tibia was unspined, placing it under *Caltoris* Swinhoe, 1893 (Ek-Amnuay, 2012). In the examined specimen, the underside hindwing has two spots in spaces 2 & 3; the upper forewing has two cell spots, with the upper one smaller than the lower.

**A key to identify Indian *Caltoris* species based on fascies**

1.UnH spots in space 2 and sometimes in space 3, UpF two cellspots ……..……2, 3

-UnH spots in space 2 and sometimes in space 3, UpF no cellspots……. *kumara*

2.UpF upper cell spot always rather larger than lower cell spot…….…. *canaraica*

-UpF upper cell spot always smaller than lower cell spot ……..……3

3.Both FW always a non-hyaline spot in space 1b……..…*bromus*

*Caltoris bromus* has been reported from Assam, N.E. India and Myanmar (Van Gasse, 2013; Varshney & Smetacek, 2015). This record confirms the presence of *Caltoris bromus* in West Bengal. Robinson et al. (2001) record *Bambusa* and grasses as larval hostplants for this species from Hong Kong. This appears to be the first record of the species on *Phragmites* and is therefore an unrecorded larval host plant for this species.

**Acknowledgement**

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Fig.1: A 4th instar caterpillar feeding from the host plant

Fig.2: A 5th instar caterpillar resting on the host plant

Fig.3: A pupa formed on the host plant

Fig.4: An underside view of freshly eclosed *Caltoris bromus*

Fig.5: An upperside view of freshly eclosed *Caltoris bromus*

# OVIPOSITION BY *JAMIDES BOCHUS* (STOLL, [1782]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN NEW DELHI, INDIA

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*Reviewer: Peter Smetacek*

Several individuals of the Dark Cerulean (*Jamides bochus*) were sighted 3-4 times daily between 30. viii.2020 to 20.ix.2020, fluttering over the crown of *Millettia pinnata* (L.) Panigrahi (Fabaceae). On two occasions, more than two individuals were sighted at a time. On 22.ix.2020, a female *J. bochus* was observed laying eggs on nascent buds and leaves of *M. pinnata*, in the Rohini area of New Delhi. It was observed for 5 minutes from a distance of 2.5-3 m and the events were photographed (Figures 1). The butterfly returned twice to the same spot to lay eggs after fluttering for about 1 minute in the vicinity of the twig, where it had laid the first batch of eggs.

*M. pinnata* is a medium sized tree planted commonly alongside many roads in Delhi. Sightings of *Jamides bochus* in Delhi are rare. However, during the past few years it has been sighted several times. It was so far not known to breed in Delhi (Chaudhary *et. al*., 2019, Dr. Surya Prakash, *pers. comm.*). The present observation provides supporting evidence towards the assertion by Chaudhary & Kumar (2019) that the records of the *J. bochus* in Delhi are of a breeding population rather than of migrants.

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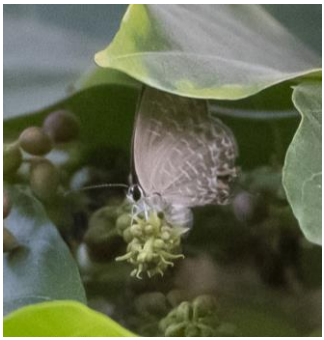

Fig.1 & 2: Oviposition by *Jamides bochus* on nascent buds and leaf of *Millettia pinnata* in Delhi.

# DISTRIBUTIONAL RANGE EXTENSION OF BANANA SKIPPER *ERIONOTA TORUS* (LEPIDOPTERA: HESPERIIDAE) TO THANE AND PALGHAR DISTRICTS OF MAHARASHTRA, INDIA WITH DISCUSSION ABOUT ITS HARMFUL EFFECTS ON LOCAL BANANA PLANTATIONS

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**Abstract**

The Banana Skipper *Erionota torus* is reported from Thane and Palghar districts in the northernmost parts of Konkan region in Maharashtra with observations of its different life-stages on banana.

**Introduction**

The Banana Skipper *Erionota torus* Evans, 1941 (Lepidoptera: Hesperiidae) has been recorded in India from Uttarakhand to Northeast India, Karnataka, Kerala and Tamil Nadu (Varshney & Smetacek, 2015). Since 2015, it has been reported from various parts of Maharashtra extending towards northern areas of the Western Ghats and west coast (Konkan region) of Maharashtra. It was first observed in Amboli, Sindhudurga district (Hemant Ogale, 2015), Satara (Milind Bhakare, 2016), Tamhanmala, Ratnagiri district (Pranav Gokhale, 2017) and further north in Kurul, Raigad district (Tushar Bhagwat, 2017-18) (*personal communications*) making its appearance to the areas in northern and coastal parts of Maharashtra (Fig. 1).

Banana (*Musa* x *paradisiaca (*Musaceae)) is an important crop in India. In southern India, the fruit and leaves are economically important, the latter for use as platters, especially in restaurants. In Maharashtra, the leaves are not usually used as platters and the object of banana plantation owners is to produce fruit.

The occurrence of the adult butterflies, along with immature life-stages, feeding in remarkably large numbers on banana leaves, from an area close to the banana plantation hotspots in Vasai tehsil, Palghar, Maharashtra is a matter of concern. Caterpillars are known to feed voraciously on the leaves of banana, causing qualitative as well as quantitative damage to the plantations. Areas studied in this report showed active infestation by larval stages of *E. torus* on banana plants, indicating the colonisation by this pest species of these regions due to the widespread cultivation of its larval food plant.

**Observations**

On 03.xi.2019, in Patonapada village, Yeoor range of Sanjay Gandhi National Park (19°24”15’N, 72°94”09’E; 497 msl), Thane district, Maharashtra, four banana plants in agricultural plantations were found with rolled leaves. Closer observation of the leaves revealed the presence of Hesperiidae caterpillars and pupae in them. The same plants were revisited on 12.xi.2019 and more caterpillars were found. One caterpillar and one pupa were collected. On 14.xi.2019, an adult *E. torus* butterfly emerged.

On 09.xi.2019, in Tungareshwar Wildlife Sanctuary (19°40”33’ N,72°95”56’ E; 726 msl), Palghar district, Maharashtra, two banana plants full of rolled leaves were observed. In total there were about 80-90 larval cells as rolled leaves seen. A few of them had actively feeding caterpillars with powdery white substance on their body while a few cells had freshly formed yellow pupae covered with a similar white powdery substance as the larvae. Some of the pupae were darker, indicating the imminent emergence of adult butterflies. Two adult butterflies were also spotted. These individuals were identified as *E. torus* (Bhakare & Ogale, 2018).

Later, on 28.xi.2019, during the second visit to the same location those banana plants were again observed with an increased number of larval cells on the host and correspondingly severe damage by defoliation to both the banana plants. Further, two more visits to the same location showed similar results.

On 05.xii.2019, banana plants in the campus of B.N. Bandodkar College, Thane-West were observed with eggs of *E. torus* on them. Further, on the nearby banana plants, 20-30 larval cells rolled on the leaves were observed. On 14.i.2020, once again 10-15 larval cells and pupae were observed on same plants.

In the month of December 2019, a single, bigger sized banana plant in Dombivli-West, Thane loaded with 30-40 larval cells, mainly on the larger leaves, was observed. Another banana plant with 20-25 larval cells and pupae was observed in Dombivli-East, Thane in the month of January 2020.

On 08.i.2020, in Kasarwadavali, Thane-West, three banana plants with eggs and larval cells with actively feeding caterpillars were seen. Since these were present on the lower leaves, it was possible to monitor the growth of life-stages in their natural habitat without collecting them. Similar observations were also made in the month of February, 2020.

In the month of February 2020, during a visit to Vasai fort, Vasai-Palghar, it was seen that most of the banana plants present in the vicinity of the fort showed evidence of attack by the *E. torus*.

**Discussion**

All the above mentioned observations from various locations indicated the continuing spread of *E. torus* in Thane and Palghar districts. Being known as a pest on banana, the species showed signs of its active and aggressive attack on its host, causing defoliation within this study area too. The infestation by the larval stages of the species showed some ill effects on the banana leaves in the following ways: cutting and rolling of leaves, defoliation leaving only midrib of the leaf and in later stages, drying as well as darkening of the leaf surfaces (Fig.4). A brief summary of all the above mentioned sightings is represented below in the form of an observation table. Locations of the reports from Thane and Palghar districts are indicated on a map (Fig.2).

*E. torus* is also commonly known as banana leaf-roller. Heavy infestation causes the defoliation of banana leaves, leaving only the midrib intact. Such severe defoliation can cause considerable reduction in photosynthetic efficiency of the plant resulting in a decreased bunch size and weight (Jayanthi *et.al,* 2015). Literature revealed that detailed studies on use of biorationals against *E. torus* on banana are not available (Sharanabasappa, 2017).

Between 2015 and 2018, there were several reports of adult insects along with life-stages and their infestations on local banana plantations, observed by people in several districts of Maharashtra mainly from Konkan region and western districts (*www.ifoundbutterflies.org*). The current report mentioning its occurrence in parts of Thane and Palghar district suggests the need for monitoring the northward spread of this insect in search of banana plantations.

A literature searches (Patwardhan, 2010; Kasambe, 2012; Patwardhan, 2014) revealed that there is no previous record of this species from Sanjay Gandhi National Park or from Thane-Mumbai area, including Sanjay Gandhi National Park or BNHS Nature Reserve, Mumbai (Kasambe *et. al.*, 2018). The butterfly fauna of these places is well documented. It was neither reported from Western Ghats or Maharashtra (Gaonkar, 1996; Kehimkar, 2016) in slightly older literature. Hence, this record of *E. torus* in banana plantations in SGNP assumes importance.

The observations on the increasing incidence and damage from Palghar and Thane is of significance as they are among the major banana growing areas of Maharashtra. The record of this species from Tungareshwar Wildlife Sanctuary is a cause for concern, since the sanctuary is located on outskirts of Vasai. Within a span of 2-3 months, *E. torus* was seen to have reached the interior areas of Vasai tehsil, with the possibility that infestation must have already started among plantations in the area.

In the near future, severe infestation of banana plantations in the area by *E. torus* can be expected in this area.

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Table.1- *E. torus* life-stages observed in Thane and Palghar districts (Fig.3)

| Location | Date | Life-stages |
|---|---|---|
| Yeoor Range, SGNP, Thane | 03-xi-2019 | Caterpillars |
| | 12-xi-2019 | Caterpillars |
| | 14-xi-2019 | Adult reared |
| B.N.Bandodkar College Campus,Thane | 05-xii-2019 | Eggs, pupae (empty) |
| | 14-i-2020 | Larval cells, pupae |
| Dombivli, Thane | 23-xii-2019 | Larval cells |
| | 26-i-2020 | Larval cells, Pupae |
| Kasarwadavali, Thane | 08-i-2020 | Eggs, larval cells |
| | 07-ii-2020 | Adult, pupae (empty) |
| Vasai Fort, Palghar | 16-ii-2020 | Adult, larval cells |


Fig.1: Records of *E. torus* from various locations in Maharashtra (2015-2018)


Fig. 2: Records of *E. torus* in Thane and Palghar district, Maharashtra (November 2019 – February 2020)

Fig.3: Egg

Fig.4: Caterpillar of early stage

Fig.5: Caterpillar of late stage

Fig.6: Pupa

Fig.7: *Erionota torus*, upperside

Fig.8: *Erionota torus*, underside

Fig.9

Fig.10

Fig.11

Fig.13

Fig.12

Fig. 9-13: Destruction of banana leaves caused by larval and pupal cells of *E. torus*

# NECTAR RETRIEVAL BY INSECT SWARM DOES NOT RESULT IN POLLINATION OF *LYONIA OVALIFOLIA* FLOWERS IN THE KUMAON HIMALAYA, INDIA

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**Introduction**

*Lyonia ovalifolia* (Wall) Drude (Ericaceae) is a deciduous woody shrub or small tree. It has oval leaves and white hermaphrodite pendulous flowers. It attains a height upto 7 metres. It is native to the Himalaya in India, Nepal and Bhutan (Brandis, 1874) and Pakistan, Bangladesh, Myanmar, China, Cambodia, Thailand, Vietnam and Malaysia (KEW B.D. accessed on 20.ix.2020).

In the Kumaon Himalaya, it is known as *Aiyar* and grows in the belt between 600 m to 3,500 m (Osmaston, 1927). It is found in subtropical evergreen forests with rhododendron (*Rhododendron arboreum* Smith) and oak (*Quercus leucotrichophora* A. Camus) as dominant species.

Maheshkhan Reserve Forest is a subtropical broadleaf evergreen forest in the Gagar range of Nainital district in Uttarakhand. *L. ovalifolia* is a common plant at Maheshkhan Reserve Forest (2080 m), Nainital district. The plants are scattered singly in the forest with other species including *Aesculus indica* (Wall. ex Cambees.) Hook.Sapindaceae), *Myrica esculenta* Buch. Ham. *ex* D. Don (Myricaceae), *Pinus roxburghii* Sarg. (Pinaceae), *Daphne papyracea* Wall.*ex* G. Don (Thymelaeaceae), *Indigofera heterantha* Brandis (Fabaceae), etc. The forest is in good condition with perennial streams and therefore, high humidity.

**Methodology**

The forest was visited on 11.vi.2020, 12.vi.2020 and 27.vi.2020 when the flower visitors were observed and studied. On 11.vi.2020, Maheshkhan forest was visited between 10 am to 4 pm and a flowering *Lyonia* tree was observed with hundreds of bugs of a single species, *Physopelta gutta* (Burmeister, 1834) (Hemiptera: Largidae) on it. The bugs were largely restricted to a single tree, although other trees of the species were flowering nearby. On the next visit to Maheshkhan, i.e.12.vi.2020 from 10 am to 4 pm, some more trees of *Lyonia* were flowering but most of the bugs were on the original tree. In addition, two butterfly species were also feeding on the flowers. Only a few bugs were present on another tree which was about 30 m away from the original tree.

On the third visit, i.e. 27.vi.2020 from 3 pm to 6 pm, the flower petals of the original tree had fallen and the calyces of all the flowers were still attached to the plant. All the bugs had moved on to the next tree, which earlier had only a few bugs despite being in full bloom. It was unchanged to superficial view, yet the bugs had suddenly found it attractive and moved to it.

On 7.viii.2020, during the visit to Maheshkhan, the fruit set of the two trees was observed and photographed. There were no flowers and therefore no insects on the trees.

All the visitors were photographed with their proboscises inserted into the flowers. The bugs were on the flowers from 10 am when observations began till 6 pm. Experience with moth trapping in the western Himalaya confirms that these bugs are also active throughout the night, since they tend to arrive

in large numbers throughout the night at moth traps (Peter Smetacek, *pers. comm*.).

**Remarks**

The observations here show that in *L. ovalifolia*, the flowers bloom together but mature asynchronously on trees and the insects are attracted accordingly and feed on them. So, in a way, cross pollination is effected, so that all the insects are on one tree for a few days and then move on to the other, taking with them the pollen from the first tree.

The fruit set was low; most racemes contained 15 to 25 flowers, but the fruit set was 0 to 10 fruit per raceme. The racemes with 5< calyces were very few. This was not proportionate to the huge number of bugs on the first *Lyonia* tree nor was fruit set on the second tree found to be any better.

The trees were not observed at night.

**Discussion**

The large number of *P. gutta* with pollen on their mouthparts suggested that there would be a proportionately large fruit set, but observations belied these assumptions.

It therefore seems that *P. gutta* is not the pollinator of choice of *L. ovalifolia*. This confirms what is often observed, that a large number of insects visit flowers without performing any useful task for the flower. In the case of *L. ovalifolia*, the pollinator of choice is as yet unknown, but it is certainly not *P. gutta*, regardless of the quantity of individuals swarming over the flowers. Except for the two butterflies, who were also probing the flowers for more than twenty minutes, no other insects were observed on the flowers. The possibility of the pollinator being nocturnally active cannot be ruled out.

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Table1: The insect visitors found in *Liona*

| S.N | Visitor | Scientific name | Common name | Family |
|---|---|---|---|---|
| 1 | Butterfly | *Dodona durga* (Kollar, [1844]) | Common Punch | Riodinidae |
| 2 | Butterfly | *Rapala manea* (Hewitson, 1863) | Slate Flash | Lycaenidae |
| 3 | Bug | *Physopelta gutta* (Bu rmeister,1834) | Gutta bug | Largidae |

Fig.1: *Dodona durga* on *Lyonia*

Fig.2: *Rapala manea* on *Lyonia*

Fig.3: *Physopelta gutta* on *Lyonia ovalifolia*

Fig.4: Fruit set after pollination in *Lyonia ovalifolia*

Fig.5: *Physopelta gutta* with proboscis inserted in flower

Fig.6: Racemes with no calyces, showing low pollination success

Fig.7: Racemes showing calyces after petals shed

Fig.8: Racemes with sepals remaining after unpollinated calyces were shed

Fig.9 &10: *Physopelta gutta* attracted to artificial light, Mussoorie

# A COMPREHENSIVE CHECKLIST OF BUTTERFLIES SEEN IN CORBETT TIGER RESERVE, UTTARAKHAND, INDIA

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**Abstract**

Corbett Tiger Reserve (CTR) conserves a wealth of flora and fauna and is a known destination for ecotourism in Northern India. Besides mammals and birds, for which CTR is known to many, frequent visits to CTR and its vicinity for watching butterflies are also on the rise in recent times. In this respect, an account of species of butterflies in the CTR and its vicinity would be useful not only for butterfly ecotourism but also for conservational, educational and scientific purposes. By virtue of photographic documentation of species of butterflies in CTR for over a decade, we provide here a list of butterflies seen in various tourist zones of CTR and its immediate vicinity. We recorded 94 genera and 130 species belonging to six families. On the basis of our records and work by others in CTR, a comprehensive checklist of 143 species of butterflies has been compiled.

**Introduction**

Corbett Tiger Reserve (CTR) is one of the key biodiversity areas in the foothills of Himalaya in Northern India. Established as a wildlife sanctuary with a total area of few hundred square kilometres in 1934, it was upgraded to a National Park in 1936 (Khanna *et al*., 2008). Presently, the CTR has a well-protected expanse of 1288.31 km² **(**NTCA, 2009). The spread of CTR encompasses a variety of habitats that support diverse flora and fauna (Pant, 1986, Editor-Director, 2008, Khan *et al*., 2008). Besides conserving wilderness, the location and approachability of CTR; and plentiful wildlife attracts lakhs of tourists every year (Badola *et al*., 2010; Gusain, 2015). The recreational value of CTR generates livelihood for the local community (Badola *et al*. 2010; Kumar *et al*., 2019).

Today, butterfly watching is one of the favourite recreational activities for many, and the trend is gradually on the rise. This makes butterflies important from the perspective of ecotourism; defined here as "low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing revenue to the local community sufficient for local people to value, and therefore protect, their wildlife heritage area as a source of income" (Fennel, 2015; Kurnianto *et al*., 2016; Singh *et al*., 2016). The diverse and pristine habitat of CTR is expected to be rich in the diversity of butterflies. However, literature on butterfly diversity in and around CTR is sparse. Only two reports provide an account of species of butterflies found in CTR (Kumar, 2008; Arya *et al*., 2020). The number of species of butterflies mentioned in these reports are 36 (Kumar, 2008), and 56 (Arya *et al*., 2020). The present communication reports 130 species of butterflies based on the observations made

during the last 13 years in CTR and its immediate vicinity. Based on the data from present and previous studies, a checklist of species of butterflies that can be sighted in this area has also been compiled.

**Material and Methods:**

**Sites Surveyed**

Various sites surveyed and their approximate geographical coordinates are given in Table 1. The sites belonged to two groups 1) sites located inside the administrative boundary of CTR i.e. tourist zones including Jhirna, Bijrani, Dhikala, Durgadevi and Halduparao; and 2) villages and resorts along the boundary of CTR i.e. Dhela, Resorts near Amdanda, Dhikuli, Garjiya, Mohaan and Rahtuaadhab.

**Methods of Survey**

Inside the boundary of CTR, butterflies among bushes along vehicle tracks were observed from safari vehicles, whereas those in the compounds of Forest Rest Houses were approached on foot. Butterflies in the villages and resorts were approached on foot. The species data presented here is a result of observations spanning last 13 years and includes butterflies sighted during chance encounters and surveys at sites mentioned in Table 1. Visits covered all the seasons i.e. spring, summer, monsoon, post-monsoon and winter. Of all the sites mentioned in Table 1, S3, S5, S6 and S8 were visited at all seasons. Also, multiple visits were made to each site.

Identification of butterflies:

Images of butterflies were taken using digital cameras and identification was done as suggested by Kehimkar (2016), Smetacek (2016), and Sondhi (2018). Arrangement of various species and genera is primarily based on Varshney & Smetacek (2015).

**Results and Discussions**

Based on long term observation at the sites within CTR and its immediate vicinity (Table 1), we hereby report sighting of butterflies belonging to 6 families, 94 genera and 130 species (Papilionidae: 9 species; Hesperiidae: 14 species; Pieridae: 14 species; Riodinidae: 2 species, Lycaenidae: 44 species and Nymphalidae: 47 species; Table 2 and Figure 1). Previous studies performed in similar locations reported only 36 (Kumar, 2008), and 56 species of butterflies (Arya *et al*., 2020) respectively; and this could be due to the longer study period of this study. We, however, could not sight about 13 species of butterflies (Table 3) which have been reported by previous workers (Kumar, 2008, Arya *et al*., 2020). Since identification of species in the present study was solely done on the basis of photographs of butterflies taken in the field, a few butterflies could be identified only up to the level of their genus. The same reason is applicable for non-reporting of a few Hesperids sighted during the study as to confirm their identity, examination of male genitalia by dissection is required. In case of genus *Tarucus*- the superficial markings are extremely variable and tend to overlap, so the species in this genus are best distinguished by an examination of male genitalia and androconia. Females of *Tarucus* are best separated by breeding or if they are found paired with known males (Wynter- Blyth, 1957).

All the species sighted inside CTR in the present study were also sighted at sites located outside CTR (Table 1). However, the population of butterflies were found to be significantly higher inside CTR, which is most likely due to an undisturbed habitat in the protected forest area (CTR).

Based on the total number of butterfly species observed in the present study and those observed by other workers (but not sighted in present study), a comprehensive checklist of butterflies found in CTR and its immediate vicinity has been prepared (Table 2). The state of Uttarakhand is known to have about 500 species (60 species not recorded for many decades) of butterflies; which is nearly 35 percent of the total butterfly species known from India (Sondhi & Kunte, 2018, Varshney & Smetacek, 2015). The list of butterflies

provided here is however incomplete and some species may still be added in due course.

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**Table 1:** Location of various sites, in tourist zones of CTR and its vicinity (with their geographical coordinates and habitat types) included in the study. *https://earth.google.com/

| Sites | Location of the sites | Habitat types | Geographical coordinates* |
|---|---|---|---|
| S1 | Jhirna (Tourist Zone inside CTR) | Scrub, grassland, mixed forest, ravines. | 29° 26′ 12″ N, 78° 54′ 2″ E Altitude: 325 m. aprox. |
| S2 | Dhela (village) | Agriculture landscape, fringes of mixed forest. | 29° 25′ 17″ N, 78° 59′ 57″ E Altitude: 330 m. aprox. |
| S3 | Amdanda (Resorts) | Mixed forest. | 29° 24′ 47″ N, 79° 07′ 44″ E Altitude: 415 m. aprox. |
| S4 | Bijrani (Tourist Zone inside CTR) | Sal forest, mixed Sal forest, grasslands, scrub and ravines. | 29° 26′ 20″N, 79° 04′ 39″ E Altitude: 410-450 m. aprox. |
| S5 | Dhikuli (Village) | Fringes of mixed Sal forest, human habitation, orchards, streams. | 29° 28′ 09″ N, 79° 8′ 51″ E Altitude: 425 m. aprox. |
| S6 | Garjiya (Village) | Scrub, fringes of mixed forest, streams. | 29° 29′ 39″ N, 79° 08′ 25″ E Altitude: 450 m. aprox |
| S7 | Dhikala (Tourist Zone inside CTR) | Sal forest, open-mixed forest, forest fringes, scrub, grasslands, river bed and streams. | 29° 35′ 06″ N, 78° 51′ 46″ E Altitude: 375- 650 m. aprox. |
| S8 | Mohaan (Near village) | Human habitation, forest fringes, streams. | 29° 32′ 52″ N, 79° 06′ 25″ E Altitude: 550 m. aprox. |
| S9 | Durgadevi (Tourist Zone inside CTR) | Mixed forest, river bed, scrub, rivers. | 29° 36′ 15″ N, 7° 59′ 42″ E Altitude: 475-575 m. aprox. |
| S10 | Rathudhab (Near Village) | Agriculture fields, human habitation, river bed, scrub fringes of forest. | 29° 40′ 04″ N, 78° 51′ 13″ E Altitude: 700 m. aprox |
| S11 | Halduparao (Tourist Zone inside CTR) | Mixed forest, scrub, river bed. | 29° 39′ 04″ N, 78° 44′ 14″ E Altitude: 400 m. aprox |

**Table 2:** Comprehensive checklist of butterflies sighted in Corbett Tiger Reserve (CTR) and its immediate vicinity.

| Species Record | Remarks |
|---|---|
| Papilionidae | |
| *Pachliopta aristolochiae* (Fabricius, 1775), Common Rose | Occasionally sighted from March to November in forested areas and nearby. |
| *Papilio clytia* (Linnaeus, 1758), Common Mime | Sighted at forest edges and mud pudding in ravines. |
| *Papilio polytes* (Linnaeus, 1758), Common Mormon | More common near human habitations than forested areas. |
| *Papilio demoleus* (Linnaeus, 1758), Lime Butterfly | More common near human habitations than forested areas. |
| *Papilio protenor* (Cramer, 1775), Spangle | Rare |
| *Graphium nomius* (Esper, 1799), Spot Swordtail | ---- |
| *Graphium sarpedon* (Linnaeus, 1758), Common Bluebottle | ---- |
| *Graphium doson* (C. & R. Felder, 1864), Common Jay | ---- |
| *Graphium agamemnon* (Linnaeus, 1758), Tailed Jay | Rare |
| Hesperiidae | |
| *Badamia exclamationis* (Fabricius, 1775), Brown Awl | Uncommon; could be sighted only on few occasions. |
| *Bibasis sena* (Moore, 1866), Orange-tailed Awl | Rare |
| *Burara oedipodea* (Swainson, 1820), Branded Orange Awlet | Uncommon, could be sighted only on few occasions. |
| *Hasora chromus* (Cramer, 1780), Common Banded Awl | Uncommon, could be sighted only on few occasions. |
| *Tagiades menaka* (Moore, 1866), Spotted Snow Flat | Rare |
| *Pseudocoladenia dan* (Fabricius, 1787), Fulvous Pied Flat | Rare |
| *Caprona* sp. (Wallengren , 1857), Angle | Rare |
| *Sarangesa purendra* ( Moore, 1882), Spotted Small Flat | Rare |
| *Sarangesa dasahara* (Moore, 1866), Common Small Flat | Common at the fringes of forest during rainy season |
| *Spialia galba* (Fabricius, 1793), Indian Grizzled Skipper | Uncommon, could be sighted only on few occasions |
| *Notocrypta curvifascia* (C. & R. Felder, 1862), Restricted Demon | Rare |
| *Udaspes folus* (Cramer 1775), Grass Demon | |

| | |
|---|---|
| *Hyarotis adrastus* (Stoll 1780), Tree Flitter | Rare |
| *Erionota torus* (Evans, 1941), Banana Skipper | Rare |
| *Matapa aria* (Moore, 1866), Common Redeye | Uncommon, could be sighted only at few occasions |
| *Potanthus* sp.(Scudder, 1872*)* | Identification up to species level requires examination of male genitalia. |
| Pieridae | |
| *Catopsilia pomona* (Fabricius, 1775), Common Emigrant | Very common during rainy season. |
| *Catopsilia pyranthe* (Linnaeus, 1758), Mottled Emigrant | Very common during rainy season. |
| *Eurema brigitta* (Stoll, 1780), Small Grass Yellow | Common during rainy season in open areas. |
| *Eurema hecabe* (Linnaeus, 1758), Common Grass Yellow | Common during rainy season in open areas. |
| *Eurema laeta* (Boisduval, 1836), Spotless Grass Yellow | Common during rainy season in open areas. |
| *Colias fieldii* (Ménétriés, 1855 ), Dark Clouded Yellow | Sighted occasionally during in late winters to spring. |
| *Leptosia nina* (Fabricius, 1793), Psyche | Common during rainy season in forested areas. |
| *Pieris brassicae* (Linnaeus, 1758), Large Cabbage White | Common near human habitations and farms in winters. |
| *Pieris canidia* (Linnaeus, 1768), Indian Cabbage White | Common near human habitations and farms in winters. |
| *Pontia daplidice* (Linnaeus, 1758), Bath White | Rare |
| *Belenois aurota* (Fabricius, 1793), Pioneer | Seen from March to November. |
| *Cepora nerissa* (Fabricius, 1775), Common Gull | Seen from March to November. |
| *Delias eucharis* (Drury, 1773), Common Jezabel | Common during rainy season in open areas. |
| *Pareronia hippia* (Fabricius, 1787), Indian Wanderer | Sighted in forested areas and fringes. |
| Riodinidae | |
| *Zemeros flegyas* (Cramer, 1780), Punchinello | Sighted in forested areas and fringes. |
| *Abisara bifasciata* (Moore, 1877), Double Banded Plum Judy | Sighted in forested areas and fringes. |
| Lycaenidae | |
| *Curetis acuta* (Moore, 1877), Angled Sunbeam | Sighted in open sunny areas and fringes of forest. |
| *Poritia hewitsoni* (Moore, 1866), Common Gem | Rare species sighted in forested areas. |
| *Spalgis epius* (Westwood, 1851), Apefly | Rare |
| *Heliophorus sena* (Kollar, 1844), Sorrel Sapphire | Could be sighted at sites S7,S9, S10 S11 |
| *Spindasis vulcanus* (Fabricius, 1775), Common Silverline | Sighted on hedges in resorts and villages in rainy season. |

| | |
|---|---|
| *Arhopala amantes* (Hewitson, 1862), Large Oakblue | Common during spring season, resting on fallen leaves in forested areas. |
| *Arhopala atrax* (Hewitson, 1862), Indian Oakblue | Abundant in forested areas, resting on dry fallen leaves. |
| *Flos adriana* (de Nicéville, 1884), Variegated Plushblue | Occasionally seen in forested areas. |
| *Flos asoka* (de Nicéville, 1884), Spangled Plushblue | Occasionally seen in forested areas. |
| *Loxura atymnus* (Stoll, 1780), Yamfly | Sighted in rainy season but not very commonly. |
| *Horaga onyx* (Moore, 1858), Common Onyx | Rare could be sighted only on two occasions. |
| *Tajuria cippus* (Fabricius, 1798), Peacock Royal | Rare could be sighted only on two occasions |
| *Chliaria othona* (Hewitson, 1865), Orchid Tit | Very rare and could be sighted only once. |
| *Rapala iarbus* (Fabricius, 1787), Common Red Flash | ----- |
| *Rapala pheretima* (Hewitson, 1863), Copper Flash | Rare |
| *Rapala manea* (Hewitson, 1863), Slate Flash | Seen at fringes of forests. It is more common than Indigo Flash |
| *Rapala varuna* (Horsfield, 1829), Indigo Flash | Seen at fringes of forests |
| *Anthene emolus* (Godart, 1824), Common Ciliate Blue | Could be sighted only on 3-4 occasions |
| *Prosotas dubiosa* (Semper, 1879), Tailless Lineblue | ---- |
| *Prosotas nora* (C. Felder, 1860), Common Lineblue | Common in forested areas. |
| *Jamides bochus* (Stoll, 1782) Dark Cerulean | ---- |
| *Jamides celeno* (Cramer, 1775), Common Cerulean | Sighted in rainy season. |
| *Catochrysops strabo* (Fabricius, 1793), Forget-me-not | Common in rainy season in open areas. |
| *Lampides boeticus* (Linnaeus, 1767), Pea Blue | Common near human habitations. |
| *Leptotes plinius* (Fabricius, 1793), Zebra Blue | ----- |
| *Castalius rosimon* (Fabricius, 1775), Common Pierrot | Sighted at the fringes of forest, it is not common species. |
| *Tarucus balkanicus* (Freyer, 1844), Black-Spotted Pierrot | The two species as mentioned here, and a third *T. callinara* requires further confirmation by examining male genitalia. |
| *Tarucus nara* (Kollar, 1848), Striped Pierrot | |
| *Talicada nyseus* (Guérin-Méneville, 1843), Red Pierrot | Sighted near human habitations close to its host plant. |
| *Zizeeria karsandra* (Moore, 1865), Dark Grass Blue | Very common during rainy season in open areas. |
| *Pseudozizeeria maha* (Kollar, 1844), Pale Grass Blue | Very common during rainy season in open areas. |

| | |
|---|---|
| *Zizina otis* (Fabricius, 1787), Lesser Grass Blue | Sighted during rainy season in open areas but less commonly than Dark and Pale Grass blues. |
| *Zizula hylax* (Fabricius, 1775), Tiny Grass Blue | Sighted during rainy season in open areas but less common than Dark and Pale Grass Blues. |
| *Everes argiades* (Pallas, 1771 ), Tailed Cupid | Rare |
| *Everes hugelii* (Gistel, 1857), Dusky Blue Cupid | Rare |
| *Everes lacturnus* (Godart, 1824), Indian Cupid | Rare |
| *Neopithecops zalmora* (Butler, 1870), Quaker | Common among bushes along forest fringes. More common in forested areas than around human habitations. |
| *Megisba malaya* (Horsfield, 1828), Malayan | Sighted in rainy season. |
| *Acytolepis puspa* (Horsfield, 1828), Common Hedge Blue | Sighted in rainy season |
| *Euchrysops cnejus* (Fabricius, 1798), Gram Blue | Common around human habitations. |
| *Freyeria putli* (Kollar, 1844), Lesser Grass Jewel | Common in scrubs. |
| *Freyeria trochylus* (Freyer, 1845), Grass Jewel | Not common as Lesser as Grass Jewel. |
| *Chilades pandava* (Horsfield, 1829), Plains Cupid | --- |
| *Chilades lajus* (Stoll, 1780), Lime Blue | Not common at any of the sites included in the study. |
| Nymphalidae | |
| *Danaus chrysippus* (Linnaeus, 1758), Plain Tiger | Commonly sighted from March to November. |
| *Danaus genutia* (Cramer, 1779), Common Tiger | Sightings frequent during March to November. |
| *Parantica aglea* (Stoll, 1782), Glassy Tiger | Not common outside the rainy season. |
| *Parantica sita* (Kollar, 1844), Chestnut Tiger | Not common, could be sighted in open forested areas. |
| *Tirumala limniace* (Cramer, 1775), Blue Tiger | Not common outside the rainy season. |
| *Tirumala septentrionis* (Butler, 1874), Dark Blue Tiger | Not as common as Blue Tiger. |
| *Euploea core* (Cramer, 1780), Common Crow | Seen during most part of the year. Fairly common in rainy season. |
| *Euploea mulciber* (Cramer, 1777), Striped Blue Crow | Not as common as Common Crow |
| *Polyura athamas* (Drury 1773), Common Nawab | --- |
| *Elymnias hypermnestra* (Linnaeus, 1763), Common Palmfly | Sighted from March to November, but it is not a common species. |
| *Melanitis leda* (Linnaeus, 1758), Common Evening Brown | Common in forested areas. |
| *Lethe europa* (Fabricius, 1775), Bamboo Treebrown | Rare |
| *Lethe rohria* (Fabricius, 1787), Common Treebrown | Sighted in forested areas but uncommonly. |

| | |
|---|---|
| *Mycalesis* sp. (Huebner, 1818), Bushbrown | Identification up to species level requires examination of captured specimens. |
| *Ypthima baldus* (Fabricius, 1775), Common Five-ring | Common in rainy season and early winters. |
| *Ypthima huebneri* (Kirby, 1871), Common Four-ring | Common in rainy season and early winters. |
| *Neptis hylas* (Linnaeus, 1758), Common Sailer | --- |
| *Neptis sappho* (Pallas, 1771), Pallas' Sailer | Common in open forested areas. |
| *Pantoporia* sp. (Huebner, 1819), Lascar | Identification up to species level requires examination of captured specimens. |
| *Athyma nefte* (Cramer, 1780), Colour Sergeant | Sighted; is rare |
| *Athyma perius* (Linnaeus, 1758), Common Sergeant | Sighted; is rare |
| *Athyma selenophora* (Kollar, 1844), Staff Sergeant | Sighted; is rare |
| *Moduza procris* (Cramer, 1777), Commander | Sighting is fairly common in rainy season in forested areas and fringes. |
| *Euthalia aconthea* (Cramer, 1777), Common Baron | Sighting is uncommon. |
| *Euthalia lubentina* (Cramer, 1777), Gaudy Baron | Sighting is rare. |
| *Symphaedra nais* (Forster, 1771), Baronet | Common in rainy season in forested areas and fringes. |
| *Argynnis hyperbius* (Linnaeus, 1763), Indian Fritillary | Frequent sightings from early winters to spring. |
| *Phalanta phalantha* (Drury, 1773), Common Leopard | Common in rainy season in forested areas and fringes. |
| *Cupha erymanthis* (Drury, 1773), Rustic | --- |
| *Vagrans egista* (Cramer, 1780), Vagrant | --- |
| *Ariadne merione* (Cramer, 1777), Common Castor | Common near human habitations, close to its host plant *Ricinus* sp. |
| *Euripus consimilis* (Westwood, 1851), Painted Courtesan | Sighting is extremely rare. |
| *Cyrestis thyodamas* (Doyère, 1840), Common Map | --- |
| *Symbrenthia lilaea* (Hewitson, 1864), Common Jester | Fairly common during rainy season in thinly forested areas, forest and villages. |
| *Aglais caschmirensis* (Kollar, 1844), Indian Tortoiseshell | Frequent sightings from early winters to spring. |
| *Kaniska canace* (Linnaeus, 1763), Blue Admiral | --- |
| *Vanessa cardui* (Linnaeus, 1758), Painted Lady | Occasionally seen most part of the year. |
| *Vanessa indica* (Herbst, 1794), Indian Red Admiral | Occasionally sighted most part of the year. Lays eggs on *Urtica* sp. |
| *Junonia almana* (Linnaeus, 1758), Peacock Pansy | Common during rainy season. |
| *Junonia atlites* (Linnaeus, 1763), Grey Pansy | --- |
| *Junonia hierta* (Fabricius, 1798), Yellow Pansy | --- |
| *Junonia iphita* (Cramer, 1779), Chocolate Pansy | Common in forested areas and nearby. |
| *Junonia lemonias* (Linnaeus, 1758), Lemon Pansy | --- |
| *Junonia orithya* (Linnaeus, 1758), Blue Pansy | --- |

| | |
|---|---|
| *Hypolimnas bolina* (Linnaeus, 1758), Great Eggfly | -- |
| *Kallima inachus* (Doyère, 1840), Orange Oakleaf | Occasionally sighted at the fringes of forest. |
| *Acraea terpsicore* (Linnaeus, 1758), Tawny Coster | --- |
| *Acraea issoria* (Hübner, 1819), Yellow Coster | Sighted once at site S9. |
| *Libythea myrrha* (Godart, 1819 ), Club Beak | Occasionally sighted in forested areas. |

**Table 3:** List of species of butterflies that were reported by Arya *et al*., 2020, Kumar, 2008 but could not be recorded in the present study.

| Species Reported by Other Workers |
|---|
| 1. *Parnara guttatus* (Bremer & Grey, 1852), Straight Swift |
| 2. *Eurema andersoni* (Moore, 1886), One-spot Grass Yellow |
| 3. *Eurema blanda* (Boisduval, 1836), Three-spot Grass Yellow |
| 4. *Colias erate* (Esper, 1805), Pale Clouded Yellow |
| 5. *Polyura agraria* (Swinhoe, 1887), Anomalous Nawab |
| 6. *Neptis sankara* (Kollar, 1844), Broad-banded Sailer |
| 7. *Athyma zeroca* (Moore, 1872), Small Staff Sergeant |
| 8. *Hestinalis nama* (Doubleday, 1844), Circe |
| 9. *Borbo bevani* (Moore, 1878), Bevan's Swift |
| 10. *Tarucus indica* (Evans, 1932), Transparent Pierrot |
| 11. *Mycalesis perseus* (Fabricius, 1775), Common Bushbrown |
| 12. *Ypthima sakra* (Moore, 1858), Himalayan Five-ring |
| 13. *Libythea lepita* (Moore, 1858), Common Beak |


**1.** *Pachliopta aristolochiae* **2.** *Papilio clytia* **3.** *Papilio polytes* **4.** *Papilio demoleus* **5.** *Papilio protenor* **6.** *Graphium nomius*

**7.** *Graphium sarpedon* **8.** *Graphium doson* **9.** *Graphium agamemnon*


**10.** *Badamia exclamationis* **11.** *Bibasis sena* **12.** *Burara oedipodea* **13.** *Hasora chromus* **14.** *Tagiades menaka* **15.** *Pseudocoladenia dan* **16.** *Caprona* sp. **17-18.** *Sarangesa dasahara* **19.** *Spialia galba* **20.** *Notocrypta curvifascia* **21.** *Udaspes folus* **22.** *Hyarotis adrastus*


**23.** *Erionota torus* **24.** *Matapa aria* **25.** *Potanthus* sp.

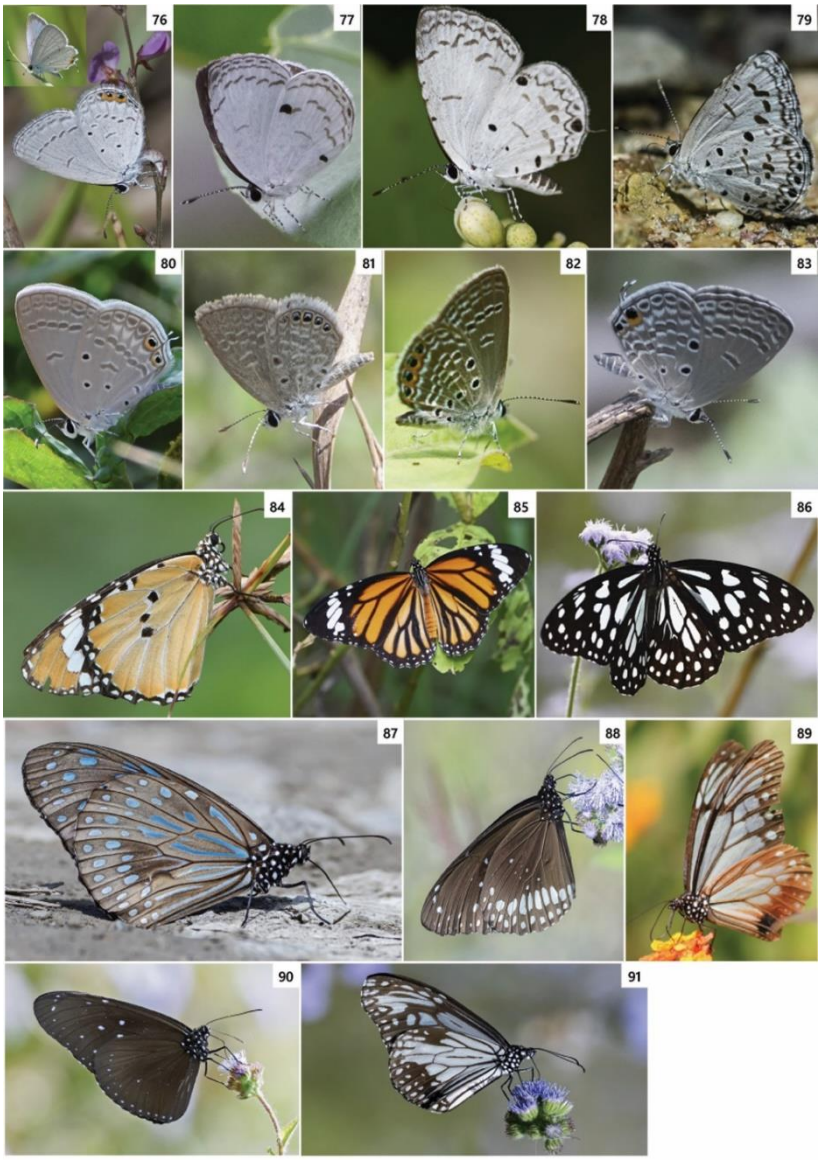

**26.** *Catopsilia pomona* **27.** *Catopsilia pyranthe* **28.** *Eurema brigitta* **29.** *Eurema hecabe* **30.** *Eurema laeta* **31.** *Colias fieldii*

**32.** *Leptosia nina* **33.** *Pieris brassicae* **34.** *Pieris canidia* **35.** *Pontia daplidice* **36.** *Cepora nerissa* **37.** *Belenois aurota*


**38.** *Delias eucharis* **39.** *Pareronia hippia* **40.** *Abisara bifasciata* **41.** *Zemeros flegyas* **42.** *Curetis acuta* **43.** *Poritia hewitsoni* **44.** *Spalgis epius* **45.** *Heliophorus sena* **46.** *Spindasis vulcanus* **47.** *Arhopala amantes* **48.** *Arhopala atrax* **49.** *Flos adriana*


**50.** *Flos asoka* **51.** *Loxura atymnus* **52.** *Horaga onyx* **53.** *Tajuria cippus* **54.** *Chliaria othona* **55.** *Rapala iarbus* **56.** *Rapala manea* **57.** *Rapala varuna* **58.** *Anthene emolus* **59.** *Prosotas dubiosa* **60.** *Prosotas nora* **61.** *Jamides bochus*


**62.** *Jamides celeno* **63.** *Catochrysops strabo* **64.** *Lampides boeticus* **65.** *Leptotes plinius* **66.** *Castalius rosimon* **67.** *Tarucus balkanicus* **68.** *Tarucus nara* **69.** *Zizeeria karsandra* **70.** *Pseudozizeeria maha* **71.** *Talicada nyseus* **72.** *Zizina otis* **73.** *Zizula hylax* **74.** *Everes argiades* **75.** *Everes hugelii*




**76.** *Everes lacturnus* **77.** *Neopithecops zalmora* **78.** *Megisba Malaya* **79.** *Acytolepis puspa* **80.** *Euchrysops cnejus* **81.** *Freyeria putli* **82.** *Freyeria trochylus* **83.** *Chilades pandava* **84.** *Danaus chrysippus* **85.** *Danaus genutia* **86.** *Tirumala limniace* **87.** *Tirumala septentrionis* **88.** *Euploea core* **89.** *Parantica sita* **90.** *Euploea mulciber* **91**. *Parantica aglea*


**92.** *Polyura athamas* **93.** *Elymnias hypermnestra* **94.** *Melanitis leda* **95.** *Lethe europa* **96.** *Lethe rohria* **97.** *Mycalesis* sp. **98.** *Ypthima baldus* **99.** *Ypthima huebneri* **100.** *Neptis hylas* **101.** *Neptis Sappho* **102.** *Pantoporia* sp. **103.** *Athyma nefte* **104.** *Athyma selenophora* **105.** *Athyma perius* **106.** *Euthalia aconthea* **107.** *Symphaedra nais* **108.** *Euthalia lubentina*


**109.** *Moduza procris* **101.** *Argynnis hyperbius* **111.** *Phalanta phalantha* **112.** *Cupha erymanthis* **113.** *Vagrans egista* **114.** *Ariadne merione* **115.** *Euripus consimilis* **116.** *Cyrestis thyodamas* **117.** *Symbrenthia lilaea* **118.** *Aglais caschmirensis* **119.** *Kaniska canace* **120.** *Vanessa cardui*


**121.** *Vanessa indica* **122.** *Junonia almana* **123.** *Junonia atlites* **124.** *Junonia hierta*

**125.** *Junonia iphita* **126.** *Junonia lemonias* **127.** *Junonia orithya* **128.** *Hypolimnas bolina*

**129.** *Kallima inachus* **130.** *Acraea terpsicore* **131.** *Acraea issoria* **132.** *Libythea myrrha*

**133.** *Rapala pheretima*

# FIRST RECORD OF THE ZEBRA SKIPPER *SPIALIA ZEBRA* (LEPIDOPTERA: HESPERIIDAE)

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*Spialia zebra* (Butler 1888) was described from 12 specimens taken at Chittar Pahar, Campbellpore (= Attock), Punjab, Pakistan. *Hesperia hellas* de Niceville, 1889 was described from the same locality and synonymised with *S. zebra* by Swinhoe (1912).

It is distinguished by the discal band on the underside hindwing being continuous with the outer spot in space 7, the inner spot being adjoined to the basal cell spot. On the underside, the hindwing discal band is straight and directed to the tornus. On the upperside, the basal cell spot is absent (Evans, 1949).

On the Indian subcontinent, it is reported from the "Margalla hills; the northern part of Punjab, "Azad Kashmir" = Pakistan occupied Kashmir; Islamabad and south-eastern part of Khyber-Pakhtunkhwa" in Pakistan (Tshikolovets & Pages, 2016). According to them, the habitat is dry xerophite (*sic*.) places and cultivated areas in lowlands or arid foothills.

On 8.xi.2014, a specimen of *S. zebra* was photographed at Sagwara (23.6623 N; 74.0348 E), tehsil Sagwara, district Dungarpur, Rajasthan, India. Several individuals were observed from 1.20 pm to 1.57 pm and one was collected and depostied in the collection of the Butterfly Research Centre, Bhimtal, Uttarakhand, with a forewing length of 11 mm. This is an extension to the known distribution by more than 1100 km southwards. The butterfly is difficult to observe because it is quite small and flies rapidly low over the ground.

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Fig.1: *Spialia zebra* upperside

Fig.2: *Spialia zebra*

# CONFIRMATION OF THE ROSY FLASH BUTTERFLY *RAPALA ROSACEA* (LEPIDOPTERA: LYCAENIDAE) IN MIZORAM, INDIA

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The Rosy Flash (*Rapala rosacea* de Niceville, [1889]) (Insecta: Lepidoptera: Lycaenidae) was described from 5 male and 6 female specimens from Sikkim, all collected in March. There are no reliable records of this species subsequently from India and distribution notes about the species record Sikkim to N.E. India (Varshney & Smetacek, 2015). Mizazaki *et al*. (2007) report the species from Vietnam.

According to de Niceville ([1889]), "the reddish-vinous colouration of the underside at once distinguishes it from all the species of the genus known to me." These included *Rapala nissa* (Kollar, [1844]) and *Rapala rectivitta* (Moore, 1879), the only two similar species within India.

The original description states:

Habitat: Sikkim.

Description: Male. Upperside *both wings* fuscous. *Forewing* glossed with shining deep steel-purple from the base to beyond the middle. *Hindwing* with all but the costa, outer margin narrowly, and abdominal margin broadly, glossed with shining deep steel-purple. UNDERSIDE, both wings vinous-red, in some specimens the red colour somewhat obsolescent. *Forewing* with two short dark lines at the end of the cell, a discal very even slightly curved narrow dark band from the costa to the submedian fold, a submarginal obscure fascia. *Hindwing* with the disco-cellular and discal markings as in the forewing but the latter at its posterior end assuming a W-shaped figure, the whole band outwardly narrowly defined with white, at its posterior end also inwardly defined with white, the anal lobe marked with red in the middle, a red spot on the margin beyond the base of the tail; between which the wing is irrorated with grey scales, a narrow red line running up from the anal lobe to the abdominal margin below the discal line. *Cilia* reddish brown throughout. *Tail* black, tipped with white."

On 18.viii.2012 in Tlangnuam Veng, Aizawl, Mizoram, a single male of this species was observed and photographed (Figures 1 & 2), confirming its presence in Mizoram.

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Fig.1: *Rapala rosacea*, underside

Fig.2: *Rapala rosacea*, upperside

# SOME NEW DISTRIBUTION RECORDS OF HESPERIID BUTTERFLIES IN NEPAL

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**Introduction**

Butterflies are highly mobile organisms that frequently travel from one place to another place in search of host plant, mates, food and proper climate for their survival. This leads to their distribution in newer places every now and then. Their colonisation of an area mainly depends upon suitable habitat structure and availability of their food plants (Abideen *et al.*, 2015). Moreover, they can be taken as vital ecological indicators and their distribution can be related to factors like habitat loss, fragmentation, land use change and most of all, climate change (Thomas *et al*., 1998).

Nepal is home to 660 species of butterflies (Smith, 2011), although the correct number adds up to 670 today after taking into consideration recent additions. Colin Smith recorded the distribution of butterflies of Nepal from four zones. These are: West (W), encompassing the Karnali watershed, the Centre (C) encompassing the Gandaki watershed, the East, encompassing the Koshi and Mechi watersheds and Kathmandu (K) encompassing the Bagmati watershed (Smith 2011). However, it is natural that these distribution records, most of which were based on decades old records, have changed over time, and the species in the east (E) and the west (W) have frequently been seen in Kathmandu (K) and other central Nepal regions (C) as well.

This paper highlights my findings during the past 2 years (2019-2020) at Bhorletar, Lamjung (28°09'57" N 84°13'02" E) and Lakeside, Kaski (28°26'29" N 83°96'85" E) in which anomalous records with reference to Colin Smith's distribution records (1994; 2011; 2016) have been presented. The findings are based on photographic records. ID keys from Evans (1927, 1932, 1949) have been followed.

**Family: Hesperiidae**

1. *Burara anadi anadi* (de Niceville, [1884])- Plain Orange Awlet

This species is new to Nepal. A rather worn individual was spotted at Lakeside, Kaski at 850 m in mid-September 2020. The HW patch is in thin streaks and not bulky solid like in *B. oedipodea* (Swainson, 1820) or broad as in *B. harisa harisa* (Moore, [1866])*;* and the dorsal part of antennae is white. The HW streak extends up to space 7. Moreover, it does not have a white FW discoidal cellspot like in *B. jaina jaina* (Moore, [1866]), in which the abdominal end is also more broadly orange than brown. Blurred ochraceous area on disc and more or less purple washed (Evans, 1949). Note that the only similar species found in Nepal, *B. jaina jaina* always has an UnFW discoidal white cell spot.

This species has been reported from Uttarakhand and N.E. India (Varshney & Smetacek, 2015), so it was expected in Nepal.

2. *Celaenorrhinus putra putra* (Moore, [1866])- Bengal Spotted Flat

This species was very common in Lamjung, Bhorletar throughout March-October, although it was reported only from the East in the past. The termen of FW is equal to the dorsum giving FW a sharper and more produced appearance. In *C. leucocera* (Kollar, [1844]), the FW dorsum is longer, giving the

wing a rounded look. Also, the UpFW cell spot does not extend up to the costa in *C. putra*, while it usually extends up to costa in *C. leucocera* (Evans, 1949) and, if not, is present as a tiny spot only.

3. *Seseria dohertyi dohertyi* Watson, 1893- Himalayan White Flat

It was only recorded in the east and Kathmandu area by Smith (2011). An individual was seen in Lamjung at Bhorletar, at 1500 ft in the month of April 2020. It has been reported from Jammu & Kashmir to N.E. India (Varshney & Smetacek, 2015), so its appearance in Lamjung is not unusual.

4. *Ctenoptilum vasava vasava* (Moore, [1866])- Tawny Angle

Within Nepal, it was only recorded from Kathmandu area in the past (Smith, 2011). An individual was seen in Lamjung at Bhorletar, 460 m in April 2020. It has been reported from Uttarakhand to N.E. India (Varshney & Smetacek, 2015), so its appearance westward in Nepal is not unusual.

5. *Halpe filda* Evans, 1949- Elwes' Ace

It was only recorded from the east in the past from as close as Sankhuwasabha (Smith, 1994). Several individuals were seen in Lamjung, Bhorletar at 460 m, in April, May of 2020. UpFW does not have any cell spot (or sometimes a small one) and the discal spots are barely overlapped. UnHW central band is not prominent and suffused (Evans, 1949). Note that the FW discal spots in *H. arcuata* are prominently overlapped. The present record constitutes an extension westward to the global distribution of the species.

6. *Halpe arcuata* Evans, 1937– Evans' Ace

An addition to the known butterflies of Nepal. Records from Assam and Sikkim have been found (Gogoi, 2013; Gasse, 2013). Several individuals were found in April and May of 2020 in Lamjung, Bhorletar, 460 m. They were found in company with *H. filda*, but their discal spots are wider and largely overlapped (Evans, 1949), and sometimes a small forewing cell spot can be found. All of such individuals bore only 2 subapical spots while individuals with 3 subapical spots were also seen in *H. filda*. UnHW, *vide* Evans (1949), was very variable. Upon dissection of a male, gnathos horn was curved and sharply pointed as stated by Evans (1949).

7. *Pithauria murdava* (Moore, [1866])- Dark Straw Ace

Another species which was recorded only from east in the past (Smith, 2011) was recorded in Lakeside, Kaski at 850 m in September, 2020. This is an extension westward to the known distribution of this species globally. Darker than *P. stramineipennis* with very little straw-colored hair, some spots visible on UnHW as well (Evans, 1932).

8. *Matapa druna* (Moore, [1866])- Grey-Brand Redeye

This species is rarer than its look alike, *M. aria* (Moore, [1866]), and was reported from the East only in the past (Smith, 2011). However, it is rarely seen in central hills as well. Smith *et al*. (2016) had reported it from Rupa, Kaski as well, as very rare. An individual was seen in Lamjung, Bhorletar, 460 m on dung, in August, 2019. The cilia of the HW are clearly deeper orange than that of FW (Evans, 1949). In males, the brand on UpF is bolder and more curved (Evans, 1949).

9. *Zenonoida discreta discreta* (Elwes & Edwards, 1897)- Himalayan Swift

The distribution record of this species is missing in Smith (2011). It is reported from Jammu & Kashmir to N.E. India (Varshney & Smetacek, 2015), so should be found throughout Nepal. An individual was seen in Lakeside at 850 m in May 2019. The tornal HW cilia are white unlike in *Z. eltola eltola* (Hewitson, 1869) in which they are yellow/ochraceous (Evans, 1949).

**Discussion**

The record of these butterflies in new regions of Nepal confirms the changing distribution of species. In most cases, the extension of distribution of species is from from the west

and the east to central areas. In most cases, the anomalous species were seen in March-May and not in other months, which could be linked to spring migration. These months are also the best months to observe butterflies in Nepal, besides September-November.

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Fig.1: Dark Straw Ace, underside

Fig.2: Dark Straw Ace, upperside

Fig.3: Bengal Spotted Flat

Fig.4: Elwes Ace, underside

Fig.5: Elwes Ace, upperside

Fig.6: Evan's Ace, upperside

Fig.7: Evan's Ace, underside

Fig.8: Evan's Ace, Gnathos

Fig.9: Grey-brand Red Eye, upperside

Fig.10: Grey-brand Red Eye, underside

Fig.11: Himalayan Swift, underside

Fig.12: Himalayan Swift, upperside

Fig.13: Plain Orange Awlet, underside

Fig.14: Plain Orange Awlet

Fig.15: Himalayan White Flat, upperside

Fig.16: Tawny Angle, upperside

# BUTTERFLIES OF GOVERNMENT NURSERY, BHATAGAON, CHHATTISGARH WITH TWO ADDITIONS TO THE STATE FAUNA

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**Abstract**
Butterflies visiting the Government Nursery, Bhatagaon, Chhattisgarh in May, June and July 2020 were recorded. A total of 38 species of butterflies were recorded and two of them, *Jamides bochus* and *Anthene lycaenina*, are reported here as new records for Chhattisgarh.
**Keywords:** Chhattisgarh, Biodiversity, Butterfly, New Record, *Jamides bochus*, *Anthene lycaenina.*

**Introduction**
Chhattisgarh is rich in biodiversity and 162 species of butterflies have been documented in a review of literature by Sisodia (2019) and recent field work (Sisodia & Kshirsagar (2020). The Government Nursery (20°86' N; 81°69' E; 457m) is located at Bhatagaon village, near National Highway 30, about 50 km from Raipur towards Jagdalpur in Kurud block of Dhamtari district, Chhattisgarh, India. The nursery is maintained by government of Chhattisgarh for supplying plants to various government projects, local farmers, schools and colleges, etc. These plants are host for various butterfly species; therefore, the nursery is rich in butterfly diversity. The nursery was established in 2008, and is spread over 15 acres.

Butterflies were photographed by Canon 1300D DSLR Camera and an iPhone mobile camera during visits to the nursery from May to July, 2020. Field identification was undertaken with the help of Evans (1932); Wynter Blyth (1957); Haribal (1992) & Smetacek (2016). During the study, a total of 38 species of butterflies belonging to five families were photographed. During this study we found two species which were not recorded earlier from Chhattisgarh and therefore have added these to the butterfly fauna of the state.

**Result and Discussion**
A total of 38 species belonging to five families are reported from Bhatagaon nursery, of which two species were recorded for the first time from Chhattisgarh. 36 species were known from the area but are of interest because, as mentioned above, the nursery supplies plants for various purposes. Most of the plants are native species and are therefore hosts to insect species. The role of nurseries as islands of biodiversity in urban or degraded rural landscapes cannot be overlooked.

The two additions to the state fauna of Chhattisgarh butterflies both belong to Lycaenidae and are as follows:

*Jamides bochus* (Stoll, [1782]) Dark Cerulean

**Specimen Photographed** 01.vii.2020 and 19.vii.2020, Government Nursery, Bhatagaon, (20°86' N & 81°69' E), Chhattisgarh; Gulab Chand.

**Known Distribution**

There are two subspecies of *J. bochus* recorded in India, *J. b. bochus* distributed throughout India including Andaman Is. and *J. b. nicobaricus* (de Niceville, 1890) from the Nicobars Is. (Varshney & Smetacek, 2015).

**Remarks**

The species was first photographed on 01.vii.2020 on a cloudy day at Government Nursery, Bhatagaon and subsequently it was observed at the same location on 19.vii.2020. The butterfly was flying very actively in a grassland, settling only for few seconds at a time. Mainly the species was found flying about 1.5 to 2 m high bushes and also flying over mango trees at a height of up to 3 to 5 m. It was also observed at the residence of Gulab Chand on 25.vii.2020 & 27.vii.2020 in Atang village, and in Kurud village of Dhamtari district by Swati Tandan on 22.vii.2020.

The present observations confirm the presence of this species in Chhattisgarh. It is not a range extension.

*Anthene lycaenina* (R. Felder, 1868) Pointed Ciliate Blue

**Specimen Photographed**

19.vii.2020, Government Nursery, Bhatagaon, (20°86' N & 81°69' E), Chhattisgarh; Gulab Chand.

**Known Distribution:** Gujarat southwards to Kerala and eastwards to Odisha and W. Bengal. (Varshney & Smetacek, 2015). Jharkhand, Northeast, Odisha, Sikkim in the west to Arunachal Pradesh in the east in Himalaya, South India up to Gujarat, Tripura, West Bengal, Bangladesh, Myanmar, Sri Lanka. (Lodh & Agarwala, 2015)

**Remarks**

The specimen photographed was sitting on a concrete surface of the approach road inside the nursery and photographed only once. This record also merely confirms the presence of this butterfly in Chhttisgarh and is not an extension to the known distribution, since it was reported from Odisha as well as south India earlier (Lodh & Agarwala, 2015).

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**Table – 1:** List of the recorded butterflies from Government Nursery Bhatagaon, District-Dhamtari, Chhattisgarh, India.

| S. N. | Common Name | Scientific Name | Recorded on (07:00 am to 11:00 am) | | | Distribution in India (Varshney & Smetacek, 2015) |
|---|---|---|---|---|---|---|
| | | | 22.v. 2020 | 30.vi. 2020 | 19.vii. 2020 | |
| **Family: Papilionoidae** | | | | | | |
| **Sub family: Papilioninae** | | | | | | |
| *01.* | Common Rose | *Pachliopta aristolochiae* (Fabricius, 1775) | – | – | + | Throughout India |
| *02.* | Lime Swallowtail | *Papilio demoleus* Linnaeus, 1758 | – | + | + | Throughout India below 2000m elevation |
| *03.* | Common Mormon | *Papilio polytes* Linnaeus, 1758 | – | + | + | Throughout India below 2000m elevation |
| *04.* | Common Jay | *Graphium doson* (C&R. Felder, 1864) | + | + | + | J&K to N.E. India, Delhi, South India to W. Bengal |
| **Family: Hesperiidae** | | | | | | |
| **Sub Family: Coeliadinae** | | | | | | |
| *05.* | Common Banded Awl | *Hasora chromus* (Cramer, 1780) | – | – | + | Throughout India and Andaman & Nicobar Islands |
| **Family: Pieridae** | | | | | | |
| **Sub Family: Coliadinae** | | | | | | |
| *06.* | Common Emigrant | *Catopsilia pomona* (Fabricius, 1775) | + | + | + | Throughout India |
| *07.* | Mottled Emigrant | *Catopsilia pyranthe (Linnaeus, 1758)* | + | + | + | Throughout India |
| *08.* | Common Grass Yellow | *Eurema hecabe* (Linnaeus, 1758) | + | + | + | Throughout India including Andaman & Nicobar Islands |
| **Sub Family: Pierinae** | | | | | | |
| *09.* | Pioneer | *Belenois aurota* (Fabricius, 1793) | + | + | + | Throughout India except N.E. States |
| **Family: Lycaenidae** | | | | | | |
| **Sub Family: Theclinae** | | | | | | |
| *10.* | Large Oakblue | *Arhopala amantes* (Hewitson, 1862) | – | – | + | Gujarat to Andhra Pradesh and southwards to Kerala, Arunachal to Manipur |
| *11.* | Common Guava Blue | *Virachola isocrates* (Fabricius, 1793) | – | – | + | Throughout India |
| **Sub Family: Polyommatinae** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| *12.* | Pointed Ciliate Blue | *Anthene lycaenina* (R. Felder, 1868) | − | − | + | Gujarat southwards to Kerala and eastwards to Odisha and W. Bengal |
| *13.* | Common Lineblue | *Prosotas nora* (C. Felder, 1860) | + | − | + | Andaman & Nicobar Islands, throughout India except arid regions |
| *14.* | Dark Cerulean | *Jamides bochus* (Stoll, [1782]) | − | + | + | Throughout India including Andaman & Nicobar Islands |
| *15.* | Zebra Blue | *Leptotes plinius* (Fabricius, 1793) | + | + | + | Throughout India except Jammu & Kashmir |
| *16.* | Common Pierrot | *Castalius rosimon* (Fabricius, 1775) | + | − | + | Throughout India including Andaman and Nicobar Islands |
| *17.* | Dark Grass Blue | *Zizeeria karsandra* (Moore, 1865) | + | − | + | Throughout India, Andaman & Nicobar Islands |
| *18.* | Lesser Grass Blue | *Zizina otis* (Fabricius, 1787) | + | + | + | Throughout India, W. Bengal and Sikkim to N.E. India, Andaman & Nicobar Islands |
| *19.* | Indian Cupid | *Everes lacturnus* (Godart, [1824]) | − | − | + | Himachal to N.E. India, Uttar Pradesh and Bihar, Andaman & Nicobar Islands, Gujarat southwards to Andhra Pradesh and Kerala |
| *20.* | Gram Blue | *Euchrysops cnejus (*Fabricius, 1798) | + | + | + | Throughout India |
| *21* | Grass Jewel | *Freyeria trochylus* (Freyer, 1845) | + | + | + | South India, North India from Punjab to N.E. India |
| *22.* * | Small Grass Jewel | *Freyeria putli* (Kollar, [1844] ) | + | + | + | Throughout India |
| *23.* | Lime Blue | *Chilades lajus* (Stoll, [1780]) | + | + | + | Throughout India |
| *24.* | Small Cupid | *Chilades parrhasius* (Fabricius, *1793)* | − | − | + | Rajasthan to Kerala; eastwards to Uttar Pradesh; Himachal Pradesh and Uttarakhand. |
| **Family: Nymphalidae** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Sub Family: Danainae** | | | | | | |
| *25.* | Plain Tiger | *Danaus chrysippus* (Linnaeus, 1758) | + | + | + | Throughout India |
| *26.* | Common Tiger | *Danaus genutia* (Cramer, [1779]) | + | + | + | Throughout India |
| *27.* | Blue Tiger | *Tirumala limniace* (Cramer, [1775]) | + | + | + | Throughout India including Andaman & Nicobar Island and Lakshadweep |
| *28.* | Common Crow | *Euploea core* (Cramer, [1780]) | + | + | + | Throughout India, Andaman & Nicobar Islands |
| **Sub Family: Satyrinae** | | | | | | |
| *29.* | Common Evening Brown | *Melanitis leda* (Linnaeus, 1758) | + | + | + | Throughout India |
| **Sub Family: Limenitidinae** | | | | | | |
| *30.* | Common Sailer | *Neptis hylas* (Linnaeus, 1758) | + | − | + | Andaman Island, Uttarakhand to N.E. India, Southern Nicobar Island, Gujarat, Madhya Pradesh and Jharkhand southwards to Kerala |
| *31.* | Baronet | *Symphaedra nais* (Forster, 1771) | − | − | + | Tamil Nadu to Gujarat and Rajasthan, eastwards to W. Bengal and along the Himalaya from Uttarakhand to W. Bengal |
| **Sub Family: Nymphalinae** | | | | | | |
| *32.* | Peacock Pansy | *Junonia almana (Linnaeus,1758)* | + | + | + | Throughout India |
| *33.* | Gray Pansy | *Junonia atlites* (Linnaeus, 1763) | + | + | + | Throughout India |
| *34.* | Lemon Pansy | *Junonia lemonias* (Linnaeus, 1758)) | + | + | + | Sikkim to N.E. India, J&K to Uttarakhand, Rajasthan to Kerala and eastwards to Jharkhand |
| *35.* | Blue Pansy | *Junonia orithya* (Linnaeus, 1758) | + | + | + | Sikkim to N.E. India, Nicobar Islands, J&K to Kerala and W. Bengal |

| | | | | | | |
|---|---|---|---|---|---|---|
| *36.* | Great Eggfly | *Hypolimnas bolina* (Linnaeus, 1758) | + | − | + | Throughout India except very arid region |
| *37.* | Danaid Eggfly | *Hypolimnas misippus* (Linnaeus, 1764) | − | + | + | Throughout India |
| **Sub Family: Acraeinae** | | | | | | |
| *38.* | Tawny Coster | *Acraea violae (Fabricius, 1793)* | + | + | + | Throughout India |

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

Fig. 1: *Jamides bochus* underside


Fig. 2: *Jamides bochus* upperside

Fig.3: *Anthene lycaenina*

Fig.4: *Hasora chromus*

Fig.5: *Eurema hecabe*

Fig.6: *Prosotas nora*

Fig.7: *Everes lacturnus*

Fig.8: *Arhopala amantes*

Fig.9: *Freyeria trochylus*

Fig.10: *Freyeria putli*