

## ADDITIONS TO THE MOTH FAUNA OF DALMA WILDLIFE SANCTUARY, JHARKHAND (INDIA)

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### ABSTRACT

The present communication deals with the addition of 23 species under 19 genera of three families: Erebidæ, Noctuidæ & Nolidae of moths from Dalma Wildlife Sanctuary. Two new species, *Ophiusa pseudotirhaca* Singh & Ranjan, sp. nov. and *Rusicada pindraberensis* Singh & Ranjan, sp. nov. are described and one species, *Pericyma cruegeri* (Butler, 1886) is reported for the first time from India. This is an addition of about 17% of moths to the already recorded 138 species from Dalma Wildlife Sanctuary.

### INTRODUCTION

Dalma Wildlife Sanctuary is situated on the Chota Nagpur plateau in the Dalma Hill range of East Singhbhum district of Jharkhand. It lies between 22° 46' and 22° 57' North latitude and 86° 7' and 86° 26' East longitude with an area of 193.22 km<sup>2</sup>. The sanctuary has undulating terrains with high hillocks, plateau, deep valleys and open fields. The elevation of sanctuary area varies from 154 m above MSL to more than 900 m above MSL. The climatic conditions of Dalma Wildlife Sanctuary are extremely variable throughout the year. The forests of Dalma Wildlife Sanctuary come under the category of North Tropical high deciduous forests. The diverse range of climatic conditions coupled with varied type of topography and vegetation makes the Dalma Wildlife Sanctuary a heaven for the faunal diversity. Among the faunal diversity, moths (Lepidoptera) are one of the most important groups of insects in terms of species diversity and economic importance. Moths are generally nocturnal Lepidopterans and can be separated from Butterflies due to its various types of antennae but not clubbed, fat

furry bodies and the sitting posture, where adults sit by spreading wings. Because of their nocturnal habits, moths are among some of the least studied group of insects. As far as the moths of Dalma are concerned, important publications are by Sambath (2009, 2014), in which the author recorded a total of 138 species of moths from Dalma Wildlife Sanctuary.

In continuation, the present communication deals with the addition of 23 species under 19 genera of three moth families, Erebidæ, Noctuidæ and Nolidae. Two new species, *Ophiusa pseudotirhaca* Singh & Ranjan, sp. nov. and *Rusicada pindraberensis* Singh & Ranjan, sp. nov. are described and one species, *Pericyma cruegeri* (Butler, 1886) is reported for the first time from India. This is an addition of about 17% of moths to the already recorded 138 species from Dalma Wildlife Sanctuary. The present work is based on the survey tours conducted during the years 2011 to 2013. Survey tours were conducted under a ZSI programme on 'Taxonomic studies on family of Noctuidæ from Bihar and Jharkhand'. The collections were made with the help of light

traps fitted during night time at Pindraber and Makulakocha of Dalma Wildlife Sanctuary. The collected moths were killed with the help of ethyl acetate vapours and processed as per techniques in Lepidopterology. The identification is done with the help of relevant literature (Hampson, 1892, 1894, 1895). The classification followed here was given by Nieukerken *et al.* (2011) and Zahiri *et al.* (2012).

## TAXONOMIC ACCOUNT

Order LEPIDOPTERA

Suborder GLOSSATA

Infraorder HETERONEURA

Superfamily NOCTUOIDEA

Family EREBIDAE

Subfamily EREBINAE

### 1. *Artena submira* Walker, 1858

1858. *Artena submira* Walker, *List Spec. Lepid. Insects Colln Br. Mus.*, **14**: 1389.

**Diagnosis:** Adults red brown. Forewings with costal and medial area suffused with bluish scales; reniform prominent; orbicular represented by a black spot; ante-medial line oblique; post-medial line excurved beyond cell; sub-marginal line dentate. Hindwings with cilia and underside ochreous.

**Material examined:** Pindraber, 23.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1696), (Coll. Navneet Singh).

**Distribution:** India: Travancore, Jharkhand. **Elsewhere:** Sylhet [Bangladesh], Burma [Myanmar].

### 2. *Daddala quadrisignata* Walker, 1865

1865. *Daddala quadrisignata* Walker, *List Specimens lepid. Insects Colln Br. Mus.*, **33**: 974.

**Diagnosis:** Adults fuscous. Antennae bipectinate. Forewings with basal, sub-basal and medial lines prominent. Hindwings with apical area yellow. Cilia of both wings black, except apical area of hindwings. Underside of both wings having prominent markings.

**Material examined:** Pindraber, 21.x.2013 – 3 exs. (Reg. No. ZSI, GPRC, A-1711), 22.x.2013 –

1 ex. (Reg. No. ZSI, GPRC, A-1712), 23.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1713), (Coll. Navneet Singh).

**Distribution:** India: Himalaya, Jharkhand. **Elsewhere:** Thailand, Peninsular Malaysia, Sumatra, Borneo.

### 3. *Ercheia diversipennis* Walker, [1858]

1858. *Ercheia diversipennis* Walker, *List Spec. Lepid. Insects Colln Br. Mus.*, **13**: 1108.

**Diagnosis:** Forewings with elongated streaks of dark and pale brown, the apical area with some additional dark streaks. Hindwings with a medial band below cell, a terminal spot above anal angle, cilia below apex white.

**Material examined:** Pindraber, 30.xi.2011 – 3 exs. (Reg. No. ZSI, GPRC, A-1427). (Coll. Navneet Singh).

**Distribution:** India: Sikkim, [Meghalaya] Khasis, Jharkhand. **Elsewhere:** Ceylon [Sri Lanka], Moulmein [Mawlamyine, Myanmar], Malacca, Borneo.

### 4. *Ophiusa disjungens* (Walker, 1858)

1858. *Ophiodes disjungens* Walker, *List Specimens lepid. Insects Colln Br. Mus.*, **14**: 1360.

**Diagnosis:** Adults yellow. Forewings lightly marked on sub-apical area; reniform present; marginal area darker. Hindwings with a black sub-marginal patch.

**Material examined:** Pindraber, 30.xi.2011 – 2 exs. (Reg. No. ZSI, GPRC, A-1480), 2.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1481), (Coll. Navneet Singh).

**Distribution:** India. **Elsewhere:** Sri Lanka, Vietnam, China, Singapore, Australia, Tonga.

### 5. *Ophiusa pseudotirhaca* Singh & Ranjan, sp. nov.

**Description:** Head, thorax and forewing pale greenish yellow, the latter with slightly darker striae; an indistinct, outwardly oblique ante-medial line meeting the sinuous post-medial at inner margin, the latter arises from a black spot on costa; a sub-apical indistinct dentate line with two black sub-apical spots; the area beyond is slightly darker. Hindwings yellowish, with two

submarginal patches of black scales on radial veins. Male genitalia with uncus broadly bifurcated with a short process between two lobes; a supra-uncus process present; tegumen broad and short with lateral arms, the left arm thicker and longer than right arm; vinculum longer; saccus minute; valvae sclerotized, triangular with a broad rounded flap towards distal end, distal costal process rod like; aedeagus long and narrow, coiled towards ductus ejaculatorious, vesica unornamented.

**Holotype:** Jharkhand: Dalma WLS, Pindraber, 01.xii.2011 – 1 male (Reg. No. ZSI, GPRC, A-1606), (Coll. Navneet Singh).

**Diagnosis:** Morphologically, *Ophiusa pseudotirhaca* sp. nov. is closely similar to *Ophiusa tirhaca* (Cramer, 1777) but is distinct due following attributes: forewings are comparatively lightly marked; male genitalia with uncus having short process between two lobes (absent in *O. tirhaca*). The size and shape of lateral arms of tegumen is completely distinct from *O. tirhaca*. Another closely similar species is *Ophiusa tirhacoides*, Holloway, 2005 but the general ground colour of forewings, absence of marginal band in hindwings, shape and size of lateral arms of tegumen and distal costal process of male genitalia separate *O. tirhacoides* from *O. pseudotirhaca* sp. nov.

**Etymology:** The name of the species is due to its close resemblance with *O. tirrhaca*.

#### 6. *Pericyma cruegeri* (Butler, 1886)

1886. *Homoptera cruegeri* Butler, *Trans. ent. Soc. London*, 1886: 411.

**Diagnosis:** Adults dark brown. Collar and thorax covered with dull white scales. Forewings with indistinct ante-medial line, with a broad blue brown band inside it; post-medial line highly angled and oblique towards inner margin; medial portion of wing covered with blue black scales; reniform represented by a rectangular brown patch; marginal line crenulated. Hindwings with dark scales on inner area; some dark lines on outer area; marginal line crenulated.

**Material examined:** Pindraber, 21.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1723), (Coll. Navneet Singh).

**Distribution:** India: Jharkhand (new record). **Elsewhere:** China, Indonesia (Sumatra, Borneo), Philippines, Hong Kong, Taiwan, Vietnam, Thailand, Peninsular Malaysia, New Guinea, Queensland.

**Remarks:** The species is first record from India.

#### Subfamily LYMANTRIINAE

#### 7. *Euproctis semisignata* (Walker, 1865)

1865. *Cispia semisignata* Walker, *List Spec. Lepid. Insects Colln Br. Mus.*, 32: 356.

**Diagnosis:** Adults orange yellow. Forewings with a black spot at end of cell.

**Material examined:** Pindraber, 2.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1402), (Coll. Navneet Singh).

**Distribution:** Throughout the plains of India. **Elsewhere:** Sri Lanka.

#### Subfamily ARCTIINAE

#### 8. *Brunia antica* (Walker, 1854)

1854. *Lithosia antica* Walker, *List Spec. Lepid. Insects Colln Br. Mus.*, 2: 505.

**Diagnosis:** In males, forewings uniformly fawn, may be with paler costa and females with grey forewings with costa yellow. Hindwings yellow.

**Material examined:** Pindraber, 22.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1675), (Coll. Navneet Singh).

**Distribution:** Indian sub region. **Elsewhere:** Borneo, Java.

#### 9. *Cyana peregrina* (Walker, 1854)

1854. *Bizone peregrina* Walker, *Lep. Ins. Colln Br. Mus.*, 2: 551.

**Diagnosis:** This species is distinct due to the presence of a large chocolate coloured patch of modified scales on the discal area of underside of forewings and a similar patch on the discal area of upper side of hindwings.

**Material examined:** Pindraber, 22.x.2013 – 4 exs. (Reg. No. ZSI, GPRC, A-1659), 23.x.2013 – 2 exs. (Reg. No. ZSI, GPRC, A-1660), (Coll. Navneet Singh).

**Distribution:** Throughout India. **Elsewhere:** Sri Lanka, Myanmar, Sumatra.

### 10. *Cyana puella* (Drury, 1773)

1773. *Phalaena puella* Drury, Ill. Exot. Ins., 2.

**Diagnosis:** Forewings with scarlet bands, antemedial band excurved below costa and postmedial band incurved. Hindwings pale crimson.

**Material examined:** Pindrabera, 30.xi.2011 – 2 exs. (Reg. No. ZSI, GPRC, A-1567), 1.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1568), 21.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1614), (Coll. Navneet Singh).

**Distribution:** India: North West Himalayas, Maharashtra (Mumbai), Tamil Nadu (Nilgiris), Madhya Pradesh (Seoni, Umaria), South India, Chattisgarh (Kanger valley), Sikkim, Jharkhand. *Elsewhere:* Sri Lanka, Java.

### 11. *Cyana subornata* (Walker, 1854)

1854. *Bizone subornata* Walker, List Specimens Lepid. Insect. Coll. Br. Mus., 2: 550.

**Diagnosis:** Forewings with scarlet lines; postmedial line angled inwards at vein  $M_2$  and bent outwards towards costa. Hindwings pale crimson, costal area and cilia white.

**Material examined:** Pindrabera, 30.xi.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1562), 1.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1563), 2.xii.2011 – 2 exs. (Reg. No. ZSI, GPRC, A-1564), (Coll. Navneet Singh).

**Distribution:** India: Maharashtra (Bombay, Khandala, Matheran), Karnataka (N. Canara), Andamans, Rajasthan, Jharkhand. *Elsewhere:* Sri Lanka, Borneo.

### 12. *Nishada flabrifera* Moore, 1878

1878. *Nishada flabrifera* Moore, Proc. Zool. Soc. Lond., 1878: 23.

**Diagnosis:** Forewings yellowish brown. Hindwings paler.

**Material examined:** Pindrabera, 02.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1572), (Coll. Navneet Singh).

**Distribution:** India: Nilgiris, Travancore, Kolkata, North East India, Jharkhand. *Elsewhere:* Nepal, China, Sri Lanka, Myanmar, Thailand, Java; Laos, Peninsular Malaysia.

### 13. *Mangina argus* (Kollar, 1844)

1844. *Euprepia argus* Kollar, Kaschmir, 4 (2): 467-468.

**Diagnosis:** Adults brownish red. Forewings with transverse series (six) of white ringed black spots. Abdomen scarlet with dorsal, ventral and lateral series of black spots.

**Material examined:** Pindrabera, 30.xi.2012 – 1 ex. (Reg. No. ZSI, GPRC, A-1439), (Coll. Navneet Singh).

**Distribution:** Throughout India. *Elsewhere:* Sri Lanka, Myanmar.

### Subfamily ANOBINAE

### 14. *Anoba polypila* (Walker, 1865)

1865. *Athyra polypila* Walker, List Spec. Lepid. Insects Colln. Br. Mus., 33: 966.

**Diagnosis:** Adults brownish, irrorated with dark brown scales. Head and collar dark brown, the former with a transverse yellow line. Forewings with a large black spot on interno-median space, black spots on discocellular and below it, some more spots on the postmedial area from apex to vein  $Cu_2$ .

**Material examined:** Pindrabera, 30.xi.2011 – 5 exs. (Reg. No. ZSI, GPRC, A-1601), 01.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1607), 22.x.2013 – 2 exs. (Reg. No. ZSI, GPRC, A-1635), 02.xii.11 – 1 ex. (Reg. No. ZSI, GPRC, A-1670), (Coll. Navneet Singh).

**Distribution:** India: Nagaland, Jharkhand.

### Subfamily SCOLIOPTERYGINAE

### 15. *Rusicada pindraberensis* Singh & Ranjan, sp. nov.

**Description:** Orange red. Forewings with sub-basal red line not reaching inner margin; ante-medial and post-medial lines crenulated, the latter sharply incurved at vein  $Cu_2$  to meet inner margin; indistinct post-medial band; veins greyish, more prominent on outer area; orbicular white, rounded with dark scales; reniform with posterior lobe distinct. Hindwings fuscous. Male genitalia with uncus curved, basal half broad flap like and distal half digitate; sub-uncus arrow like; tegumen narrow and very long; vinculum shorter; saccus concaved; valvae elongated flap like; aedeagus

short and narrow with two asymmetrical, apically setosed projections attached to annals with an apical robust spine; vesica with two prominent cornuti.

**Diagnosis:** Morphologically, the new species is closely similar to *Rusicada ravocans* (Walker, 1858) and is better distinguished due to external male genitalia with uncus comparatively long; arms of juxta shorter, not reaching base of uncus; saccus shallow whereas, in *R. ravocans* uncus is short and robust; arms of juxta reaches up to the base of uncus and saccus is deeper.

**Holotype:** Jharkhand, Pindrabera, 21.x.2013 – male (Reg. No. ZSI, GPRC, A-1644), Coll.: Navneet Singh.

**Paratypes:** Jharkhand, Pindrabera 22.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1645), 23.x.2013 – 1 ex., (Reg. No. ZSI, GPRC, A-1646) (Coll. Navneet Singh).

**Etymology:** The species is named after its type locality Pindrabera (Dalma, WLS).

#### Subfamily HERMINIINAE

##### 16. *Simplicia bimarginata* (Walker, 1864)

1864. *Culicula bimarginata* Walker, *J. Proc. Linn. Soc., (Zool.)* 7: 178.

**Diagnosis:** Adults brown. Forewings with straight sub-marginal line having diffused fuscous on its inner side; the area beyond it grey. Hindwings with a similar sub-marginal line ending before anal angle.

**Material examined:** Pindrabera, 21.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1647), 22.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1648), 23.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1649), (Coll. Navneet Singh).

**Distribution:** India: Mizoram, Jharkhand. **Elsewhere:** Thailand, Malaysia, Sri Lanka, Indonesia, New Guinea, Philippines, Taiwan.

#### Family NOCTUIDAE

##### Subfamily HADENINAE

##### 17. *Mythimna yu* (Guenee, 1852)

1852. *Leucania yu* Guenee, *Hist. nat. Insectes, Spec. gen. Lepid.*, 5: 78.

**Diagnosis:** Adults ash brownish. Forewings with dark spot in cell; median nervure dark, area

above it silvery. Hindwings with fuscous suffusion at margin.

**Material examined:** Pindrabera, 30.xi.2011 – 2 exs. (Reg. No. ZSI, GPRC, A-1478), 2.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1479), 21.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1634), (Coll. Navneet Singh).

**Distribution:** Oriental tropics east to Fiji and Tonga; absent from New Caledonia (Holloway, 1989).

#### Family NOLIDAE

##### Subfamily NOLINAE

##### 18. *Beana terminigera* (Walker, 1858)

1858. *Felinia terminigera* Walker, *List Specimens lepid. Insects Colln Br. Mus.*, 15: 1850.

**Diagnosis:** Adults whitish. Forewings with a triangular black brown patch on base of costa; an indistinct oblique post-medial line before middle of costa to before anal angle; area beyond it brown, which is suffused with black scales, leaving apical area white. Hindwings with outer half black brown.

**Material examined:** Pindrabera, 21.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1720), 22.x.2013 – 1 ex. (Reg. No. ZSI, GPRC, A-1721), (Coll. Navneet Singh).

**Distribution:** Indian Sub region. **Elsewhere:** Myanmar, Peninsular Malaysia, Borneo, Philippines.

##### Subfamily CHLOEPHORINAE

##### 19. *Carea angulata* (Fabricius, 1793)

1793. *Bombyx angulata* Fabricius. *Ent. Syst.*, 3(1): 481.

**Diagnosis:** Adults fleshy pink. Thorax with greenish tinge. Forewings with ante-medial line outwardly oblique from costa to inner margin; double and slightly curved lines from before apex to anal angle; area before it tinged with grey scales. Hindwings white at its basal and inner area.

**Material examined:** Pindrabera, 30.xi.2011 – 1 ex., (Reg. No. ZSI, GPRC, A-1421), 02.xii.2011 – 1 ex. (Reg. No. ZSI, GPRC, A-1422), (Coll. Navneet Singh).

**Distribution:** Throughout India. **Elsewhere:** Ceylon [Sri Lanka], Java.

20. ***Chandica quadripennis*** Moore, 1888

1888. *Chandica quadripennis* Moore, *Descr. new Indian lepid. Insects Colln* W.S. Atkinson: 286.

**Diagnosis:** Adults reddish brown. Head and collar yellow, the former with a brown patch. Forewings with costa and terminal area yellowish with irregular inner edge, a slightly curved medial line and post-medial line highly dentate, marginal series of brown spots. Hindwings with reduced coloration.

**Material examined:** Pindraber, 30.xi.2011 -2 exs. (Reg. No. ZSI, GPRC, A-1424), 1.xii.2011 -3exs. (Reg. No. ZSI, GPRC, A-1425), 2.xii.2011 -1ex. (Reg. No. ZSI, GPRC, A-1426), 22.x.2013 -4exs. (Reg. No. ZSI, GPRC, A-1623), 23.x.2013 -2exs. (Reg. No. ZSI, GPRC, A-1624), 21.x.2013 -1ex. (Reg. No. ZSI, GPRC, A-1731), (Coll. Navneet Singh).

**Distribution:** India: Sikkim, Jharkhand. *Elsewhere:* Borneo.

Subfamily EARIADINAE

21. ***Earias flavida*** Felder, 1861

1861. *Earias flavida* Felder, *Sber. Akad. Wiss. Wien*, 43: 34.

**Diagnosis:** Head, thorax and forewings bright canary yellow, the latter with indistinct ante-medial and post-medial lines; a brown point at end of cell; terminal area greenish. Hindwings with apical area greenish.

**Material examined:** Pindraber, 01.xii.2011 - 1 ex. (Reg. No. ZSI, GPRC, A-1433), (Coll. Navneet Singh).

**Distribution:** India: Nilgiris, Jharkhand. *Elsewhere:* Sri Lanka, Sumatra, Java.

22. ***Earias luteolaria*** Hampson, 1891

1891. *Earias luteolaria*. Hampson, *Ill. Het. Br. Mus.*, 8: 46.

**Diagnosis:** Head, thorax and forewings bright canary yellow, the latter with indistinct ante-medial and post-medial lines; a brown point at end of cell; the outer margin dark brown. Hindwings semi-diaphanous, the apical area suffused with yellow.

**Material examined:** Pindraber, 21.x.2013 - 1

ex. (Reg. No. ZSI, GPRC, A-1639), 22.x.2013 - 1 ex. (Reg. No. ZSI, GPRC, A-1640), (Coll. Navneet Singh).

**Distribution:** India: Nagaland, Nilgiris, Jharkhand. *Elsewhere:* Sri Lanka.

Subfamily WESTERMANNIINAE

23. ***Westermannia superba*** Hübner, 1823

1823. *Westermannia superba* Hübner, *Zutrage Samml. exot. Schmett.*: 23.

**Diagnosis:** Head pure white, thorax dull brown. Forewings with basal two third covered with silvery scales leaving one brownish spot in cell and a similar spot below median nervure, the outer area reddish brown. Hindwings with fuscous margins.

**Material examined:** Pindraber, 30.xi.2011 - 1 ex. (Reg. No. ZSI, GPRC, A-1419), 01.xii.2011 - 1 ex. (Reg. No. ZSI, GPRC, A-1420), 21.x.2013 - 1 ex. (Reg. No. ZSI, GPRC, A-1665), 22.x.2013 - 3 exs. (Reg. No. ZSI, GPRC, A-1666), 23.x.2013 - 1 ex. (Reg. No. ZSI, GPRC, A-1667), (Coll. Navneet Singh).

**Distribution:** India: West and South India, Jharkhand. *Elsewhere:* Sri Lanka, Java.

**A CONSOLIDATED LIST OF 161 SPECIES OF MOTHS OF DALMA WILDLIFE SANCTUARY (UPDATED FROM SAMBATH, 2009 & 2014)**

Family HYBLAEIDAE

1. *Hyblaea puera* (Cramer, 1777)

Family CRAMBIDAE

2. *Botyodes asialis* Guenee, 1854
3. *Caprinia conchylalis* Guenee, 1854
4. *Glyphodes stolalis* Guenee, 1854
5. *Lepyrodes neptis* (Cramer, 1779)
6. *Maruca testulalis* (Geyer, 1832)
7. *Pygospila tyres* (Cramer, 1779)
8. *Terastia meticulosalis* Guenee, 1854

Family ZYGAENIDAE

9. *Gynautocera papilionaria* Guerin-Meneville, 1831

## Family URANIIDAE

10. *Micronia aculeata* Guenee, 1857

## Family GEOMETRIDAE

11. *Agathia lycaenaria* (Kollar, 1844)
12. *Buzura suppressaria* (Guenee, 1862)
13. *Chlorissa distinctaria* (Walker, 1866)
14. *Eumelea ludovicata* Guenee, 1858
15. *Ophthalmitis herbidaria* Guenee, 1858
16. *Pingasa chlora* (Stoll, 1782)
17. *Pingasa ruginaria* (Guenee, 1857)
18. *Problepsis deliaria* (Guenee, 1858)
19. *Semiothisa fasciata* (Fabricius, 1775)
20. *Thalassodes quadraria* Guenee, 1857
21. *Zamarada translucida* Moore, 1887

## Family DREPANIDAE

22. *Cyclidia substigmata* Hubner, 1825

## Family BOMBYCIDAE

23. *Triuncina huttoni* (Westwood, 1847)

## Family LASIOCAMPIDAE

24. *Gastropacha pardale nandina* Moore, 1859
25. *Trabala vishnou* (Lefebvre, 1827)

## Family BRAHMAEIDAE

26. *Brahmidia hearseyi* White, 1862

## Family SATURNIIDAE

27. *Actias selene* Hubner, 1806
28. *Antheraea paphia* (Linnaeus, 1758)

## Family SPHINGIDAE

29. *Acherontia lachesis* Fabricius, 1798
30. *Acherontia styx styx* Westwood, 1844
31. *Acosmeryx anceus subdentata* Rothschild & Jordan, 1903
32. *Agrius convolvuli convolvuli* (Linnaeus, 1758)
33. *Ambulyx subocellata* Felder, 1874
34. *Ambulyx substrigilis aglaia* Jordan, 1923
35. *Deilephila hypothous hypothous* Cramer, 1780

36. *Dolbina inexacta* Walker, 1856
37. *Hippotion boerhaviae* Fabricius, 1775
38. *Macroglossum belis* (Linnaeus, 1756)
39. *Meganoton nyctiphanes* Walker, 1856
40. *Oxyambulyx maculifera* Walker, 1866
41. *Pergesa acteus* (Cramer, 1779)
42. *Polyptychus dentatus* (Cramer, 1777)
43. *Psilogramma menephron menephron* Cramer, 1780
44. *Theretra alecto alecto* (Linnaeus, 1758)
45. *Theretra clotho clotho* (Drury, 1773)
46. *Theretra nessus* (Drury, 1773)
47. *Theretra oldenlandiae oldenlandiae* (Fabricius, 1775)

## Family EREBIDAE

48. *Acanthodelta janata* (Linnaeus, 1758)
49. *Adlullia icilia* (Stoll, 1790)
50. *Aedia acronyctoides* (Guenee, 1852)
51. *Amata cyssea* (Cramer, 1782)
52. *Amata passalis* Fabricius, 1856
53. *Amerila astreus* (Drury, 1773)
54. *Amsacta sara* (Swinhoe, 1889)
55. *Anisoneura hypocyanea* Guenee, 1775
56. *Anoba polyspila* (Walker, 1865)
57. *Anomis fulvida* (Guenee, 1852)
58. *Anomis illita* Guenee, 1852
59. *Anua coronata* (Fabricius, 1775)
60. *Anua cuprea* (Moore, 1867)
61. *Anua trapezium* (Guenee, 1852)
62. *Anua triphaenoides* (Walker, 1858)
63. *Argina astrea* (Drury, 1773)
64. *Artena dotata* (Fabricius, 1794)
65. *Artena submira* Walker, 1858
66. *Asota caricae* (Fabricius, 1775)
67. *Asota ficus* (Fabricius, 1775)
68. *Asota plana* (Walker, 1854)
69. *Brunia antica* (Walker, 1854)

70. *Calesia dasyptera* Kollar, 1844
  71. *Chalciope mygdon* (Cramer, 1777)
  72. *Chionaema amabilis* (Moore, 1877)
  73. *Chionaema bianca* (Walker, 1856)
  74. *Cretonotos gangis* (Moore, 1763)
  75. *Cretonotos transiens* (Walker, 1855)
  76. *Cyana peregrina* (Walker, 1854)
  77. *Cyana puella* (Drury, 1773)
  78. *Cyana subornata* (Walker, 1854)
  79. *Daddala plana* (Moore, 1882)
  80. *Daddala quadrisignata* Walker, 1856
  81. *Dasychira grotei* Moore, 1859
  82. *Dysgonia algira* (Linnaeus, 1766)
  83. *Egnasia ephyrodalis* Walker, 1858
  84. *Episparis varialis* (Walker, 1858)
  85. *Ercheia cyllaria* (Cramer, 1782)
  86. *Ercheia diversipennis* Walker, 1858
  87. *Erebus glaucopis* (Walker, 1857)
  88. *Erebus hieroglyphica* (Drury, 1773)
  89. *Eupatula macrops* (Linnaeus, 1768)
  90. *Euproctis lunata* Walker, 1855
  91. *Euproctis semisignata* (Walker, 1865)
  92. *Fodina stola* (Guenée, 1852)
  93. *Grammodes geometrica* (Fabricius, 1775)
  94. *Hamodes aurantiaca* Guenée, 1852
  95. *Hypocala deflorata* Fabricius, 1794
  96. *Ischyja manlia* Cramer, 1776
  97. *Macrobrochis gigas* (Walker, 1854)
  98. *Mangina argus* (Kollar, 1844)
  99. *Mitochrista cuneonotata* (Walker, 1855)
  100. *Nagia linteola* (Guenée, 1852)
  101. *Neochera inops* (Walker, 1854)
  102. *Nishada flabrifera* Moore, 1878
  103. *Nygmyia bipunctapex* (Hampson, 1891)
  104. *Olepa ricini* (Fabricius, 1775)
  105. *Ophiusa disjunctens* (Walker, 1858)
  106. *Ophiusa fulvotaenia* Guenée, 1852
  107. *Ophiusa tirrhaca* Cramer, 1777
  108. *Ophiusa pseudotirrhaca* Singh & Ranjan, sp. nov.
  109. *Othreis fullonica* (Linnaeus, 1767)
  110. *Parallelia onelia* (Guenée, 1852)
  111. *Pericyma cruegeri* (Butler, 1886)
  112. *Pindra illibata* (Fabricius, 1775)
  113. *Plecoptera reflexa* Guenée, 1852
  114. *Rajendra biguttata* (Walker, 1855)
  115. *Rajendra vittata* (Moore, 1879)
  116. *Ramadasa pavo* Walker, 1856
  117. *Remigia archesia* (Cramer, 1780)
  118. *Remigia frugalis* (Fabricius, 1775)
  119. *Remigia undata* (Fabricius, 1775)
  120. *Rusicada pindraberensis* Singh & Ranjan, sp. nov.
  121. *Simplica bimarginata* (Walker, 1864)
  122. *Sphingomorpha chlorea* (Cramer, 1777)
  123. *Spilosoma obliqua* (Walker, 1855)
  124. *Spirama retorta* (Clerck, 1764)
  125. *Syntomoides imaon* Cramer, 1856
  126. *Tephriopsis divulsa* (Walker, 1865)
  127. *Thyas honesta* (Hubner, 1806)
  128. *Trigonodes hyppasia* (Cramer, 1779)
- Family NOCTUIDAE
129. *Aegocera bimacula* Walker, 1854
  130. *Agrotis ipsilon* (Hufnagel, 1776)
  131. *Callopietria maillardi* (Moore, 1882)
  132. *Chrysodeixis eriosoma* (Doubleday, 1843)
  133. *Craniophora fasciata* Moore, 1884
  134. *Episteme adulatrix* Kollar, 1844
  135. *Helicoverpa armigera* (Hubner, 1827)
  136. *Mimeusemia basalis* Walker, 1854
  137. *Mythimna yu* (Guenée, 1852)
  138. *Neurois atrovirens* (Walker, 1865)
  139. *Prodenia littoralis* Boisduval, 1833

140. *Sarbanissa albifascia* (Walker, 1865)

Family NOLIDAE

141. *Spodoptera litura* (Fabricius, 1775)153. *Beana terminigera* (Walker, 1858)142. *Spodoptera mauritia* (Boisduval, 1833)154. *Blenina donans* Walker, 1859143. *Thysanoplusia orichalcea* (Fabricius, 1775)155. *Carea subtilis* Walker, 1856

Family EUTELIIDAE

156. *Chandica quadripennis* Moore, 1888144. *Odontodes aleuca* Guenee, 1852157. *Earias luteolaria* Hampson, 1891

Family NOTODONTIDAE

158. *Earias uninotata* (Walker, 1862)145. *Neocerura liturata* (Walker, 1855)159. *Eligma narcissus* (Cramer, 1775)146. *Neostauropus alternus* (Walker, 1855)160. *Westermannia superba* Hübner, 1823147. *Phalera raya* Moore, 1859161. *Westermannia triangularis* Moore, 1877

Family EUPTEROTIDAE

**ACKNOWLEDGEMENTS**148. *Eupterote fabia f. doscordans* Butler, 1881

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149. *Ganisa plana* Walker, 1855

Family LIMACODIDAE

150. *Birhamoides junctura* (Walker, 1865)151. *Cheromettia laleana* (Moore, 1859)

Family COSSIDAE

152. *Xyleutes persona* (Le Guillou, 1841)**REFERENCES**

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PLATE 1



*Artena submira* Walker



*Daddala quadrisignata* Walker



*Ercheia diversipennis* Walker



*Ophiusa disjuncta* (Walker)



*Ophiusa pseudotirrhaca* Singh & Ranjan,  
sp. nov.



*Pericyma cruegeri* (Butler)



*Euproctis semisignata* (Walker)



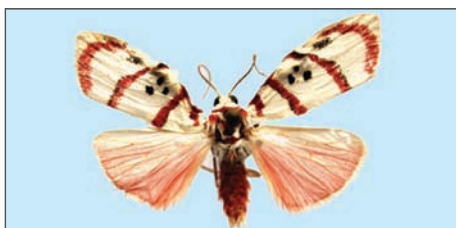
*Brunia antica* (Walker)



*Cyana peregrina* (Walker)



*Cyana puella* (Drury)



*Cyana subornata* (Walker)



*Nishada flabrifera* Moore

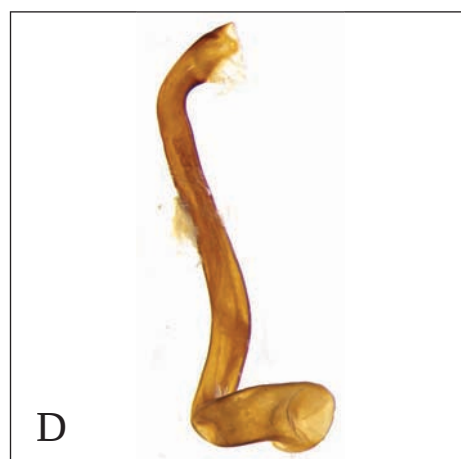
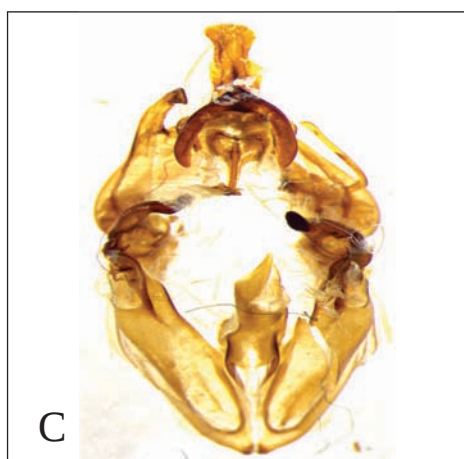
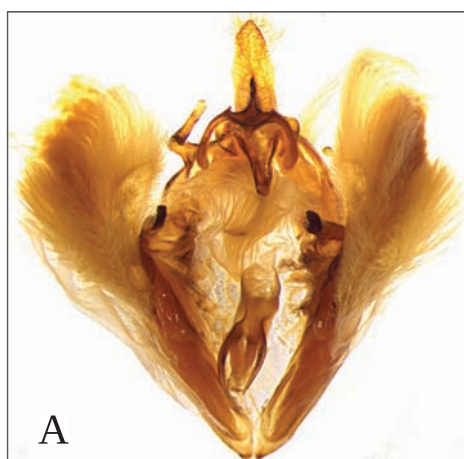
## PLATE 2

*Mangina argus* (Kollar)*Anoba polypispa* (Walker)*Rusicada pindraberensis* Singh & Ranjan, sp. nov.*Simplicia bimarginata* (Walker)*Mythimna yu* (Guenée)*Beana terminigera* (Walker)*Carea angulata* (Fabricius)*Chandica quadripennis* Moore*Earias flavida* Felder*Earias luteolaria* Hampson*Westermannia superba* Hübner

PLATE 3



*Ophiusa Pseudotirhaca* Singh and Ranjan sp. nov.



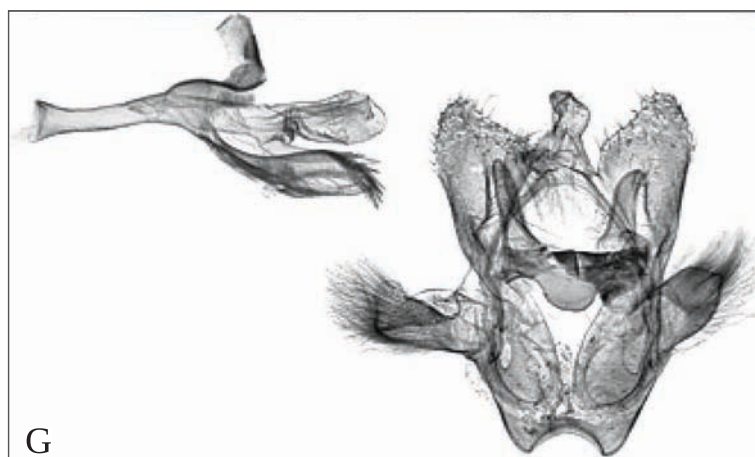
**Fig. A and B:** Male Genitalia and Aedeagus of *Ophiusa Pseudotirhaca* Singh and Ranjan sp. nov.

**Fig. C and D:** Male Genitalia and Aedeagus of *Ophiusa tirhaca* (Cramer)

## PLATE 4



*Rusicada pindraberensis* Singh and Ranjan, sp. nov.



*Rusicada revocans* ♂, aedeagus above left  
(Courtesy: Moths of Borneo vol. 15 & 16)

**Fig. E and F:** Male Genitalia and Aedeagus of *R. Pindraberensis* Singh and Ranjan, sp. nov.