Fifty-one new additions to the butterfly (Lepidoptera: Rhopalocera) fauna of Tripura, North-east India

Cincuenta y una nuevas incorporaciones a la fauna de mariposas (Lepidoptera: Rhopalocera) de Tripura, noreste de India

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Abstract. The state of Tripura of North-east India is a part of the Indo-Myanmar biodiversity hotspot and rich in unique biological flora and fauna. The present study is based on extensive surveys done by the author for a period of 5 years in different parts of North Tripura, North-east India. Here, I present a total of 21 genera and 51 species that are new additions to the butterfly fauna of Tripura. These new records include 18 species of Hesperiidae, 12 species of Lycaenidae, 17 species of Nymphalidae and 4 species of Pieridae. These records represent a 20.90% increase in the number of butterflies known from Tripura and update the existing checklist of butterfly fauna of the state.

Key words: Conservation; Jampui Hills; new additions; North Tripura; North-east India.

Introduction

Butterflies hold promise as bioindicators of terrestrial environments and habitat quality. They have established roles in biological monitoring and conservation policy makings (Koh 2007; McGeoch 1998; Stork et al. 2003). Because of their close association with specific larval host plants, as well as their pollinating activities, butterflies often reflect potentials to be strong indicators of the presence of particular plant taxa (Sparrow et al. 1994). They are valuable pollinators moving from plant to plant, gathering nectar and are one of the important food chain components of birds, reptiles, spiders, and predatory insects (Sharma...
& Joshi 2009). Many butterfly species are strictly seasonal and prefer only a particular set of habitats (Kunte 1997). So, they also provide clues to small changes in climate conditions. They also serve as good indicators in terms of anthropogenic disturbance and habitat quality (Kocher & Williams 2000).

The picturesque hill state Tripura is situated in the western heart of Indo-Myanmar global hotspot (Mittermier et al. 2005; Tordoff et al. 2012). Tripura lies between 22°56’ - 24°32’ N latitude and 90°09’ - 92°20’ E longitude, covering an area of 10,492 square km. The forest covering area of the state is about 60% of the total area (Forest of Tripura 2020; www.forest.tripura.gov.in). The forest of the state is mostly dominated by semi-evergreen to moist deciduous plants and secondary bamboo breaks (Majumdar et al. 2012). Tripura has a humid climate and the annual rainfall ranges between 2,250 mm to 2,500 mm: and the annual temperature varies from 7 °C to 36 °C (ISFR 2019). Tripura is surrounded by Bangladesh on its north, south, and west, sharing about 856 km international border. In the east, it shares a common boundary with Mizoram and Assam for about 109 km and 53 km, respectively. Almost 30% of the total area is hilly tracts and mountains and the rest are alluvial plain, well cultivated and traversed by rivers (Nandi & Varshney 1988). The undulating topography of the state is due to the presence of a series of six major hill ranges running parallel with north-south orientation, each separated by subsequent narrow valleys. From west to the east each successive hill range rises higher than the previous; the lowest Deotamura Range is followed by the Baramura, Atharamura, Langtarai, Sakhan and Jampui range. The highest peak of Tripura, Betlingchhip, resides to the extreme south of the Jampui range.

There are around 244 species of butterflies under six families of insect order Lepidoptera in Tripura based on observation and sighting records by previous researchers (Nandi & Varshney 1988; Watson 1891; Majumder et al. 2012, 2013; Lodh & Agarwala 2015, 2016; Das 2017; Nair et al. 2018; Agarwala & Majumder 2019; Bhowmik et al. 2020; Deb & Mandal 2020).

The present work provides a brief description of 51 butterfly species that are new additions to the existing butterfly fauna of Tripura thereby increasing the total species number by 20.90 percent.

**Materials and Methods**

The author is constantly surveying butterflies in different parts of Tripura to document current populations, distribution, and status of butterflies for the last few years. As part of this long-term monitoring and diversity inventory programme, the author conducted preliminary and opportunistic surveys at different locations of Tripura from 2015-2020. The present observation on butterflies is based on the surveys conducted in the following study sites of North Tripura, Northeast India.

1. **Jampui Hills**: Jampui Hills is situated in northern part of the state and it ranges north to south, bordering the state Mizoram in the east. This area holds high potential for butterfly diversity being consists of small to large waterfalls and supportive vegetations. The coordinates included in this area are 24°2’20” N & 92°16’18” E; 23°48’51” N & 92°15’33” E; 24°0’9” N & 92°16’44” E; 24°2’20” N & 92°16’19” E; 23°59’17” N & 92°16’46” E; 24°0’6” N & 92°16’44” E; 24°1’54” N & 92°15’37” E.

2. **Panisagar**: Being situated in North Tripura District, The Rowa Wildlife Sanctuary is placed in the heart of this area. There are various potential areas for butterflies outside Rowa Wildlife Sanctuary that lies in the periphery of this area. The coordinates included in this area are 24°17’29” N & 92°9’31” E; 24°17’38” N & 92°9’27” E; 24°17’6” N & 92°9’20” E.

3. **Kameswar Village**: It is a small village under Dharmanagar Sub-division of North Tripura 36
District. A tributary of Kakri river flows through the heart of this village. There are many supportive larval host plants and nectaring plants along side of this tributary. The blooms of *Chromolaena odorata* (L.) R.M. King & H. Rob. and other wild flowers during winter season attract substantial number of butterfly species in this village. This area is especially important for butterflies that feed on Fabaceae plants. The coordinates included in this area are 24°22′21″ N & 92°10′47″ E; 24°22′21″ N & 92°10′51″ E.

**Figure 1.** Localities of new additions situated in Tripura, North-east India. Map courtesy Google Earth. / Localidades de las nuevas adiciones situadas en Tripura, noreste de India. Mapa cortesia de Google Earth.
4. **Kakrir Par Village**: A small village situated in Dharmanagar, North Tripura District, in the bank of Kakri river. This area is significant for butterflies that feed on bamboo breaks. The coordinate included in this area is 24°22’12” N & 92°10’31” E.

5. **Ganganagar Tea Garden**: It lies in North Tripura District. Vegetations that grow in fences or boundaries of this tea garden support wide variety of butterfly species. The coordinates included in this area are 24°3’29” N & 92°16’43” E; 24°3’29” N & 92°16’42” E.

The species identification was done by consulting the original taxonomic work and field guides (Evans 1927, 1932, 1949; Moore 1890-1892, 1893-1896, 1899-1900, 1901-1903, 1903-1905; Swinhoe 1905-1910, 1910-1911, 1911-1912, 1912-1913; Talbot 1947; Wynter-Blyth 1957). All the subspecies listed in this paper are based on the distribution of subspecies in Indian literature (Van Gasse 2013; Varshney & Smetacek 2015). Standard common English names for butterflies are used in this present work following Varshney & Smetacek (2015).

**Results and Discussion**

In the present study, the author documented a total of 51 butterfly species belonging to 4 families, 13 subfamilies and 41 genera (Table 1). These 51 species are documented for the first time in the state and considered as new additions to the butterfly fauna of Tripura (Nandi & Varshney 1988; Watson 1891; Majumder et al. 2012; Majumder et al. 2013; Lodh & Agarwala 2015, 2016; Das 2017; Nair et al. 2018; Agarwala & Majumder 2019; Bhowmik et al. 2020; Deb & Mandal 2020). Out of these 51 new additions, 18 species are from family Hesperiidae, 12 species from family Lycaenidae, 17 species from family Nymphalidae and 4 species from family Pieridae. Out of 41 genera, 21 genera are documented for the first time in the state (Table 1). A total of 35 species out of the new additions are documented from Jampui Hills, North Tripura District (Table 2).

| Family    | Subfamily | Number of new recorded genera | Total number of new recorded genera | Number of new recorded species | Total number of new recorded species |
|-----------|-----------|-------------------------------|------------------------------------|-------------------------------|-------------------------------------|
| Hesperiidae | Coeliadinae | 1                             | 5                                  | 1                             | 18                                  |
|           | Hesperinae | 3                             |                                    | 12                            |                                     |
|           | Pyrginae   | 1                             |                                    | 5                             |                                     |
| Lycaenidae | Lycaeninae | -                             | 9                                  | 1                             | 12                                  |
|           | Miletinae  | 1                             |                                    | 1                             |                                     |
|           | Polyommatinae | 8                        |                                    | 10                            |                                     |
| Nymphalidae | Aputurinae | 1                             | 7                                  | 2                             | 17                                  |
|           | Danainae   | -                             |                                    | 4                             |                                     |
|           | Heliconiinae | 2                           |                                    | 4                             |                                     |
|           | Nymphalinae | 1                             |                                    | 1                             |                                     |
|   | Satyrinae  | 3                             |                                    | 6                             |                                     |
| Pieridae | Coliadinae | -                             | -                                  | 1                             | 4                                    |
|           | Pierinae   | -                             | -                                  | 3                             |                                     |

Table 1. Taxonomic overview of new additions to the butterfly fauna of Tripura. / Resumen taxonómico de las nuevas adiciones a la fauna de mariposas de Tripura.
Table 2. List of 51 species that are new additions to the butterfly fauna of Tripura. The list of 21 new genera additions is marked with asterisks in the table. / Lista de 51 nuevas adiciones a la fauna de mariposas de Tripura. Los 21 géneros adicionados están marcados con asterisco.

| SL. No. | Common name       | Scientific name                                      | Location          | Habitat | Number of sighting records |
|---------|-------------------|-----------------------------------------------------|-------------------|---------|----------------------------|
| 1       | Small Green Awlet | *Burara amara* (Moore, [1866])*                     | Jampui Hills      | NW      | 1                          |
| 2       | Narrow-banded     | *Koruthialos rubecula cachara* (Evans, 1949)        | Jampui Hills      | NW      | 2                          |
| 3       | Silver-spotted    | *Plastingia naga* (de Niceville, [1884])*           | Panisagar         | F       | 1                          |
| 4       | Bevan’s Swift     | *Borbo bevani* (Moore, 1878)                        | Kameswar Village  | HG      | 1                          |
| 5       | Leech’s Swift     | *Calotis bromus bromus* (Leech, 1894)               | Kameswar Village, Kakrir Par Village | VR | 4 |
| 6       | Dark-branded Swift| *Calotis brunnea caer* (de Niceville, 1891)         | Panisagar         | VR      | 1                          |
| 7       | Full-stop Swift   | *Calotis cormasa* (Hewitson, 1876)                  | Kakrir Par village | VR  | 1 |
| 8       | Tufted Swift      | *Calotis plebeia* (de Niceville, 1887)              | Ganganagar Tea Garden | VR | 1 |
| 9       | Sirius Swift      | *Calotis sirius sirius* (Evans, 1926)               | Kameswar village  | HG      | 1                          |
| 10      | Himalayan Swift   | *Polytremis discreta discreta* (Elwes & Edwards, 1897)*)# | Jampui Hills | VR | 1 |
| 11      | Pale Dart         | *Potanthus pallida* (Evans, 1932)                   | Jampui Hills      | HF      | 1                          |
| 12      | Indian Dart       | *Potanthus pseudomaesa clio* (Evans, 1932)          | Jampui Hills      | HF      | 5                          |
| 13      | Common Grass Dart | *Taractrocera maevius sagara* (Moore, [1866])*       | Ganganagar Tea Garden | TG | 1 |
| 14      | Elwes’s Pied Flat | *Coladenia agnioides* Elwes & Edwards, 1897         | Jampui Hills      | HF      | 2                          |
| 15      | Tricolour Pied Flat| *Coladenia indrani uposathra* Fruhstorfer, [1911] | Jampui Hills, Ambassa | NW | 3 |
| 16      | Common Yellow-breast Flat | *Gerosis bhagava bhagava* (Moore, [1866]) | Jampui Hills | R | 1 |
| 17      | Yellow Flat       | *Mooreana trichoneura pralaya* (Moore, [1866])*     | Jampui Hills      | NW      | 2                          |
| 18      | Spotted Snow Flat | *Tagiades menaka menaka* (Moore, [1866])*           | Jampui Hills      | NW      | 1                          |
| 19      | Indian Purple     | *Heliophorus indicus indicus* (Fruhstorfer, 1908)  | Jampui Hills      | VR      | 1                          |
| 20      | Great Darkie      | *Allotinus drumila drumila* (Moore, [1866])*#       | Jampui Hills      | HF      | 2                          |
| 21      | Fawcett’s Pierrot | *Niphanda asialis marcia* (Fawcett, 1904)*          | Jampui Hills      | VR      | 1                          |
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| 22. | Glistening Cerulean | *Jamides elpis pseudelpis* (Butler, [1879]) | Jampui Hills | NW | 1 |
| 23. | White-banded Hedge Blue | *Lestranicus transpectus* (Moore, 1879)* | Jampui Hills | NW | 3 |
| 24. | Opaque Sixlineblue | *Nacaluba beroe gythion* Fruhstorfer, 1916 | Panisagar | F | 1 |
| 25. | Blue Imperial | *Ticherra acte* (Moore, [1858])* | Jampui Hills | HF, NW | 6 |
| 26. | Cornelian | *Deudorix epijarbas epijarbas* (Moore, [1858])* | Jampui Hills, Panisagar | HF, F | 3 |
| 27. | Broadtail Royal | *Crem cleobis cleobis* (Godart, [1824])* | Kameswar village | VR | 2 |
| 28. | Double-tufted Royal | *Dacalana penicilligera* (de Niceville, 1890)* | Panisagar | F | 4 |
| 29. | White Royal | *Pratapa deva lila* Moore, [1884]*# | Kameswar village | VR | 1 |
| 30. | Saffron | *Mota massyla* (Hewitson, [1869])* | Jampui Hills | HF | 1 |

**Family - Nymphalidae, Subfamily - Apaturinae**

| 31. | Indian Purple Emperor | *Mimathyma ambica ambica* (Kollar, [1844])* | Jampui Hills | NW | 1 |
| 32. | Sergeant Emperor | *Mimathyma chevana chevana* (Moore, [1866]) | Jampui Hills | VR | 1 |

**Family - Nymphalidae, Subfamily - Danainae**

| 33. | Long-branded Blue Crow | *Euploea algea deione* Westwood, 1848 | Jampui Hills | NW | 1 |
| 34. | Double-branded Crow | *Euploea sylvester hopei* C. & R. Felder, [1865] | Panisagar | F | 5 |
| 35. | Chocolate Tiger | *Parantica melanoe plataniston* (Fruhstorfer, 1910) | Jampui Hills | VR | 1 |
| 36. | Dark Blue Tiger | *Tirumala septentrionis septentrionis* (Butler, 1874) | Panisagar | F | 2 |

**Family - Nymphalidae, Subfamily - Heliconiinae**

| 37. | Banded Marquis | *Bassarona teuta teuta* (Doubleday, [1848])*# | Jampui Hills | NW, AL | 8 |
| 38. | Green Commodore | *Sumalia daraxa daraxa* (Doubleday, [1848])* | Jampui Hills | HF, NW | 3 |
| 39. | Small Yellow Sailer | *Neptis miah miah* Moore, [1858] | Jampui Hills | NW | 4 |
| 40. | Perak Lascar | *Pantoporia paraka paraka* (Butler, 1879) | Panisagar | F | 1 |

**Family - Nymphalidae, Subfamily - Nymphalinae**

| 41. | Autumn Leaf | *Doleschallia bisaltide indica* Moore, 1899* | Jampui Hills | HF, NW | 2 |

**Family - Nymphalidae, Subfamily - Satyrinae**

| 42. | Common Faun | *Faunis canens arcesilas* Stichel, 1933* | Jampui Hills | HF | 1 |
| 43. | Bamboo Forester | *Lethe kansa* (Moore, [1858]) | Jampui Hills | VR | 1 |
| 44. | Plain Bushbrown | *Telinga malsarida* (Butler, 1868)* | Jampui Hills | VR | 1 |
| 45. | Plain Threering | *Ypthima lycur lycus* de Niceville, 1889 | Jampui Hills | GL | 1 |
A brief description on the locations of observation along with geographical coordinates and altitudes; date of observations; habitat; and photographic records of the 51 new additions are given in this section.

**Family - Hesperiidae**

**Subfamily - Coeliadinae**

1. **Burara amara (Moore, [1866])** (Small Green Awlet)

**Remarks.** A single individual was sighted in Jampui Hills (24°2’20” N & 92°16’18” E, ca. 335 m above msl.), while mud-puddling near roadsides on 7.viii.2016. This species is rare throughout the state.

**Current known distribution.** Nepal, Myanmar, India (Sikkim to Northeast India; Andaman Islands) (Van Gasse 2013; Varshney & Smetacek 2015).

**Family - Hesperiidae**

**Subfamily - Hesperiinae**

2. **Koruthaialos rubecula cachara Evans, 1949** (Narrow-banded Velvet Bob)

**Remarks.** On 07.xii.2019, a single individual (red-banded form) was sighted in Jampui Hills (24°0’9” N & 92°16’44” E, ca. 571 m above msl.) while mud-puddling near roadsides. Recently in October, 2020 a female individual was recorded at Betlingchhip (23°48’51” N & 92°15’33” E) in Jampui Hills. This species is rare throughout the state.

**Current known distribution.** Nepal, Bangladesh, India (Assam, Manipur, Meghalaya, Nagaland) (Van Gasse 2013; Varshney & Smetacek 2015).

3. **Plastingia naga (de Niceville, [1884])** (Silver-spotted Lancer)

**Remarks.** On 03.xii.2018, a single individual was recorded in Panisagar (24°17’29” N
& 92°9’31” E, ca. 8 m above msl.), perching on a small tree canopy. This species is rare throughout North-east India.

**Current known distribution.** Myanmar, India (Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

4. *Borbo bevani* (Moore, 1878) (Bevan’s Swift)

**Remarks.** Rare in Tripura. One individual was recorded while nectaring on Marigold flower, at Kameswar village (24°22’21” N & 92°10’47” E, ca. 15 m above msl.) in Dharmanagar, North Tripura District. This observation was made on 13.xii.2016.

**Current known distribution.** Pakistan, Bangladesh, Myanmar, Bhutan, India (Gujarat east to West Bengal and southwards to Kerala; Jammu & Kashmir to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

5. *Caltoris bromus bromus* (Leech, 1894) (Leech’s Swift)

**Remarks.** On 17.vii.2016, a single individual was sighted busking on a small tree at Kameswar Village (24°22’21” N & 92°10’47” E, ca. 15 m above msl.) Dharmanagar, North Tripura district. Later several individuals were observed at Kakrir Par Village (24°22’12” N & 92°10’31” E) in Dharmanagar, North Tripura district. This species is rare throughout the state.

**Current known distribution.** Myanmar, India (Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

6. *Caltoris brunnea caere* (de Niceville, 1891) (Dark-branded Swift)

**Remarks.** This species is very rare throughout the state. After searching for several years, one male individual was recorded while nectaring on *Chromolaena odorata* in Panisagar (24°17’38” N & 92°9’27” E, ca. 10 m above msl.). This sighting was made on 28.xii.2019.

**Current known distribution.** Myanmar, Bangladesh, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

7. *Caltoris cormasa* (Hewitson, 1876) (Full-stop Swift)

**Remarks.** This species is rare throughout the state. On 17.xii.2017, a single individual was recorded while nectaring on *Chromolaena odorata* at Kakrir Par village (24°22’12” N & 92°10’31” E, ca. 39 m above msl.), Dharmanagar, North Tripura.

**Current known distribution.** Myanmar, Bangladesh, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

8. *Caltoris plebeia* (de Niceville, 1887) (Tufted Swift)

**Remarks.** A Single individual was recorded at Ganganagar Tea Garden (24°3’29” N & 92°16’43” E, ca. 29 m above msl.), while busking on a fern. This record was made on 04.vi.2018. This species is rare throughout the state.
Current known distribution. Nepal, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

9. *Caltoris sirius sirius* (Evans, 1926) (Sirius Swift)

Remarks. On 12.xii.2016, two individuals were recorded, nectaring on Marigold flower at Kameswar Village (24°22′21″ N & 92°10′47″ E, ca. 15 m above msl.). This species is rare throughout the state.

Current known distribution. Nepal, Myanmar, India (Assam, Manipur, Meghalaya) (Van Gasse 2013; Varshney & Smetacek 2015).

10. *Polytremis discreta discreta* (Elwes & Edwards, 1897) (Himalayan Swift)

Remarks. This species is legally protected under schedule II of the Indian Wildlife (Protected) Act, 1972 (Anonymous 1997). A single individual was recorded at Betlingchhip (23°48′51″ N & 92°15′33″ E, ca. 335 m above msl.) in Jampui Hills, while busking on a bush. This record was made on 08.xi.2019. This species is very rare throughout the state.

Current known distribution. Pakistan, Myanmar, India (Jammu & Kashmir to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

11. *Potanthus pallida* (Evans, 1932) (Pale Dart)

Remarks. On 06.xi.2019, a single individual was recorded at Vangmun (24°0′9″ N & 92°16′44″ E, ca. 571 m above msl.) in Jampui Hills. This species is rare throughout the state.

Current known distribution. Sri Lanka, Myanmar, India (Karnataka to Kerala; Himachal Pradesh to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

12. *Potanthus pseudomaesa clio* (Evans, 1932) (Indian Dart)

Remarks. A total of three individuals were sighted in Jampui Hill (24°2′20″ N & 92°16′19″ E, ca. 329 m above msl.). This observation was made on 15.i.2017. This species is quite common in Jampui Hills but rare throughout the state.

Current known distribution. Bangladesh, Myanmar, India (Jammu & Kashmir to Northeast India; Uttar Pradesh to West Bengal) (Van Gasse 2013; Varshney & Smetacek 2015).

13. *Taractrocera maevius sagara* (Moore, [1866]) (Common Grass Dart)

Remarks. On 12.viii.2015, on individual was recorded at Ganganagar Tea Garden (24°3′29″ N & 92°16′42″ E, ca. 49 m above msl.), North Tripura District while perching on a grass. This species is rare throughout the state.

Current known distribution. Pakistan, Bangladesh, Myanmar, India (Gujarat to Kerala; Madhya Pradesh; West Bengal; Jammu & Kashmir to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).
Figure 2. Photographic records of: 1. *Burara amara*. 2-4. *Koruthaialos rubecula cachara* (red-banded form). 5. *Plastingia naga*. 6-7. *Borbo bevani*. 8-9. *Caltoris bromus bromus*. 10-11. *Caltoris brunnea caere*. 12. *Caltoris cormasa*. / Registros fotográficos de: 1. *Burara amara*. 2-4. *Koruthaialos rubecula cachara* (forma con bandas rojas). 5. *Plastingia naga*. 6-7. *Borbo bevani*. 8-9. *Caltoris bromus bromus*. 10-11. *Caltoris brunnea caere*. 12. *Caltoris cormasa*.
Figure 3. Photographic records of: 13. Caltoris cormasa. 14-16. Caltoris plebeia. 17-18. Caltoris sirius sirius. 19-20. Polytremis discreta discreta. 21-22. Potanthus pallida. 23-24. Potanthus pseudomaesa clio. / Registros fotográficos de: 13. Caltoris cormasa. 14-16. Caltoris plebeia. 17-18. Caltoris sirius sirius. 19-20. Polytremis discreta discreta. 21-22. Potanthus pallida. 23-24. Potanthus pseudomaesa clio.
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Family - Hesperiidae
Subfamily – Pyrginae

14. **Coladenia agnioides** Elwes & Edwards, 1897 (Elwes’s Pied Flat)

**Remarks.** Two individuals were recorded at Betlingchhip (23°48'51” N & 92°15'33” E, ca. 827 m above msl.), on 26.viii.2019, near a roadside. Recently in October 2020 another individual was sighted at the same location. This species is very rare throughout the state.

**Current known distribution.** Nepal, Myanmar, India (Manipur, Nagaland, Sikkim) (Van Gasse 2013; Varshney & Smetacek 2015).

15. **Coladenia indrani uposathra** Fruhstorfer, [1911] (Tricolour Pied Flat)

**Remarks.** A single individual was recorded in Jampui Hills (24°2'20” N & 92°16'19” E, ca. 329 m above msl.) till 04.vi.2016. Later three individuals were sighted in Ambassa, Dhalai District, on 15.iv.2017. Recently in October 2020 another individual was sighted at the same location in Jampui Hills. This species is rare throughout the state.

**Current known distribution.** Myanmar, India (Manipur) (Van Gasse 2013; Varshney & Smetacek 2015).

16. **Gerosis bhagava bhagava** (Moore, [1866]) (Common Yellow-breast Flat)

**Remarks.** On 05.xii.2015, a single individual was recorded at Vanghmun (24°0’9” N & 92°16’44” E, ca. 571 m above msl.) in Jampui Hills, while resting on a Pteridophyte. This species is not common in Tripura.

**Current known distribution.** Nepal, Myanmar, India (Goa to Jharkhand and south to Kerala; Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

17. **Mooreana trichoneura pralaya** (Moore, [1866]) (Yellow Flat)

**Remarks.** A single individual was recorded in Jampui Hills (24°2’20” N & 92°16’19” E, ca. 329 m above msl.), near to a waterfall on 03.vi.2018. In November 2019 two more individuals were sighted in the same area. This species is very rare in Tripura.

**Current known distribution.** Myanmar, India (Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

18. **Tagiades menaka menaka** (Moore, [1866]) (Spotted Snow Flat)

**Remarks.** One individual was recorded in Jampui Hills (24°2’20” N & 92°16’19” E, ca. 329 m above msl.) till 05.xi.2019. On 07.xi.2019, two more individuals were recorded in the same area. This species is very rare throughout the state.

**Current known distribution.** Bhutan, Myanmar, India (Kashmir to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Lycaenidae
Subfamily - Lycaeninae
19. *Heliophorus indicus indicus* (Fruhstorfer, 1908) (Indian Purple Sapphire)

**Remarks.** A mating couple was sighted from Jampui Hills (23°59′17″ N & 92°16′46″ E, ca. 350 m above msl.) on 07.xi.2019. Immediately after mating, the male flew away and perched on a Colocasia leaf with his wing wide open, where it was photographed. This species is very rare throughout the state.

**Current known distribution.** Nepal, Myanmar, India (Sikkim, Assam) (Van Gasse 2013; Varshney & Smetacek 2015).

**Family** - Lycaenidae  
**Subfamily** - Miletinae

20. *Allotinus drumila drumila* (Moore, [1866]) (Great Darkie)

**Remarks.** This species is legally protected under schedule I of the Indian Wildlife (Protected) Act, 1972 (Anonymous 1997). One individual was recorded perching on bushes in Jampui Hills (23°59′17″ N & 92°16′46″ E, ca. 350 m above msl.), on 06.xi.2019. Recently in October 2020 eight individuals were sighted at Betlingchhip in Jampui Hills. The species is quite rare in the state.

**Current known distribution.** Bangladesh, India (Uttarakhand, Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

**Family** - Lycaenidae  
**Subfamily** - Polyommatinae

21. *Niphanda asialis marcia* (Fawcett, 1904) (Fawcett’s Pierrot)

**Remarks.** At 11:30 am, one individual was observed, when nectaring on a wild flowering plant in Jampui Hills (24°2′20″ N & 92°16′18″ E, ca. 335 m above msl.), on 31.xii.2017. The species is rare in Tripura as well all throughout India.

**Current known distribution.** Myanmar, India (Assam) (Van Gasse 2013; Varshney & Smetacek 2015).

22. *Jamides elpis pseudelpis* (Butler, [1879]) (Glistening Cerulean)

**Remarks.** On 12.v.2019, a male individual was sighted hovering over the puddling ground near a waterfall (24°2′20″ N & 92°16′19″ E, ca. 329 m above msl.), in Jampui Hills. Rarely found *Jamides* species of the state.

**Current known distribution.** Bangladesh, Myanmar, India (Sikkim to Northeast India; Andaman & Nicobar Islands) (Van Gasse 2013; Varshney & Smetacek 2015).

23. *Lestranicus transpectus* (Moore, 1879) (White-banded Hedge Blue)

**Remarks.** One individual recorded from Jampui Hills (24°2′20″ N & 92°16′19″ E, ca. 329 m above msl.), on 29.xii.2017, during mud-puddling near roadsides. After that, several individuals were recorded in Betlingchhip, the highest peak of the state. This species is very rare throughout the state but can be seen most often in Jampui Hills.
Figure 4. Photographic records of: 25. *Taractrocera maevius sagara*. 26-27. *Coladenia agnioides*. 28. *Coladenia indrani uposathra*. 29. *Gerosis bhagava bhagava*. 30. *Mooreana trichoneura pralaya*. 31. *Tagiades menaka menaka*. 32-33. *Heliophorus indicus indicus*. 34. *Allotinus drumila drumila*. 35. *Niphanda asialis marcia*. 36. *Jamides elpis pseudelpis*. / Registros fotográficos de: 25. *Taractrocera maevius sagara*. 26-27. *Coladenia agnioides*. 28. *Coladenia indrani uposathra*. 29. *Gerosis bhagava bhagava*. 30. *Mooreana trichoneura pralaya*. 31. *Tagiades menaka menaka*. 32-33. *Heliophorus indicus indicus*. 34. *Allotinus drumila drumila*. 35. *Niphanda asialis marcia*. 36. *Jamides elpis pseudelpis*. 
Current known distribution. Nepal, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

24. *Nacaduba beroe gythion* Fruhstorfer, 1916 (Opaque Sixlineblue)

**Remarks.** On 08.i.2017, a mating couple was recorded in Panisagar (24°17’29” N & 92°9’31” E, ca. 8 m above msl.) near roadside. This species is very rare throughout the state.

Current known distribution. Myanmar, India (Sikkim to Northeast India; Maharashtra to Kerala) (Van Gasse 2013; Varshney & Smetacek 2015).

25. *Ticherra acte acte* (Moore, [1858]) (Blue Imperial)

**Remarks.** This species was first observed in Jampui Hills while busking on tree canopy in December 2015. Later this species was sighted several times in Jampui Hills but unable to photograph on each encounter. However, on 07.xi.2019, one male individual was photographed in Jampui Hills (24°2’20” N & 92°16’19” E, ca. 329 m above msl.). Another observation occurred in Panisagar, near the Rowa Wildlife Sanctuary. This species is not so rare in Tripura.

Current known distribution. Bangladesh, Myanmar, India (Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

26. *Deudorix epijarbas epijarbas* (Moore, [1858]) (Cornelian)

**Remarks.** This species is rare in Tripura and only a single record was made from Panisagar (24°17’6” N & 92°9’20” E, ca. 61 m above msl.), till 16.v.2018, while puddling on sandy surface. Two more sightings were made afterwards in Jampui Hills.

Current known distribution. Sri Lanka, Pakistan, Nepal, Myanmar, India (South India to West Bengal; Jammu & Kashmir to Uttarakhand; Sikkim to Northeast India, Andaman & Nicobar Islands) (Van Gasse 2013; Varshney & Smetacek 2015).

27. *Creon cleobis cleobis* (Godart, [1824]) (Broadtail Royal)

**Remarks.** One individual was recorded at Kameswar village (24°22’21” N & 92°10’51” E, ca. 29 m above msl.) in Dharmanagar, North Tripura district on 01.viii.2016 while resting on grass. In January 2018, another individual was sighted in the same place, nectering on *Chromolaena odorata*. This species is not so common in Tripura.

Current known distribution. Bangladesh, Myanmar, India (Goa to Kerala; Himachal Pradesh to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

28. *Dacalana penicilligera* (de Niceville, 1890) (Double-tufted Royal)

**Remarks.** A single individual was sighted from Panisagar till 03.v.2016, inside a forest patch (24°17’6” N & 92°9’20” E, ca. 61 m above msl.) near roadsides. Later several observations were made in Rowa Wildlife Sanctuary. This species is rare throughout the state, but it can be seen from March onwards in the present locality.

Current known distribution. Bangladesh, Myanmar, India (West Bengal to Northeast
India) (Van Gasse 2013; Varshney & Smetacek 2015).

29. Pratapa deva lila Moore, [1884] (White Royal)

Remarks. This species is legally protected under schedule II of the Indian Wildlife (Protected) Act, 1972 (Anonymous 1997). On 07.i.2018, a male individual was recorded while nectaring on Chromolaena odorata near roadsides (24°22'21” N & 92°10'51” E, ca. 29 m above msl.) at Kameswar village in Dharmanagar, North Tripura district. This species is very rare throughout the state.

Current known distribution. Bangladesh, Myanmar, India (Andaman & Nicobar Islands; Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Lycaenidae
Subfamily - Polyommatinae

30. Mota massyla (Hewitson, [1869]) (Saffron)

Remarks. One female individual was recorded while egg laying in its host plant on 10.x.2020, in Jampui Hills (23°48'51” N & 92°15'33” E, ca. 827 m above msl.). This species is very rare throughout the state.

Current known distribution. Bhutan, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Nymphalidae
Subfamily - Apaturinae

31. Mimathyma ambica ambica (Kollar, [1844]) (Indian Purple Emperor)

Remarks. Two individuals were sighted in Jampui Hills during mud-puddling near to a waterfall (23°59'17” N & 92°16'46” E, ca. 350 m above msl.), on 07.xi.2019. This species is rare throughout the state.

Current known distribution. Myanmar, India (Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

32. Mimathyma chevana chevana (Moore, [1866]) (Sergeant Emperor)

Remarks. On 07.xi.2019, one individual was sighted perching on bushes along roadsides in Jampui Hills (23°59'17” N & 92°16'46” E, ca. 350 m above msl.). This species is very rare throughout the state.

Current known distribution. Nepal, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family Nymphalidae
Subfamily - Danainae

33. Euploea algea deione Westwood, 1848 (Long-branded Blue Crow)
Remarks. This species was recorded in Jampui Hills (24°2'20" N & 92°16'19" E, ca. 329 m above msl.), while puddling on roadways. This observation was made on 15.vi.2016. This species is also rare in the state.

Current known distribution. Nepal, Bangladesh, Myanmar, India (Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

34. Euploea sylvester hopei C. & R. Felder, [1865] (Double-branded Crow)

Remarks. On 08.vi.2019, two individuals were observed inside a forest patch in Panisagar (24°17'29" N & 92°9'31" E, ca. 8 m above msl.). Later this species was sighted several times inside Rowa Wildlife Sanctuary, although it is rare throughout the state.

Current known distribution. Nepal, Bangladesh, Myanmar, India (Sikkim and Assam) (Van Gasse 2013; Varshney & Smetacek 2015).

35. Parantica melaneus plataniston (Fruhstorfer, 1910) (Chocolate Tiger)

Remarks. One single individual was recorded on 06.xi.2019, at Betlingchhip (23°48'51" N & 92°15'33" E, ca. 827 m above msl.) in Jampui Hills while nectaring on a wild plant. This species is very rare throughout the state.

Current known distribution. Nepal, Myanmar, India (Uttarakhand to Northeast India; Nicobar Island) (Van Gasse 2013; Varshney & Smetacek 2015).

36. Tirumala septentrionis septentrionis (Butler, 1874) (Dark Blue Tiger)

Remarks. A male individual was recorded in Panisagar (24°17'38" N & 92°9'27" E, ca. 10 m above msl.) near Rowa Wildlife Sanctuary on 12.v.2016. In June 2019, another individual was sighted in the same locality, while resting on a dried stem. This species is not common in Tripura.

Current known distribution. Bangladesh, Myanmar, India (Himachal Pradesh to Northeast India; Andaman & Nicobar Islands) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Nymphalidae
Subfamily - Heliconiinae

37. Bassarona teuta teuta (Doubleday, [1848]) (Banded Marquis)

Remarks. This species is legally protected under schedule II of the Indian Wildlife (Protected) Act, 1972 (Anonymous 1997). On 05.xii.2015, a male individual was observed on a Citrus sinensis plant in Jampui Hills (24°0'6" N & 92°16'44" E, ca. 575 m above msl.). Later several sightings were made in different locations of Jampui Hills including a female. This species is not very rare in Jampui Hills, although very rare throughout the state.

Current known distribution. Bangladesh, Myanmar, India (Meghalaya & Manipur) (Van Gasse 2013; Varshney & Smetacek 2015).

38. Sumalia daraxa daraxa (Doubleday, [1848]) (Green Commodore)
Remarks. One individual was sighted at Betlingchhip (23°48’51” N & 92°15’33” E, ca. 827 m above msl.), the highest peak of Tripura. This record was made on 05.viii.2019. Later another two sightings were made at Vanghmun in Jampui Hills. This species is rare throughout the state.

Figure 5. Photographic records of: 37. Jamides elpis pseudelpis. 38. Lestranicus transpectus. 39. Nacaduba beroe gythion. 40-41. Ticherra acte acte. 42. Deudorix epijarbas epijarbas. 43. Creon cleobis cleobis. 44. Dacalana penicilligera. 45-46. Pratapa deva lila. 47. Mota massyla. 48. Mimathyma ambica ambica. / Registros fotográficos de: 37. Jamides elpis pseudelpis. 38. Lestranicus transpectus. 39. Nacaduba beroe gythion. 40-41. Ticherra acte acte. 42. Deudorix epijarbas epijarbas. 43. Creon cleobis cleobis. 44. Dacalana penicilligera. 45-46. Pratapa deva lila. 47. Mota massyla. 48. Mimathyma ambica ambica.
Current known distribution. Nepal, Bangladesh, Myanmar, India (Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Figure 6. Photographic records of: 49. Mimathyma ambica ambica. 50. Mimathyma chevana chevana. 51. Euploea algea deione. 52-53. Euploea sylvester hopei. 54. Parantica melaneus plataniston. 55. Tirumala septentrionis septentrionis. 56-57. Bassarona teuta teuta (male and female). 58-59. Sumalia daraxa daraxa. 60. Neptis miah miah. / Registros fotográficos de: 49. Mimathyma ambica ambica. 50. Mimathyma chevana chevana. 51. Euploea algea deione. 52-53. Euploea sylvester hopei. 54. Parantica melaneus plataniston. 55. Tirumala septentrionis septentrionis. 56-57. Bassarona teuta teuta (macho y hembra). 58-59. Sumalia daraxa daraxa. 60. Neptis miah miah.
39. *Neptis miah miah* Moore, [1858] (Small Yellow Sailer)

**Remarks.** Recorded one individual from Jampui Hills on 04.viii.2019, during mud-puddling near to a waterfall (24°2’20” N & 92°16’19” E, ca. 329 m above msl.). Later several sightings were made in Jampui Hills. This species is rare throughout the state.

**Current known distribution.** Nepal, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

40. *Pantoporia paraka paraka* (Butler, 1879) (Perak Lascar)

**Remarks.** This species is very rare throughout the state. One individual was recorded in Panisagar (24°17’6” N & 92°9’20” E, ca. 61 m above msl.) feeding on mosses. This observation was made on 10.vi.2016.

**Current known distribution.** Bangladesh, Myanmar, India (Arunachal Pradesh, Assam) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Nymphalidae  
Subfamily - Nymphalinae

41. *Doleschallia bisaltide indica* Moore, 1899 (Autumn Leaf)

**Remarks.** On 21.viii.2016, one individual was recorded during mud-puddling at Betlingchhip (23°48’51” N & 92°15’33” E, ca. 827 m above msl.) in Jampui Hills. Recently on 22.ii.2020, another individual was recorded near the same locality (24°2’20” N & 92°16’19” E). This species is very rare throughout the state.

**Current known distribution.** Nepal, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Nymphalidae  
Subfamily - Satyrinae

42. *Faunis canens arcesilas* Stichel, 1933 (Common Faun)

**Remarks.** One individual was recorded at Betlingchhip (23°48’51” N & 92°15’33” E, ca. 827 m above msl.), Jampui Hills on 08.xi.2019. This species is very rare throughout the state.

**Current known distribution.** Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

43. *Lethe kansa* (Moore, [1858]) (Bamboo Forester)

**Remarks.** A single individual was sighted at Vanghmun (23°59’17” N & 92°16’46” E, ca. 350 m above msl.) on puddling ground in Jampui Hills. This record was made on 07.xi.2019. Rare throughout the state.

**Current known distribution.** Myanmar, India (Uttarakhand to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).
44. *Telinga malsarida* (Butler, 1868) (Plain Bushbrown)

**Remarks.** At Vanghmun (23°59′17″ N & 92°16′46″ E, ca. 340 m above msl.) in Jampui Hills, a single individual was recorded perching on bushes. This observation was made on 06.xi.2019. This species is very rare throughout the state.

**Current known distribution.** Northeast India (Van Gasse 2013; Varshney & Smetacek 2015).

45. *Ypthima lycus lycus* de Niceville, 1889 (Plain Threering)

**Remarks.** Recorded one individual at Betlingchhip (23°48′51″ N & 92°15′33″ E, ca. 827 m above msl.), perching on grasses in Jampui Hills. This observation was made on 06.viii.2019. This species is very rare in Tripura.

**Current known distribution.** Sikkim to Northeast India (Van Gasse 2013; Varshney & Smetacek 2015).

46. *Ypthima newara newara* Moore, [1875] (Newar Threering)

**Remarks.** On 10.xi.2020, one male individual was recorded in Jampui Hills (23°48′51″ N & 92°15′33″ E, ca. 827 m above msl.), while nectaring on *Bidens pilosa* flowers. Later in the same day and same spot, a female individual was recorded while egg laying on a Poaceae plant. This species is rare throughout the state.

**Current known distribution.** Nepal, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

47. *Ethope himachala* (Moore, [1858]) (Dusky Diadem)

**Remarks.** This species is rare throughout the state, but not rare in Jampui Hills. A single individual was sighted from Jampui Hills till 07.viii.2016, inside a dark forest patch (24°2′20″ N & 92°16′19″ E, ca. 329 m above msl.) near roadsides. Later several observations were made in different locations of Jampui Hills.

**Current known distribution.** Bangladesh, Myanmar, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

Family - Pieridae

Subfamily - Coliadinae

48. *Eurema simulatrix sarinoides* (Fruhstorfer, 1910) (Scarce Grass Yellow)

**Remarks.** At Kameswar village (24°22′21″ N & 92°10′47″ E, ca. 15 m above msl.) in Dharmanagar, one female individual was recorded during egg laying on a Fabaceae plant. The observation was made on 11.i.2017. Due to its close similarity with *E hecabe* and *E blandia*, this species is often overlooked and hence it is difficult to evaluate its relative status in Tripura.

**Current known distribution.** Myanmar, India (Sikkim) (Van Gasse 2013; Varshney & Smetacek 2015).
Family - Pieridae  
Subfamily - Pierinae

49. *Appias indra indra* (Moore, [1858]) (Plain Puffin)

**Remarks.** One individual was recorded in Jampui Hills (24°2’20” N & 92°16’19” E, ca. 329 m above msl.) on 07.xi.2016, busking on a bush. Later several individuals were observed in Jampui Hills. This species is rare throughout the state.

**Current known distribution.** Nepal, Myanmar, Bangladesh, India (Sikkim to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

50. *Appias lalage lalage* (Doubleday, 1842) (Spot Puffin)

**Remarks.** On 22.ii.2020, two individuals were sighted at Betlingchhip (23°48’51” N & 92°15’33” E, ca. 827 m above msl.) in Jampui Hills, while nectaring on *Bidens pilosa* flowers. This species is very rare throughout the state.

**Current known distribution.** Myanmar, India (Uttarakhand to Northeast India; Kerala, Tamil Nadu) (Van Gasse 2013; Varshney & Smetacek 2015).

51. *Delias acalis pyramus* (Wallace, 1867) (Redbreast Jezabel)

**Remarks.** One individual was recorded in Jampui Hills (24°1’54” N & 92°15’37” E, ca. 212 m above msl.), nectaring on *Mikania* sp. flowers on 30.xi.2019. Very rare in Tripura.

**Current known distribution.** Nepal, Myanmar, India (Himachal Pradesh to Northeast India) (Van Gasse 2013; Varshney & Smetacek 2015).

The persistence of minimal pollution and a balanced habitat made up of different species of plants are one of the most important requisite for survivability of butterflies. There are innumerable potential areas for butterfly conservation exists in Tripura that need to be explored. These potential areas consist of different species of host plants and valuable nectaring plants that support and holds a substantial number of butterflies and their life cycle. An effort has been made to identify some of these potential areas during the present work.

The total numbers of butterflies so far recorded in Tripura by various authors and researchers does not reflect the actual potential of the state to be a butterfly hotspot, being part of North-east India. The present study provides an excellent justification of the above statement by increasing 20.90% species to the existing butterfly fauna of Tripura.

There is a great need not only to preserve potential habitats but also to safeguard different types of butterfly host plants and nectaring plants including essential micro habitats for proper conservation of butterflies. The first step towards any conservation plan is to stop arbitrary deforestation followed by long term plantation. Most often uncontrolled deforestation results in local extinctions of many species of important herbs, shrubs, climbers, and trees that holds a substantial number of butterfly species and unfortunately there is a negligible chance of replantation of these local extinsts. The best policy towards butterfly conservation is community based conservation made for ecological restoration of a landscape. This helps to create awareness among local people about the importance of butterflies and their ecological role. In India protection of butterflies is made available only in the protected areas. However, there are many potential areas outside these protected areas that are providing
suitable habitat and breeding grounds to butterflies and many other insects. Legal protection and conservation of these butterfly hotspots will not only help to preserve butterflies but also maintain an ecological balance as a whole.

**Figure 7.** Photographic records of: 61. Neptis miah miah. 62. Pantoporia paraka paraka. 63. Doleschallia bisaltide indica. 64. Faunis canens arcesilas. 65. Lethe kansa. 66. Telinga malsarida. 67. Ypthima lycus lycus. 68-69. Ypthima newara newara (male). 70-71. Ypthima newara newara (female). 72. Ethope himachala. / Registros fotográficos de: 61. Neptis miah miah. 62. Pantoporia paraka paraka. 63. Doleschallia bisaltide indica. 64. Faunis canens arcesilas. 65. Lethe kansa. 66. Telinga malsarida. 67. Ypthima lycus lycus. 68-69. Ypthima newara newara (macho). 70-71. Ypthima newara newara (hembra). 72. Ethope himachala.
Conclusion

This study reported 51 butterfly species for the first time in Tripura. This study will be important in the context of updating the checklist, status, distribution, seasonal and habitat wise diversity and conservation of the butterfly fauna of Tripura. The findings of 51 new records along with addition of 21 new genera to the state within a period of five years signifies that many species are constantly colonizing new areas of the Himalayan region and can be found in areas that remain unexplored. The present study is a clear indication of the above statement. The author hopes and believes that the major findings of this study can be used for future studies with respect to distribution, habitat, and seasonal availability of butterfly.

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