FAUNA OF SIKKIM
(PART-4)
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PART-4
(INSECTS)

Edited by
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Zoological Survey of India
Kolkata
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INSECTA : LEPIDOPTERA : PAPILIONIDAE
DANAINAE (NYMPHALIDAE), LASIOCAMPIDAE, LYMANTRIIDAE AND RATARDIDAE

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INTRODUCTION

Sixty nine species and subspecies from the state of Sikkim distributed over 24 genera and five families of butterflies-Papilionidae, Danainae (Nymphalidae) and moths-Lasiocampidae, Lymantriidae and Ratardidae have been systematically accounted for along with a table of their distribution. In addition, 135 species and subspecies in 50 genera under these five families have been reviewed from literature. The studies are based on the material collected from all the four districts of the state during February-November between 1962-1995 by different faunistic survey parties of the Zoological survey of India and also specimens available in the collection of N.Z.C.

Earlier works on the faunistics of Lepidoptera from Sikkim range is of East Himalaya, as under report date back to De Nicville (1881-1885). In (1884) De Niceville contributed to the annotated glimpses of the State fauna in the form of a Gazzetteer and further studies on the group were continues by Elwes (1882, 1888) and Dudgeon (1898, 1900-1901). Elwes (1988) prepared a catalogue of Lepidoptera of Sikkim, supplemented by addition, corrections and distribution by Otto Moeller in the same work. Saiunders (1955) and Haribal (1992) dealt with lepidopteran accounts particularly on butterflies of the state.

The family Papilionidae includes two subfamilies, viz., Papilioninae and Parnassiinae of which the former is represented in Sikkim by 6 genera and 40 species and subspecies. 29 species and subspecies of moths from Sikkim belong the family Lasiocampidae (5 spp.), Lymantriidae (23 spp.) and Ratardidae (1 sp.).

The studies indicates that eight (* – marked) lymantrids constitute new locality records for Sikkim, including one new record for the whole of the mainland. The species Princeps elephenor (Doubleday) of the family Papilionidae, Dasychira virescens (Moore) of the family Lymantriidae are represented in the collection by only a specimens of each species. A consolidated list of 204 species and subspecies in 55 genera has been in the Appendix I.

SYSTEMATIC ACCOUNT

Family PAPILIONIDAE
Subfamily PAPILIONINAE

Key to genera

1. Fore wing basal spur weak. Tibiae and tarsi scaled ........................................ Graphium Scopoli

   - Fore wing basal spur strong. Tibiae and tarsi not scaled ........................................ 2

2. Tibio-tarsal rows of spines irregular. Hind wing precostal vein forked .................................... 3

   - Tibio-tarsal rows of spines regular. Hind wing precostal vein not forked ......................... 4

3. Pattern black with white and red spots. Fore wing R\textsubscript{a} arising opposite Cu\textsubscript{1}a. Hind wing tailed. never with golden transparent scales ........

   - Pattern dark with pale spots. Fore wing R\textsubscript{a} arising opposite Cu\textsubscript{1}b. Hind wing not tailed. golden transparent scales present ...................

   - Atrophaneura Reakirt

   - Troilus Hübner
4. Hind wing upperside at base with a white dot or spot and tailless. **Chilasa** Moore
   - Hind wing upperside without white dot or spots at base and often tailed .............................. 5

5. Head and pronotum with white dots. Fore wing with transparent dot or band. Abdomen underside with thin white lines. **Princes** Huebner
   - Head and thorax with white dots. Fore wing of male often with woolly-scent stripes. Abdomen without white dots .................................................. **Papilio** Linnaeus

**Genus Graphium** Scopoli


Seven species of this genus are treated from Sikkim.

**Key to species**

1. Fore wing middle discocellular much shorter than upper discocellular; hind wing with submarginal blue scales
   - Fore wing middle discocellular not much shorter than upper discocellular; hind wing without submarginal blue scales ........................................ 2

2. Pattern primitive banded or mimetic. Tail present in non-mimetic species ....................... 3
   - Pattern modified or specialised, never mimetic. Tail reduced or absent ............................ 5

3. Fore wing upperside with three dark cell bars ........................................ **agetes** (Westwood)
   - Fore wing upperside with four dark cell bars .................................................. 4

4. Hind wing underside with a discal rows of red spots ................................................ **aristeus** (Cramer)
   - Hind wing underside without any discal rows of red spots ................................ **antiphates** (Cramer)

5. Thorax with dorso-lateral grey stripes. Fore wing upperside dark bars angled, underside costal base with dark scales; hind wing underside with red spots never in M, or Cula area. Tail present .................................................. **agamemnon** (Linnaeus)
   - Thorax without dorso-lateral grey stripes. Fore wing upperside dark bars not angled, underside costal base with white scales; hind wing underside with red spots never in M, area. Tail absent ........................................ 6

6. Fore wing underside with dark bars straight. Hind wing underside with dark costal band. Tail absent ............... **eurypylus** (Linnaeus)
   - Fore wing underside with a single cell spot; hind wing underside with a red-centered costal bar .................. **doson** (C. & R. Felder)

1. **Graphium (Pazala) eurous sikkimica** (Heron)
   *Material examined* : Sikkim, 1ex., (no data). Wing expanse : 70 mm.

2. **Graphium (Pathysa) agetes agetes** (Westwood)
   *Material examined* : Sikkim, 1ex., (no data). Wing expanse : 75 mm.
   *Remarks* : Talbot (1939) mentioned nominate subspecies **agets** occurring in the Sikkim.

3. **Graphium (Pathysa) aristeus anticrates** (Doubleday)
MAULIK: Insecta: Lepidoptera: Papilionidae and Danaidae (Nymphalidae)


Material examined: Sikkim, lex., (no data). Wing expanse: 70 mm.


Remarks: Talbot (1939) mentioned its status 'rare' and stated occurrence of subspecies antichrates in the Sikkim.

4. Graphium (Pathysa) antiphates pompilius (Fabricius)


Material examined: Sikkim, lex., (no data). Wing expanse: 75 mm.


5. Graphium (Graphium) agamemnon agamemnon (Linnaeus)


Material examined: 3exs. : 2 exs., Torengthus, 1 km. West of Nayabazar, South district, 5.xi.94, G.C.Sen and party coll. : lex., Rabangla, South district, 16.x.95, S.C. Mitra and Party Coll. Wing expanse: 75-80 mm

Distribution: India: Sikkim (South district), Arunachal Pradesh, Manipur, Uttarakhand and West Bengal. Elsewhere: Sino-Malayan.

6. Graphium (Graphium) eurypylus cheronus (Fruhstorfer)


1983. Graphium (Graphium) eurypylus (Fruhstorfer) : Hancock, Smithersia. 2 : 47.

Material examined: Sikkim, lex., (no data). Wing expanse: 95 mm.


Remarks: Talbot (1939) mentioned nominate subspecies cheronus occurring in the Sikkim.

7. Graphium (Graphium) doson axion (C. & R. Felder)


Material examined: Sikkim, lex., (no data). Wing expanse: 75 mm.


Genus Atrophaneura Reakirt


Five species of this genus are known from Sikkim.

Key to species

1. Hind wing tail long and spatulate; anal region in male with a white scent-wool ............... 2
   - Hind wing tail short and pointed; anal region in male with white scent scales .................. 3
2. Hind wing upperside with submarginal spot in area M 2 ; cilia from tornus to Cu 1 a black; tail tipped black .................... latreilei (Donovan)
   - Hind wing upperside in male without white spot anterior to the quadrature spot on M 2 . Frons and abdomen in both sexes pale black ....
      ........................................................................ polyeuctes Doubleday
3. Male scent-organ well developed and wooly; abdominal fold very broad and rolled-up .......... 4

- Male scent-organ reduced or absent; abdominal fold narrow or vestigial .................. aristochiae Fabricius

4. Fore wing underside in male with entirely bluish-black; in female with uniformly grey brown; hind wing upperside with rounded anal fold being red or pink on the tormen and with indistinct sheen .......... aidoneus Doubleday

- Fore wing underside in male not entirely bluish-black only in the basal half, in the female with a large pale posterior patch; hind wing upperside with metallic blue. Male with black-brown scent-fold with long frings ................. varuna (white)

8. Atrophaneura (Atrophaneura) latreilei (Donovan)


1983. Atrophaneura (Atrophaneura) latreilei (Donovan) : Hancock, Smithersia. 2 : 47.

Material examined : Sikkim, 1ex., (no data).

Wing expanse : 105 mm.

Distribution : India : Sikkim (C 2150–3000m.) and Arunachal Pradesh and West to North-West Himalaya. Elsewhere : Nepal.

Remarks : Talbot (1939) stated occurance of subspecies latreilei in the Sikkim.

9. Atrophaneura (Atrophaneura) philoxenus polyeuctes (Doubleday)


Material examined : Sikkim, 1ex., (no data).

Wing expanse : 140 mm.


Remarks : Talbot (1939) mentioned nominate subspecies polyeuctes occurring in the Sikkim.

10. Atrophaneura (Atrophaneura) aristochiae aristochiae (Fabricius)


Material examined : 2exs. Rabibagan, South district, 19. x. 95. S.C. Mitra and party coll. Wing expanse : 88–95 mm.

Distribution : India : Sikkim (South District); Widely distributed in India.

11. Atrophaneura (Atrophaneura) aidoneus (Doubleday)


Material examined : Sikkim, 1ex., (no data).

Wing expanse : 110 mm.

Distribution : India : Sikkim (c. 1500 m.), Arunachal Pradesh, Meghalaya and North-West Himalaya. Elsewhere : Bhutan, Myanmar, Hainan and Tonkin.

Remarks : Talbot (1939) stated occurrence of subspecies aidoneus in the Sikkim.

12. Atrophaneura (Atrophaneura) varuna astorion (Westwood)


Material examined : Sikkim, 1ex., (no data).

Wing expanse : 125 mm.

Genus *Troides* Huebner


Two species of this genus are reported from Sikkim.

**Key to species**

Hind wing upperside with prominent proximal suffusion the marginal spots in area 2 to 4. Male with area 7 yellow to the marginal spots.

- Female with area 1b black at the base; a white area in cell of fore wing ..................................................... *aeacus* (C.&R. Felder)

Hind wing upperside without any black suffusion to the marginal spots in area 2 to 4. Male with area 7 without yellow to the marginal spots. Female with area 1b entirely black; without white spots area in cell of forewing ............................................. *helenae* (C.&R. Felder)


**Material examined** : Sikkim. 4 exs., (no data), Wing expanse : 110-170 mm.

**Distribution** : India : Sikkim; extended to Garhwal in the North-West India. Elsewhere : Myanmar, Taiwan and West China.

**Remarks** : Talbot (1939) mentioned nominate subspecies *aeacus* occurring in the Sikkim.


**Material examined** : Sikkim, 1 ex. (no data). Wing expanse : 120 mm.

**Distribution** : India : Sikkim to Orissa and North-East India. Elsewhere : Borneo, the Natuna Island, Malaysia, Myanmar and Tonkin.

Genus *Chilasa* Moore


One species of this genus is dealt with from Sikkim.

15. *Chilasa* (*Chilasa*) *clytia clytia* (Linnaeus)


**Material examined** : 4 exs.; 3exs., Jorethang, South district, 15.x. 95. S.C. Mitra and party coll.; 1ex., Sikkim. (no data). Wing expanse : 95-105 mm.

**Distribution** : India : Sikkim (South district) : widely distributed in the mainland.

Genus *Princeps* Huebner


Thirteen species of this genus are known from Sikkim.

**Key to species**

1. Frons, thorax and abdomen overlaid with metallic green scales .....................................................

- Frons, thorax and abdomen not overlaid with metallic scales .....................................................

2. Hind wing upperside with a green patch in inner area and a series of claret-red submarginal lunules. Hind wing with tail ...........

- Hind wing upperside with green or blue patches or band and without submarginal red lunules, Hind wing without tail ...........

3. Hind wing upperside with a series of submarginal red or yellowish-red lunules. Male without scent-streak on fore wing ..............

- Hind wing upperside without submarginal red lunules. Male with wooly-scent-streak on fore wing ................................
4. Hind wing upperside with prominent submarginal red lunules ........................................... 5

- Hind wing upperside with a complete row of red or yellowish-red submarginal lunules ........... ................................................ paris Linnaeus

5. Hind wing upperside with a large discal blue patch; a submarginal row of 3 to 6 red spots and a red anal ring ................................................................. arcturus (Westwood)

- Hind wing upperside with a large blue spots; four submarginal spots and a large purplish-red anal eye spot........ krishna (Moore)

6. Hind wing upperside of male in area 7 with cream or white or with dispersed blue scales; underside at base of wing without red markings. Male without and Iroconia. Hind wing tailless ........................................ protenor (Fruhstofer)

- Hind wing upperside of male in area 7 with dark or blue-green-sheen; underside a white discal markings. Male with and Iroconia. Hind wing with tail ........................................................ protenor (Fruhstofer)

7. Head red and abdomen with lateral red stripes. ...................................................... janaka (Moore)

- Head and abdomen without red stripes ..... 8

8. Fore wing upperside black with greenish or blueish sheen. Hind wing upperside with a large white discal band; underside with a large dull red basal spot. Hind wing without tail ...

- Fore wing upperside with white transverse or oblique band. Hind wing upperside with white discal band. Hind wing with tail .......... 10

9. Hind wing with anal white-edged occillus .. ...................................................... alconenor (C. & R. Felder)

- Hind wing without anal white-edged occillus .......................................................... memnon (Linnaeus)

10. Fore wing upperside of male black with a white transverse or oblique band; hind wing upperside with white or greenish-blue discal band. Male with and Iroconia .............................................................. helenus (Linnaeus)

- Fore wing upperside of male black with yellowish-brown streak; hind wing upperside with elongate white discal spot. Male without and Iroconia ................................................................. 11

11. Hind wing upperside with four chalky-white band; underside with yellow submarginal lunules ............. nephelus (Westwood)

- Hind wing upperside with a white discal band; underside with a series of white discal spots and without submarginal white lunules ........ polyes (Cramer)

- Hind wing upperside with a large discal spots in area 4 to 6. and a small spot in area 7. Fore wing upperside in female with submarginal spots. Hind wing with submarginal lunules ...

16. **Princeps (Princeps) polyctor ganesa**

 (Doubleday)


1997. **Princeps (Princeps) polyctor ganesa** (Doubleday) :


**Distribution** : India : Sikkim (East, North and South districts), Widely distributed in the North-East India. **Elsewhere** : Myanmar.

17. **Princeps (Princeps) elephenor elephenor**

 (Doubleday)


**In Press : Princeps (Princeps) elephenor elephenor**

(Doubleday) : Mondal & Maulik, *State Fauna Series*.

**Material examined** : Sikkim, 1ex., (no data). **Wing expanse** : 110 mm.
MAULIK: Insecta: Lepidoptera: Papilionidae and Danainae (Nymphalidae)


Remarks: This species is very rare butterfly of extreme aesthetic value. Talbot (1939) mentioned nominate subspecies elephenor occurring in the Sikkim.

18. Princeps (Princeps) paris decorosa (Fruhstorfer)


Material examined: 4 exs., 1 ex., Tumin, C. 1475 m., East district, 10.x.88, V.C. Agrawal and party coll.; 2 exs., Dentam, Srigutam, South district, 18.x. 95, S. C. Mitra and party coll.; 1 ex., Sikkim (no data). Wing expanse: 100-112 mm.

Distribution: India: Sikkim (East district) widespread in the Himalaya and adjoining belts of the East Himalaya. Elsewhere: Japan, Philippines, S.E. Asia and Sundaland.

Remarks: Talbot (1939) stated occurrence of subspecies decorosa in the Sikkim. It shows seasonal variation and dry season form is called splendorifer (Fruhstorfer).

19. Princeps (Princeps) arcturus arcturus (Westwood)


Material examined: 2 exs.; 1 ex., Tumin, C. 1475 m., East district, 30. ix. 88, V.C. Agrawal and party coll.; 1 ex., Sikkim, (no data). Wing expanse: 110-120 mm.


20. Princeps (Princeps) krishna krishna (Moore)


Material examined: Sikkim, 1 ex., (no data). Wing expanse: 95 mm.


21. Princeps (Menelaides) proteo euprotenor euprotenor (Fruhstorfer)


22. Princeps (Menelaides) janaka janaka (Moore)


Material examined: Sikkim, 1 ex., (no data). Wing expanse: 110 mm.

Distribution: India: Sikkim; East Himalaya including Arunachal Pradesh, Assam and West Himalaya including Uttar Pradesh; Garhwal to Mussoorie and West Bengal.
23. Princeps (Menelaides) alcmenor rhetenor  
(Westwood)

1997. Princeps (Menelaides) alcmenor rhetenor  
(Westwood) : Mondal & Maulik. State Fauna Series 
3 : Fauna of West Bengal, Part-7 : 760.

Material examined : 4exs. : 3exs., Tumin, C.  
1475m., East district, 30.ix.95, V.C. Agrawal and 
party coll.; 1ex., Sikkim (no data). Wing expanse 
: 116 mm.

Distribution : India : Sikkim (East district);  
Widespread in both East and West Himalaya. Elsewhere 
: Bhutan, Myanmar and Nepal.

24. Princeps (Menelaides) memnon agenor  
(Linnaeus)

1997. Princeps (Menelaides) memnon agenor (Linnaeus) :  
Mondal & Maulik. State Fauna Series 3 : Fauna of 
West Bengal, Part-7 : 770.

Material examined : 10 exs. : 3exs., Melli, 20  
kilometres of Rangpo, C. 500m., East district, 18.ix.93.  
T.K. Pal and party coll.; 2 exs., 1 km. West of Rangpo 
F.R.H. South district, 3.iv.94, G.C. Sen 
and party coll.; 5 exs., Sikkim (no data). Wing expanse 
: 125-150 mm.

Distribution : India : Sikkim (East and South  
district), Widely distributed in the East Himalaya and adjoining 
belts, Andaman and South Nicobar Island.  
Elsewhere : Myanmar.

25. Princeps (Menelaides) helenus helenus  
(Linnaeus)

1997. Princeps (Menelaides) helenus helenus (Linnaeus) :  
Mondal & Maulik. State Fauna Fauna Series 3 : Fauna of 
West Bengal, Part-7 : 771.

Material examined : 10 exs., 6 exs., Singtam,  
East district, 29.x.92, M.S. Shshodia and party  
coll.; 1ex., Saramsa, 3 km. South of Rangpo,  
East district, 7.iv.94, P.H.Roy and party coll.;  
1ex., Soem C. 1260 m. Mangan. North district. 
28.iv.93, T.K.Pal and party coll.; 1ex., Pedang,  
South district, 11.x.95, S.C. Mitra and party coll.;  
1ex., Geyzing, West district, 17.x.95, S.C. Mitra 
and party coll. Wing expanse : 115-130 mm.

Distribution : India : Sikkim (North, South,  
East and West district), wide spread in the East Himalaya and adjoining belts. Elsewhere 
: Myanmar, Malaya Peninsular and Thailand.

26. Princeps (Menelaides) nephelus chaon  
(Westwood)

1997. Princeps (Menelaides) nephelus chaon (Westwood) :  
Mondal & Maulik. State Fauna Series 3 : Fauna of 
West Bengal, Part-7 : 772.

Material examined : Sikkim, 1ex., (no data), 
Wing expanse : 115 mm.

Distribution : India : Sikkim, Wide spread in 
India. Elsewhere : Myanmar and Nepal.

27. Princeps (Menelaides) polytes romulus  
(Cramer)

1997. Princeps (Menelaides) polytes romulus (Cramer) :  
Mondal & Maulik. State Fauna Series 3 : Fauna of 
West Bengal, Part-7 : 771.

Material examined : 5 exs., 3exs., Marchak  
village, C. 1600 m., Gangtok. East district. 3.x.  
93, T.K. Pal and party coll.; 1ex., Jorethang,  
F.R.H. compound, South district, 5.x.94, G.C. Sen 
and party coll.; 1ex., Torengthus, Nayabazar, West  
district, 10.x.94, G.C. Sen and party coll. Wing expanse 
: 75-100 mm.

Distribution : India : Sikkim (East, South and  
West district), Widespread in India including 
Lakhsadweep Island. Elsewhere : Malaysia.

28. Princeps (Menelaides) castor polias (Jordan)

1983. Princeps (Menelaides) castor (Jordan) : Hancock,  
Smithersia. 2 : 48.
Material examined: Sikkim, lex., (no data).
Wing expanse: 115 mm


Remarks: Jardon (1909) and Talbot (1939) mentioned nominate subspecies polias occurring in the Sikkim.

Genus Papilio (Linnaeus)
One species of this genus known from Sikkim.

29. Papilio machon annae (Gistal)
Material examined: Sikkim, (no data). Wing expanse: 80 mm.


Remarks: Gistal (1857) stated nominate species annae and Hemming (1925) mentioned nominated species machon. Talbot (1939) stated nominate subspecies annae occurring in the Sikkim.

Family NYMPHALIDAE
Subfamily DANAINAE

Key to genera

1. Pulvilli and paronychia of mid and hind legs vestigial; tarsal claws curved at tips only .............................................

2. - Pulvilli and paronychia of mid and hind legs functional; tarsal claws evenly curved throughout their length ............................................. Euploea Fabricius

3. Hind wing submarginal series of spots evenly aligned and close to marginal ............................................. Danaus Kluk

- Hind wing submarginal series of spots irregularly displaced from marginals ............................................. Tirumala Moore

Genus Euploea Fabricius
Four species of this genus are treated from Sikkim.

Key to species

1. Hind wing with a scent patch .................................. 2

2. Hind wing without a patch of and Iroconia .................................. sylvestor (Fabricius)

2. Hind wing upperside in male with a small off-white or light brown alar patch within discal cell and discal area being covered with dense apatulate scales .................................. mulciber (Cramer)

- Hind wing upperside in made without such alar patch in the cell area, but fore wing with a androconial brand in cell area .................................. 3

3. Male and Iroconial brand short, distally displaced from point of origin of CuIb ............................................. core (Cramer)

- Male and Iroconial brand long, commencing level with or proximal to point of origin of CuIb ............................................. algea (Godart)

30. Euploea sylvestor hopei C. & R. Felder

Material examined: Sikkim, lex., (no data). Wing expanse: 99 mm.

31. *Euploea mulciber mulciber* (Cramer)


*Material examined*: Sikkim, 1 ex., (no data).

*Wing expanse*: 90 mm

*Distribution*: India : Sikkim, widespread in the Oriental Region.

32. *Euploea core core* (Cramer)


*Material examined*: Sikkim, 1 ex., (no data).

*Wing expanse*: 90 mm

*Distribution*: India : Sikkim, widespread in the Oriental Region.

33. *Euploea algea deione* Westwood


*Material examined*: 3 exs., 1 ex., Marchak, C. 1600 m. 12 km. off Gangtok, 3.x.93, T.K. Pal and party coll.; 1 ex., Singtok, South district, 9.x.95, S.C. Mitra and party coll.; 1 ex., Sikkim. (no data)

*Wing expanse*: 95 mm

*Distribution*: India : Sikkim (South district), widespread in the North-East belts. Elsewhere : Myanmar and Tibet.

Genus *Parantica* Moore


Three species of this genus are dealt with from Sikkim.

**Key to species**

1. Hind wing upperside in male with a scentpatch on vein 2 near margin and a smaller one underside on vein 1b. Smaller species ...........

2. Hind wing upperside marginal border bright chestnut, obscurely spotted ................

3. Hind wing upperside marginal border broad, dark, chocolate, prominently spotted ..........

34. *Parantica algea melanoides* Moore


*Wing expanse*: 70-85 mm

*Distribution*: India : Sikkim (North, South and East districts) throughout India including Andaman and Nicobar Island. Elsewhere : Annam, Formosa, Hainan, Malaysia, Myanmar, Thailand, South China and Tonkin.

35. *Parantica sita sita* (Kollar)


*Material examined*: 2 exs. 1 ex., Tumin, East district, 30. ix. 88, V.C. Agrawal and party coll.; 1 ex., Sikkim (no data).

*Wing expanse*: 90-100 mm

*Distribution*: India : Sikkim (East district), throughout the Himalaya. Elsewhere : Bhutan, Mismir Hills and South-East Tibet.
36. Parantica melaneus plataniston (Fruhstorfer)


Material examined : Sikkim, lex., (no data).
Wing expanse : 90 mm.


Genus Danaus Kluk


Two species of this genus are reported from Sikkim.

Key to species

Apex of fore wing underside with ground colour uniformly dark brown distal to white precostal transverse bar ........................................... genuitia (Cramer)

Apex of fore wing underside with some light brown markings distal to pale precostal transverse bar ................................................... chrysippus (Linnaeus)

37. Danaus genutia genutia (Cramer)


Material examined : 2 exs., lex., Ranipool, East district, 25.v.94, B.C. Saha and party coll.; lex., Sikim (no data), Wing expanse : 85-90 mm.

Distribution : India : Sikkim (East district), widespread in the Oriental Region. Elsewhere : China, Malaysia and Tonkin.

38. Danaus chrysippus chrysippus (Linnaeus)


Distribution : India : Sikkim (East and South district). Widespread in the Oriental Region, extending to Asia Minor.

Genus Tirumala Moore


Two species of this genus are known from Sikkim.

Key to species

Lager species less boldly marked than limniac ......................... septentrionis (Butler)
Smaller species being more boldly marked ........................................ linzniace (Cramer)

39. Tirumala septentrionis septentrionis (Butler)


Material examined : 2 exs., lex., 1 km., South of Jorethang F.R.H. South district, 8.xi.94 G.C. Sen and party coll.; lex., Singtok, South district, 15.x.95, S.C. Mitra and party coll. Wing expanse : 88-95 mm.

Distribution : India : Sikkim (South district). widespread in the Oriental Region.

40. Tirumala limniace leopardus (Butler)


*Material examined*: Sikkim, lex., (no data).

*Wing expanse*: 90 mm.

*Distribution*: India: Sikkim, widespread in the Oriental Region.

Suborder HETEROCERA

**Key to families**

Both wings without cell veinlet. Hind wing without frenulum; no bar between Sc + R₁ and Rs; accessory costal veinlet present.................. LASIOCAMPIDAE

Both wings with cell veinlet. Hind wing with frenulum; a bar between Sc + R₁ and Rs; accessory costal veinlet absent.................. LYMANTRIIDAE

Family LASIOCAMPIDAE

**Key to genera**

1. Hind wing vein Sc running nearer to vein Rs; no bar between Rs and Sc; accessory costal veinlet present........................................2
   - Hind wing vein Sc remote from vein Rs; a bar between vein Rs and Sc forming a large precostal cell; no accessory costal veinlet.... ...................... Cosmotriche Walker

2. Both wings cell open. Fore wing broad, apex rounded; hind wing without accessory costal veinlet. Mid and hind tibiae with a pairs of terminal spurs .................. Trabala Walker
   - Both wings cell closed. Fore wing broad, apex not rounded; hind wing with accessory costal veinlet. Mid and hind tibiae with a minute terminal pairs of spurs..........................3

3. Fore wing elongate, apex rounded; hind wing with two accessory costal veinlet. Mid and hind tibiae with a minute terminal pairs of spurs .................. Dendrolimus Germer
   - Fore wing broad or narrow, apex rounded or not rounded; hind wing with one or slightly accessory costal veinlet. Mid and hind tibiae with a pairs of spurs. ........................................4

4. Fore wing broad, apex rounded; hind wing costa excised and with slightly accessory costal veinlet. Mid and hind tibiae with a minute terminal pairs of spurs.............. Lebeda Walker
   - Fore wing long and narrow, apex rectangular; hind wing with one slight accessory costal veinlet. Mid and hind tibiae without terminal pairs of spurs ...................... *Suana* Walker

Genus *Cosmotriche* Huebner


One species of this genus is recorded from Sikkim.

41. *Cosmotriche laeta decisa* (Walker)


*Material examined*: Sikkim, lex., (no data).

*Wing expanse*: 75 mm.


Genus *Trabala* Walker


One species of this genus is known from Sikkim.

42. *Trabala vishnou* Lefebvre


*Distribution*: India: Sikkim (South district);
throughout India. Elsewhere : China, Java, Myanmar and Sri Lanka.

Genus *Dendrolimus* Germer


One species of this genus is dealt with from Sikkim.

43. *Dendrolimus latipennis* (Walker)


*Material examined*: Sikkim, lex., (no data).

*Wing expanse*: 70-170 mm.


Genus *Lebeda* Walker


One species of this genus is reported from Sikkim.

44. *Lebeda nobilis* Walker


*Distribution*: India: Sikkim (West district); widespread in the North-West and East Himalayas. Elsewhere: Bangladesh and Nepal.

Genus *Suana* Walker


One species of this genus is treated from Sikkim.

45. *Suana concolor* Walker


*Material examined*: Sikkim, lex., (no data).

*Wing expanse*: 70-170 mm.

*Distribution*: India: Sikkim; widespread in India. Elsewhere: Malaysia and Sri Lanka.

Family *LYMANTRIIDAE*

Subfamily *LYMANTRIINAE*

**Key to genera**

1. Fore wing R₂ originating from cell.; areole very often present ........................................2
   - Fore wing R₂ not originating from cell; areole very often absent ................................6

2. Antennae with pinnae longer in both sexes. Fore wing R₃ given off from R₂ and anastomising with R₄ to form areole ..................3
   - Antennae with pinnae longer in male than in female. Fore wing R₃₊₄ anastomosing with R₂ to form an areole .......... *Leucoma* Stephens

3. Palpi porrect. Antennae with pinnae usually longer in male than in female ............4
   - Palpi upturned. Antennae with pinnae uniform length in both sexes .......... *Numenes* Walker

4. Fore wing produced, outer margin oblique. Fore tarsi with lateral tufts of hair to the joints. Hind tibiae with two pair of spurs ............ *Dasychira* Stephens
   - Fore wing not produced, outer margin nearly erect. Fore tarsi without lateral tufts of hair to the joints. Hind tibiae with one or two pair of spurs ........................................5

5. Hind tibiae with two pairs of spurs ..........4
   - Hind tibiae with one pair of spurs .......... *Aroa* Walker
   - Hind tibiae with two pairs of spurs .......... *Pantana* Walker
6. Palpi upturned. Antennae in male serrate, in female bipectinate. Fore wing apex rounded; R₂ given off nearer the cell than from the origin of R₃. .......... *Lymantria Huebner*

   - Palpi porrect. Antennae-bipectinate in both sexes. Fore wing R₂ given off nearer the apex than from the origin of R₃. .......... 7

7. Palpi obliquely porrect. Antennae bipectinate in both sexes, branching long in male than in female. Fore wing R₂ given off towards the apex than from the origin of R₃. .......... *Euproctis Huebner*

   - Palpi porrect. Antennae bipectinate, branching long in both sexes. Fore wing R₂ given off nearer the cell, or from the same point as R₂. .......... *Cispia Walker*

Genus **Leucoma** Stephens


Four species of this genus are known from Sikkim.

**Key to species**

1. Fore wing silvery white ......................... 2
   - Fore wing being orange .......................... 3

2. Antennae brownish yellow. Fore wing silvery white, apex without yellow, no cell spot. Fore legs with black dotted .......... *divisa* (Walker)
   - Antennae brownish. Fore wing silvery white, apex with yellow, a black cell spot. Legs with black spotted .......... *submarginata* (Walker).

3. Antennae being orange. Fore wing with orange, in costa, a few hair like scales present. Legs tinged with orange .... *diaphana* Moore
   - Antennae brownish. Fore wing whitish, irrorated with silvery scales; outer area of fore wing with slight indication of corrugations ............

   * 46 *Leucoma divisa* (Walker)


   Material examined : Sikkim, 1ex., (no data).
   Wing expanse : 52 mm.

   Distribution : India : Sikkim; West Bengal. Elsewhere : Bangladesh, Malayan and Myanmar.

47. **Leucoma submarginata** Walker,


   Material examined : Sikkim, 12 exs., (no data).
   Wing expanse : 45 mm.

   Distribution : India : Sikkim; Widespread in India. Elsewhere : Java, Myanmar and Sri Lanka.

48. **Leucoma diaphana** Moore


   Material examined : Sikkim, 10 exs., (no data).
   Wing expanse : 40–45 mm.

   Distribution : India : Sikkim; Meghalaya and West Bengal. Elsewhere : Myanmar and Sino-Malayan.

   * 49 *Leucoma flavescens* (Moore)


   Material examined : Sikkim, 3exs., (no data).
   Wing expanse : 55 mm.

   Distribution : India : Sikkim; Andaman Island.

Genus **Numenes** Walker


   Material examined : Sikkim, 3exs., (no data).
   Wing expanse : 55 mm.

   Distribution : India : Sikkim; Andaman Island.
One species of this genus is reported from Sikkim.

50. **Numenes patrana** Moore


*Distribution*: India: Sikkim (East district); Meghalaya and West Bengal. *Elsewhere*: Bhutan and Taiwan.

Genus *Dasychira* Stephens


Seven species of this genus are from Sikkim.

**Key to species**

1. Abdomen clothed with long hair and without dorsal crests ..................... *complecata* Walker
   - Abdomen smoothly scaled and with or without dorsal crests ..............................................2

2. Abdomen with dorsal crests .........................3
   - Abdomen without dorsal crests ......................
     .................................................. *lineata* Walker

3. Fore wing without reniform spot ...............4
   - Fore wing with prominent reniform spot ....
     ......................................................5

4. Head and thorax whitish grey. Fore wing greyish white irrorated with dark scales; reniform spot with dark outline; hind wing white with inner area orange. Abdomen orange in male, white in female .................. *horsfieldi* Sander
   - Head and thorax being whiter. Fore wing pure white; female slightly irrorated with dark scales. Hind wing pale brown; in female pure white. Abdomen pale brown without any orange ......................................................5

5. Head and thorax being whiter. Fore wing pure white, postmedial lines double near the margin; submarginal lines absent ....... *thwaitesi* Moore
   - Head and thorax being tinged with brown. Fore wing silky white, antemedial and postmedial black patch on the costa; submarginal lines present ........................................... *cinctata* Moore

6. Head and thorax paler green. Fore wing paler green with grey reniform spot; hind wing orange; a large black cell spot at the end of cell ........................................... *virescens* Moore
   - Head and thorax dark brown. Fore wing dark brown with six indistinct waved dark lines; a submarginal series of dark lunules. Hind wing fuscos brown .................. *bhana* More

51. *Dasychira complecata* Walker


*Distribution*: India: Sikkim (North district), Manipur and West Bengal.

52. *Dasychira lineata* (Walker)


*Material examined*: Sikkim, 1 ex., (no data). *Wing expanse*: 90 mm.


*53. Dasychira horsfieldi* (Saunder)


*Material examined* : 1ex., Zena Transit camp, North district, 25. vii. 89, S. Chatterjee and party coll. *Wing expanse* : 52 mm.

*Distribution* : India : Sikkim (North district); Meghalaya, Tamil Nadu and West Bengal. *Elsewhere* : Austro-Malayan.

*54 Dasychira thwaitesi* Moore


*Material examined* : Sikkim, (no data), *Wing expanse* : 65 mm.

*Distribution* : India : Sikkim, Manipur and West Bengal.

55. *Dasychira cinctata* Moore


*Material examined* : Sikkim; 4exs., (no data). *Wing expanse* : 70 mm.

*Distribution* : India; Sikkim; West Bengal.

56. *Dasychira virescens* (Moore)


*Material examined* : Sikkim, 2exs., (no data). *Wing expanse* : 58 mm.

*Distribution* : India ; Sikkim; West Bengal.

*Remarks* : This species is confined to the East Himalaya.

57. *Dasychira bhana* Moore


*Distribution* : India : Sikkim (North district); Manipur, Meghalaya, Nilgiri Plateau and West Bengal.

Genus *Aroa* Walker


One species of this genus is treated from Sikkim.

*58 Aroa simplex* Walker


*Material examined* : Sikkim, 9 exs.. (no data). *Wing expanse* : 30 mm.

*Distribution* : India ; Sikkim; Nilgiri Hills.

Genus *Pantana* Walker


One species of this genus is reported from Sikkim.

59. *Pantana albifascia* (Walker)


Material examined: Sikkim, 6 exs., (no data).
Wing expanse: 250-50 mm.

Distribution: India: Sikkim, Meghalaya and West Bengal.

Remarks: This species is restricted to North-East India.

Genus Lymantria Huebner


Five species of this genus are dealt with from Sikkim.

Key to species

1. Fore wing in male with paler white ground colour; in female with white, a dark spot at the end of cell. Hind wing in male with orange, in female with crimson; hind wing in both sexes a dark post at the end of cell. ..................
   .............................................................................. mathura Moore 60. Lymantria mathura Moore

- Fore wing ground colour white with black markings. Hind wing white with a submarginal band ................................. concolor Walker 61. Lymantria concolor Walker

2. Fore wing in male white with black markings, antemedial line irregularly waved, a black streak at end of cell. Hind wing suffused with black ............................................................... similis Moore 62. Lymantria similis Moore

- Fore wing white in both sexes .........................

3. Fore wing white with black patch on costa; hind wing whitish with fuscous submarginal band and marginal spots......... similis Moore

- Fore wing dark black, a yellow cell spot; hind wing crimson with broad marginal black border ......................................................... semicincta (Walker) 63. Lymantria semicincta (Walker)

4. Fore wing deep black, a yellowish-white spot at the end of cell; hind wing with crimson, broad submarginal black border ............. ............................................................... grandis Walker 60. Lymantria mathura Moore

- Fore wing in male white, banded pattern partly broken up into spots; in female with a red and black basal spots, a dark transverse band partly broken up into spots. Hind wing in male pink with a greyish brown discal spot; in female crimson with dark discal spot ..................
   .............................................................................. grandis Walker


Material examined: Sikkim, 1ex., (no data).
Wing expanse: 38 mm.

Distribution: India: Sikkim; Meghalaya, West Bengal and North-West Himalaya. Elsewhere: Japan.

61. Lymantria concolor Walker


Material examined: Sikkim, 2 exs., (no data).
Wing expanse: 45 mm.

Distribution: India: Sikkim; Himachal Pradesh, Meghalaya and Nagaland. Elsewhere: Bangladesh, Myanmar, Taiwan and Sze-Chwan.

62. Lymantria similis Moore


Material examined: Sikkim, 2 exs., (no data).
Wing expanse: 40 mm.

Distribution: India: Sikkim; Assam and West Bengal. Elsewhere: Bhutan, Philippines and Sundaland.

63. Lymantria semicincta (Walker)


Material examined: Sikkim, 5 exs., (no data).
Wing expanse: 50-58 mm.

Distribution: India; Sikkim; Himachal Pradesh and West Bengal.
**64. *Lymantria grandis* Walker**


*Material examined*: Sikkim, 2 exs., (no data).

*Wing expanse*: 45 mm.


**Genus *Euproctis* Huebner**


Four species of this genus are treated from Sikkim.

**Key to species**

1. Fore wing pure white or dull white, without trace of line or band .................. 2
   - Fore wing bright orange yellow or uniformly brown, diffused with red brown or dark scales ........................................ 3
2. Head and thorax white. Abdomen deep black with orange anal tufts. ........... *divisa* (Walker)
   - Head and thorax dull white or tinged with ochreous. Abdomen fuscous black with brownish orange anal tufts .................. *latifascia* (Walker)
3. Fore wing uniformly brown or red brown diffused with dark scales; submarginal spot present ................... *atomaria* (Walker)
   - Fore wing bright purplish-brown and diffused with red-brown or vinous brown band; submarginal spot absent .................. *plagiata* (Walker)

**65. *Euproctis divisa* (Walker)**


*Distribution*: India : Sikkim (East and North district); Manipur, Meghalaya and West Bengal.

**66. *Euproctis latifascia* (Walker)**


*Material examined*: 3 exs., Zena Transit camp, North district, 22.vi.89, S. Chatterjee and party coll. *Wing expanse*: 52-55 mm.

*Distribution*: India : Sikkim (North district); Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya and West Bengal. *Elsewhere*: Hongkong, Taiwan and Vietnam.

**67. *Euproctis atomaria* (Walker)**


*Material examined*: 1 ex., Mangan, North district, 30.v.90, B.C. Das and party coll. *Wing expanse*: 30 mm.


*Remarks*: Cotes & Swinhoe (1887) provided its distribution in North India. Myanmar and Sri Lanka. Hampaoon (1892) and Gupta *et al.* (1981) did not mention its occurrence in North India and Myanmar, respectively. The species is a new record for the state of Sikkim.
MAULIK: Insecta: Lepidoptera: Papilionidae and Danaidae (Nymphalidae)

* 68. *Euproctis plagiatia* (Walker)


Material examined: 3 exs., Zena Transit camp, North district, 22. vi. 89, S. Chatterjee and party coll. Wing expanse: 70-75 mm.

**Distribution**: India; Sikkim (North district), Manipur, Meghalaya and West Bengal, Elsewhere: Nepal.

Genus *Cispa* Walker


One species of this genus is known from Sikkim.

69. *Cispa Venosa* Walker


Material examined: Sikkim, lex., (no data). Wing expanse: 30 mm.

**Distribution**: India: Sikkim, West Bengal.

**Remarks**: The species is endemic in the East Himalaya.

**SUMMARY**

Systematic account of 69 species and subspecies in 24 genera of five families viz. Papilionidae, Danainae (Nymphalidae), Lasiocampidae, Lymantriidae and Ratardidae are dealt with from Sikkim. A good number of species are not available in the collection but reviewed from literature. Keys to the taxa only for the material examined have been provided. Eight species constitute new records for Sikkim.

**ACKNOWLEDGEMENT**

The author is grateful to Dr. S.K. Mitra, Scientist-SF(retd.), Sri. D.K. Mondal, Scientist–SE (retired) and Sri I.J. Gupta, Scientist–B, for their valuable suggestions and going through the manuscript.

**APPENDIX**

List of species/ subspecies of butterflies and moths known from Sikkim for which material was not available for study.

Family PAPILIONIDAE

1. *Atrophaneura dasarada dasarada* (Moore, 1857)
2. *A.d. ravana* (Moore, 1857)
3. *A. plutonius pembertoni* (Moore, 1902)
4. *Chilasa agestor agestor* (Gray, 1832)
5. *C. epycides epycides* (Hewitson, 1862)
6. *C. slateri slateri* (Hewitson, 1859)
7. *Graphium chiron chiron* (Wallace, 1865)
8. *G. cloanthus cloanthus* (Westwood, 1841)
9. *G. macareus indicus* (Rothchild, 1895)
10. *G. mandarinus Oberthur*, 1893
11. *G. megarus megapenthes* (Fruhstorfer, 1902)
12. *G. nomius nomius* (Esper, 1785)
13. *G. sarpeden corbeti* Toxopeus
14. *G. xenocles phrontis* (de Niceville, 1897)
15. *Meandrusa payeni evan* (Doubleday, 1845)
16. *M. sciron* Leach, 1815
17. *Papilio machaon asiatica* Menetries, 1855
18. *Parnassius acco gemmifer* Fruhstorfer, 1904
20. *P. delphius lampidius* Fruhstorfer, 1903
21. *P. d. lathonias* Bryk, 1913
22. *P. epithus sikkimensis* Elwes, 1882
23. *P. hardwickei albicans* Fruhstorfer, 1898
24. *P. imperator augustus* Fruhstorfer, 1903
25. *P. simo acconus* Fruhstorfer, 1903

He is also grateful to Dr. S.K. Mitra, Scientist-SF(retd.), Sri. D.K. Mondal, Scientist–SE (retired) and Sri I.J. Gupta, Scientist–B, for their valuable suggestions and going through the manuscript.
26. *Princeps bootes* Westwood, 1842
27. *P. demoleus demoleus* (Linnaeus, 1758)
28. *P. polynestor polynestor* (Cramer, 1775)
29. *Teinopalpus imperialis imperialis* Hope, 1843
30. *Triodes minos* Cramer, 1779

**Family NYMPHALIDAE**

**Subfamily DANAINAE**

31. *Danaus melanippus indicus* (Fruhstorfer, 1899)
33. *E. klugii klugii* Horsfieldi & Moore, 1857
34. *E. k. kollar;* C. & R. Felder, 1865
35. *E. midamus roepstorffi* (Moore, 1883)
36. *E.m. rogenhoferi* C. & R. Felder, 1865
37. *E. modesta* Butler, 1866
38. *E. radamanthus diocletianus* (Fabricius, 1793)
39. *E. r. ramsayi* (Moore, 1890)
40. *Parantica aspasia aspasia* (Fabricius 1878)
41. *P. agleoides agleoides* (C.&R. Felder, 1860)

**Family LASIOCAMPIDAE**

1. *Alompra ferruginea* (Moore, 1872)
2. *Arguda bheroba* Moore, 1859
3. *A. decurtata* Moore, 1879
4. *A. vinata* Moore, 1865
5. *Bharetta cinnamomea* Moore, 1865
6. *Cosmotriche castanes* Hampson, 1892
7. *C. divisa* Moore, 1882
8. *C. pyriformis* Moore, 1879
9. *C. signata* Moore, 1879
10. *Crinocraspeda torrida* Moore, 1879
11. *Dendrolimus aconyta* (Cramer, 1777)
12. *D. fulgens* (Moore, 1879)
13. *D. hyrtaca* Cramer, 1775
15. *Gastropacha divaricata* Moore, 1884
16. *Kosala flavosignata* Moore, 1879
17. *K. sanguinea* Moore, 1879
18. *Metanastria ampla* Walker, 1855
19. *M. lidderdalii* Butler, 1881
20. *M. lineata* Moore, 1879
21. *M. nanda* Moore, 1859
22. *M. obliguioscia* Swinhoe, 1887
23. *Paralebeda plagifera* (Walker, 1855)
24. *Stenophylloides sikkima* Moore, 1879
25. *S. sinuata* Moore, 1879
26. *Syrostrena minor* Moore, 1879
27. *Trichius khasiana* Moore, 1879

**Family LYMANTRIIDAE**

1. *Aroa aretta* Hampson, 1892
2. *A. pyrrochorums* Walker, 1865
3. *Aruta flavpes* Hampson, 1892
4. *Caviria clara* Walker, 1865
5. *C. ochripes* Moore, 1879
6. *C. sericea* Moore, 1879
7. *Cifusa cervina* Moore, 1879
8. *Clocupes* Walker, 1855
9. *Cispia punctifascia* Walker, 1855
10. *Daplana irrorata* Moore, 1879
11. *Dasychirs albescens* Moore, 1879
12. *D. brunnescens* Moore, 1879
13. *D. flavimacula* Moore, 1865
14. *D. mendosa* Huebuer, 1823
15. *D. pedrix* Moore, 1879
16. *D. pennatula* Fabricius, 1781
17. *D. strigata* Fabricius, 1781
18. *D. variā* Walker, 1855
19. *Dura alba* Moore, 1879
20. *Euproctis albopunctata* Hampson, 1892
21. *E. arenacea* Hampson, 1892
22. *E. basalis* Moore, 1879
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<thead>
<tr>
<th>No.</th>
<th>Species</th>
<th>Author, Year</th>
</tr>
</thead>
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<td><em>E. bimaculata</em></td>
<td>Walker, 1855</td>
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<td>24.</td>
<td><em>E. bipartita</em></td>
<td>Moore, 1879</td>
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<td>25.</td>
<td><em>E. diagramma</em></td>
<td>Guerin, 1829-38</td>
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<td>26.</td>
<td><em>E. dispersa</em></td>
<td>Moore, 1879</td>
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<td>27.</td>
<td><em>E. flavinata</em></td>
<td>Walker, 1865</td>
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<td>28.</td>
<td><em>E. fraterna</em></td>
<td>Moore, 1882</td>
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<td>29.</td>
<td><em>E. guttata</em></td>
<td>Walker, 1855</td>
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<td>30.</td>
<td><em>E. inconcisa</em></td>
<td>Moore, 1865</td>
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<td>31.</td>
<td><em>E. lativitta</em></td>
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<td>32.</td>
<td><em>E. lunata</em></td>
<td>Walker, 1855</td>
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<td>33.</td>
<td><em>E. madana</em></td>
<td>Moore, 1859</td>
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<td>34.</td>
<td><em>E. marginata</em></td>
<td>Moore, 1879</td>
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<td><em>E. plana</em></td>
<td>Walker, 1856</td>
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<td><em>E. negrita</em></td>
<td>Hampson, 1892</td>
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<td>37.</td>
<td><em>E. postincisa</em></td>
<td>Moore, 1879</td>
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<td>38.</td>
<td><em>E. subfasciata</em></td>
<td>Walker, 1865</td>
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<td>39.</td>
<td><em>E. uniformis</em></td>
<td>Moore, 1879</td>
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<td>40.</td>
<td><em>E. venosa</em></td>
<td>Moore, 1879</td>
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<td>41.</td>
<td><em>E. varians</em></td>
<td>Walker, 1855</td>
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<td>42.</td>
<td><em>E. varia</em></td>
<td>Walker, 1855</td>
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<td>43.</td>
<td><em>E. variegata</em></td>
<td>Hampton, 1892</td>
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<td>44.</td>
<td><em>Euzora costalis</em></td>
<td>Moore, 1865</td>
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<td>45.</td>
<td><em>Heracula discivitta</em></td>
<td>Moore, 1865</td>
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<td><em>Himala argentes</em></td>
<td>Walker, 1855</td>
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<td>Hampson, 1892</td>
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<td>Moore, 1877</td>
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<td>52.</td>
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<td>Hampson, 1892</td>
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<td>53.</td>
<td><em>Lymantia ampla</em></td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>54.</td>
<td><em>L. bivitta</em></td>
<td>Moore, 1879</td>
</tr>
<tr>
<td>55.</td>
<td><em>L. grisea</em></td>
<td>Moore, 1879</td>
</tr>
<tr>
<td>56.</td>
<td><em>L. lepcha</em></td>
<td>Moore, 1879</td>
</tr>
<tr>
<td>57.</td>
<td><em>L. marginata</em></td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>58.</td>
<td><em>L. serva bhascara</em></td>
<td>Moore, 1859</td>
</tr>
<tr>
<td>59.</td>
<td><em>Mardara calligramma</em></td>
<td>Walker, 1865</td>
</tr>
<tr>
<td>60.</td>
<td><em>M. irrata</em></td>
<td>Moore, 1879</td>
</tr>
<tr>
<td>61.</td>
<td><em>M. plagidotata</em></td>
<td>Walker, 1862</td>
</tr>
<tr>
<td>62.</td>
<td><em>Numenes silleti</em></td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>63.</td>
<td><em>Orgyia australis postica</em></td>
<td>Walker, 1865</td>
</tr>
<tr>
<td>64.</td>
<td><em>Pida apicalis</em></td>
<td>Walker, 1865</td>
</tr>
<tr>
<td>65.</td>
<td><em>P. strigipennis</em></td>
<td>Moore, 1879</td>
</tr>
<tr>
<td>66.</td>
<td><em>Pantana bicolor</em></td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>67.</td>
<td><em>P. interjecta</em></td>
<td>Swinhoe, 1891</td>
</tr>
<tr>
<td>68.</td>
<td><em>Perina nuda</em></td>
<td>Fabricius, 1781</td>
</tr>
<tr>
<td>69.</td>
<td><em>Porthesia aurantica</em></td>
<td>Hampson, 1892</td>
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<tr>
<td>70.</td>
<td><em>P. scintillans</em></td>
<td>Walker, 1856</td>
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<tr>
<td>71.</td>
<td><em>P. xanthorrhoea</em></td>
<td>Kollar, 1848</td>
</tr>
</tbody>
</table>

**Family RATARDIDAE**

72. *Ratarda marmorata* Moore, 1879

**REFERENCES**


HAMPSON, G.F. 1892. The Fauna of British India, including Ceylon and Myanmar. Moths, 1 : xxiii + 527, Taylor and Francis


NICEVILLE, L. De. 1881-1885. First to fourth list of butterflies taken in Sikkim. J. Asiatic Soc. Bengal, 50 (1) : 49-60 (1881); 51 (2) : 54-66 (1882); 52 (2) : 92-100 (1883); 54 (2) : 1-5 (1885).


List of Species / Subspecies of Butterflies and Moths Represented in the collection made from Sikkim

<table>
<thead>
<tr>
<th>SI No.</th>
<th>Name of species/subspecies</th>
<th>District of Sikkim</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>North</td>
</tr>
<tr>
<td>1.</td>
<td><em>Atrophaneura aidoneus</em> aidoneus (Doubleday) +</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td><em>A. aristolochiae</em> aristolochiae (Fabricius) +</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td><em>A. latreilei</em> latreilei (Donovan) +</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td><em>A. polyeuctes</em> polyeuctes (Doubleday) +</td>
<td></td>
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<tr>
<td>5.</td>
<td><em>A. varuna</em> astorion (Westwood) +</td>
<td></td>
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<tr>
<td>6.</td>
<td><em>Chilasa clytia</em> clytia (Linnaeus) +</td>
<td></td>
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<tr>
<td>7.</td>
<td><em>Graphium agamemnon</em> agamemnon (Linnaeus) +</td>
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<tr>
<td>8.</td>
<td><em>G. agetes</em> agetes (Westwood) +</td>
<td></td>
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<tr>
<td>9.</td>
<td><em>G. aristeus</em> antirates Doubleday +</td>
<td></td>
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<tr>
<td>10.</td>
<td><em>G. doson</em> axion (G. &amp; R. Felder) +</td>
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<tr>
<td>11.</td>
<td><em>G. eurypylus</em> cheronus (Fruhstorfer) +</td>
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<tr>
<td>12.</td>
<td><em>G. eurus</em> sikkimica (Heron) +</td>
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<tr>
<td>13.</td>
<td><em>G. antinphates</em> pompilius (Fruhstorfer) +</td>
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<tr>
<td>14.</td>
<td><em>Papilio machaon</em> annae Gistal +</td>
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<tr>
<td>16.</td>
<td><em>P. arcturus</em> arcturus (Westwood) +</td>
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<tr>
<td>17.</td>
<td><em>P. castor</em> polias (Jordan) +</td>
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<tr>
<td>18.</td>
<td><em>P. elephenor</em> elephenor (Doubleday) very rare +</td>
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<tr>
<td>19.</td>
<td><em>P. helenus</em> helenus (Linnaeus) +</td>
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<tr>
<td>20.</td>
<td><em>P. janaka</em> janaka (Moore) +</td>
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<td>21.</td>
<td><em>P. krishna</em> krishna (Moore) +</td>
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<tr>
<td>22.</td>
<td><em>P. memnon</em> agenor (Linnaeus) +</td>
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<tr>
<td>23.</td>
<td><em>P. nephelus</em> chaon (Westood) +</td>
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<tr>
<td>24.</td>
<td><em>P. paris</em> paris (Linnaeus) +</td>
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<td>25.</td>
<td><em>P. polycor</em> ganesa (Doubleday) +</td>
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<td>26.</td>
<td><em>P. polytes</em> polya (Linnaeus) +</td>
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<td>27.</td>
<td><em>P. protoner</em> euprotenor (Fruhstofer) +</td>
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<td>Sl</td>
<td>Name of species/subspecies</td>
<td>District of Sikkim</td>
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<tr>
<td></td>
<td></td>
<td>North</td>
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<tr>
<td>30</td>
<td>Danaus chrysippus chrysippus (Linnaeus)</td>
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<tr>
<td>31</td>
<td>D. gemutia genuita (Cramer)</td>
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<td>32</td>
<td>Euploea algea deione (Westwood)</td>
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<td>33</td>
<td>E. core core (Cramer)</td>
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<td>34</td>
<td>E. mulciber mulciber (Cramer)</td>
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<td>35</td>
<td>E. sylvestor hopei (C. &amp; R. Felder)</td>
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<tr>
<td>36</td>
<td>Parantica aglea melanoides Moore</td>
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<td>37</td>
<td>P. melanoe platanistion (Frustorfer)</td>
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<tr>
<td>38</td>
<td>P. sita sita (Kollar)</td>
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<td>39</td>
<td>Tirumala limniace leopardus (Butler)</td>
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<td>40</td>
<td>T. septentrionis septentrionis (Butler)</td>
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<tr>
<td></td>
<td>Family NYMPHALIDAE</td>
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<tr>
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<td>Subfamily DANAINAE</td>
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<tr>
<td>41</td>
<td>Cosmotriche leata decisa (Walker)</td>
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<td>42</td>
<td>Dendrolimus latipennis (Walker)</td>
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<td>43</td>
<td>Lebeda nobilis Walker</td>
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<td>44</td>
<td>Suana concolor (Walker)</td>
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<tr>
<td>45</td>
<td>Trabala vishnou (Lefebvre)</td>
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<td>Family LASIOCAMPIDAE</td>
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<td>46</td>
<td>Aroa simplex (Walker)</td>
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<td>47</td>
<td>Cisgpa venosa Walker</td>
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<tr>
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<td>Dasychira bhana Moore</td>
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<td>49</td>
<td>D. cinctata Moore</td>
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<tr>
<td>50</td>
<td>D. complicata Walker</td>
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<tr>
<td>51</td>
<td>D. horsfieldi (Sander)</td>
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<tr>
<td>52</td>
<td>D. lineata (Walker)</td>
<td></td>
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<tr>
<td>53</td>
<td>D. thwaitesi Moore</td>
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<td>54</td>
<td>D. virescens (Moore)</td>
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<td>55</td>
<td>Euproctis atomaria (Walker)</td>
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<td>56</td>
<td>E. divisa (Walker)</td>
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<td>57</td>
<td>E. latifasia (Walker)</td>
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<td>58</td>
<td>E. plagiata (Walker)</td>
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<td>Aroa simplex (Walker)</td>
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<td>Cisgpa venosa Walker</td>
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<td>D. lineata (Walker)</td>
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<td>Euproctis atomaria (Walker)</td>
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<td>67</td>
<td>E. divisa (Walker)</td>
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<td>68</td>
<td>E. latifasia (Walker)</td>
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<td>Leucoma diaphana Moore</td>
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<td>Sl No.</td>
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<td>District of Sikkim</td>
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<tr>
<td>*60.</td>
<td><em>L. divisa</em> (Walker)</td>
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<tr>
<td>*61.</td>
<td><em>L. flavescens</em> (Moore)</td>
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<td>62.</td>
<td><em>L. submarginata</em> (Walker)</td>
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<td><em>Lymantria concolor</em> Walker</td>
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<td>*64.</td>
<td><em>L. grandis</em> (Walker)</td>
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<td>65.</td>
<td><em>L. mathura</em> Moore</td>
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<td>66.</td>
<td><em>L. semicincta</em> (Walker)</td>
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<td><em>L. similsi</em> Moore</td>
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<tr>
<td>68.</td>
<td><em>Numenes pratana</em> Moore</td>
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<tr>
<td>69.</td>
<td><em>Pantana albifascia</em> (Walker)</td>
<td></td>
</tr>
</tbody>
</table>

* Indicates new records for the state of Sikkim.

+ Indicates the species known from the particular district.
INSECTA: LEPIDOPTERA: NYMPHALIDAE

I.J. GUPTA
Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

INTRODUCTION

Of the more than 17,000 species of butterflies known in the world, 1500 occur in India. The state of Sikkim alone abounds about 700 species of which 155 are represented by six subfamilies, viz., Acraeinae, Calinaeinae Morphinae, Libytheinae, Charaxinae and Nymphalinae of the family Nymphalidae.

The earlier well known works on butterflies of India of the family Nymphalidae are by Marshall and De Nicèville (1883), De Nicèville (1886), Bingham (1905), Evans (1912), Antram (1924), Evans (1932), Piele (1937), Talbot (1947) and Wynter-Blyth (1957). The significant contributions to the butterfly fauna, particularly, from Sikkim are due to De Nicèville (1881, 1882, 1883, 1885, 1894), Elwes (1882), Elwes and Moeller (1888) and, later on, by Haribal et al. (1988) and Haribal (1992).


Altogether, 155 species/subspecies spread over 66 genera and six subfamilies have been dealt with from Sikkim. The definitive records of species of butterflies in all the four districts of Sikkim are: East Sikkim (31 spp.), North Sikkim (39 spp.), South Sikkim (48 spp.) and West Sikkim (19 spp.).

The caterpillars or larvae of these butterflies feed upon several food plants. The increasing pressure of human population and its growing demands have led to deforestation thereby causing loss of their natural habitats and food. Consequently, there has been decline in their population and diversity. A number of species referred in literature and their specimens available in the old collections of musea are not represented among the butterflies collected during the recent surveys of the state. Such not collected or observed species have become rare and endangered. Thus, these butterflies of the latter category along with their habitats need protection. Accordingly, the Wild Life (Protection) Act of 1972 amended from time to time includes species which require protection. Of the 155 species, 55 listed are in-Schedule-1, Part-4 (15 spp.); Schedule-II, Part-2 (39 spp.) and Schedule-IV (1 sp.).

The keys to identification of species and genera, not given by Haribal (1992), have been provided. The common name, fore wing length, distribution and remarks for each species/subspecies have been included. An appendix listing species/subspecies and showing their district-wise distribution in Sikkim have been given.

SYSTEMATIC ACCOUNT

Family NYMPHALIDAE

Antennae completely or partially scaled. Palpi not more than twice as long as the head except in Libytheinae. Fore wing with all the 12 veins present, one vein usually dilated at base, R₁ arising
nearer apex of cell of wing, vein 1A+2A may or may not be bifurcated at base. Hind wing cell closed by a tubular or non-tubular vein, precostal vein present. Fore legs imperfect in both sexes and not used for walking except in the female of Libytheinae. In male, fore tarsus always reduced to a single segment clothed with hair like scales resembling a small brush; in female fore tarsus with a variable number of segments.

Corbet and Pendlebury (1992) have been followed for treating subfamilies under the family Nymphalidae. At present, following six subfamilies have been dealt with from Sikkim.

Subfamily MORPHINAE
Subfamily CALINAGINAE
Subfamily ACRAEINAE
Subfamily NYMPHALINAE
Subfamily CHARAXINAE
Subfamily LIBYTEINAE
Subfamily MORPHINAE

The subfamily includes very large and showy species. The majority of the species have enormous size of wings as compared to that of the body. The subfamily has three tribes, viz., Morphini, Brassolini and Amathusiini. Only the tribe Amathusiini is represented in the tropics of the Oriental Region (including the Papuan subregion).

Tribe Amathusiini

Eyes smooth; labial palpi usually long, prominent and laterally compressed; termen of wings usually entire, underside of hind wing usually with submarginal ocellus in each of areas Cu and M; fore legs imperfect in the both sexes.

The tribe is represented in India by 24 species and subspecies belonging to eight genera. Of these, 10 species and subspecies in seven genera are dealt with from Sikkim.

Key to genera

1. Fore wing with discocellular veins tubular throughout. Hind wing with vein 3A longer than abdomen. In male, abdomen not compressed .................................................... 2

- Fore wing with middle discocellular vein absent. Hind wing with vein 3A shorter than abdomen. In male, abdomen basally at base ventrally compressed .................................................... 6

2. In hind wing, cell more or less closed............

- Amathuxidia Staudinger

3. In fore wing, vein Cu arising about midway between Cu and M; M not strongly curved proximad .................................................... 4

- In fore wing, vein Cu arising much nearer M than to Cu; M strongly curved proximad .................................................... 5

4. In fore wing, R and Sc anastomosed...........

- Aemona Hewitson

- In fore wing, R and Sc free ......................

- Faunis Huebner

5. In fore wing, R absent, veins R and Sc free

- Stichophthalma C. & R. Felder

- In fore wing, R and R anastomosed with Sc

- Thaumantis Huebner

6. In fore wing, veins R and R anastomosed with Sc. In male, upperside of hind wing with rounded discal black brand extending into areas Cu and M ....................................................

- Discophora Boisduval

- In fore wing, vein R absent, R anastomosed with Sc. In male, upperside of hind wing with area of cell strongly hairy ....................................................

- Enispe Doubleday

I. Genus Amathuxidia Staudinger

1887. Amathuxidia Staudinger, Exot. Schmett., 1 : 188.

This genus is represented in India by a nominate subspecies, Amathuxidia amythaon amythaon (Doubleday).

I. Amathuxidia amythaon amythaon

(Doubleday)

Material examined: Nil.

Wing expanse: 110-130 mm.


Remarks: The upperside of wings is dark brown - fore wing bearing a broad pale blue band in male but yellow band in female. The underside of wings is pinkish lavender marked with prominent dark lines, and two ocelli are present on hind wing. The nominate subspecies is rare in status and it is enlisted in Schedule II (Part 2) of the Indian Wild Life (Protection) Act.

II. Genus Aemona Hewitson


There is only a nominate subspecies, Aemona amathusia amathusia (Hewitson) known from India.

2. Aemona amathusia amathusia (Hewitson) (Yellow Dryad)


Material examined: Nil.

Wing expanse: 75-90 mm.


Remarks: Its status is rare, particularly of the female. This butterfly has been listed in Schedule –II (Part 2) of the Indian Wild Life (Protection) Act.

III. Genus Faunis Huebner


This genus is represented in India by two species, viz., Faunis canens Huebner and F. eumeus (Drury), of which the former is treated from Sikkim.

3. Faunis canens arcesilas Stichel

(Common Faun)


Material examined: Nil.

Wing expanse: 65-75 mm.

Distribution: India: Sikkim. Elsewhere: Bhutan, Malaya, Myanmar, Sumatra. Thailand (Siam) and Tonkin.

Remarks: Talbot (1947) referred to observations of De Nicèville (1894) that its occurrence was very rare in Sikkim.

IV. Genus Stichophthalma C. & R. Felder


The genus is represented in India by three species of which two are dealt with from Sikkim.

Key to species

Upperside of hind wing with submarginal markings small and slender ........................................

........................................ nourmahal (Westwood)

– Upperside of hind wing with submarginal markings large and prominent ..................................

........................................ camadeva (Westwood)

4. Stichophthalma nourmahal nourmahal (Westwood)

(Chocolate Jungle Queen)


Material examined: Sikkim, lex bearing two labels of Native Sikkim (De Nicèville Coll.) and Sikkim, Aug. 1889 (Knyvett Coll).

Fore wing length: 44 mm.
5. Stichophthalma camadeva camadeva (Westwood)  
(Northern Jungle Queen)


Material examined: Sikkim, 4 exs, no data, (De Nicèville Coll): 1 ex, purchased), no further data, 1 ex, purchased, De Nicèville, 2 exs J.A. Bourdillon purchased; 2 exs, purchased, no further data.

Fore wing length: 60-71 mm.

Distribution: India: Sikkim.

Remarks: There are four subspecies of this species occurring in India. This nominate subspecies has upperside of wings milky white and pale marginal area narrow in hind wing, thus, differing from the other three subspecies, viz., *S. camadeva nicèvillei* Roeber from Assam; *S. camadeva naganesis* Rothschild found in Nagaland; and *S. camadeva aborica* Tytler from Abor Hills (Arunachal Pradesh). The latter resembles *S. camadeva nicèvillei* except having ground colour of a warmer brown. De Nicèville (1885) reported it from Sikkim in June and July. Talbot (1947) mentioned its status not rare but Haribal (1992) referred to its status as rare in Sikkim. Further east it is quite common. It is endemic to Sikkim.


*Material examined*: Sikkim, 1ex, -viii-; 1ex, -ix-; 3exs, -x-; 1ex, no date; (De Nicèville coll.)

*Fore wing length*: 42-49 mm.

*Distribution*: India : Sikkim (South Sikkim) and West Bengal. Elsewhere: Assam, Bangladesh, Malaya, Myanmar and Tonkin.

*Remarks*: This nominate subspecies differs from its counterpart *D. timora andamanensis* Staudinger found in Andaman by upperside of fore wing bearing more or less prominent yellow spots in male and underside of wings marked with well defined markings in female. De Nicèville (1881) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence rarer than that of *D. sondaica zal* Westwood.

8. *Discophora sondaica zal* Westwood (Common Duffer)


*Material examined*: Sikkim, 1ex, -ix-; 3ex, -ix-; 4exs, no date; (De Nicèville coll.)

*Fore wing length*: 40-43 mm.


*Remarks*: The nominate subspecies differs from its counterpart, *E. cycnus verbanus* Fruhstorfer from Assam and Bhutan, by upperside of fore wing bearing a broader bluish white band and in male hind wing is devoid of yellow spots. D’Abrera (1985) retained Bhutan only as abode of *E. cycnus verbanus*. De Nicèville (1884) referred to its very rare occurrence in Sikkim. Evans (loc. cit) and Talbot (loc. cit.) mentioned its status rare. It has been listed in Schedule-II (Part-2) of the Indian Wild Life Protection Act.

10. *Enispe euthymius euthymius* (Doubleday)

32


*Material examined*: Sikkim, 3 exs, no date; lex, - iv-, lex, -v- (De Nicèville coll).

*Fore wing length*: 38-41 mm.

*Distribution*: India: Sikkim (South Sikkim), Assam, Meghalaya and Nagaland. *Elsewhere*: Myanmar.

*Remarks*: Only the nominate subspecies occurs in India. Talbot (1947) mentioned its two forms, *viz.*, *tesselata* Moore and *melaena* Tytler, all these three forms occurring in Assam. De Nicèville (1883) mentioned its collection by Otto Moeller from South Sikkim (Rungeet Valley). Its status is not rare.

Subfamily CALINAGINAE

Thorax clothed in part with orange or red hairs. Both fore and hind wing with cells closed; in fore wing, vein R₂ arising from R₁; in hind wing, prediscoidal cell present.

Two genera, *viz*; *Calinaga* Moore and *Penthema* Doubleday represent this subfamily in India.

Key to genera

Eyes hairy. Antennae equal to one-third the length of costa of fore wing. Fore wing with lower discocellular vein straight. Hind wing with vein Sc + R₁ ending before apex ........

..............................................*Calinaga* Moore

- Eyes not hairy. Antennae equal to one half the length of costa of fore wing. Fore wing with lower discocellular vein curved. Hind wing with vein Sc+R₁ ending, as usual, at apex ........

..............................................*Penthema* Doubleday.

VIII. Genus *Calinaga* Moore


Of the three species of this genus occurring in India, only *Calinaga gautama* Moore is dealt with from Sikkim.

11. *Calinaga gautama* Moore

(Freak)


*Material examined*: Sikkim, 3 exs, no date (De Nicèville coll).

*Fore wing length*: 46-48mm.

*Distribution*: India: Sikkim.

*Remarks*: Varshney (1994) treated it under Calinaginae of family Satyridae. This species is endemic to Sikkim. Its status is very rare and it has been included in schedule-I (Part-4) of the Indian Wild Life (Protection) Act.

IX. Genus *Penthema* Doubleday


This genus is known in India by a single species, *Penthema lisarda* Doubleday.

12. *Penthema lisarda lisarda* (Doubleday)

(Yellow Kaiser)


*Material examined*: Sikkim, lex, no more data; lex, -v-(De Nicèville coll.). Sikkim, lex, no more data; lex (purchased) no more data, lex, no date (L. Mandelli coll).

*Fore wing length*: 63-65 mm.

*Distribution*: India: Sikkim (East Sikkim and North Sikkim), Manipur, Meghalaya and Nagaland.

*Remarks*: Only the nominate subspecies occurs in India and differs from *P. lisarda*...
mihintala Fruehsforfer found in Myanmar by underside of wings being reddish brown. Wood-Mason (1881) reported its occurrence in Sikkim Hills. Haribal (1992) recorded it from East Sikkim (Dikchu) and North Sikkim (Singhik) and treated it under Nymphalinae. Its status is rare and it has been included in Schedule II (Part 2) of the Indian Wild Life (Protection) Act.

Subfamily ACRAEINAE

Wings sparsely scaled and spotted; cell of fore wing and hind wing closed by tubular veins; hind wing flat; and fore legs imperfect in both sexes.

The subfamily is represented by a single genus Acraea Fabricius in India.

X. Genus Acraea Fabricius


Two species, viz., Acraea violae (Fabricius) and A. issoria Huebner occurring in India are dealt with from Sikkim.

Key to species

Antennae with a short abrupt club. Hind wing with veins M₁ and R₁ not stalked, vein Rₛ arising from apex of cell ............... violae (Fabricius)

- Antennae with a gradually formed club. Hind wing with veins M₁ and Rₛ stalked well beyond upper apex of cell ........... issoria (Huebner).

13. Acraea violae (Fabricius)
   (Tawny Coster)


Material examined : Nil.

Wing expanse : 50-65 mm.

Distribution : India : Sikkim (South Sikkim, West Sikkim), widely distributed in India. Elsewhere : Sri Lanka.

Remarks : The upperside of wings is tawny with black spots. The white spots on black border on upperside of hind wing are more pronounced. Haribal (1992) mentioned its occurrence at lower altitudes up to 1500 m in South and West Sikkim.

14. Acraea issoria issoria (Huebner)
   (Yellow Coster)


Fore wing length : 35-38 mm.


Remarks : The nominate subspecies differs from its counterpart, A. issoria anomala Kollar from Kulu to Kumaon mainly by its larger wing expanse. It exhibits sexual dimorphism as black markings on upperside of fore wing seen in male are broadened in female.
Subfamily NYMPHALINAE

Butterflies of medium to large size; antennae always at best partly scaled, with two grooves separated by a central ridge and bordered by two lateral carinae on the ventral surface; wings with terminal margins may be scalloped, crenulate or dentate, hind wing may be caudate; fore tarsi imperfect, brush like and useless for walking in both sexes, although usually longer and several segmented, often spined and rarely clawed in female; male secondary sexual characters not strongly developed except in Heliconini.

These nymphalids have ground colour of wings bright brown or yellowish brown, some with striking or beautiful colour patterns. These are sun lovers and are often seen at flowering plants in the garden and forest. Some larger species are attracted by over ripe fruits, toddy, excreta of animals, etc.

There is no accord on the higher classification of the subfamily Nymphalinae but the widely accepted arrangement into tribes has been followed after Corbet and Pendleburry (1992). The following tribes are represented in Sikkim.

Tribe Biblidini
Tribe Heliconini
Tribe Nymphalini
Tribe Cyrestini
Tribe Limenitidini
Tribe Pseudergolini
Tribe Apaturini
Tribe Biblidini

The tribe includes two genera., viz., Ariadne Horsfield and Byblia Huebner from India, of which the former is represented in Sikkim.

XI Genus Ariadne Horsfield


Two species, viz., Ariadne ariadne (Linnaeus) and A. merione (Cramer) found in India are reported from Sikkim.

Key to species

Upperside of wings with a single discal line just beyond cell, being regular. Outer margin of fore-wing concave between vein Cu_{1a} and M_{1} ................................. ariadne (Linnaeus)

– Upperside of wings with a double discal line just beyond cell, being highly irregular. Outer margin of fore wing faintly concave between veins Cu_{1a} and M_{2} ............ merione (Cramer)

15. Ariadne ariadne pallidior (Fruhstorfer) (Angled Castor)


Material examined : Sikkim, 3ex, no further data.

Fore wing length : 23-25 mm.

Distribution : India : Sikkim (South Sikkim), Arunachal Pradesh, Uttar Pradesh. Elsewhere : Myanmar.

Remarks : This subspecies differs from its conterpart, A ariadne indica (Moore) from South India to Bengal by upperside of hind wing with veins M_{2} and M_{1} not conspicuously white and discal lines run to costa. De Nicèville (1881, 1885) recorded it as Ergolis ariadne (Linnaeus) from South Sikkim (Rungeet Valley) and E. indica Moore during collection made from Rungeet Valley and road between it and Darjeeling.

16. Ariadne merione assama (Evans)


Material examined : Sikkim, 1ex, no further data.
GUPTA : Insecta : Lepidoptera : Nymphalidae

Fore wing length : 29 mm.


Remarks : The subspecies prefers forested areas and is distinguished from the nominate subspecies (South India to Maharashtra) by underside of hind wing with upper part of disc being not darkened and bands distinct, and from A. merione tapestrina (Moore) (Central Provinces to Orissa and Jammu & Kashmir to Uttar Pradesh) by its large wing expanse of 50-60 mm and dry season form never variegated.

Tribe Heliconiini

Labial palpi with second segment inflated. Fore wing vein not dilated at base, R₄ arising from Rₛ or cell, apex of cell and origin of Cu₁₄ equidistant from wing base or former more distant; hind wing precostal vein arising beyond origin of vein.

This tribe represented in India by eight genera is dealt with from Sikkim.

Key to genera

1. Tarsal claws very long and without appendages ........................................... Cethosia Fabricius
   - Tarsal claws normal and with appendages ........................................... 2

2. Fore wing with lower discocellular vein, if present, ending beyond origin of vein Cu₁₄ ........................................... 3
   - Fore wing with lower discocellular vein ending before/at or only just beyond origin of vein Cu₁₄ ........................................... 4

3. Cell open in hind wing ........................................... Melitaea Fabricius
   - Cell closed in hind wing ........................................... Argytnnis Fabricius

4. Fore wing vein R₄ arising from cell, Rₛ ending on apex behind a line joining ends of veins Rₛ, R₃ and M₁ ........................................... 5
   - Fore wing vein R₄ arising from Rₛ, R₃ ending on costa and Rₛ behind a line joining ends of Rₛ and M₁ ........................................... 6

5. Antennae longer than half the length of costa, club gradual. Fore wing with lower discocellular vein ending at or just beyond origin of vein Cu₁₄ ........................................... Vindula Hemming
   - Antennae equal to half the length of costa, slender and clubless. Fore wing with lower discocellular vein ending before origin of vein Cu₁₄ ....................... Cirrochroa Doubleday

6. Antennal club absent. Fore wing vein R₄ arising well beyond origin of Rₛ, R₄ very short; hind wing cell open ....................... Cupha Billberg
   - Antennal club moderate. Fore wing vein R₄ arising just beyond origin of vein Rₛ; hind wing cell closed ........................................... 7

7. Hind wing with a spur from the angle of vein Mₛ towards M₃ ........................................... Vagrants Hemming
   - Hind wing without any spur from the angle of vein Mₛ ........................................... Phalanta Horsfield

XII genus Cethosia Fabricius


This genus is represented in India by three species of which two are known from Sikkim.

Key to species

Upperside of fore wing, in both sexes, marked with a broad oblique discal white or yellowish band ........................................... cyane (Drury)
   - Upperside of fore wing, in either sex, without a broad oblique discal white or yellowish band ........................................... biblis (Drury)

17. Cethosia cyane (Drury) (Leopard Lacewing)

1770. Papilio cyane Drury, Ill. exot. Ent., 1 : Pl. 4. fig. 1.

Material examined : Sikkim, lex, 20-xii-1886, 5 exs, no data, (De Nicéville Coll.). Sikkim, lex, no further data.
Fore wing length: 40-42 mm.

Distribution: India: Sikkim, Arunachal Pradesh, Uttar Pradesh and West Bengal.
Elsewhere: Myanmar.

Remarks: Evans (1932) mentioned its status 'not rare' but Haribal (1992) commented about it to be rather rare in Sikkim.

18. Cethosia biblis tisamena Fruhstorfer (Red Lacewing)


Material examined: Sikkim, 8exs, no date, 2100-2590 m, lex, no date; East Sikkim, Rungeet Valley, 305 m, 4exs, no date (De Nicèville Coll). North Sikkim, Manshithing, alt. 1576m, lex, 25-vii-1959 (A.G.K. Menon Coll). South Sikkim, Namchi, 1620m, lex, 25-ix-1983 (G.K. Srivastava & Party Coll.).

Fore wing length: 31-38 mm.

Distribution: India: Sikkim (East, North and West Sikkim). Arunachal Pradesh and West Bengal.
Elsewhere: Tibet.

Remarks: This subspecies differs from other three subspecies, viz., balbi More [Pakistan (Chitral)—Kashmir (India)], sindura Moore [Jammu & Kashmir (Ladakh) – Uttar Pradesh (Kamaon)] and thibetana Fawcett (Sikkim at very high elevations—Tibet) by its upperside of wings heavily marked, submarginal band nearly or quite coalesced to the dash margin and underside also heavily marked. Haribal (1992) reported it from North Sikkim beyond Gingong to Chho Lamho area.

20. Melitaea arcesia thibetana Fawcett (Blackvein Fritillary)


Material examined: Sikkim (native), lex, no date, (De Nicèville coll). Sikkim, 3exs, no further data, 3000 feet, lex, no further data.

Fore wing length: 16-18 mm.

Distribution: India: Sikkim at very high elevations. Elsewhere: Tibet.

Remarks: Bingham (1905) considered thibetana from Tibet as a form of sikkimensis and, the former differing from later by its upperside being prominently pale ochraceuos at base and apex of cell of fore wing, and similarly coloured terminal row of lunular transverse marks

This genus represented in India by a single species, Melitaea arcesia Bremer is dealt with from Sikkim.
on fore-and hind wings; and underside paler. Bingham (loc. cit) and Evans (1932) mentioned its wing expanse less than 40 mm and 40-45 mm for sikkimensis, respectively. Haribal (1992) followed Evans (loc. cit.) for wing expanse for subspp., thibetana and sikkimmensis.

XIV. Genus Argynnis Fabricius


Of the 14 species occurring in India, eight are dealt with from Sikkim.

**Key to species**

1. Fore wing with vein R₂ arising from cell, upper apex opposite well beyond origin of Cu₁a ...
   − Fore wing with vein R₂ arising from R₅ (except in gemmata) ........................................ 6

2. Hind wing precostal vein well curved forward ................................................................. 3
   − Hind wing precostal vein straight and rather obscure .................................................... 5

3. Underside of hind wing ochreous and olive brown with silver stripes ........................................................... hyperbius (Linnaeus)
   − Underside of hind wing dark green with silver spots ........................................................................ 4

4. Underside with basal silver stripes continued to costa; discal silver band straight ...........
   ........................................................ childreni Gray
   − Underside with no silver marking in space, discal bands very sinuate ...... kamala Moore

5. Underside of hind wing ochreous bearing very large silver spots, postdiscal series of small, brown ringed silver spots bowed in the middle present ......................... lathonia (Linnaeus)
   − Underside of hind wing dark green bearing a discal series of long silver streaks complete but postdiscal series absent................................. clara Blanchard

6. Hind wing costa straight and apex pointed; underside markings not prominently silver and spot at end cell not elongated................................. pales (Dennis Schiff)
   − Hind wing apex rounded, underside markings brilliant silvery, spot at end cell very long, nearly or quite reaching postdiscal row of small spots ...................................................... 7

7. Underside of hind wing with marginal silver markings long, narrow, of equal width throughout and nearly reaching postdiscal spots ..................................... altissima Elwes
   − Underside of hind wing with marginal silver markings short, not of even width and also not reaching postdiscal spots .... gemmata Butler

21. *Argynnis hyperbius hyperbius* (Linnaeus) (Indian Fritillary)


**Material examined**: Sikkim, lex, no date, (C. Lynch coll.); Sikkim, lex, no date (purchased), 549 m, lex, no further data.

**Fore wing length**: 35-37 mm.

**Distribution**: India : Sikkim (East, North and West Sikkim). Elsewhere : North Myanmar and Pakistan.

**Remarks**: This nominate subspecies is distinguished from other two Indian subspp., viz., castesi Oberthuer found in Travancore and Palni hills, hyrida Evans occurring in Nilgiris by the much produced apex of fore wing in male and in female termen concave in the middle. Corbet & Pendlebury (1992), Haribal (1992) and Varshney (1994) treated this taxon under the genus Argyreus Scopoli. Haribal (loc. cit.) recorded it from East, North and West Sikkim.

22. *Argynnis childreni childreni* Gray (Large Silver Stripe)


Fore wing length : 42 mm.


Remarks : This nominate subspecies is distinguished from A. childreni sakontala Kollar [Pakistan (Chitral)—India (Kumaon)] by its wing expanse more and upperside of hing wing with marginal blue suffusion broad and prominent. Elwes (1882) reported it from Sikkim. Haribal (1992) recorded it from East Sikkim (Bushuk, Gangtok and Penlongla), North Sikkim (Lachen, Lachung) and West Sikkim (Yoksum). Haribal (1992) and Varshney (1994) treated this species under the genus Childrena Hemming.

23. Argynnis kamala Moore
(Common Silverstripe)


Material examined : Nil.

Wing expanse : 65-75 mm.


24. Argynnis lathonia issoea Doubleday
(Queen of Spain)


Material : Sikkim, 2 exs, no date ; North Sikkim, Lachung Valley, lex, no date, (De Nicéville Coll.).

Fore wing length : 24-25 mm.


Remarks : This subspecies differs from the nominate one by underside of hind wing basal yellow spot in a space Cu₁₁ and second silver spot from base in space Cu₁₇. Elwes (1882) recorded it from Sikkim as Argynnis Lathonia Linnaeus (= A. issoea Moore). Haribal (1992) treated its species under the genus Fabriciana Reuss and Varshney (1994) considered lathonia Linnaeus and issoea Doubleday as two distinct species.

25. Argynnis clara manis Fruhstorfer
(Silverstreak)


Material examined : Sikkim; North Sikkim, lex, -viii-, 10000–14000feet, lex, no date; Sikkim (native), lex, no date; Sikkim, lex, 6-xi–(De Nicéville Coll).

Fore wing length : 22-23 mm.


Remarks : This subspecies is distinguished from the nominate subspecies by upperside pale ochreous, and broader dark markings. Haribal (1992) and Varshney (1994) considered the species clara Blanchard under the genera Melitaea Fabricius and Mesoacidalia Reuss, respectively.

26. Argynnis pales eupales (Fruhstorfer)
(Straightwing Silverspot)


**Material examined**: Sikkim, 1ex, no further data. Native Sikkim, 1ex, no data, 427-549 m. 2exs, — viii—, (De Niceville Coll).

**Fore wing length**: 18-19 mm.

**Distribution**: India : Sikkim. Elsewhere : Tibet.

**Remarks**: This subspecies is distinguished from other two subspecies, viz., *sipora* Moore and *korla* Fruhstorfer mainly by upperside darker with heavier markings. Corbet and Pendlebury (1992) and Haribal (1992) treated the species *pales* (Dennis Schiffer-Miller) under the genus *Boloria* and Varshney (1994) followed it.

27. *Argynnis altissima* Elwes (Mountain Silverspot)


**Material examined**: Sikkim, native, 3exs, no date, (De Nicéville Coll.). Sikkim, Chumbi Valley, 1ex, 7-xi—, (D. Mac. Donald Coll.).

**Fore wing length**: 16-17 mm.

**Distribution**: India : Sikkim (North Sikkim), Elsewhere : Tibet.

**Remarks**: Evans (1932) and Haribal (1992) treated *altissima Elwes* as species and subspecies *gemmata altissima*, respectively, under the genus *Argynnis*. Varshney (1994) considered *altissima* and *gemmata Butler* as separate species under the genus *Kuekenthaliella* Reuss. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

28. *Argynnis gemmata gemmata* Butler (Gem Silverspot)


**Material examined**: Sikkim, 1ex, —. — 1881. 6 exs, no date (H.J. Elwes exchange). Sikkim, 1ex, no date. Native Sikkim, 5 exs, no date, 527-549M, 1ex, no date, (De Nicéville coll). Sikkim, 1ex, — vii & ix—1911 (Harryngton coll).

**Fore wing length**: 22-24 mm.

**Distribution**: India : Sikkim and Uttar Pradesh. Elsewhere : Tibet.

**Remarks**: Elwes (1882) recorded the nominate subspecies from Sikkim. Evans (1932) and Haribal (1992) treated it under the genus *Argynnis*. Varshney (1994) considered it under the genus *Kuekenthaliella* Reuss. Bingham (1905) mentioned its distribution from Kumaon to Chumbi Valley, east of Sikkim and Tibet.

XV Genus **Vindula** Hemming


Only a single species, *Vindula erota* (Fabricius) occurring in India is reported from Sikkim.

29. *Vindula erota erota* (Fabricius) (Cruiser)


**Material examined**: Sikkim, 4 exs, no date, 1ex,—ix—, 3 exs, —xi— (De Nicéville coll). Sikkim, 1ex, — x—, no coll, 2 exs, no date (purchased).

**Fore wing length**: 46-48 mm.

**Distribution**: India : Sikkim (East Sikkim), Arunachal Pradesh and West Bengal. Elsewhere : Myanmar.

**Remarks**: The nominate subspecies differs from its two counterparts viz., *V. erota saloma* Swinhoe found in South India and *V. erota pallida* Staudinger occurring in Andamans by its seasonal forms very-sharply marked, in female hind wing.
upperside bases green, discal band running from costa to vein Cu₄, marginal area broad and ochreous brown. Haribal (1992) reported it from East Sikkim (Tumin Khola and Rangli Valley).

XVI. Genus *Cirrochroa* Doubleday


Of the four species of this genus occurring in India, two viz., *C. aoris* Doubleday and *C. tyche* Felder are dealt with from Sikkim.

**Key to species**

Fore wing with apex truncated.........................

................................................. *aoris* Doubleday

- Forewing with apex rounded........................

................................................. *tyche* Felder

30. **Cirrochroa aoris aoris** Doubleday

(Large Yeoman)


*Material examined* : Sikkim, 2exs, no date, (purchased), 12exs, no date, 1ex, —viii—, 1ex, 13–xi–1879 (*De Nicèville Coll*). Sikkim, 1ex, 10–x–1884, (*O. Moeller Coll*). West Sikkim, Geyzing, 1ex, 16–x–1959, Naya Bazar, 1ex, 17–x–1959 (*B.K.Tikader Coll*).

*Fore wing length* : 37–40 mm.

*Distribution* : India : Sikkim (East, North, South and West Sikkim), Arunachal Pradesh and West Bengal.

*Remarks* : Haribal (1992) recorded it from East Sikkim (Dikchu, Rangpo), North Sikkim (Mangan) and South Sikkim.

31. **Cirrochroa tyche mithila** Moore

(Common Yeoman)


*Material examined* : Nil.

*Wing expanse* : 65–75 mm.

*Distribution* : India : Sikkim (South Sikkim), Arunachal Pradesh, Meghalaya, Nagaland and West Bengal. *Elsewhere* : Myanmar.

*Remarks* : Haribal (1992) observed it near Norak in South Sikkim. Varshney (1994) treated *tyche* (Cramer) and *mithila* Moore as separate species under the genus *Cirrochroa*.

XVII Genus *Cupha* Billberg


Only a single species, *Cupha erymanthis* (Drury) occurring in India is dealt with from Sikkim.

32. **Cupha erymanthis lotis** Sulz.

(Rustic)


*Material examined* : Sikkim, 1ex, no date. (*De Nicèville coll*).

*Fore wing length* : 26 mm.


*Remarks* : This subspecies is distinguished from other three subspecies, viz., *maja* Fruhstorfer found in South India, *andamanica* Moore.
occurring in Andamans and nicobarica Felder confined to Nicobars by the upperside of the fore wing with a black spot in space 1A + 2A much larger than spots in spaces Cu1b and Cu1a, yellow spots on black apex; underside markings in cells pale and conjoined. De Nicèville (1883) mentioned that Moeller observed this subspecies in the bed of a stream below Poshak.

XVIII. Genus Vagrans Hemming

This monotype genus is represented in India by a single species, Vagrans egista (Cramer).

33. Vagrans egista sinha (Kollar) (Vagrant)

1844. Terinas sinha Kollar, Huegel’s Kaschnir, 4 (2) : 438.

Material examined : Nil.

Wing expanse : 55-65 mm.

Distribution : India : Sikkim, Bengal (old) and Orissa. Elsewhere : Myanmar.

Remarks : Evans (1932) and Haribal (1992) treated this taxon under the genus Issoria Moore. De Nicèville (1883) referred that Moeller observed this butterfly in the bed of a stream below Poshak.

XIX. Genus Phalanta Horsfield


Two species, viz., Phalanta phalantha (Drury) and P. alcippe (Cramer) of this genus found in India are dealt with from Sikkim.

Key to species

Fore wing with four black lines within the cell, other markings rounded .. phalantha (Drury)
- Fore wing with five or six black lines within the cell, other markings more linear ............

...........................................

34. Phalanta phalantha phalantha (Drury) (Common Leopard)


Material examined : Sikkim, lex, no date, (bred from pupa), lex, no date, (De Nicèville coll.); North Sikkim, about 11 km from Lachung on Yumathang Road, lex., 21-iv-1992 (R.S. Mirdha coll.)

Fore wing length : 25-26 mm.

Distribution : India : Sikkim, (East, North and South Sikkim), Arunachal Pradesh, Madhya Pradesh, Maharasthra, Nicobar Island, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere : Myanmar and Pakistan.

Remarks : Only the nominate subspecies known in India is widely distributed. Haribal (1992) reported it from East Sikkim (Rangpo), North Sikkim ((Sanklang and Mangan in Teesta Valley) and South Sikkim (Rungeet Valley).

35. Phalanta alcippe alcippoides (Moore) (Small Leopard)

1900. Atella alcippoides Moore, Lep. Ind. 4 : 199, pl. 361., fig. 1, 1a-1d, 19.

Material examined : Sikkim. 4exs, no date. (De Nicèville Coll.).

Fore wing length : 17-19 mm.


Remarks : This subspecies is distinguished from other subspp. viz., mercea Evans occurring in South India, andamana Frushstorfer in Andamans.
and *fratrena* Moore in Central and South Nicobars by upperside wing veins not black, fore wing fully spotted, postdiscal line slender and in an even curve between Cu, and M4.

**Tribe Nymphalini**

Fore wing termen and dorsum subequal, fore wing vein Sc not dilated at base, R2 arising from end cell, R3 equidistant between R2 and M1 or only a little closer to M1, R4 arising well beyond origin of R3 and ending at apex or termen. Hind wing precostal vein arising beyond origin of Sc. Female fore tarsus normal and not clawed.

The tribe is represented in India by 11 genera.

**Key to genera**

1. Eyes smooth .................................................. 2
   - Eyes hairy.................................................. 5

2. Labial palpi black above, white beneath. Head and thorax black, each with a pair of white dots. Fore wing only slightly falcate .......... ................................. *Hypolimnas* Huebner
   - Labial palpi not as above. Head and thorax not white spotted. Fore wing markedly falcate .............................................................. 3

3. Hind wing not tailed ........... *Junonia* Huebner
   - Hind wing tailed or prominently toothed ..... 4

4. Upperside orange brown with a black apical border on fore wing. Cell open in fore and hind wing ............. *Doleschallia* Felder
   - Upperside purple blue with a broad orange or pale blue subapical band on fore wing. Cells slenderly closed in fore and hind wing .............. ................................. *Kallima* Doubleday

5. Antennae equal to half the length of costa of fore wing. Cell open in hind wing ........
   - Antennae longer than half the length of costa of fore wing. Cell closed in hind wing ..... 6

6. Hind wing not produced and angled at vein M3 ................................................................. 7
   - Hind wing termen produced at vein M3 .... 8

7. Upperside pinkish red, base golden brown, fore wing with three central black spots on the red area. ................................ *Cynthia* Fabricius
   - Upperside dark brown with a red central band on fore wing and a black spotted red marginal band on underside of hind wing ................
   - Upperside very dark indigo blue with a broad postdiscal blue band on fore wing and hind wing .......................... *Kaniska* Moore

8. Fore wing dorsum excavated in the distal half. Hind wing termen excavated above vein R1 ................................. 9
   - Fore wing dorsum straight. Hind wing termen not excavated above vein R1 .................... 10

9. Upperside very dark indigo blue with a broad postdiscal blue band on fore wing and hind wing .......................... *Kaniska* Moore
   - Upperside tawny with black spots .................. ................................. *Polygonia* Huebner

10. Palpi, costa of fore wing and dorsum of hind wing with long, black, coarse and erect hairs ................................. *Nymphalis* Kluk
    - Palpi, costa of fore wing and dorsum of hind wing without long, black coarse and erect hairs ................................. *Aglais* Dalman.

**XX Genus Hypolimnas** Huebner


This genus is represented in India by two species, viz., *Hypolimnas bolina* (Linnaeus) and *H. misippus* (Linnaeus) which are dealt with from Sikkim.

**Key to species**

Underside of hind wing with a prominent middle black costal spot in space R1 .......... ................................. *misippus* (Linnaeus)
- Underside of hind wing without any prominent middle black costal spot in space R1 .......... ................................. *bolina* (Linnaeus)

36. *Hypolimnas misippus* (Linnaeus)
   (Danaid Egyfly)


**Material examined**: Nil.

**Wing expanse**: 70-85 mm.


**Remarks**: The female of this species is polymorphic and also mimicks the Danaus chrysippus Linnaeus of the subfamily Danainae. Bingham (1905), Evans (1932) and Wynter Blyth (1957) stated its distribution India throughout India. This species has been included in Schedule-I (Part-4) and Schedule-II (Part-2) of the Indian Wild Life (Protection) Act.

**Key to species**

1. Upperside of fore wing with a black spot of variegated ocellus in space Cu₁b ........................................ 2
   - Upperside of fore wing without any ocellus in space Cu₁b ........................................... iphita (Cramer)
2. Upperside of hind wing with a black spot in space Cu₁b .................................................. hierta (Fabricius)
   - Upperside of hind wing with a variegated ocellus in space Cu₁b ......................................... 3
3. Upperside of fore wing and hind wing with submarginal ocelli in all spaces .................................................. atlites (Linnaeus)
   - Upperside of fore wing and hind wing without submarginal ocelli in space Cu₁a and M₁ ........................................ 4
4. Upperside of fore wing with a whitish subapical band .................................................. orithya (Linnaeus)
   - Upperside of fore wing without any whitish subapical band ............................................... 5
5. Upperside of fore wing brown with pale yellow spots .................................................. lemonias (Linnaeus)
   - Upperside of fore wing fulvous orange and without pale yellow spots .................................................. almana (Linnaeus)

37. Hypolimnas bolina (Linnaeus) (Great Eggfly)


**Material examined**: Sikkim, 1ex., no further data. Sikkim, 5 exs, no date, (De Nicèville Coll.).

**Fore wing length**: 38-48 mm.

**Distribution**: India: Sikkim, (East and South Sikkim), Andaman & Nicobar Islands, Arunachal Pradesh, Madhaya Pradesh, Meghalaya, Uttar Pradesh and West Bengal. Elsewhere: Myanmar, Pakistan and Sri Lanka.

**Remarks**: Haribal (1992) reported this species from East Sikkim (Rangpo and Gangtok) and South Sikkim (Rungeet Valley). Evans (1932) and Wynter –Blyth (1957) considered its status common but in 1981 this species was listed in a title 'Rare and Endangered Animals of India' issued by the Director, Zoological Survey of India.

XXI Genus Junonia Huebner


Six species representing this genus in India are dealt with from Sikkim.

38. Junonia iphita iphita (Cramer) (Chocolate Pansy)


**Material examined**: Sikkim, 2exs, no date (De Nicèville Coll.).

**Fore wing length**: 29-30 mm.

Remarks: This nominate subspecies differs from its two other counterparts, viz., siccata Stichel found from Kashmir to Kumaon and pluviatalis Fruhstorfer occurring in Central and South India, Maldives and Sri Lanka, by its larger wing expanse, darker colouration and dry season form may be variegated.

39. Junonia hierta magna (Evans) (Yellow Pansy)


Material examined: Sikkim, 2exs, no date, (De Nicèville Coll.).

Fore wing length: 24-26 mm.

Distribution: India: Sikkim (East, North and South Sikkim), Andaman & Nicobar Islands, Arunachal Pradesh. Elsewhere: Myanmar.

Remarks: This subspecies differs from the nominate subspecies by larger wing expanse and brighter colouration. Haribal (1992) reported it from East Sikkim (Rangpo), North Sikkim (Mangan and Singhik) and South Sikkim (Rungeet Valley).

40. Junonia atlites (Linnaeus) (Grey Pansy)


Material examined: Sikkim, lex, no date, (De Nicèville Coll.). North Sikkim, between Lachen and Zumaban, lex, 25-iv-1992 (no coll.).

Forewing length: 26 mm.

Distribution: India: Sikkim (East, North and South Sikkim), widely distributed in India.

Remarks: De Nicèville (1881) recorded this species from South Sikkim (Rungeet Valley) and Haribal (1992) reported it from East Sikkim (near Rangpo).

41. Junonia orithya ocyale (Huebner) (Blue Pansy)

1819. Papilio ocyale Huebner, Verz., bekannt. Schmett., : 34.

Material examined: Sikkim, lex, no date, (De Nicèville Coll.).

Fore wing length: 22 mm.

Distribution: India: Sikkim (East, North, South and West Sikkim), Andaman & Nicobar Islands, Arunachal Pradesh, West Bengal. Elsewhere: Myanmar.

Remarks: This subspecies differs from its counterpart, J. orithya swinhoei Butler found in India, Baluchistan and Sri Lanka, by its wing expanse larger and underside darker. De Nicèville (1883) reported it from South Sikkim Rungeet Valley). Haribal (1992) observed it in East Sikkim (Rangpo, Gangtok), North Sikkim (Mangan) and West Sikkim (Legship).

42. Junonia lemonias lemonias (Linnaeus) (Lemon Pansy)

GUPTA: Insecta: Lepidoptera: Nymphalidae

Material examined: Nil.
Wing expanse: 50-60 mm.

Distribution: India, Sikkim (South Sikkim), Arunachal Pradesh. Elsewhere: Myanmar.

Remarks: This nominate subspecies differs from other two subspp. viz., vaisya Fruhstorfer occurring in Central and South India and Sri Lanka, and persicaria Fruhstorfer found from Kashmir to Kumaon, by wing expanse larger, very variable dry season form and underside often rosy. Haribal (1992) recorded it from South Sikkim.

43. Junonia almana almana (Linnaeus) (Peacock Pansy)


Material examined: Sikkim, lex, no date, 689-1475 m, lex, no date, (De Niceville Coll); 3exs, no further data; South Sikkim, Melli, lex, 21-ix-1983 (G. K. Srivastava & Party Coll).

Forewing length: 25 mm.

Distribution: India: Sikkim (East and North Sikkim), widely distributed in India. Elsewhere: Myanmar and Sri Lanka.

Remarks: This nominate subspecies differs from its counterpart nicobariensis Felder found in Car Nicobar mainly by its larger wing expanse. De Nicèville (1883) recorded it from East Sikkim (Rungeet Valley). Haribal (1992) found it common up to an altitude of 1800 m in Sikkim.

XXII. Genus Doleschallia Felder

This genus is represented in India by a single species, Doleschallia bisaltide (Cramer).

44. Doleschallia bisaltide indica Moore (Autumn Leaf)

1900. Doleschallia indica Moore. Lep. Ind., 4 : 155, pl. 336, fig. 1. 1a-1c, & 2. 2a, 2b, male, female, larve and pupa.


Material examined: Sikkim, lex, 15-v-1886, 5exs, no date, (De Nicèville Coll); 3exs, no further data; South Sikkim, Melli, lex. 21-ix-1983 (G. K. Srivastava & Party Coll).

Forewing length: 38-40 mm.


Remarks: Haribal (1992) mentioned its occurrence in East Sikkim (Dichu) and North Sikkim (Mangan, Singhik and Tholung).

XXIII Genus Kallima Doubleday


This genus is represented in India by four species of which three species are dealt with from Sikkim.

Key to species
1. Upperside fore wing with dark basal area extending beyond end cell ................................2
   - Upperside fore wing the dark basal area not extending beyond end cell ... alompra Moore
2. Upperside of fore wing with discal band blue or bluish white .......... philarchus Westwood
   - Upperside of fore wing with discal band orange ......................... inachus Boisduvel

45. Kallima alompra Moore (Scarce Blue Oakleaf)

1886. Kallima knyvetti De Nicèville, Butterflies of India, Burmah and Ceylon, 2 : 267

Material examined: Nil.
Wing expanse: 95–110 mm.


Remarks: De Nicèville (1886) recorded it from Sikkim (Buxa), Bhutan and Myanmar. Evans (1932) mentioned its distribution from Sikkim to Myanmar. Haribal (1992) did not list this species from Sikkim.

46. Kallima philarchus horsfieldi (Kollar) (Blue Oakleaf)


Material examined: Nil.

Wing expanse: 85–110 mm.

Distribution: India: Sikkim (North Sikkim), Karnataka, Maharashtra and South India. Elsewhere: Myanmar.

Remarks: This subspecies differs from the nominate one found in Sri Lanka by its paler colouration, discal band uniformly coloured and female is much greener. De Nicèville (1886) mentioned its distribution in Himalayas, Belgaum (Karnataka) and Mathern Hill, Bombay (Maharashtra) whereas Evans (1932) considered it as confined to South India. Haribal (1992) stated its occurrence in North Sikkim (Tholung Valley).

47. Kallima inachus inachus (Boisduval) (Orange Oakleaf)


Fore wing length: 39–41 mm.

Distribution: India: Sikkim (South Sikkim) and Assam.

Remarks: This nominate subspecies is distinct from its counterpart, K. inachus huegeli (Kollar) found from Kashmir to Kumaon in having dry season form not much paler than the wet season form which is darker. De Nicèville (1881) reported it from South Sikkim (Rungeet Valley).

XXIV. Genus Symbrenthia Huebner


All the four species of this genus occurring in India are dealt with from Sikkim.

Key to species

1. Underside of fore and and hind wings marked with black tesselations .................................. 2

- Underside of fore and hind wings marked with ferruginous markings; black tesselations absent ....................................... lilaea De Nicèville

2. Underside of hind wing with subterminal lunules metallic cerulean blue ......................... ........................................ silana De Nicèville

- Underside of hind wing with subterminal lunules metallic green ................................... 3

3. Upperside of fore wing with preapical oblique fulvous or yellow irregular short band extended to costal margin ................. niphanda Moore

- Upperside of fore wing with preapical oblique fulvous or yellow irregular short band not extended to costal margin ......................... hypselis Godart

48. Symbrenthia lilaea khasiana Moore (Common Jester)


Material examined: Sikkim, 9exs, no date, 914 m, 1ex, no date, 689-1323 m, 1ex, no date (De Nicèville Coll.). South Sikkim, Tashingong, 1ex, 29–ix–1959 (B.K. Tikader Coll.) Sikkim, Paykong, 1ex, 12–ix–1993 (S.K. Saha & S.K. Chatterjee Coll).

Forewing length: 22–23 mm.


49. Symbrenthia silana De Nicèville

1885. Symbrenthia silana De Nicèville, J. Asiat. Soc. Beng., 54 (2) : 117.


Material examined: Sikkim, 7exs, no date, 1ex, 11–iii–1887. (De Nicèville Coll.).

Forewing length: 25–27 mm.


Remarks: Bingham (1905) treated this species as a race of S. niphanda Moore whereas Evans (1932) and Varshney (1994) maintained its species status. Haribal (1992) did not list this species. Its status is very rare and it has been included in Schedule-I (Part-4) of the Indian Wild Life (Protection) Act.
Sikkim (Mangan, Tholung Valley) and West Sikkim (Tashiding).

XXV. Genus Cynthia Fabricius


Only a single species represents this genus in India.

52. Cynthia cardui (Linnaeus) (Painted Lady)


Material examined : Sikkim : North Sikkim, Yathang (about 15 km North of Lachen), lex, 26-iv-1992 (R.S. Mirdha coll.).

Forewing length : 26 mm.

Distribution : India: Sikkim (North Sikkim), Arunachal Pradesh, Jammu & Kashmir. Elsewhere : worldwide except South America and Antarctica.

Remarks : The species is migratory in habit. It was treated earlier under the genus Vanessa Fabricius but Field (1971) resurrected the genus Cynthia Fabricius and held Cynthia cardui (Linnaeus) a valid species and followed by Varshney (1977), Gupta (1988), Haribal (1992). De Nicèville (1883) stated that the species is not common in Sikkim and it fed upon thistle but Haribal (1992) mentioned it to be common in Sikkim.

XXVI. Genus Vanessa Fabricius


Only a single species, Vanessa indica (Herbst) occurs in India.

53. Vanessa indica indica (Herbst) (Indian Red Admirable)

1794. Papilio atlanta indica Herbst. Nat. Syst. Schmett. 7 : 171, pl. 180, fig. 1, 2.


Material examined : Sikkim, lex, --x--, lex, no date, (De Nicèville Coll.); Sikkim, Rangli, alt. 800m, lex, 20-xii-1975, alt. 950 m, lex, 23-xii-1975 South Sikkim, Melli, lex, 21-ix-1983 (G.K. Srivastava & Party Coll).

Forewing length : 25–26 mm.

Distribution : India : Sikkim (East, North, South and West Sikkim), Arunachal Pradesh and Jammu & Kashmir. Elsewhere : North Myanmar.

Remarks : This nominate subspecies differs from its counterpart, V. indica pholoe Fruhstorfer found in South India by upperside dark brown areas with a golden gloss, fore wing bearing a discal band much wider and paler, and lower of two central spots detached; underside fore wing with bluish spots at end cell large and prominent, hind wing termen red. Haribal (1992) observed it in East Sikkim (Gangtok), North Sikkim (Mangan and Tholung Valley) and West Sikkim (Yoksum).

XXVII. Genus Kaniska Moore

1899. Kaniska Moore, Lep. Ind., 2 (14) : 42.

This genus is represented in India by a single species Kaniska canace (Linnaeus)

54 Kaniska canace canace (Linnaeus) (Blue Admirable)


Material examined : Sikkim, 2exs, no date (De Nicèville Coll).
Insecta: Lepidoptera: Nymphalidae

**Forewing length**: 31-32 mm.


**Remarks**: This nominate subspecies differs from other two Indian subspp., viz., *himalaya* Evans found from Pakistan (Chitral) to India (Kumaon) and *viridis* Evans occurring in South India by wing expanse larger, postdiscal band blue and wider.

**XXVIII. Genus Polygonia Huebner**


Only a single species, *Polygonia egea* (Cramer) representing this genus in India, is dealt with from Sikkim.

55. *Polygonia egea agnicula* (Moore) (Eastern Comma)


**Material examined**: Sikkim, lex, no date (De Nicéville Coll).

**Forewing length**: 25 mm.


**Remarks**: This subspecies differs from its counterparts, viz., *cognata* Moore occurring from Nathia Gali-Kumaon, *kashmira* Evans found in Kashmir and Ladakh by upperside uniformly fulvous red with comparatively narrow markings, margin uniform, hind wing without yellow spots instead a submarginal red band present which is inwardly bordered by a dark broken postdiscal band. Its status is rare and its has been included in Schedule-II (Part-2) of the Indian Wildlife Protection Act.

**XXIX. Genus Nymphalis Kluk**


This genus is represented in India by three species of which *Nymphalis antiopa* (Linnaeus) is dealt with from Sikkim.

56. *Nymphalis antiopa yedanula* (Fruhstorfer) (Camperwell Beauty)


**Material examined**: Sikkim, lex, no date (purchased).

**Forewing length**: 35 mm.


**Remarks**: Only this single subspecies represented in India is confined to Sikkim. Its status is very rare and it has been listed in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

**XXX. Genus Aglais Dalman**


Three species of this genus known in India are dealt with from Sikkim.

**Key to species**

1. Fore and hind wings narrow and produced. Upperside of hind wing with submarginal row of blue centred black spots inwardly fuscous bordered .................. *cashmirensis* Fruhstorfer
   - Fore and wings broad and squared. Upperside of hind wing with submarginal row of blue centred black spots not inwardly fuscous bordered ......................................................... 2

2. Forewing termen rounded at apex and only slightly produced at vein M₁ ..........................................
   - Fore wing termen concave below apex........
     .................................................. *urticae* Linnaeus
57. Aglais cashmirensis aesis (Frushstorfer) (Indian Tortoishell)


Forewing length : 24-28mm.

Distribution : India : Sikkim (East and North Sikkim), Himachal Pradesh and West Bengal.

Remarks : This subspecies differs from its nominate counterpart occurring from Pakistan, North Waziristan, Safed Koh, Chitral - India (Kulu) by upperside of fore wing with fuscous inner border wider and yellow area more developed. Elwes (1882) recorded it from Sikkim.

59. Aglais urticae rizana (Moore) (Mountain Tortoishell)


Material examined : Nil.

Wing expanse : 50-60 mm.


Remarks : The status of this subspecies is rare and it has been listed in Schedule-II (Part-2) of the Indian Wild Life (Protection) Act.

Tribe Cyrestini

Both fore and hind wings marked with transverse and stripes running across their surfaces. Fore wing with vein Sc not dilated at base, R₄ ending on costa; hind wing with precostal vein arising beyond origin of Sc.

This tribe is known in India by two genera, viz., Cyrestis Boisduval and Chersonesia Distant.

Key to genera

Fore wing with vein R₂ arising directly from cell.......................... Cyrestis Boisduval
- Fore wing with vein R₂ arising from vein R₃

Chersonesia Distant

XXXI. Genus Cyrestis Boisduval


Of the three species occurring in India, two viz. Cyrestis cocles Fabricius and C. thyodamas Boisduval are treated from Sikkim.

Key to species

Fore wing termen even and hind wing apex rounded ......................... cocles (Fabricius)
Fore wing tornus and hind wing apex truncated ....................................... *thyodamas* Boisduval

60. *Cyrestis cocles cocles* (Fabricius) (Marbled Map)


**Material examined** : Nil.

**Wing expanse** : 50-60 mm.

**Distribution** : India : Sikkim, Orissa.
**Elsewhere** : Myanmar.

**Remarks** : The nominate subspecies is distinguished from its counterpart *C. cocles formosa* Felder found in Andamans by its lesser wing expanse. Its status is rare and also included in Schedule-II (Part-2) of the Indian Wild Life (Protection) Act.

61. *Cyrestis thyodamas thyodamas* Boisduval

1836. *Cyrestis thyodamas* Boisduval, Cuv. Reg. Anim Ins., 2 : pl 138, Fig. 4.

**Material examined** : Sikkim, 4exs, no date, 1ex, –xi–, South Sikkim, Rungeet Valley, alt. 305m, 1ex, 15–x–1880, (De Nicèville coll.), Sikkim, 2exs, no date. (De Nicèville, purchased).

**Fore wing length** : 26–28 mm.

**Distribution** : India : Sikkim (East and South Sikkim) Arunachal Pradesh and West Bengal.
**Elsewhere** : Bhutan, Myanmar and Nepal.

**Remarks** : The nominate subspecies is characteristically nearly always white on upperside of wings and fore wing with apical and terminal dark areas much broader and brown, thus, differs from other counterparts, *indica* Evans from south India, *ganescha* Kollar from Kashmir to Kumaon and *andamanica* Wood-Mason from Andamans.

De Nicèville (1881) reported it from South Sikkim (Rungeet Valley). Haribal (1992) recorded it from East Sikkim (Rangpo).

XXXII. Genus *Chersonesia* Distant


The genus is known in India by two species, *Chersonesia rahria* Moore and *C. risa* (Doubleday & Hewitson) of which the latter is dealt with from Sikkim.

62. *Chersonesia risa* (Doubleday & Hewitson) (Common Maplet)


**Material examined** : Sikkim, 7 exs, no date (De Nicèville Coll.), South Sikkim, Runjeet Valley, 2exs, 15–x–1880, no further data.

**Fore wing length** : 20–21 mm.

**Distribution** : India : Sikkim (South and West Sikkim), Arunachal Pradesh and Uttar Pradesh.
**Elsewhere** : Bhutan, Myanmar and Nepal.

**Remarks** : De Nicèville (1881) and Haribal (1992) reported it from South Sikkim (Rungeet Valley) and West Sikkim respectively. Bingham (1905) and Evans (1932) mentioned its occurrence from Uttar Pradesh (Kumaon) to Myanmar whereas Haribal (1992) provided its distribution from Nepal to Myanmar.

Tribe *Limenitidini*

Fore wing with vein Sc not dilated at base, *R*<sub>1</sub> arising before end cell, origin of *R*<sub>4</sub> opposite or beyond end of *R*<sub>1</sub>, *R*<sub>4</sub> ending at apex or on termen, *R*<sub>5</sub> arising close to *M*<sub>1</sub> than *R*<sub>3</sub>; termen and dorsum subequal. Hind wing precostal vein arising opposite or beyond origin of vein Sc + *R*<sub>1</sub>.

This tribe is represented in India by 21 genera, of which 17 are dealt with from Sikkim.
Key to genera

1. Hind wing precostal vein arising at or before the origin of vein Sc ................................. 2
   - Hind wing precostal vein arising beyond the origin of vein Sc ......................................... 10

2. Hind wing with vein Sc ending on costa or, if ending on termen (Phaedyma only), veins M₁, Rs and Sc ending close together, and M₁ remote from M₂ ........................................... 3
   - Hind wing with vein Sc reaching termen in both sexes, ending of veins M₂, M₁, Rs and Sc more or less equidistant ......................................................... 6

3. Fore wing with vein R₂ arising from vein Rs ............................................................... Pantoporia Huebner
   - Fore wing with vein R₂ arising from the cell ......................................................................... 4

4. Hind wing with vein Sc ending on termen in male; precostal vein with a spur directed basad ........................................... Phaedyma Felder
   - Hind wing with vein Sc ending on costa in male; precostal vein with a long spur directed distad ............................................................... 5

5. Mostly small orange species with two submarginal lines on fore wing or fuliginous species with small subcostal spots above the end of cell streak ................. Lasippa Moore
   - Mostly black and white species; if orange, with only a single submarginal line on fore wing; if fuliginous, then without subcostal spots above the end of cell streak ........ Neptis Fabricius

6. Hind wing cell open ........................................ 7
   - Hind wing cell closed ........................................ 9

7. Fore wing lower discocellular vein ending well beyond origin of Cu₁a .............................. Moduza Moore
   - Fore wing cell open or, if closed, with lower discocellular vein ending close to vein Cu₁a ......................................................... 8

8. Proximal end of abdomen with pale band (except in selenophora male), the latter with a longitudinal whitish cell streak on underside of fore wing ..................... Athyma Westwood
   - Abdomen not pale-banded. Underside of fore wing without any whitish cell streak .......... Parasarpa Moore

9. Eyes hairy. Upperside of wings with a pale green transverse band ................ Sumalia Moore
   - Eyes smooth. Upperside of wings without any pale green transverse band ......................... Auzakia Moore

10. Fore wing with vein R₄ arising before end of R₂ ................................................................. 11
    - Fore wing with vein R₄ arising beyond end of R₂ .............................................................. 14

11. Antennae almost equal to half the length of costa of fore wing ........................................ 12
    - Antennae more than half the length of costa of fore wing .................................................. 13

12. Fore wing with vein 1A + 2A highly sinuous ................................................................ Neurosigma Butler
    - Fore wing with vein 1A + 2A straight ........ Abrota Moore

13. Labial palpi with thin long hairs. Fore wing with vein R₃ distorted, hind wing with precostal vein forked at end ................ Parthenos Huebner
    - Labial palpi smooth. Fore wing with vein R₃, R₂, R₁ distorted but R₃ arising well before R₄; hind wing precostal vein not forked ........................................ Lebadea Felder

14. Cell open in fore wing ........................................ 15
    - Cell closed in fore wing ........................................ 16

15. Upperside of fore and hind wings tawny orange with black markings .......................... Symphaedra Huebner
    - Upperside of fore and hind wings brown with white markings ............................................. 16

16. Thorax relatively slender. Fore wing with veins R₁ and Sc anastomosed in both sexes in female R₄ arising approximately mid-way between apex of cell and origin of R₄ ........................................ Tanaecia Butler
GUPTA : Insecta : Lepidoptera : Nymphalidae

- Thorax robust. Fore wing with veins R₁ and Sc free in male; free or anastomosed in female and with R₃ arising close to cell apex and remote from R₄. **Euthalia** Huebner

17. Fore wing lower discocellular vein ending well beyond origin of vein of Cu₁; veins R₁ and Sc anastomosed in one or both sexes. Underside of fore wing with two contiguous central cell spots echeloned one below the other. **Lexias** Boisduval

- Fore wing lower discocellular vein ending close to origin of vein Cu₁; veins R₁ and Sc free in both sexes. Underside of fore wing with central cell spot undivided. **Bassarona** Moore

XXXIII. Genus **Pantopia** Huebner


This genus is represented in India by a single species, *Pantopia hordonia* (Stoll).

63. **Pantopia hordonia hordonia** (Stoll) (Common Lascar)

1790. *Papilio hordonia* Stoll. In Cramer. Pap. exot. Suppl., 3 pl. 33. fig. 4. 4D.


Material examined : Nil.

Fore wing length : 45-50mm.

Distribution : India : Sikkim (North and South Sikkim), Arunachal Pradesh, Assam, North East India. Elsewhere : Myanmar, Malaya, Thailand (Siam), North and South Vietnam.

Remarks : This nominate subspecies differs from its counterpart *cnalis* Hewitson found in Andamans by the upperside hind wing subbasal band ochraceous orange. De Nicéville (1881) recorded it from South Sikkim (Rungeet valley). Haribal (1992) mentioned its occurrence in North Sikkim (Mangan).

XXXIV. Genus **Phaedyma** Felder (C.)


The genus is represented in India by two species, viz., *Phaedyma columella* Cramer and *P. aspasia* (Leech) of which the former is dealt with from Sikkim.

64. **Phaedyma columella ophiana** (Moore) (Short Banded Sailer)


Material examined : Sikkim, 4exs, no date, lex, -iv-, lex., -x- (De Nicéville Coll.; lex, no date (T.S.Gardner Coll). Sikkim, Terai, lex., 18-viii-1881, (no coll). Sikkim, lex, -x–1882 (De Nicéville, purchased).

Fore wing length : 32-34 mm.


Remarks : This subspecies is distinguished from its counterparts, viz., *nilgirica* (Moore) found in South India and *binghami* Fruhstorfer (= *kankena* Evans 1932) occurring in Nicobar Islands, mainly by upperside wing markings white, and subbasal streak, on underside of hind wing less wider than in *nilgirica*. Haribal (1992) could not observe this subspecies in Sikkim.
XXXV. Genus *Lasippa* Moore


This genus includes two species, viz., *Lasippa viraja* (Moore) and *L. tiga* (Moore) from India and the former is dealt with from Sikkim.

65. *Lasippa viraja viraja* (Moore) (Yellow Jack Sailer)


Material examined: Sikkim, 689 m 1 ex., no data; Sikkim, 4 exs., no data, Sikkim (Terai), 1 ex., --vi--, (De Nicéville coll.).

Fore wing length: 28-32 mm.

Distribution: India: Sikkim, (North Sikkim), Assam Bengal (old) and Orissa. Elsewhere: Myanmar, Bhutan.

Remarks: This nominate subspecies is distinguished from *L. viraja kanara* (Evans) found in South India by upperside of wings with bands narrower and underside darker bearing sharply defined edges. De Nicéville (1886) mentioned its occurrence in Sikkim and Haribal (1992) observed it in North Sikkim (Mangan).

XXXVI. Genus *Neptis* Fabricius


Of the 30 species occurring in India, 22 are found in Sikkim.

Key to species

1. Fore wing with subcostal spots internal to the upper postdiscal band ................. 2
   - Fore wing without subcostal spots internal to the upper postdiscal band ............. 6

2. Fore wing postdiscal spot in space *Cu* _1a_ if present, placed above the spot in *Cu* _1a_ or, at most, only slightly shifted in ................... 3
   - Fore wing postdiscal spot in space *Cu* _1a_ much shifted in, often touching the streak beyond cell, so that cell streak, streak beyond cell and lower postdiscal band form a continuous hockey stick ........................................ 5

3. Fore wing postdiscal spot in space *Cu* _1a_ absent or, at most; a mere extension of the spot in space *Cu* _1a_ across vein *Cu* _1a_; streak beyond cell not entering base of space *Cu* _1a_ ............ .................................................. *armandia* Oberthuer
   - Fore wing postdiscal spot in space *Cu* _1a_ well developed; streak beyond cell extending into the base of space *Cu* _1a_ at least on the underside larger ........................................ 4

4. Fore wing with subcostal spot in space. Underside hind wing variegated with mauve markings; no basal or sub-basal streaks ....... .................................................. *radha* Moore
   - Fore wing without subcostal spot in space. Underside hind wing with basal or subbasal streaks; no mauve markings ......................... .................................................. *narayana* Moore

5. Upperside markings creamy to orange. Underside hind wing with a washed out appearance ........................................ *manasa* Moore
   - Upperside markings white. Underside hind wing with prominent mother-of-pearl markings in basal area .................. *nycteus* De Nicéville

6. Fore wing with streak beyond cell not extending into base of space *Cu* _1a_ (except in *miah* sometimes) ........................................ 7
   - Fore wing with streak beyond cell extending narrowly into base of space *Cu* _1a_ on upper or underside or on both .......... *zaida* westwood

7. Underside hind wing with a subbasal streak, basal streak not reaching vein *Sc + R* _1_ ........... .................................................. 11
   - Underside hind wing without subbasal streak, basal streak reaching vein *Sc + R* _1_ near its origin ........................................ 8

8. Fore wing with prominent postdiscal spot in space *Cu* _1a_ .................. *cartica* Moore
GUPTA: Insecta: Lepidoptera: Nymphalidae

9. Underside fore wing with postdiscal fascia and submarginal series reaching vein $R_3$, as usual, and not bluish. $nashona$ Swinhoe

10. Upperside markings broader and paler, cilia very obscurely chequered. Female with fore wing upper and lower postdiscal bands well separated. $ananta$ Moore

11. Underside hind wing discal fascia obsolete or much closer to the discal than to the postdiscal band and outwardly edged, or partly obscured, by a dark band or series of blochy spots. $namba$ Tytler

12. Underside hind wing with one or two round dark spots in cell, in addition to a v-or-u shaped mark below vein $M_2$ just internal to the discal band. $jumbah$ Moore

13. Fore wing upper postdiscal band entirely above vein $M_2$. $yerburii$ Butler

14. Upperside markings orange. Underside hind wing with v-or-u shaped mark nearly always present. $miah$ Moore

15. Fore wing cilia fuscous on fore wing and at most very obscurely chequered on hind wing with lighter and dark brown. $sankara$ Kollar

16. Fore wing cilia usually fuscous in spaces $M_1$ and $R_3$ but occasionally with a few white hair scales $clinia$ Moore

17. Upperside fore wing cell streak without indications of a transverse line. Hind wing cilia narrowly chequered, the white patches smaller than the darker ones, post discal band inwardly almost even-edged. $yerburii$ Butler

18. Underside with some shade of yellow to reddish ochreous, with the hind wing discal band and usually most of the other white markings outlined by black lines. $hylas$ Linnaeus

19. Underside of hind wing with the discal band usually weakly or not outlined in black. $Sappho$ Pallas

20.
20. Upperside white markings with a creamy tinge .................................................... *soma* Moore

- Upperside white markings without a creamy tinge .................................................... 21

21. Antennal club with tip of nudum dark brown, barely contrasting with the rest of the club ............................................................. *mahendra* Moore

- Antennal club with tip of nudum yellow-brown to light brown contrasting well with the rest of the club .................................................... *nata* Moore.

66. *Neptis armandia melba* Evans
(Variegated Sailer)


*Material examined* : Sikkim, 1 ex., no date, (De Niceville coll.)

*Fore wing expanse* : 55 mm.

*Distribution* : India : Sikkim.

*Remarks* : This subspecies differs from *N. armandia gafuri* Tytler found in Nagaland by the upperside markings white. It is endemic in Sikkim and its status is very rare. It has been included in Schedule-I (Part-4) of the Indian Wildlife Protection Act.

67. *Neptis radha radha* Moore
(Great Yellow Sailer)


*Material examined* : Sikkim, 2 exs, no date, (De Niceville coll)

*Fore wing length* : 30-31 mm.


*Remarks* : Haribal (1992) mentioned its occurrence in Kulu (Himachal Pradesh). Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

68. *Neptis narayana nana* De Nicéville


*Material examined* : Sikkim, 1 ex., no date, (De Nicéville coll).

*Fore wing length* : 30 mm.


*Remarks* : This subspecies is distinguished from the nominate one from Kulu to Kumaon by the yellow markings on upperside of wings. Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

69. *Neptis manasa manasa* Moore
(Pale Hockeystick Sailer)


*Material examined* : Nil.

*Wing expanse* : 65 mm.

*Distribution* : India : Sikkim, N. India. *Elsewhere* : Myanmar (South Shan States), North Thailand.

*Remarks* : Its status is very rare. It has been included in Schedule-I (Part-4) of the Indian Wildlife Protection Act.

70. *Neptis nycteus* De Nicéville
(Hockeystick Sailer)


Material examined: Sikkim, 1 ex (damaged) -i-1903 (De Nicéville coll).

Fore wing length: 29 mm.


Remarks: The status of this species is very rare and it has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

71. Neptis zaida bhutanica Tytler
(Pale Green Sailer)


Fore wing length: 33–35mm.


Remarks: This subspecies differs from N. zaida manipurensis Tytler found in Manipur and the nominate one occurring from Pakistan (Muree) to India (Uttar Pradesh: Kumaon) by upperside wing markings ochreous and hind wing central band nearly white. Its status is rare and it has been included in Schedule-2 (Part-II) of the Indian Wildlife (Protection) Act.

72. Neptis cartica cartica Moore
(Plain Sailer)


Material examined: Sikkim (E. Himalaya), 5 exs, (no date), 1 ex, –viii–, 2 exs, –x–, (De Nicéville coll). Sikkim, 1 ex, 8 –x– 1880, (no coll).

Fore wing length: 28 – 30 mm.


Remarks: This nominate subspecies differs from its counterpart N. cartica burmana De Nicéville occurring in South Myanmar and North Thailand (Siam) by upperside markings broad.

73. Neptis nashona nashona Swinhoe
(Rich Sailer)


Material examined : Nil.

Wing expanse: 65-70 mm.


Remarks: Evans (1932) treated it as N. anjana nashona Swinhoe. Eliot (1969) recognized N. anjana Moore and N. nashona Swinhoe as two separate species and as such followed by Haribal (1992) and Varshney (1994). Its status is rare and it has been in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

74. Neptis ananta ochracea Evans
(Yellow Sailer)


Wing expanse: 28 mm.

Distribution: India: Sikkim (North Sikkim), Manipur, Meghalaya, Nagaland and West Bengal. Elsewhere: Bhutan, Myanmar and Nepal.

Remarks: This subspecies is distinguished from the nominate one found from Himachal Pradesh (Chamba) to Uttar Pradesh (Kumaon) by the underside markings dark ferruginous ochreous. Haribal (1992) recorded it in the vicinity of Pashok in Sikkim. Its status is rare and it is included in
Schedule-II (Part-2) of the Indian Wildlife Protection Act.

75. *Neptis namba namba* Tytler
   (Yellow Sailer)


*Material examined* : Nil.

*Wing expanse* : 55-70 mm.


76. *Neptis jumbah jumbah* Moore
   (Chestnut Streaked Sailer)


*Material examined* : Nil.

*Wing expanse* : 60-70 mm.


*Remarks* : This nominate subspecies differs from its other counterparts, viz., *N. jumbah naland* Fruhstorfer found in Peninsular India and Sri Lanka and *N. jumbah amorosca* (Fruhstorfer) in Andamans by wing expanse of 60-70 mm and a discal spot present in space R₃ on underside of hind wing. Its status is not rare.

77. *Neptis miah miah* Moore
   (Small Yellow Sailer)


*Material examined* : Sikkim, 9 exs, no date (De Niceville Coll); 1 ex, -x-1882, (no date Coll.); 1 ex, no further data.

*Fore wing length* : 25-27 mm.

*Distribution* : India : Sikkim (North and South Sikkim), Assam. Elsewhere : Bhutan.

*Remarks* : Only the nominate subspecies is represented in India. Haribal (1992) mentioned its occurrence in North and South Sikkim. Its status is not rare.

78. *Neptis sankara amba* Moore
   (Broad Banded Sailer)


*Material examined* : Sikkim, 5 exs, no date, (De Niceville Coll.)

*Fore wing length* : 32-34 mm.


*Remarks* : This subspecies differs from its nominate one found from Kashmir to Kumaon by upperside wing markings white, narrow and spots forming a discal band are well separated.

79. *Neptis harita harita* Moore
   (Dingiest Sailer)


*Material examined* : Nil.

*Wing-expans* : 55-60 mm.

Remarks: Only the nominate subspecies is found in India. Haribal (1992) followed Evans (1932) regarding its occurrence from Bengal to Myanmar. Presently, distribution of this subspecies has been given after Eliot (1969).

80. Neptis pseudovikasi (Moore) (Dingy sailer)


1932. Neptia vikasi pseudovikasi (Moore); Identification of Indian Butterflies, : 168.


Material examined: Sikkim, 4 exs, no date, 1 ex, =vi=. 2 exs, =vi=. 1 ex, =vi=. 1 ex, =ix=. 1 ex, =x=. (De Nicéville Coll).

Fore wing length: 31-33 mm.


Remarks: Evans (1932) mentioned its distribution from Kumaon (Uttar Pradesh) to Assam which was followed by Haribal (1992).

81. Neptis clinia susruta Moore (Clear Sailer)


Material examined: Sikkim Terai, 2exs, no date, South Sikkim, Rungeet Valley, 305 m 1 ex, no date (De Nicéville Coll.), Sikkim, 5 exs, no date, 2exs, =vi=. 1ex, =v=. 3exs, =vi=. 2exs =vi=. 1ex, =vii=. 3exs, =ix=. 1 ex, =xii=. (De Nicéville coll.).

Fore wing length: 23-27 mm.

Distribution: India: Sikkim (South Sikkim), Assam, North East India. Elsewhere: Laos, Myanmar, Siam, North and South East China (South Yunnan, Hainan, Fukien).


82. Neptis yerburii pandoces Eliot (Yerbury’s Sailer)


Material examined: Nil.

Wing expanse: not provided (Eliot, 1969).

Distribution: India: Sikkim (Tumlong), Meghalaya and West Bengal. Elsewhere: North East Myanmar and West Thailand (Siam).

Remarks: Eliot (1969) described this subspecies on the basis of specimens collected from localities as mentioned under distribution.

83. Neptis hylas varmona Moore (Common Sailer)


Material examined: Sikkim, 1ex, no date, 1 ex, =vi=.1885 (De Nicéville, O. Moeller coll.); Sikkim, 6 exs, no date, 2 exs, =vi=. (De Nicéville coll.). North Sikkim, Rishikhola, alt. 994 m, 1ex, 7 =v. 1959; East Sikkim, Dikchu, alt. 542 m, 1 ex, 14 =vii. 1959 (A.K.G. Menon Coll.).

Fore wing length: 26-28 mm.

Distribution: India: Sikkim (East and North Sikkim), Himachal Pradesh, South India to Uttar Pradesh. Elsewhere: Sri Lanka.
Remarks: This subspecies differs from its allies, viz., kamarupa Moore found in North India, Myanmar, Thailand, North and South Vietnam; andamana Moore occurring in Andamans and nicobarica Moore found in Car and Central Nicobars by the hind wing upperside bearing evenly curved submarginal band and two submarginal lines obsolete. De Nicéville (1886), Evans (1932) and Haribal (1992) mentioned its occurrence in Sikkim. However, Eliot (1969) considered it to be confined to Peninsular India and Sri Lanka.

84. Neptis hylas kamarupa Moore
(Common Sailer)

1932. Neptis hylas adara Moore : Evans, Identification of Indian Butterflies. : 166

Material examined: Nil.

Wing expanse: 50-60 mm.

Distribution: India: Sikkim, North India (from Mussoorie extending along Himalayan foothills to Assam.). Elsewhere: Myanmar, Thailand, South and North Vietnam.

Remarks: This subspecies differs from its counterparts, viz., varmona Moore, andamana Moore and nicobarica Moore by the hind wing upperside submarginal band deflected towards anal angle and underside white bands and spots narrowly margined with black. The occurrence of two subspecies, kamarupa and varmona in Sikkim may be attributed to the sympatric distribution of their populations. De Nicéville (1886) also mentioned its occurrence in Sikkim.

85. Neptis sappho astola Moore
(Common Sailer)


Material examined: Sikkim, 1 ex. no date, 1 ex., –x–, 1 ex., –xi, (De Nicéville coll.) East Sikkim, Rangli; 2 km east, alt. 900m, 1ex, 21–xii–1995, Rhencock, alt. 1000m, 1ex, 22–xii–1975 (G.K. Srivastava Party Coll.)

Fore wing length: 25–26 mm.


86. Neptis soma soma Moore
(Sullied Sailer)


Material examined: Sikkim, 6 exs, no date, (De Nicéville coll). Sikkim, 2 exs, no date, 2 exs, –v–1883 · (De Nicéville purchased).

Fore wing length: 29–30 mm.

Distribution: India: Sikkim (South Sikkim). Eastern Himalaya and Assam.

Remarks: This nominate subspecies differs from N. soma palnica Eliot found in South India (Palmi Hills, Travancore and Trichinopoly) by white markings with creamy tinge wider especially the cell streak and streak beyond cell. De Nicéville (1882) recorded it from South Sikkim (Rungeet Valley). Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.
87. Neptis mahendra mahendra Moore (Himalayan Sailer)


Material examined: Nil.

Wing expanse: 55-60 mm.

Distribution: India: Sikkim, Uttar Pradesh. Elsewhere: Pakistan (Chitral) and West Nepal.

Remarks: Haribal (1992) listed this species from Sikkim.

88. Neptis nata adipala Moore (Sullied Sailer)


Material examined: Sikkim, lex., 24. iv. 1884, 6 exs., -vi-, 2 exs., no date, Sikkim, Terai, 2exs, no date (De Niceville coll.)

Fore wing length: 25-27 mm.


Remarks: This subspecies is distinguished from its counterparts, viz., peilei Eliot occurring in North West Himalaya, hamptoni Moore in South India and evansi Eliot in Andamans by the presence of a large white spot at end cell, wider bands on upperside of wings and, underside of wings paler and more irrorated with violet. De Niceville (1882) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence in Lower Teesta Valley.

XXXVIII. Genus Athyma Westwood


Of the 13 species of this genus occurring in India, ten are dealt with from Sikkim.

Key to species

1. Cell closed in fore wing ........................................... 2
- Cell open in fore wing ........................................... 7

2. Sexes dissimilar. In male, upperside of fore wing with discal spots from dorsum to spaces Cu₁ or Cu₂ conjoined and directed to apex or costa ................................................................. 3
- Sexes similar. On upperside of fore wing discal spot in space Cu₁ well separated from spot in interspace 1A+2A, no discal spot in interspace Cu₂, lower part of discal band directed to mid termen ............................................. 6

3. Upperside of fore wing with prominent discal spot in interspace Cu₁. In female, upperside of wings with white or sullied brownish bands ........................................................................ 4
- Upperside of fore wing without a prominent discal spot in space Cu₁. In female, upperside of wings with broad orange markings normally arranged ......................................................... 5

4. Underside of fore wing with the discal streak twice divided by a brown line across cell; a triangular spot, at base of space M₂ beyond cell well separated ................................................. selenophora (Kollar)

- Underside of fore wing with the discal streak entire and hardly separated from the spot at end cell in interspace M₃ ................................................................. zeroca (Moore) 5

5. In male, underside of fore wing with discal streak much broken. In female, discal spots in spaces M₁, M₂ forming a continuous and even edged apical band ..................... nefita (Cramer)

- In male, underside of fore wing with the discal streak continuous but upper edge irregular. In female, a small discal spot in interspace M₃ and against outer edge spot in space Cu₁b ............................................................. cama (Moore) 6

6. Upperside of fore wing with a large triangular white spot just beyond apex of cell ..................... opalink (Kollar)

- Upperside of fore wing without a larger triangular white spot just beyond apex of cell ...................................................... ranga (Moore) 7

7. Eyes smooth .................................................. 8

- Eyes hairy................................................................ jina Moore 8

8. Upperside of fore wing with discoidal streak divided ..................................................... perius (Linnaeus)

- Upperside of fore wing discoidal streak not divided ................................................................. 9

9. A spot present beyond apex of discal streak ........................................................................ asura Moore

- No spot beyond apex of discoidal streak .... ................................................................. pravara Moore 9

90. Athyma selenophora selenophora (Kollar) (Small Staff Sergeant)

1848. Limenitis selenophora Kollar. Huegel's Kaschmir. 4 (2) : 426, pl. 7, figs. 1, 2, male.


Material examined : Sikkim, 14 exs, no date, 1ex, vi, 1 ex, x, South Sikkim, Rangeet valley, 1ex, no date, (De Nicéville coll.).

Fore wing length : 28-32mm.

Distribution : India : Sikkim (East, North and South Sikkim), Uttar Pradesh to Arunachal Pradesh. Elsewhere : Myanmar.

Remarks : The nominate subspecies differs from A. selenophora kanara Evans found in South India by upperside of wings markings darker and bearing narrow bands in male and broad white markings in female. De Nicéville (1881) recorded it from South Sikkim (Rungeet valley). Haribal (1992) reported its occurrence in East Sikkim (Tumin Khola) and North Sikkim (Tholung bridge).

91. Athyma zeroca Moore (Small Staff Sergeant)


Material examined : Sikkim, 3exs, vi, 9exs, no date, (De Nicéville coll); Sikkim, 3exs, no date (De Nicéville purchased).

Fore wing length : 26-29mm.


Remarks : De Nicéville (1882, 1883) recorded it from Sikkim.
GUPTA : Insecta : Lepidoptera : Nymphalidae

92. Athyma nefte inara (Doubleday)  
(Colour Sergeant)


Material examined : Sikkim, 2exs, -viii-, 1ex, -x-9 4exs, no date (De Nicéville coll); Sikkim, 1ex, no further data. East Sikkim, (Rangpo), alt, 400m, 1ex, 26. xii-1975. (G.K. Srivastava & Party Coll).


Remarks : Previously, this species is known from Sikkim.

93. Athyma cama Moore  
(Orange Staff Sergeant)


Material examined : Sikkim, 2exs, no date, 1ex, -iii– (De Nicéville coll.) North Sikkim, alt. 1576m, Singhik, 2exs, 6–viii–1959, Naga, 1515m, 1ex, 2–viii–1959 (A.G.K. Menon coll.).

Fore wing length : 30-33mm.


Remarks : This subspecies is distinguished from the nominate subspecies occurring from Jammu & Kashmir to Uttar Pradesh by the presence of often sullied narrow white bands on upperside of wings. Earlier, this subspecies is known from Sikkim.

94. Athyma opalina orientalis Elwes  
(Himalayan Sergeant)

1888. Athyma orientalis Elwes, Trans. ent. Soc. Lond., : 354, pl. 9, fig. 4.


Material examined : Sikkim, 2exs, no date, 1ex, -ii– (De Nicéville coll.) North Sikkim, alt. 1576m, Singhik, 2exs, 6–viii–1959, Naga, 1515m, 1ex, 2–viii–1959 (A.G.K. Menon coll.).

Fore wing length : 30-33mm.


Remarks : This subspecies is distinguished from the nominate subspecies occurring from Jammu & Kashmir to Uttar Pradesh by the presence of often sullied narrow white bands on upperside of wings. Earlier, this subspecies is known from Sikkim.

95. Athyma ranga ranga Moore  
(Blackvein Sergeant)

1857. Athyma ranga Moore, Cat. Lep. Ins. Mus. East India Coy, 1 : 175, pl. 5a, fig. 6 (male).


Material examined : Sikkim, 2exs, no date, 7 exs, -iii–, 1 ex, -vii–, 3 exs, -x–, 1ex, -xii– (De Nicéville coll.).

Fore wing length : 30-33mm.

Distribution : India : Sikkim (East, South and West Sikkim), Arunachal Pradesh and West...
Bengal. Elsewhere: Myanmar.

Remarks: In this nominate subspecies, the upperside of hind wing in male bears sullied postdiscal and marginal spots, whereas in A. ranga karwarra Fruhstorfer found in South India, only discal band is present but post discal band is absent in hind wing of male. De Nicéville (1881) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence in East Sikkim (Rangpo), South Sikkim (Rungeet Valley) and West Sikkim (Sanklang in Teesta Valley). Evans (1932) and Haribal (1992) mentioned its status 'rare' and 'not rare' respectively. It has been included in Schedule-II (Part-2) of the Indian Wildlife Protection Act.

96. *Athyma jina jina* Moore
(Bhutan Sergeant)


*Material examined:* Sikkim, 2 exs, -. - 1868 (no coll), Sikkim, 8 exs, no date (De Nicéville coll.), Sikkim, 1 ex, -iv-, (No coll.) North Sikkim, Naga, alt. 1515m, 1ex, 2–viii–1959 (A.G.K. Menon coll.)

*Fore wing length:* 29–32 mm.


Remarks: This nominate subspecies differs from its counterpart i.e. *A. jina jinoides* Moore found in North East Myanmar by upperside of wings bearing large sullied markings. It is a definitive record from North Sikkim. Its status is very rare and it has been included in Schedule–I (Part–4) of the Indian Wildlife (Protection) Act.

97. *Athyma perius* (Linnaeus)
(Common Sergeant)


*Material examined:* Sikkim, 1ex, 16–viii–1879, 1ex, no date (De Nicéville coll.).

*Fore wing length:* 31mm.


Remarks: This species is widely distributed in India. Haribal (1992) mentioned its occurrence in North Sikkim (Ryngym Monastery) and South Sikkim (around Tashiding)

98. *Athyma asura asura* Moore
(Studded Sergeant)


*Material examined:* Nil.

*Wing expanse:* 65–75 mm.


Remarks: This nominate subspecies is distinguished from its ally *A. asura idita* Moore found in Myanmar by the underside of hind wing bearing a postdiscal band of white spots, each with a black spot in the centre. Its status is rare and its has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

99. *Athyma pravara acutipennis* (Fruhstorfer)
(Unbroken Sergeant)


Fore wing length: 28mm.

Distribution: India: Sikkim (South Sikkim) Assam and Nagaland. Elsewhere: Myanmar.

Remarks: This subspecies has a unbroken streak in the cell on upperside of fore wing. A pravara acutipennis constitutes a definitive record from South Sikkim (Tashiding) and a first report of its occurrence in Sikkim. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife Protection Act.

XXXIX. Genus Parasarpa Moore

1898. Parasarpa Moore, Lep. indica. 3 (32) : 146.

This genus is represented in India by two species viz., Parasarpa zayla Doubleday and P. duda (Westwood).

Key to species

Upperside of fore wing with a broad yellow discal band and hind wing with a silvery white discal band present .......... zayla (Doubleday)

Upperside of fore and hind wing with a broad white discal band. ............. duda (Westwood)

100. Parasarpa zayla (Doubleday) (Bicolour Commodore)


Material examined: Sikkim, 1 ex, –vii–, 1 ex, –viii–1886, 1 ex, no date, (De Nicéville coll.), Sikkim, 2exs, no date, (L. Mandelli, purchased)

Fore wing length: 37-38mm.

Distribution: India: Sikkim (West Sikkim), Assam, Meghalaya, Nagaland. Elsewhere: Bangladesh, Myanmar and Nepal.

Remarks: Haribal (1992) recorded this species from West Sikkim. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

XL. Genus Sumalia Moore

1898. Sumalia Moore, Lep. Ind., 3 (32) : 146. 150.

Two species, viz., Sumalia daraxa (Doubleday) and S. zulema (Doubleday) of this genus known from India are dealt with from Sikkim.

Key to species

A broad pale green discal band present on upperside of wings.......... daraxa (Doubleday)

A broad white discal band present on upperside of wings......................... zulema (Doubleday)

102. Sumalia daraxa (Doubleday) (Green Commodore)


Material examined: Sikkim, 1 ex, –vii–, 2exs, –ix–, 2exs, no date, (De Nicéville coll.), Sikkim, 1 ex, no date, (E. Barlow coll.).
Fore wing length: 30-31 mm.

Distribution: India: Sikkim (East and West Sikkim), Arunachal Pradesh, Assam, Meghalaya, Nagaland, Uttar Pradesh and West Bengal. Elsewhere: Bangladesh, Bhutan, Myanmar and extending to Malay Peninsula.

Remarks: Haribal (1992) observed this species in East Sikkim (Rakadong, Rangpo and Tumin Khola) and West Sikkim.

103. Sumalia zulema (Doubleday) (Scarce White Commodore)


Material examined: Sikkim, 1ex, –. –1868, (T.C. Jerdon Coll.) Sikkim, 1ex, (L. Mandelli, purchased); Sikkim, 2exs, no date, 1ex, –. –1888 (De Nicéville Coll).

Fore wing length: 39-40 mm.


Remarks: Haribal (1992) reported this species under the genus Limenitis from Sikkim. Its status is very rare. It has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

XLI. Genus Auzakia Moore


This genus is represented in India by a single species, Auzakia danava (Moore).

104. Auzakia danava (Moore) (Commodore)

1857. Limenitis danava Moore, Cat. Lep. Mus. East India Cog., 1: 180, pl. 6a, fig. 2.

Material examined: Sikkim, 3exs, no date, (De Nicéville coll.), Sikkim, 1ex, no further data.

Fore wing length: 40-41 mm.


Remarks: Haribal (1992) recorded it from West Sikkim and considered its status not rare. Evans (1932) mentioned its status rare. This species has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

XLII. Genus Neurosigma Butler


This monotypic genus is represented in India by a species, Neurosigma siva (Westwood).

105. Neurosigma siva (Westwood) (Panther)


Material examined: Sikkim, 2exs, –. –1868 (T.C. Jerdon coll.), Sikkim, 3exs, no date, (De Nicéville coll.), Sikkim, no date, 1ex, no date, 1ex, (Purchased).

Fore wing length: 41-43mm.


Remarks: The species exhibits variation regarding extent and prominence of spots and other markings on wings. Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

XLIII. Genus Abrota Moore


A single species, Abrota ganga Moore represents this genus in India.
GUPTA: Insecta: Lepidoptera: Nymphalidae

106. *Abrota ganga* Moore
   (Sergeant Major)


*Material examined*: Sikkim, 2 ex, –. –1868 (T.C. Jerdon coll.), Sikkim, 1 ex, no date, (B. cholorondley coll.); Sikkim, 9 exs, no date, 1 ex, –iv–, 1 ex, –vi–, 1 ex, –viii– (De Nicéville coll).

*Fore wing length*: 38–42 mm.


*Remarks*: The upperside of wings is rich yellowish brown in male and dark brown in female.

XLIV Genus *Parthenos* Huebner


This genus is represented in India by a single species, *Parthenos sylvia* Cramer.

107. *Parthenos sylvia gambrisius* (Fabricius) (Clipper)

1787. *Papilio gambrisius* Fabricius, Mantissa Ins. 2 : 12.


*Material examined*: Sikkim, 2 exs, no date (purchased). Sikkim, 1 ex, –iv–, 1 ex, –vi–, 1 ex, –viii–, 1 ex, –ix–, 1 ex, –x–, South Sikkim, Runjeet Valley, 2 ex, no date (De Nicéville coll.).

*Fore wing length*: 32–34 mm.


*Remarks*: This nominate subspecies differs from *L. martha ismene* (Doubleday & Hewitson) found from Assam – Manipur by upperside of wings bearing broader bands, inner edge of vertical spot in area Cu₁, discal band in hind wing filling basal area. De Nicéville (1881) recorded it from south Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence in North Sikkim (Singhik).

XLVI. Genus *Symphaedra* Huebner


This genus is represented in India by a single species, *Symphaedra nais* (Forster).

109. *Symphaedra nais* (Forster) (Baronet)


*Material examined*: Sikkim, 1 ex, no date, *(De Niceville coll.)*

*Fore wing length*: 32 mm.

*Distribution*: India : Sikkim, Uttar Pradesh to Arunachal Pradesh.

*Remarks*: Haribal (1992) did not observe this species in Sikkim but stated that it was recorded from lower hot valleys.

**XLVII. Genus *Tanaecia* Butler**


The genus is represented in India by five species of which three are dealt with from Sikkim.

**Key to species**

1. Fore wing with apex produced and outer margin falcate below apex. Outer margin of hind wing slightly angled at vein *Cu*, thereafter straight upwards ............................................ *lepidea* (Butler)
   - Fore wing not falcate, outer margin of hind wing evenly rounded. ........................................... 2

2. Upperside of wings with two dark discal lines composed of diffused spots .................................. ............................................. *julii* (Bougainville)
   - Upperside of wings with discal bands consisting of conspicuous connected crescents.................. ............................................. *jahnu* (Moore)

110. *Tanaecia lepidea lepidea* (Butler)  
     (Grey Count)


*Material examined*: Sikkim, 2 exs, no date (Purchased ?).

*Fore wing length*: 32-33 mm.

*Distribution*: India : Sikkim, Uttar Pradesh to Arunachal Pradesh.

*Remarks*: Haribal (1992) mentioned erroneously its occurrence from Kulu to Assam. The nominate subspecies differs from *Tanaecia lepidea miyana* (Fruhstorfer) found in North Kanara and Orissa by upperside of wings with pale grey borders. Its status is not rare but it has been listed in Schedule – II (Part-2) of the Indian Wildlife (Protection) Act.

111. *Tanaecia julii appiades* (Ménétriers)  
     (Common Earl)


*Material examined*: Sikkim, 1ex, no date (Purchased ?); Sikkim, 1ex, no further data; Sikkim, 1ex, –viii–, 2exs –x–, 5 exs, no date *(De Niceville Coll.)*; South Sikkim, Rungeet Valley, 1ex, no date, *(De Niceville coll.)*

*Fore wing length*: 33-38mm.

*Distribution*: India : Sikkim (South Sikkim) and Uttar Pradesh.

*Remarks*: This subspecies is differentiated from *T. julii adima* Moore found in Meghalaya and *T. julii sedeva* (Moore) in Manipur and North Myanmar by upperside of hind wing in male with blue margin to outer discal band and reaching vein *M*, female rather pale brown with whitish spots at the upper end of each discal band in area *M*; underside of hind wing with tornal half green and female all bluish except apex. Haribal (1992) mentioned its occurrence erroneously in Himachal Pradesh (Kulu).

112. *Tanaecia jahnu jahnu* (Moore)  
     (Plain Earl)


**Material examined**: Sikkim, 2ex, no date, lex, –x– (De Niceville coll.); South Sikkim, Rungeet Valley, 2exs, no date, (De Niceville coll).

**Fore wing length**: 33-35mm.

**Distribution**: India: Sikkim (South Sikkim), Arunachal Pradesh, Assam and West Bengal. Elsewhere: Bangladesh and North Myanmar.

**Remarks**: Only the nominate subspecies is found in India. De Niceville (1881) recorded it from South Sikkim (Rungeet Valley).

**XLVIII Genus Euthalia Huebner 1819.**

**Euthalia Huebner, Verz. bekannt. Schmett., (3) : 41.**

The genus includes more than 12 species in India, of which, seven are recorded from Sikkim.

**Key to species**

1. Upperside or underside of fore wing never with two detached apical white spots on either side of vein Rs, just behind origin of vein R₄ unless forming part of pale band in female; upperside of fore wing with basal markings in area 1A + 2A consisting of a well defined ring under origin of vein Cu₉ reaching mid 1A+2A as well as a dark dot at the extreme base ......

2. Upperside or underside of fore wing always with two detached apical white spots on either side of vein Rs just before origin of vein R₄. Upperside of fore wing basal markings on area 1A+2A consisting of a spot, not a ring, under origin of vein Cu₉ may be replaced by a ring .................................................................

3. Underside of fore wing at base in area 1A+2A bearing always a ring or round spot under origin of vein Cu₉ with usually a second below it. .................................................................

3. Apex of fore wing pointed; in male hind wing with tornus produced and termen convex. Male dark brown with a discal band on upperside of fore wing and a broad bluish grey margin on upperside of hind wing. Female paler brown with usual two dark discal lines ...............  ..............................................................................

4. Upperside of wings dark green with red spots on hind wing and in cell of fore wing ........  ..............................................................................

5. Upperside of hind wing with a outer discal band of small and usually well defined and well separated spots ...... aconthea (Cramer)  

6. Upperside of fore wing with a white streak at termen in area R₅, extending with areas M₄ and R₃ on underside of fore wing ........  ..............................................................................

4. Apex of fore wing highly falcate; in male, hind wing at tornus produced and termen being concave before tornus. Upperside of wings in male ash grey, male less suffused with greenish. In female curved row of small spots present beyond cell from area Cu₉ to costa ...........

5. Upperside of wings without any of the red spots .................................................................

6. Upperside of fore wing without any white streak in area R₅ ........ phemius (Doubleday)

113. *Euthalia telechina* (Ménétriés) (Blue Baron)


**Material examined**: Sikkim, 1ex, no date. (W.H. Evans Coll).
Fore wing length: 36mm.

Distribution: India: Sikkim (East and South Sikkim), Arunachal Pradesh, Assam, Karnataka and West Bengal. Elsewhere: Nepal and N. Myanmar.

Remarks: De Nicéville (1883) recorded it at altitude between 305-610 m in South Sikkim. Haribal (1992) observed it in East Sikkim (Gangtok). Its status is very rare. This species has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

114. Euthalia kesava arhat Fruhstorfer
(Powdered Baron)


Material examined: Sikkim, lex, 14. iv. 1885, 1 ex, –iv–, 2 exs. –x–, 4 exs. no date, South Sikkim, Rungeet Valley, 1 ex. (De Nicéville coll); Sikkim, lex, no date, (De Nicèville purchased); Sikkim, lex, no date, (Raynold coll.)

Fore wing length: 28-33mm.

Distribution: India: Sikkim (South Sikkim).

Remarks: This subspecies differs from the nominate one occurring from Assam to North Myanmar by the male being pale and in female pale discal band less developed. De Nicéville (1881, 1882) recorded it as Adolias kesava Moore and Euthalia kesava (Moore) from South Sikkim (Rungeet Valley), respectively. Haribal (1992) mentioned its distribution from North East India to Myanmar erroneously. This subspecies is endemic to Sikkim.

115. Euthalia anosia saitaphernes Fruhstorfer
(Grey Baron)


Material examined: Nil.

Wing expanse: 70-85 mm.

Distribution: India.

Remarks: This subspecies is distinguished from the nominate one found from India (Assam) to Myanmar by the presence of prominent white spot at base in area Cu₅ and absence of white costal patch on upperside of fore wing in male; in female upperside of fore wing bears rounded spots. This subspecies is endemic to Sikkim. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

116. Euthalia lubentina indica Fruhstorfer
(Gaudy Baron)


Material examined: Sikkim, 3exs, no date, (De Nicéville Coll.); Sikkim, 1ex, ? W.D. purchased.

Fore wing length: 30-32 mm.

Distribution: India: Sikkim (South Sikkim), Himachal Pradesh to Arunachal Pradesh, and Maharashtra to Bengal. Elsewhere: Bangladesh and Myanmar.

Remarks: This subspecies differs from its counterpart E. lubentina arasada Fruhstorfer found in South India by its uniform dark colouration. It exhibits considerable season variation. It has been included in Schedule-4 of the Indian Wildlife (Protection) Act.

117. Euthalia aconthea suddhodana Fruhstorfer
(Common Baron)


Material examined: Sikkim, 1 ex, no date, (Capt. Evans. Coll).
GUPTA: Insecta: Lepidoptera: Nymphalidae

Fore wing length: 29mm.

Distribution: India: Sikkim (East and South Sikkim) and Bengal (old).

Remarks: The species, Euthalia aconthea (Cramer) is highly variable and is, thus, represented in India by five subspecies, viz., E. aconthea meridionalis Fruhstorfer—from South India to North Kanara, E. aconthea anagama Fruhstorfer—Bombay to Orissa, E. aconthea aconthea Cramer—Assam to Myanmar, E. aconthea aconthis Hewitson—Andamans and lastly E. aconthea suddhodana. The latter is distinguished from others by the darker colouration and upperside of fore wing bearing discal spots smaller.

118. Euthalia jama jamida Fruhstorfer

Fore wing length: 28-29 mm.

Distribution: India: Sikkim.

Remarks: This subspecies is distinguished from the nominate one found in Assam and Manipur by the upperside of wings being pale and bearing narrow markings. This subspecies is endemic to Sikkim.

119. Euthalia phemius (Doubleday)

Fore wing length: 32-34mm.

Distribution: India: Sikkim (South Sikkim), Assam, Meghalaya and Nagaland. Elsewhere: Bangladesh, Bhutan and Myanmar.

Remarks: The species exhibits sexual dimorphism as upperside of hind wing is with broad blue border in male but upperside of hind wing entirely brown in female. De Nicéville (1883) recorded it at altitude between 305-610 m in South Sikkim.

XLIX. Genus Lexias Boisduval


Of the three species of this genus occurring in India, only a single species Lexias khasiana (Swinhoe) is treated here from Sikkim.

120. Lexias khasiana khasiana (Swinhoe)

(War Archduke)

Material examined: Sikkim, 1 ex, -vi-, 2 exs, -x-, 1 ex, -xi-, 1 ex, -xii-, 1 ex, no date (De Nicéville coll.).

Wing expanse: 80-105 mm.


Remarks: This nominate subspecies differs from L. khasiana intermedia (Tytler) found in Manipur by the male having upperside of fore wing unspotted and blue border vestigial, hind wing with blue border narrow and mostly purple bearing a row of blue spots; in female upperside of wings with bluish white spots and underside ochreous brown. Bingham (1905) and Wynter-Blyth (1957) considered it as rare. It has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

L. Genus Bassarona Moore


The genus is represented in India by ten species, of which six are found in Sikkim.
Key to species

1. Upperside of fore wing with a submarginal row of white spots, cell of fore wing not fully closed ........................................... \textit{franciae} (Gray)
   - Upperside of fore wing without any row of submarginal white spots, cell of fore wing closed ............................................................. 2

2. Upperside of fore wing with white discal band vertical and reaching inner margin beyond middle, veins R₃ and Sc anastomosed in fore wing. Cell open in hind wing ................. 3
   - Upperside of fore wing with white discal band, if present, directed to tornus and not extending below vein Cu₁ᵇ; vein R₃ in fore wing. Cell closed in hind wing ....................................... 4

3. Upperside of hind wing with discal band outwardly black edged .......... \textit{durga} (Moore)
   - Upperside of hind wing with discal band not black edged outwardly before the blue area ................................................ \textit{duda} (Staudinger)

4. Upperside of fore wing bronzy olive green in male and without any white discal band, rather a narrow white discal band present in fore wing of female spot in area M₃ elongate, pointed and well separated from the spots on either side ................................ \textit{nara} (Moore)
   - Upperside of fore wing with a pale discal band in male, spot in area M₃ conjoined to spots on either side both in male as well as in female .............................................................. 5

5. On upperside of fore wing, distance of outer edge of spot in area Cu₁ᵇ from termen about equal to the length of spot ........................................ \textit{sahadeva} (Moore)
   - On upperside of fore wing, distance of outer edge of spot in area Cu₁ᵇ from termen about half the length of the spot ...... \textit{iva} (Moore)

121. \textit{Bassarona franciae franciae} (Gray) (French Duke)


\textit{Material examined} : Sikkim, 3 exs, no date (De Nicéville coll). Sikkim, 2 exs, no date (Purchased ?).

\textit{Fore wing length} : 28-32 mm.


\textit{Remarks} : The nominate subspecies is distinguished from \textit{B. franciae rajah} (Felder) found from India (Assam) – Myanmar (Karens) by the upperside of wings bearing broad white discal band and all slightly diffused markings. Haribal (1992) observed this subspecies in North Sikkim (Tholung valley). Its status is very rare and it has been included in Schedule-1 (Par-4) of the Indian Wildlife (Protection) Act.

122. \textit{Bassarona durga durga} (Moore) (Blue Duke)


\textit{Material examined} : Sikkim, 4 exs, – – 1868 (T.C. Jerdon coll); Sikkim, lex, no date, (De Nicéville purchased); Sikkim, 2 exs, no date, Sikkim, Luhung valley, 1 ex, no date, (De Nicéville coll.).

\textit{Fore wing length} : 36-40mm.

\textit{Distribution} : India : Sikkim.

\textit{Remarks} : This nominate subspecies differs from \textit{B. durga splendens} (Tytler) found in Nagaland by the blue area not formed into lunules except near costa on upperside of hind wing. Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

123. \textit{Bassarona duda} (Staudinger) (Blue Duchess)


Material examined : Sikkim, lex, no date (De Nicéville coll.).

Fore wing length : 46 mm.

Distribution : India : Sikkim and Assam (old).

Remarks : Haribal (1992) observed this species in Teesta valley. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

124. Bassarona nara nara (Moore) (Bronze Duke)

1859. Adolias nara Moore, Trans. ent. Soc. Lond. New ser. 5 : 78, pl. 8, fig. 1.


Material examined : Sikkim, 3 exs, -- 1868 (T.C. Jerdon coll), Sikkim, 4 exs, no date, (De Nicéville coll); Sikkim, 1ex, no date (purchased ?)

Fore wing length : 35-38 mm.


Remarks : Only the nominate subspecies is found in India. Haribal (1992) mentioned its occurrence very rare in Sikkim. Its status in rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

124. Bassarona sahadeva sahadeva (Moore) (Green Duke)

1859. Adolias sahadeva Moore, Trans. ent. Soc. Lond. New series, 5 : 80, pl. 8, fig. 3.


Material examined : Sikkim, 7 exs, -- 1868 (T.C. Jerdon coll), Sikkim, 2exs, no date (De Nicéville coll).

Fore wing length : 41-44 mm.

Distribution : India : Sikkim (East Sikkim), Elsewhere : Bhutan.

Remarks : The nominate subspecies is distinguished from B. sahadeva nadaka (Frushtorfer) found from Assam to Manipur by upperside of hind wing in male bearing discal spots extending to area 1 and beyond the spots in areas M₂ and M₃ but wing being conspicuously paler, showing up the very broad postdiscal band. Haribal (1992) observed this subspecies in East Sikkim (Gangtok). Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

126. Bassarona iva (Moore)


Material examined : Nil.

Wing expanse : 115-125 mm.

Distribution : India : Sikkim and Manipur.

Remarks : Its status is very rare and it has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

Tribe Pseudergolini

Fore wing and hind wing with cells closed. Fore tarsi clawed in females with a few exceptions. The tribe is represented in India by three genera.

Key to genera

1. Eyes not hairy ................. Pseudergolis Felder
   - Eyes hairy ........................................... 2

2. Hind wing cell very short, barely one-third length of wing .................. Stibochiona Butler
   - Hind wing cell proportionately longer being about half the length of wing .............. Dichorrágia Butler
LI Genus *Pseudergolis* Felder


This genus is represented in India by only a single species, *Pseudergolis wedah* (Kollar).

127. *Pseudergolis wedah* (Kollar)
(The Tabby)


Material examined: Sikkim, 2exs, no date, Sikkim (native), 1ex, no date, South Sikkim, Rangeet Valley, 1ex, no date, *De Niceville coll.* North Sikkim, Talaymoo, alt, 3424m, 1ex, 3-vi-1959 (*A.G.K. Menon & Party coll*) and West Sikkim, Rao dhok, 1ex, 23-ix-1959; South Sikkim, Toshingong, 1ex, 29-ix-1959 (*B.K. Tikader coll*). Sikkim. alt. 1300m, 1ex, 7-iv-1981; North Sikkim, Singhik, 1ex, 11-iv-1981 (*R.K. Varshney & Party Coll*).

*Fore wing length*: 30-34 mm.

Distribution: India: Sikkim (North and South Sikkim), Arunachal Pradesh, Assam, Jammu & Kashmir, Meghalaya and West Bengal. Elsewhere: Bangladesh and North Myanmar.

Remarks: De Niceville (1881) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) found it common in cardamom plantations in North, South Sikkim and West Sikkim.

LII Genus *Stibochiona* Butler


This genus is known in India by a single species, *Stibochiona nicea* (Gray).

128. *Stibochiona nicea nicea* (Gray)
(Popinjay)


Material examined: Sikkim, 9exs, no date, Sikkim (native), 1ex, no date, South Sikkim, Rangeet Valley, 1ex, no date, *De Niceville coll.* North Sikkim, Talaymoo, alt, 3424m, 1ex, 3-vi-1959 (*A.G.K. Menon & Party coll*) and West Sikkim, Rao dhok, 1ex, 23-ix-1959; South Sikkim, Toshingong, 1ex, 29-ix-1959 (*B.K. Tikader coll*). Sikkim. alt. 1300m, 1ex, 7-iv-1981; North Sikkim, Singhik, 1ex, 11-iv-1981 (*R.K. Varshney & Party Coll*).

*Fore wing length*: 30-34 mm.

Distribution: India: Sikkim (North, South and West Sikkim), Himachal Pradesh to Arunachal Pradesh. Elsewhere: Bangladesh and North Myanmar.

Remarks: De Niceville (1881) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) found it common in cardamom plantations in North, South Sikkim and West Sikkim.

LIII. Genus *Dichorragia* Butler


The genus is represented in India by a single species, *Dichorragia nesimachus* (Boisduval).

129. *Dichorragia nesimachus* (Boisduval)
(Constable)


Material examined: Sikkim, 4exs, no date. 1ex, -ix- (*De Niceville coll*). Sikkim, 1ex, no further data.

*Fore wing length*: 32-34 mm.

Distribution: India: Sikkim, Arunachal
Pradesh, Assam and Himachal Pradesh. Elsewhere : Myanmar.

Remarks: The upperside of wings dark green with small whitish spots on fore wing as well as very prominent zig zag submarginal line single in male but double in female. Haribal (1992) mentioned it flying in Sikkim up to about 900 m and found throughout the year at lower elevations.

Tribe Apaturini

Labial palpi with second segment not inflated. Fore wing vein Sc not dilated at base, R₄ ending at apex or on termen (with a few exceptions). R₂ arising from R₃ or from end cell, apex of cell closer to wing base than origin of vein Cu₁₄; fore wing cell short and open. Hind wing precostal vein arising beyond origin of Sc + R₁.

The tribe is represente in India by 10 genera.

Key to genera

1. Antennae longer than half the length of fore wing costa. Labial palpi white or brown throughout .................................................. 2
   - Antennae equal to half the length of the costa. Labial palpi black or black and white .......... 7

2. Antennal club sharply spatulate. Fore wing with upper end of cell obtuse, R₂ arising from R₃ ............................................. Helcyra Felder
   - Antennal club stout and gradual. Fore with upper end cell right angled or acute, R₂ arising from cell ............................................. 3

3. Cell closed in fore and hind wings ................. Dilipa Moore
   - Cell open in fore and hind wings .................. 4

4. Fore wing with origin of vein R₃ nearer origin of R₃ than termen .......... Herona Doubleday
   - Fore wing with origin of vein R₃ nearer termen than origin of R₃ ............................................. 5

5. Underside of fore wing with prominent small subapical white dots in spaces M₂, M₁ and R₄ ............................. Rohana Moore
   - Underside of fore wing without any of the minute subapical white dots in spaces M₂, M₁ and R₄ ....................... 6

6. Underside of fore wing with black spots in cell ........................................ Apatura Fabricius
   - Underside of fore wing without any black spot in cell .......... Chitoria Moore

7. Fore wing with vein R₃ arising from cell ..... ........................................ Hestina Westwood
   - Fore wing with rein R₃ arising from R₃ ......... 8

8. Labial palpi very long and black with a white tip ................................ Sephisa Moore
   - Labial palpi short and white at base .......... 9

9. Eyes smooth ............ Euripus Doubleday
   - Eyes hairy .................................. Diagora Snellen

LV. Genus Helcyra Felder


Only a single species, Helcyra hemina Hewitson represents this genus in India.

130. Helcyra hemina Hewitson
(White Emperor)

1864. Helcyra hemina Hewitson, Trans. ent. Soc. Lond., (3) 2 : 245, pl. 15, Fig. 1.


Material examined: Sikkim, lex, -- 1868 (T.C. Jerdon coll), Sikkim, 3 exs, no date, (De Nicéville coll). Sikkim, lex, no further data.

Fore wing length : 32-33 mm.

Distribution : India : Sikkim (South Sikkim) and Nagaland. Elsewhere : Myanmar.

Remarks: De Nicéville (1885) recorded one female as rare in a collection made from South Sikkim (Rungeet) or roads between it and Darjiling. De Nicéville (1886) commented about this species as very beautiful and rare. It has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

LV. Genus Dilipa Moore

This genus is represented in India by a single species, *Dilipa morgiana* Westwood.

131. *Dilipa morgiana* (Westwood)  
(Golden Emperor)


*Material examined* : Sikkim, 1ex, no date, (De Nicéville coll.).

*Fore wing length* : 34mm.


*Remarks* : This species exhibits sexual dimorphism as upperside of wings is golden bronzy in male but white in female. Its status is rare and it has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

LVI. Genus *Herona* Doubleday


The genus is represented in India by a single species, *Herona marathus* Doubleday.

132. *Herona marathus marathus* Doubleday  
(Pasha)

1850. *Herona marathus* Doubleday, In Doubleday, *Westwood & Hewitson, Gen. diurn. Lep.*, 294, pl. 41, Fig. 3 male.


*Material examined* : Sikkim, 4exs, no date, 1ex, –x–, (De Nicéville coll.).

*Fore wing length* : 35-36 mm.


Remarks : This nominate subspecies differs from its counterpart *andamana* Moore found in Andamans by the presence of wide and confluent tawny bands on upperside of wings. Its status is not rare. It has also been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

LVII. Genus *Rohana* Moore


Two species, *Rohana parvata* Moore and *R. parisatis* Westwood occur in India.

**Key to species**

Eyes hairy. Upperside of fore and hind wings brown in both sexes .......... *parvata* (Moore)

Eyes not hairy. Upperside of fore and hind wings purple-black in male and brown in female .............................................. *parisatis* (Westwood)

133. *Rohana parvata* (Moore)  
(Brown Prince)


*Material examined* : Sikkim, 1ex, –x–, 1868 (R.Cholomondelay coll.), 3exs, –x– 1868 (T.C. Jordon coll.).

*Fore wing length* : 24-26 mm.


Remarks : The status of this species is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

134. *Rohana parisatis parisatis* (Westwood)  
(Black Prince)


GUPTA : Insecta : Lepidoptera : Nymphalidae


Material examined : Sikkim, 1ex, no date, (R.Cholmondelay coll); 5 exs, no date, 1ex, -- vii-- (De Nicéville coll.). Sikkim, 1ex, no date (De Nicéville purchased).

Fore wing length : 21-23mm.

Distribution : India : Sikkim (South Sikkim), Assam and Meghalaya. Elsewhere : Bangladesh and Myanmar.

Remarks : This nominate subspecies differs from its counterpart *atacinus* Fruhstorfer occurring in South India by the presence of a single apical dot on upperside of fore wing and female is much darker. DeNicéville (1882) recorded it from South Sikkim (Rungeet Valley).


Two species, viz., *Apatura ambica* Kollar and *A. chevana* Moore of this genus occurring in India are dealt with from Sikkim.

Key to species

1. Upperside of fore wing cell with a broad white streak .................................. *chevana* (Moore)
   - Upperside of fore wing cell without any streak ............................................. *ambica* Kollar

135. *Apatura chevana* (Moore) (Sergeant Emperor)


Material examined : Sikkim, 1ex, -- 1868 (T.C. Jerdon coll); 7exs, no date, 1ex, -- iv-- (De Nicéville coll.). Sikkim, 1ex, no date (De Nicéville purchased).

Fore wing length : 36-37 mm.


Remarks : The presence of a broad white streak in cell on upperside of fore wing makes this species mimick other species of *Athyma* Westwood. Its status is rare and it has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

136. *Apatura ambica ambica* Kollar (Indian Purple Emperor)


Material examined : Sikkim, 3exs, no date, 1ex, -- vii--, 1ex, -- viii-- 1ex (De Nicéville coll.). Sikkim, 2exs, no date (De Nicéville purchased).

Fore wing length : 31-33mm.

Distribution : India : Sikkim (North Sikkim), Assam and West Bengal. Elsewhere : Myanmar.

Remarks : This nominate subspecies differs from its counterpart *chitalensis* Evans found from Pakistan (Chitral) to India (Jammu & Kashmir) by lesser wing expanse and well defined markings on wings. Its status is rare. Haribal (1992) reported its occurrence in North Sikkim near Mangan (in Teesta Valley)


Three species of this genus occur in India and one i.e. *Chitoria sordida* Moore is treated here from Sikkim.

137. *Chitoria sordida sordida* (Moore) (Sordid Emperor)


Material examined: Sikkim, 3exs, -x-, 2exs, no date, (De Nicéville coll).

Fore wing length: 30-31 mm.

Distribution: India: Sikkim (South Sikkim, West Sikkim). Elsewhere: North Myanmar.

Remarks: This nominate subspecies is distinguished from C. sordida naga (Tytler) occurring in Nagaland by the presence of discal white band on upperside of fore wing, a prominent ocellus in space Cu₁b in hind wing, and, underside of wings brown. De Nicéville (1885) reported its occurrence in South Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence in West Sikkim (Rangpo) and Teesta.

LX. Genus Hestina Westwood


Only a single species, Hestina nama (Doubleday) represents this genus in India.

138. Hestina nama (Doubleday) (Circe)


Material examined: Sikkim, 4exs, no date, 1ex, 18–vii–1884, 2exs, -x-, South Sikkim (Rungeet Valley), 2exs, no date, (De Nicéville coll). Sikkim, 1ex, no date, (De Nicéville purchased).

Fore wing length: 47-49mm.

Distribution: India: Sikkim (East and South Sikkim), Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Nagaland, Uttar Pradesh and West Bengal. Elsewhere: Myanmar.

Remarks: The discal streaks and postdical spots are bifurcated outwardly. This species mimicks ‘Chestnut Tiger’– Danaus tytia Gray of the subfamily Danainae. De Nicéville (1881) recorded it from South Sikkim (Rungeet Valley). Haribal (1992) mentioned its occurrence in East Sikkim (Rangpo) and Teesta.

LXI. Genus Sephisa Moore


The genus is represented in India by two species, viz., Sephisa dichroa (Kollar) and S. chandra (Moore) and the latter is dealt with from Sikkim.

139. Sephisa chandra (Moore) (Eastern Courtier)

1858. Castalia chandra Moore, Cat. Lep. Ins. Mus. East India Coy, 1: 200, pl. 6A.


Material examined: Sikkim, 1ex, 1868 (T.C. Jerdon coll.); 1ex, -x-, (De Nicéville coll). Sikkim, 1ex, no date, (De Nicéville purchased).

Fore wing length: 38-39 mm.

Distribution: India: Sikkim (North, South and West Sikkim), Arunachal Pradesh and West Bengal. Elsewhere: Myanmar.

Remarks: The female of this species is very rare and polymorphic. De Nicéville (1882) recorded it from collection made either in South Sikkim (Rungeet) or roads between it and Darjiling. Haribal (1992) reported its occurrence in North and West Sikkim. It has been included in Schedule-1 (Part-4) of the Indian Wildlife (Protection) Act.

LXII. Genus Euripus Doubleday

1848. Euripus Doubleday, Gen. diurn. Lep., (2) : pl. 41, fig. 2.
Two species, viz., Euripus consimilis (Westwood) and E. nyctelius (Doubleday) occur in India.

Key to species

1. Underside of hind wing with red basal markings. In male, red submarginal spots present from space 3A to Cu₁₁ ●●●●●●●●●●●●●●●●
   ..................................
   consimilis (Westwood)

- Underside of hind wing without red basal markings. In male, pale submarginal spots present from space 3A to Cu₁₁ ●●●●●●●●●●●●●●●●
   ..................................
   nyctelius (Doubleday)

140. Euripus consimilis consimilis (Westwood) (Painted Courtesan)


Material examined: Sikkim, 1 ex, -iv-, 1 ex, - x-, 13 exs, no date, (De Nicéville coll), Sikkim, 1 ex, no further data.

Fore wing length: 33-36 mm.

Distribution: India: Sikkim (South and West Sikkim), Arunachal Pradesh, Assam, Meghalaya and West Bengal. Elsewhere: Myanmar.

Remarks: The female of this species is polymorphic. De Nicéville (1881) recorded it from South Sikkim (Rungreet Valley). Haribal (1992) also collected cinnamomeus (sic) f. from West Sikkim.

XLII. Genus Diagora Snellen


This genus is represented in India by two species, viz., Diagora nicévillei Moore and D. persimilis Westwood of which the latter is dealt with from Sikkim.

142. Diagora persimilis persimilis (Westwood) (Siren)


Material examined: Sikkim, 5 exs, no date, 1 ex, -v- (De Nicéville coll.).

Fore wing length: 32-33 mm.


Remarks: This nominate subspecies is
distinguished from *D. persimilis zella* Butler, found from Himachal Pradesh (Shimla) to Uttar Pradesh (Kumaon), by the presence of narrower white markings or darker wings and apex of fore wing produced. Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

**Subfamily CHARAXINAE**

Large and robust butterflies. Fore wing with cell closed, vein R₄ arising nearer to end of cell than to termen. Hind wing with cell open or closed.

This subfamily is represented in India by three genera, two of which are dealt with here.

**Key to genera**

Upperside of wings predominantly reddish to dark brown. Hind wing with cell slenderly closed, a single tooth or tail present at vein M₃

- Upperside of wings predominantly pale yellowish or greenish white. Hind wing with cell open, subequal pointed tails present at veins Cu₁₅ and M₃............... *Polyura* Billberg

**LXIV. Genus Charaxes Ochsenheimer**


All the five species of this genus occurring in India are treated from Sikkim.

**Key to species**

1. Upperside of fore wing and hind wing brown with a yellow or whitish discal band. Hind wing with long tails at veins Cu₁₅ and M₃ .......... .......................... *Charaxes* Ochsenheimer

- Upperside of fore wing and hind wing tawny or chestnut. In male, hind wing more or less toothed at M₃ whereas in female, tailed at M₃ .......................... 2

2. In male, upperside of fore wing with broad black border, never with tawny spots at apex; in female, upperside of fore wing with a broad discal band ................. *polyxena* (Cramer)

- In male, upperside of fore wing with narrow black border, tawny spots reaching the apex and inwardly bordered by a lunular dark line; in female, upperside of fore wing without a white or pale discal band ............................. 3

3. Upperside of fore wing without apical spot above vein M₁. Underside of wings purple tawny ......................... *aristogiton* Felder

- Upperside of fore wing with apical spots above vein M₁. Underside of wings ochreous ........ 4

4. Underside of wings more or less uniform and markings regular, fore wing with mid cell black bar macular, hind wing with more or less straight (except just beyond end cell) discal line beyond cell .............. *marmax* Westwood

- Underside of wings with markings prominent and irregular; central band much darker, fore wing with all cell bars entire, hind wing with discal line very irregular and broken and may be highly concave in area M₁ ........................ .............................. *kahruba* (Moore)

143. *Charaxes fabius fabius* (Fabricius) (Black Rajah)


*Material examined*: Sikkim, lex, no date, (De Nicéville coll).

*Fore wing length*: 36 mm.

*Distribution*: India : Sikkim, Himachal Pradesh, Maharashtra, Orissa, Uttar Pradesh and West Bengal.

*Remarks*: The nominate subspecies is distinguished from *Charaxes fabius sulphureus* Rothschild, found from Assam Myanmar, by the presence of white or pale discal band on upperside of wings. Evans (1932) mentioned its distribution in South India also, whereas Haribal (1992) referred that it might be migrating to South India in August.

144. *Charaxes polyxena hierax* Felder (Tawny Rajah)


**Material examined** : Sikkim, 4 exs, no further data. Sikkim, 3 exs, –x–, 8 exs, no date, 1 ex, –iv–, 3 exs, –vii–, 10-x-1885, 1 ex, –v–, 1 ex, –viii–, (De Nicéville coll). Sikkim, 4 exs, no date (De Nicéville purchased).

**Fore wing length** : 37-42 mm.

**Distribution** : India: Sikkim (South Sikkim) and West Bengal. *Elsewhere* : North Myanmar.

**Remarks** : Earlier, De Nicéville (1881) recorded this subspecies from South Sikkim (Rungeet Valley). Bingham (1905) mentioned this subspecies as highly variable. Evans (1932) and Haribal (1992) referred to males showing polymorphism.

145. *Charaxes aristogiton* Felder

(Scarce Tawny Rajah)


**Material examined** : Sikkim, 1 ex, –vii–, 3 exs, no date, (De Nicéville coll). Sikkim, 4 exs, no date, (De Nicéville purchased).

**Fore wing length** : 41-43 mm.


**Remarks** : The status of this species is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife Protection Act.

146. *Charaxes marmax* Westwood

(Yellow Rajah)


**Material examined** : Sikkim, 4 exs, no date, 2 exs, –iv–, 2 exs, –x–, 1 ex, –vii–, 1 ex, –xi–, (De Nicéville coll); 2 exs, no date, (De Nicéville purchased).

**Fore wing length** : 48-53 mm.


**Remarks** : Haribal (1992) did not observe this species in Sikkim but made reference to Sanders’ (1940s) observation that males are rather rare and females rarer. De Nicéville (1886) reported its occurrence in Sikkim. This species has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

147. *Charaxes kahruba* (Moore)

(Variegated Rajah)


**Material examined** : Sikkim, 4 exs, no date, 2 exs, –v–, 1 ex, –viii–, (De Nicéville coll).

**Fore wing length** : 48-50 mm.


**Remarks** : Its status is rare and it has been included in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

LXV. Genus *Polyura* Billberg


Of the nine species occurring in India, six are dealt with from Sikkim.

**Key to species**

1. Upperside of wings with the ground colour black or deep indigo blue ................. 2
82

- Upperside of wings with the ground colour yellowish white ..................................... 3

2. Upperside of wings with discal band pale yellow ............................................. athamas (Drury)

- Upperside of wings with discal band pale greenish white ........... arja (Felder & Felder)

3. Upperside of fore wing with one or two prominent transverse postdiscal series of pale/white spots ............................................. 4

- Upperside of fore wing without any postdiscal series of pale/white spots ............................ 5

4. Upperside of fore wing with a postdiscal series of pale white spots. Underside of fore wing with costa chocolate brown ............................................. dololi Westwood

- Upperside of fore wing with two series of pale white spots. Underside fore wing with costa white .......... eudamippus (Doubleday)

5. Underside of fore wing with a prominent chocolate brown band on inner side of discal area............................................. moori Distant

- Underside of fore wing without any chocolate brown band on inner side of discal area ......

- Underside of fore wing with costa chocolate brown ............................................. delphius (Doubleday)

148. Polyura athamas athamas (Drury) (Common Nawab)

1770. Papilio athamas Drury. Ill. exot. Ent., 1 : 5 pl. 2, fig.4.

Material examined : Sikkim, 9 exs, no date, 1ex, --viii--, 1ex, --ix-- (De Nicéville coll). Sikkim, 3exs (De Nicéville by Purchased)

Fore wing length : 37-40 mm.


Remarks : Haribal (1992) reported it from West Sikkim. Its status is not rare.

150. Polyura dolon centralis (Rothschild & Jordan) (Stately Nawab)

Material examined: Sikkim, 4exs, no date, (De Nicéville coll). Sikkim, 2exs, no data, (Purchased).

Fore wing length: 42-43 mm.

Distribution: India: Sikkim (East Sikkim, North Sikkim) and West Bengal.

Remarks: This subspecies differs from P. dolon magniplaga (Fruhstorfer) found in Assam, Meghalaya, Manipur and Nagaland by upperside of hind wing bearing admarginals yellow and blue scaling at veins obsolete; from nominate subspecies occurring in Kashmir–Nepal by hind wing upperside having submarginal spots small and pale. Evans (1932) mentioned its occurrence in Sikkim, Nepal and Bhutan whereas Smiles (1982) restricted its distribution to West Bengal and Sikkim. Sanders (1942) and Haribal recorded it from North Sikkim (Chungthang) East Sikkim (Bushuk) respectively. Its status is rare and has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

152. Polyura moori sandakana (Fruhstorfer) (Malayan Nawab)


Material examined: Nil.

Wing expanse: 80-85 mm.


Remarks: Its status is very rare. It has been included in Schedule-I (Part-4) of the Indian Wildlife (Protection) Act.

153. Polyura delphis delphis (Doubleday) (Jewelled Nawab)


Material examined: Nil.

Wing expanse: 95-100 mm.


Remarks: Evans (1932) referred to its distribution from Assam to Myanmar but Smiles (1982) mentioned its occurrence in Sikkim which was followed by Haribal (1992). It has been listed in Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

Subfamily LIBYTHEINAE

Eyes naked; labial palpi very long, porrect and beak like; wings short and broad with cell closed by tubular veins, fore wing falcate and truncate at apex and vein 1A + 2A forked at base; fore legs imperfect in male but functionally perfect in female.
The subfamily is represented in the World by a single genus *Libythea* Fabricius with 12 species of which three occur in India.

**LXVI. Genus Libythea Fabricius**


Of the three species of this genus found in India, two are dealt with from Sikkim.

**Key to species**

Upperside of fore wing with an elongate oval orange-yellow spot beyond lower apex of cell .................................................. *myrrha* Godart

Upperside of fore wing with a quadrate orange spot beyond lower apex of cell .................................................. *lepita* Moore

154. *Libythea myrrha sanguinalis* Fruhstorfer (Club Beak)


**Material examined** : Sikkim, 5exs, no date, (De Nicéville coll).

**Fore wing length** : 24-27 mm.

**Distribution** : India : Sikkim, Arunachal Pradesh, Assam, Jammu & Kashmir and Meghalaya.

**Remarks** : This nominate subspecies has been treated as *L. celtis leptia* by D’Abrera (1985). Varshney (1994) considered *L. celtis* Laicharting and *L. leptia* as separate species. Though its status is known to be not rare, the species has been included in the Schedule-II (Part-2) of the Indian Wildlife (Protection) Act.

**SUMMARY**

Altogether 155 species/subspecies belonging to 66 genera and six subfamilies viz., Morphiniae, Acraeinae, Nymphalinae, Charaxinae and Libythinae of the family Nymphalidae have been dealt with from Sikkim. Keys to identification of species and genera have been provided. An appendix listing the taxa with their district-wise distribution in Sikkim has been included. Of these 155 spp., subspp. seven are endemic to Sikkim and 55 have been afforded protection by including these in Schedule-1 (Part-4)–15 species and Schedule-2 (Part-2)–39 spp. and Schedule-4 lsp. of the Indian Wildlife (Protection) Act.

**ACKNOWLEDGEMENTS**

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APPENDIX

List of species/subspecies of butterflies of family Nymphalidae providing District-wise distribution in Sikkim.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of species/subspecies</th>
<th>Name of the District of Sikkim</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Family NYMPHALIDAE</td>
<td></td>
</tr>
<tr>
<td>I. Subfamily MORPHINAE</td>
<td>Tribe Amathusiini</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Amathuxidia anythao anythao (Doubleday)</td>
<td>—</td>
</tr>
<tr>
<td>2.</td>
<td>Aemonia amathusia amathusia (Hewitson)</td>
<td>—</td>
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<tr>
<td>3.</td>
<td>Faunis canens arcesilas Stichel</td>
<td>—</td>
</tr>
<tr>
<td>4.</td>
<td>Stichophthalma nournahal nournahal (Westwood)</td>
<td>—</td>
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<tr>
<td>5.</td>
<td>S. camadeva camadeva (Westwood)</td>
<td>—</td>
</tr>
<tr>
<td>6.</td>
<td>Thaumantis diore diore Doubleday</td>
<td>—</td>
</tr>
<tr>
<td>7.</td>
<td>Discophora timora timora Westwood</td>
<td>—</td>
</tr>
<tr>
<td>8.</td>
<td>D. sondaica zal Westwood</td>
<td>—</td>
</tr>
<tr>
<td>9.</td>
<td>Enispe cycnus cycnus Westwood</td>
<td>—</td>
</tr>
<tr>
<td>10.</td>
<td>E. euthymius euthymius (Doubleday)</td>
<td>—</td>
</tr>
<tr>
<td>II. Subfamily CALINAGINAE</td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>Calinaga gautama Moore</td>
<td>—</td>
</tr>
<tr>
<td>12.</td>
<td>Pentheuma lisarda lisarda (Doubleday)</td>
<td>+</td>
</tr>
<tr>
<td>III. Subfamily ACRAEINAE</td>
<td></td>
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</tr>
<tr>
<td>13.</td>
<td>Acraea violae (Fabricius)</td>
<td>—</td>
</tr>
<tr>
<td>14.</td>
<td>A. issoria issoria (Huebner)</td>
<td>+</td>
</tr>
<tr>
<td>IV Subfamily NYMPHALINAE</td>
<td>Tribe Biblidini</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Ariadne ariadne pallidior (Fruhstorfer)</td>
<td>—</td>
</tr>
<tr>
<td>16.</td>
<td>A. merione assama (Evans)</td>
<td>—</td>
</tr>
<tr>
<td>Tribe Heliconiini</td>
<td></td>
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<tr>
<td>17.</td>
<td>Cethosia cyane (Drury)</td>
<td>—</td>
</tr>
<tr>
<td>18.</td>
<td>C. biblis tisamena Fruhsterfer</td>
<td>+</td>
</tr>
<tr>
<td>19.</td>
<td>Melitaea arcesia sikkimensis Moore</td>
<td>+</td>
</tr>
<tr>
<td>20.</td>
<td>M. arcesia thibetana Fawcett</td>
<td>—</td>
</tr>
<tr>
<td>21.</td>
<td>Argynnis hyperbius hyperbius (Linnaeus)</td>
<td>+</td>
</tr>
<tr>
<td>22.</td>
<td>A. childreni childreni Gray</td>
<td>+</td>
</tr>
<tr>
<td>23.</td>
<td>A. kamala Moore</td>
<td>—</td>
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<tr>
<td>Sl. No.</td>
<td>Name of species/subspecies</td>
<td>Name of the District of Sikkim</td>
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<td></td>
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<td>North</td>
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<tr>
<td>24.</td>
<td>A. lathonia isaea Doubleday</td>
<td>+</td>
</tr>
<tr>
<td>25.</td>
<td>A. clara manis Fruhstorfer</td>
<td>+</td>
</tr>
<tr>
<td>26.</td>
<td>A. pales eupales (Fruhstorfer)</td>
<td>—</td>
</tr>
<tr>
<td>27.</td>
<td>A. altissima Elwes</td>
<td>+</td>
</tr>
<tr>
<td>28.</td>
<td>A. gemmata gemmata Butler</td>
<td>—</td>
</tr>
<tr>
<td>29.</td>
<td>Vindula erota erota (Fabricius)</td>
<td>—</td>
</tr>
<tr>
<td>30.</td>
<td>Cirrochroa aoris aoris Doubleday</td>
<td>+</td>
</tr>
<tr>
<td>31.</td>
<td>C. tyche mithila Moore</td>
<td>—</td>
</tr>
<tr>
<td>32.</td>
<td>Cupha erymanthis lotis Sulz.</td>
<td>—</td>
</tr>
<tr>
<td>33.</td>
<td>Vagrans egista sinha (Kollar)</td>
<td>—</td>
</tr>
<tr>
<td>34.</td>
<td>Phalanta phalantha phalantha (Drury)</td>
<td>+</td>
</tr>
<tr>
<td>35.</td>
<td>P. alcippe alcippoides (Moore)</td>
<td>—</td>
</tr>
</tbody>
</table>

**Tribe Nymphalini**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of species/subspecies</th>
<th>Name of the District of Sikkim</th>
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<tr>
<td></td>
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<td>North</td>
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<tr>
<td>36.</td>
<td>Hypolinna misippus (Linnaeus)</td>
<td>—</td>
</tr>
<tr>
<td>37.</td>
<td>H. bolina (Linnaeus)</td>
<td>—</td>
</tr>
<tr>
<td>38.</td>
<td>Junonia iphita iphita (Cramer)</td>
<td>—</td>
</tr>
<tr>
<td>39.</td>
<td>J. hierta magna (Evans)</td>
<td>+</td>
</tr>
<tr>
<td>40.</td>
<td>J. atlites (Linnaeus)</td>
<td>+</td>
</tr>
<tr>
<td>41.</td>
<td>J. orithya ocyale (Huebner)</td>
<td>+</td>
</tr>
<tr>
<td>42.</td>
<td>J. lemonias lemonias (Linnaeus)</td>
<td>—</td>
</tr>
<tr>
<td>43.</td>
<td>J. almana almana (Linnaeus)</td>
<td>—</td>
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<tr>
<td>44.</td>
<td>Doleschallia bisaltide indica Moore</td>
<td>+</td>
</tr>
<tr>
<td>45.</td>
<td>Kallima alompra Moore</td>
<td>—</td>
</tr>
<tr>
<td>46.</td>
<td>K. philarchus horsfieldi (Kollar)</td>
<td>+</td>
</tr>
<tr>
<td>47.</td>
<td>K. inachus inachus (Boisduval)</td>
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</tr>
<tr>
<td>48.</td>
<td>Symbrenthia lilaea khasiana Moore</td>
<td>—</td>
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<tr>
<td>49.</td>
<td>S. silana DeNicéville</td>
<td>—</td>
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<tr>
<td>50.</td>
<td>S. niphanda niphanda Moore</td>
<td>—</td>
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<tr>
<td>51.</td>
<td>S. hypeselis cotanda Moore</td>
<td>+</td>
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<tr>
<td>52.</td>
<td>Cynthia cardui (Linnaeus)</td>
<td>+</td>
</tr>
<tr>
<td>53.</td>
<td>Vanessa indica indica (Herbst)</td>
<td>+</td>
</tr>
<tr>
<td>54.</td>
<td>Kaniska canace canace (Linnaeus)</td>
<td>—</td>
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<td>55.</td>
<td>Polygonia egea aegicula (Moore)</td>
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<td>56.</td>
<td>Nymphalis antiopa yedanula (Fruhstorfer)</td>
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<tr>
<td>57.</td>
<td>Aglais cashmirensis aesis (Fruhstorfer)</td>
<td>+</td>
</tr>
<tr>
<td>58.</td>
<td>A. ladakensis (Moore)</td>
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<tr>
<td>59.</td>
<td>A. urticae rizana (Moore)</td>
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<td>Sl. No.</td>
<td>Name of species/subspecies</td>
<td>Tribe</td>
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<td>60.</td>
<td><em>Cyrestis cocolis cocolis</em> (Fabricius)</td>
<td>Cyrestini</td>
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<td>61.</td>
<td><em>C. thyodomas thyodomas</em> Boisduval</td>
<td>Cyrestini</td>
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<tr>
<td>62.</td>
<td><em>Chersonesia risa</em> (Doubleday &amp; Hewitson)</td>
<td>Cyrestini</td>
</tr>
<tr>
<td>63.</td>
<td><em>Pantoporia hordonia hordonia</em> (Stoll)</td>
<td>Limenitidini</td>
</tr>
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<td>64.</td>
<td><em>Phaedyma columnella ophiana</em> (Moore)</td>
<td>Limenitidini</td>
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<tr>
<td>65.</td>
<td><em>Lasippa viraja viraja</em> (Moore)</td>
<td>Limenitidini</td>
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<tr>
<td>66.</td>
<td><em>N. armandia melba</em> Evans</td>
<td>Limenitidini</td>
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<td>67.</td>
<td><em>N. radha radha</em> Moore</td>
<td>Limenitidini</td>
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<tr>
<td>68.</td>
<td><em>N. narayana nana</em> De Nicèville</td>
<td>Limenitidini</td>
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<tr>
<td>69.</td>
<td><em>N. manasa manasa</em> Moore</td>
<td>Limenitidini</td>
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<td>70.</td>
<td><em>N. nycteus</em> De Nicèville</td>
<td>Limenitidini</td>
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<td>71.</td>
<td><em>N. zaida bhutanica</em> Tytler</td>
<td>Limenitidini</td>
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<tr>
<td>72.</td>
<td><em>N. cartica cartica</em> Moore</td>
<td>Limenitidini</td>
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<tr>
<td>73.</td>
<td><em>N. nashona nashona</em> Swinhoe</td>
<td>Limenitidini</td>
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<tr>
<td>74.</td>
<td><em>N. ananta ochracea</em> Evans</td>
<td>Limenitidini</td>
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<td>75.</td>
<td><em>N. namba namba</em> Tytler</td>
<td>Limenitidini</td>
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<td>76.</td>
<td><em>Neptis jumbah jumbah</em> Moore</td>
<td>Limenitidini</td>
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<td>77.</td>
<td><em>N. miah miah</em> Moore</td>
<td>Limenitidini</td>
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<td>78.</td>
<td><em>N. sankara amba</em> Moore</td>
<td>Limenitidini</td>
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<td>79.</td>
<td><em>N. harita harita</em> Moore</td>
<td>Limenitidini</td>
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<td>80.</td>
<td><em>N. pseudovikasi</em> (Moore)</td>
<td>Limenitidini</td>
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<td>81.</td>
<td><em>N. clinia susruta</em> Moore</td>
<td>Limenitidini</td>
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<td>83.</td>
<td><em>N. hylas varmona</em> Moore</td>
<td>Limenitidini</td>
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<td>84.</td>
<td><em>N. hylas kamarupa</em> Moore</td>
<td>Limenitidini</td>
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<td>85.</td>
<td><em>N. sappho astola</em> Moore</td>
<td>Limenitidini</td>
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<td>86.</td>
<td><em>N. soma soma</em> Moore</td>
<td>Limenitidini</td>
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<td>87.</td>
<td><em>N. mahendra mahendra</em> Moore</td>
<td>Limenitidini</td>
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<td>88.</td>
<td><em>N. nata adipala</em> Moore</td>
<td>Limenitidini</td>
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<td>89.</td>
<td><em>Moduza procris procris</em> (Cramer)</td>
<td>Limenitidini</td>
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<td>90.</td>
<td><em>Athyma selenophora selenophora</em> (Kollar)</td>
<td>Limenitidini</td>
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<td>91.</td>
<td><em>A. zeroa</em> Moore</td>
<td>Limenitidini</td>
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<td>92.</td>
<td><em>A. nefle inara</em> (Doubleday)</td>
<td>Limenitidini</td>
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<td>93.</td>
<td><em>A. camo</em> Moore</td>
<td>Limenitidini</td>
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<tr>
<td>94.</td>
<td><em>A. opalina orientalis</em> Elwes</td>
<td>Limenitidini</td>
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<tr>
<td>Sl. No.</td>
<td>Name of species/subspecies</td>
<td>Name of the District of Sikkim</td>
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<td>North</td>
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<td>95.</td>
<td><em>A. ranga ranga</em> Moore</td>
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<tr>
<td>96.</td>
<td><em>A. jina jina</em> Moore</td>
<td>+</td>
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<td>97.</td>
<td><em>A. perius</em> (Linnaeus)</td>
<td>+</td>
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<td>98.</td>
<td><em>A. asura asura</em> Moore</td>
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<td>99.</td>
<td><em>A. pravara acutipennis</em> (Fruhstorfer)</td>
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<td>100.</td>
<td><em>Parsarpa zayla</em> (Doubleday)</td>
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<td>101.</td>
<td><em>P. dudu</em> (Westwood)</td>
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<td>102.</td>
<td><em>Sumalia daraxa</em> (Doubleday)</td>
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<td>103.</td>
<td><em>S. zulema</em> (Doubleday)</td>
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<td>104.</td>
<td><em>Auzakia danava</em> (Moore)</td>
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<td>105.</td>
<td><em>Neurosigma siva</em> (Westwood)</td>
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<td>106.</td>
<td><em>Abrota ganga</em> Moore</td>
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<td>107.</td>
<td><em>Parthenos sylvia gambrisius</em> (Fabricius)</td>
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<td>108.</td>
<td><em>Lebadea martha martha</em> (Fabricius)</td>
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<td>109.</td>
<td><em>Symphaedra nais</em> (Forster)</td>
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<td>110.</td>
<td><em>Tanaecia lepidea lepidea</em> (Butler)</td>
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<td>111.</td>
<td><em>T. julii appiades</em> (Ménétries)</td>
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<td>112.</td>
<td><em>T. jahnu jahnu</em> (Moore)</td>
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<td>113.</td>
<td><em>Euthalia telchinia</em> (Ménétries)</td>
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<td>114.</td>
<td><em>E. kesava arhat</em> Fruhstorfer</td>
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<td>115.</td>
<td><em>E. anosia saitaphernes</em> Fruhstorfer</td>
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<td>116.</td>
<td><em>E. lubentina indica</em> Fruhstorfer</td>
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<td>117.</td>
<td><em>E. aconthea suddhodana</em> Fruhstorfer</td>
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<td>118.</td>
<td><em>E. jama jamida</em> Fruhstorfer</td>
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<td>119.</td>
<td><em>E. phemius</em> (Doubleday)</td>
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<td>120.</td>
<td>Lexias khasiana khasiana (Swinhoe)</td>
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<td>121.</td>
<td><em>Bassarona franciae franciae</em> (Gray)</td>
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<td>122.</td>
<td><em>B. durga durga</em> (Moore)</td>
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<td>123.</td>
<td><em>B. duda</em> (Staudinger)</td>
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<td>124.</td>
<td><em>B. nara nara</em> (Moore)</td>
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<td>125.</td>
<td><em>B. sahadeva sahadeva</em> (Moore)</td>
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<td>126.</td>
<td><em>B. iva</em> (Moore)</td>
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<td><strong>Tribe Pseudergolini</strong></td>
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<tr>
<td>127.</td>
<td><em>Pseudergolis wedah</em> (Kollar)</td>
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<td>128.</td>
<td>Stibochiona nicea nicea (Gray)</td>
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<td>129.</td>
<td>Dichorragia nesimachus (Boisduval)</td>
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<td>Sl. No.</td>
<td>Name of species/subspecies</td>
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<td>130.</td>
<td><em>Helcyra hemina</em> Hewitson</td>
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<td>131.</td>
<td><em>Dilipa morgiana</em> (Westwood)</td>
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<td>132.</td>
<td><em>Herona marathus marathus</em> Doubleday</td>
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<td>133.</td>
<td><em>Rohana parvata</em> (Moore)</td>
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<td>134.</td>
<td><em>R. parisatis parisatis</em> (Westwood)</td>
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<td>135.</td>
<td><em>Apatura chevana</em> (Moore)</td>
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<td>136.</td>
<td><em>A. ambica ambica</em> Kollar</td>
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<td>137.</td>
<td><em>Chitoria sordida sordida</em> (Moore)</td>
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<td>138.</td>
<td><em>Hestina nama</em> (Doubleday)</td>
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<td>139.</td>
<td><em>Sephisa chandra</em> (Moore)</td>
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<td>140.</td>
<td><em>Euripus consimilis consimilis</em> (Westwood)</td>
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<td>141.</td>
<td><em>Euripus nyctelius</em> (Doubleday)</td>
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<td>142.</td>
<td><em>Diagora persimilis persimilis</em> (Westwood)</td>
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<td></td>
<td>V. Subfamily CHARAXINAE</td>
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<td>143.</td>
<td><em>Charaxes fabius fabius</em> (Fabricius)</td>
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<td>144.</td>
<td><em>C. polyxena hierax</em> Felder</td>
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<td>145.</td>
<td><em>C. aristogiton</em> Felder</td>
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<td>146.</td>
<td><em>C. marmax</em> Westwood</td>
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<td>147.</td>
<td><em>C. kahruba</em> (Moore)</td>
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<td>148.</td>
<td><em>Polyura athamas athamas</em> (Drury)</td>
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<td>149.</td>
<td><em>P. arja</em> (Felder &amp; Felder)</td>
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<td>150.</td>
<td><em>P. dolon centralis</em> (Rothschild &amp; Jordan)</td>
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<td>151.</td>
<td><em>P. eudamippus eudamippus</em> (Doubleday)</td>
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<td>152.</td>
<td><em>P. moori sandakana</em> (Fruhstorfer)</td>
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<td>153.</td>
<td><em>P. delphis delphis</em> (Doubleday)</td>
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<td>VI. Subfamily LIBYTHEINAE</td>
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<td>154.</td>
<td><em>Libythea myrrha sanguinalis</em> Fruhstorfer</td>
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<tr>
<td>155.</td>
<td><em>L. lepita lepita</em> Moore</td>
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</table>
INSECTA : LEPIDOPTERA : CTENUCHIDAE AND LIMACODIDAE

MRIDULA MAJUMDAR (CHAUDHURY)
Zoological Survey of India, M-Block, New Alipore, Kolkata 700 053

INTRODUCTION

The faunistic account deals with the moths of families Ctenuchidae and Limacodidae from Sikkim. Cotes and Swinhoe (1887-89) catalogued species of moths of India and neighbouring countries. Subsequently Hampson (1898) provided description of species of these families in his first volume of Fauna of British India (Moths) Series. Hampson (1898) included comprehensive account of species of Ctenuchidae. Later on, contributions have been made on Indian Ctenuchidae by Arora (1980), Arora, et al. (1982), Ghosh and Chaudhury (1997) and Ghosh and Chaudhury (1998).

The studies are based on the material collected by various survey parties of the department. The specimens of moths of families Ctenuchidae and Limacodidae available in National Zoological Collections have also been examined.

Altogether 64 species of moths of both of families have been dealt with including 13 species reviewed from literature. The family Ctenuchidae includes 20 species in 5 genera whereas family Limacodidae covers 44 species in 17 genera. Of the species dealt with 12 are new locality records viz. Trichaeta teneiformis (Walker) Syntomis serrata Hampson and Syntomis compta (Walker) of the family Ctenuchidae; Miresa decedens Walker, Thosea sinensis Walker, Parasa herbifera (Walker) Parasa herbifera and Ceratonema albifusum., Hampson, Narosa conspersa Walker, Narosa doenia (Moore), Tripleoaphelps inferna (Swinhoe) and Birthana junctura Walker of the family Limacodidae. The latter three species are also first record from India. Two species, viz. Eressa lepcha (Moore) Syntomis unifascia Hampson of the family Ctenuchidae and six species viz., Scopelodes sericea Butler, Tetraphleps crispa Swinhoe, Tetraphleps brevilinea Walker, Araeogynia castanea Hampson, Araeogynia spatulata Hampson, and Ceratonema pallidinota Hampson are endemic to Sikkim.

Keys to genera and species of families Ctenuchidae and Limacodidae have been provided. The wing expanse and geographical distribution of each species have been given. A list of 64 species so far known from Sikkim has been appended and the species reviewed from literature are marked with asterisk (*).

Family CTENUCHIDAE

Key to genera

1. Hindwing vein Cu_{1a} absent.........................
   ................................. Ceryx Wallengren
   - Hindwing vein Cu_{1a} present .................. 2
2. Hindwing vein M_{2} from lower angle of cell or stalked with vein Cu_{1a} .................................
   - Hindwing vein M_{2} from well above of lower angle of cell ...................... Eressa-Walker
3. Forewing vein Cu_{1a} from close to angle of cell ....................................... Trichaeta Swinhoe
   - Forewing vein Cu_{1a} from well before lower angle of cell .......................... 4
4. Forewing vein R_{1} stalked with R_{2}-R_{3} .......
   ................................. Syntomis Ochsenheimer
   - Forewing vein R_{1} from cell ........................ Callitomis Butler
Genus *Ceryx* Wallengren


**Key to species**

1. Abdomen with five bands .......................................................... *hyalina* (Moore)
   − Abdomen with two bands ...................................................... 2.

2. Hindwing with narrow terminal black band .................................. *godartii* (Boisduval)
   − Hindwing with broad terminal black band ................................. *imaon* (Cramer)

*1. Ceryx hyalina* (Moore)


*Material examined* : Nil

*Wing expanse* : 30–40 mm.


2. *Ceryx godartii* (Boisduval)


*Wing expanse* : 25–30 mm.

*Distribution* : India : Sikkim (East and West Sikkim), Assam, Meghalaya, South India and West Bengal. *Elsewhere* : Malaya, Myanmar and Sumatra.

3. *Ceryx imaon* (Cramer)


*Wing expanse* : 30–34 mm.

*Distribution* : India : Sikkim (East, North and South Sikkim), Andamans, Assam, Himachal Pradesh, Jammu & Kashmir, Maharashtra, Meghalaya, Tamil Nadu and West Bengal. *Elsewhere* : Indonesia, Myanmar and Sri Lanka.

Genus *Eressa* Walker


**Key to species**

1. Antennae of male bipectinate .................................................. *confinis* (Walker)
   Antennae of male serrate ..................................................... 2.

2. Wings hyaline yellow, forewing with small apical black patch not extending to vein M 3 ......... *multigutta* (Walker)
   − Wings hyaline white, forewing with apical black patch extending to vein ............................ *lepcha* (Moore)

*4. Eressa confinis* (Walker)


*Material examined* : Sikkim, 2exs., no date (G.C. Dudgeon Coll.)

*Wing expanse* : 25 mm.

5. *Eressa multigutta* (Walker)


Wing expanse: 27–30 mm.

Distribution: India: Sikkim (North Sikkim), Arunachal Pradesh, Meghalaya and West Bengal.  
Elsewhere: China, Myanmar, Nepal and Tibet.

6. *Eressa lepcha* (Moore)


Wing expanse: 24 mm.

Distribution: India: Sikkim.

Remarks: The species is endemic to Sikkim.

Genus *Trichaeta* Swinhoe


7. *Trichaeta teneiformis* (Walker)


Diagnostic character: Black, suffused with golden brown, vertex of head and collar orange. Forewing with wedge shaped hyaline spot below the costa and two spots between vein Cu₁ and M₂. Inner margin of hindwing base yellow. Abdomen with orange paired dorsolateral spots on each segments.

Material examined: Sikkim, 1ex., no date (Knyvetti Coll.)

Wing expanse: 22 mm.


Remarks: The species is a first record for Sikkim.

Genus *Syntomis* Ochsenheimer


Key to species

1. Antennae of male serrate, female simple: ........................................... *serrate* Hampson  
   – Antennae simple in both sexes: ........................................... 2

2. Abdomen without dorsal band: ........................................... 3
   – Abdomen with dorsal bands: ........................................... 3

3. Abdomen with more than two bands: ........................................... 4
   – Abdomen with two bands: ........................................... 4

4. Abdomen with lateral spots: ........................................... *lucina* Butler  
   – Abdomen without lateral spots: ........................................... 5

5. Collar with orange ring: ........................................... *cyssea* (Stoll)  
   – Collar without orange ring: ........................................... 6

6. Metathorax with orange patch: ........................................... 7  
   – Metathorax without orange patch: ........................................... 5

7. Inner area of hindwing bright orange: ........................................... *sperbius* (Fabricius)  
   – Inner area of hindwing without orange: ........................................... 8

8. Abdomen with the extremity orange: ........................................... *submarginalis* Walker  
   – Abdomen without orange extremity: ........................................... 9

9. Wings with yellow hyaline spot: ........................................... *newara* Moore  
   – Wings with white hyaline spot: ........................................... *malaena* Walker

10. Forewing without black bar across submedian interspaces: ........................................... 10

11. Frons orange: ........................................... *compta* Walker  
   – Frons white: ........................................... *divisa* Walker
8. Syntomis serrata Hampson

1892. Syntomis serrata Hampson, Fauna Brit. India, Moths, 1 : 221

Material examined : Sikkim, North Sikkim, Dikchu, lex., 15.viii.1954 (A.G.K. Menon Coll.)

Distribution : India : Sikkim (North Sikkim).

Remarks : The species is recorded as new to Sikkim.

9. Syntomis unifascia Hampson

1892. Syntomis unifascia Hampson, Fauna Brit. India, Moths 1 : 212.
1898. Syntomis unifascia Hampson : Hampson, Cat. Lep. Phal. Brit. Mus. 1 : 112, pl. 4, Fig. 20.

Wing expanse : 36 mm.

Distribution : India : Sikkim.

Remarks : The species is endemic to Sikkim.

10. Syntomis lucina Butler


Material examined : Sikkim, 2exs., No other data.

Wing expanse : 30 mm.

Distribution : India : Sikkim and West Bengal.

Elsewhere : Nepal.

11. Syntomis cysssea (Stoll)

1872. Sphinx cysssea Stoll, Pap. Exot. 4 : 124, pl. 355B.

Material examined : Sikkim, 1ex., No date (Knyvetti Coll).

Wing expanse : 28 mm.


12. Syntomis bicincta Kollar

1844. Syntomis bicincta Kollar, In Hugels Kashmir und das Reich der Siek, 4 : 460, pl. 19, fig. 8.

Material examined : Sikkim, 2exs., No date (Knyvetti Coll.) 2exs., 10.iv.1888 (O. Moller Coll).

Wing expanse : 38 mm.

Distribution : India : Sikkim. Meghalaya, North West Himalaya, Uttar Pradesh and West Bengal.

Elsewhere : China.

13. Syntomis sperbius (Fabricius)

1787. Zygaena sperbius Fabricius, Mont. Ins. 2 : 103.

Material examined : Sikkim, 2exs., No date (O. Moller Coll.)

Wing expanse : 31 mm.


14. Syntomis hydatina Butler


Wing expanse : 24-26mm.

Distribution : India : Sikkim, Calcutta and Central India.
15. **Syntomis submarginalis** Walker


*Material examined*: Sikkim, 3exs., No date (O. Moller Coll.)

*Wing expanse*: 38 mm.


16. **Syntomis newara** Moore


*Material examined*: Sikkim, 1ex., No other data.

*Wing expanse*: 40 mm.


17. **Syntomis malaena** (Walker)


*Material examined*: Sikkim, 4 exs., No other data.

*Wing expanse*: 52-54 mm.


18. **Syntomis compta** Walker


*Material examined*: Sikkim, 2exs., No other data.

*Wing expanse*: 36 mm.

*Distribution*: India : Sikkim, Assam and Meghalaya.

*Remarks*: The species is recorded for the first time from Sikkim.

19. **Syntomis divisa** Walker


*Material examined*: Sikkim, 3exs., 10. 20. iv. 1888 (O. Moller Coll.)

*Wing expanse*: 36 mm.


Genus **Callitomis** Butler


20. **Callitomis multifasciata** Hampson


*Material examined*: Sikkim, 4 exs., No other data.

*Wing expanse*: 52 mm.


Family **LIMACODIDAE**

**Key to genera**

1. Forewing short, the outer margin evenly rounded, apex not produced ...................... 2
   - Forewing elongate, the outer margin not rounded, apex produced .... *Mahanta* Moore 2
2. Palpi porrect .......................................................... 3
   - Palpi upturned .................................................. 11
3. Palpi extremely elongate ......................... 4
   - Palpi shorter .................................. 5
4. Palpi with terminal hair brush. Forewing veins R₃–R₅ stalked ....... **Scopelodes** Westwood
   - Palpi without terminal hair brush. Forewing vein R₃ free .................. **Hyphorma** Walker
5. Hindwing vein Sc + R₁ anastomosing with R₅ near base ............ **Miresa** Walker
   Hindwing vein SC + R₁ free ...................... 6
6. Forewing vein R₃ free ................................ 5
   - Forewing vein R₃ stalked with R₃ and R₄ .................. 8
7. Forewing vein R₃ and R₄ stalked, R₂ free .................. 9
   - Forewing vein R₂–R₄ stalked ..................... **Birthama** Walker
8. Forewing short, broad and rounded .......................... **Susica** Walker
   - Forewing produced ................................ 10
9. Forewing vein R₂ from angle of cell or before it .................. 10
   - Forewing vein R₂ stalked with R₂–R₄ ............... **Tetraphelps** Hampson
10. Forewing apex somewhat rectangular .................. **Thosea** Walker
    - Forewing apex rounded ........... **Parasa** Moore
11. Palpi reaching above vertex of head ........ 12
    - Palpi reaching up to vertex of head ........ 13
12. Forewing vein R₃ stalked with R₂–R₄ ............... **Monema** Walker
    - Forewing vein R₃ free ............................ **Araeogya** Hampson
13. Forewing vein R₁ not curved ..................... 14
    - Forewing vein R₁ curved ....................... 15
14. Forewing vein R₃ stalked with R₂–R₄ ............... **Triplophleps** Hampson
    - Forewing vein R₃ free ............................ **Ceratonema** Hampson
   15. Palpi short. Hindwing vein R₃ and M₁ from cell .......................... 16
      - Palpi reaching up to vertex of head. Hindwing vein R₃ and M₁ stalked ...... **Narosa** Walker.
16. Head and thorax smoothly scaled .................. **Cania** Walker
    - Head and thorax clothed with erect pile ..... **Altha** Walker

**Genus Mahanta** Moore


1. **Mahanta quadrilinea** Moore

1892. **Mahanta quadrilinea** Moore : Hampson, **Fauna Brit. India, Moths**, 1 : 401-402. fig. 227.

*Diagnostic Character*: Head grey, palpi fulvous with a white bar. Forewing ochreous with oblique medial dark line, a similar line from the apex to inner margin beyond the middle, inner area suffused with grey. Hindwing uniform ochreous.

*Material examined*: Sikkim, lex. vi. 1897 (G.C. Dadgeon Coll.)

*Wing expanse*: 48mm.

*Distribution*: India: Sikkim and Darjeeling.

**Genus Scopelodes** Westwood

1841. **Scopelodes** Westwood, Nat. Libr. 37 : 222

**Key to species**

1. Hindwing vein R₃ and M₁ from cell in male and stalked in female .......................... 2
   - Hindwing vein R₃ and M₁ stalked in both sexes ........................................... 3
2. Palpi fulvous in colour and thickly clothed with hair. Wing silky ochreous .......................... **sericca** Butler
   - Palpi brown in colour and without hair. Wing pale silky ochreous to smoky brown .......................... **venosa** Westwood
3. Palpi reddish brown, abdomen orange. Hindwing uniform pale yellow ........................ unicolor Westwood

– Palpi and abdomen blackish. Hindwing very dark brown contracta Walker

2. Scopelodes sericea Butler


Material examined : Sikkim, 4 exs., 18.viii.1890, 5.ix.1896 (G.C. Dudgeon Coll.)

Wing expanse : 70-72 mm.

Distribution : India : Sikkim.

Remarks : The species is endemic to Sikkim.

3. Scopelodes venosa Walker


Material examined : Sikkim, 6 exs., V-VIII, IX. 1896 (G.C. Dudgeon Coll.)

Wing expanse : 52–55 mm.


4. Scopelodes unicolor Westwood

1841. Scopelodes unicolor Westwood, Nat. Libr. 37 : 222, pl. 28, fig. 2.


Material examined : Sikkim, 5 exs, v–viii 1887, 22 viii. 1890, 15. v. 1891 (G.C. Dudgeon Coll.)

Wing Expanse : 42-58 mm.

Distribution : India : Sikkim and Assam. Elsewhere : Borneo and Java.

5. Scopelodes contracta Walker


Material examined : Sikkim. 1ex., vii. 1896 (G.C. Dudgeon Coll.)

Wing expanse : 38 mm.


Genus Hyphorma Walker


6. Hyphorma minax Walker


Diagnostic characters : Head, thorax and abdomen red brown, base of thorax and basal segment of abdomen deep red. Forewing silky red brown, an oblique dark line from costa before apex to lower angle of cell. Foretibiae with a silvery white spot.

Material examined : Sikkim, 1 ex., – ix.1897 (G.C. Dudgeon Coll.)

Wing expanse : 45 mm.


Genus Miresa Walker


Key to species

Forewing vein R₂ free and red brown in colour ............................................bracteata Butler

Forewing vein R₂ stalked and dark brown in colour .............................................decedens Walker.
7. *Miresa bracteata* Butler


*Material examined* : Sikkim, 2 exs., – 1889, 1 ex., vii. 1895 (*Pilcher & Dudgeon Coll*)

*Wing expance* : 40 mm.

*Distribution* : India : Sikkim, Darjeeling and Nagas.


*Material examined* : Sikkim, 3 exs., 20. viii. 1890, ix. 1897 (*G.C. Dudgeon Coll*).

*Wing expance* : 35-38 mm.


*Remarks* : The species is recorded for the first time from Sikkim.

Genus *Natada* Walker


9. *Natada conjunctana* Walker


*Material examined* : Sikkim, 1 ex., 20. vi. 1880 (*G.C. Dudgeon Coll*).

*Wing expance* : 24 mm.


10. *Natada velutina* (Kollar)


1892. *Natada velutina* (Kollar) : Hampson, *Fauna Brit India, Moths*, 1 : 382-383

*Material examined* : Sikkim, 5 exs., 7. vi. 1890, V–VI, 96, V. 1897 (*G.C. Dudgeon Coll*).

*Wing expance* : 62-65 mm.


11. *Natada ocellata* (Moore)


*Wing expance* : 40–60 mm.


Genus *Birthama* Walker


12. *Birthama. junctura* Walker


*Diagnostic characters* : Head, thorax, abdomen and forewing red brown, basal area of
forewing darkest and bounded by oblique dark medial line, two waved post medial line present. Hindwing paler.

**Material examined**: Sikkim, 1ex., vi 1897 (G.C. Dudgeon Coll.)

**Wing expanse**: 37 mm.


**Remarks**: The species is recorded as new to India.

Genus *Susica* Walker


13. *Susica pallida* Walker


1892. *Susica pallida* Walker : Hampson, Fauna Brit. India, Moths, 1 : 377, Fig. 257

**Diagnostic characters**: Pale silky brown. Forewing with an oblique line from casta just before the apex to inner margin, underside suffused with black near the base. Hind wing slightly browner.

**Material examined**: Sikkim, 5 exs, 11, 20 vi. 1890, vi. 1896 (G.C. Dudgeon Coll.)

**Wing expanse**: 25–45 mm.


Genus *Tetraphleps* Hampson


**Key to species**

Antennae with the branches long. Forewing apex round ...................... *brevilinea* (Walker)

– Antennae with the branches short. Forewing apex produced ...................... *crispa* Swinhoe

14. *Tetraphleps brevilinea* (Walker)


**Wing expanse**: 36–40 mm.

**Distribution**: India : Sikkim.

**Remarks**: The species is endemic to Sikkim.

15. *Tetraphleps crispa* Swinhoe


**Material examined**: Sikkim, 1ex., No date (J.C. Pilcher Coll.)

**Wing expanse**: 35 mm.

**Distribution**: India : Sikkim.

**Remarks**: The species is endemic to Sikkim.

Genus *Thosea* Walker


**Key to species**

1. Male with antennae bipectinate. ...................... 2

– Male with distal half of antennae serrate....

.............................................. *divergens* (Moore)

2. Forewing greyish brown ...................... 3

– Forewing not greyish brown ...................... 4

3. Head, thorax and abdomen red brown, a white spot at the end of foretibiae .............................................. *cervina* Moore

– Head, thorax and abdomen grey, foretibiae without white spot .......... *sinensis* Walker

4. Basal half of forewing dark brown ..........

.............................................. *tripartita* (Moore)

– Basal half of forewing not dark brown .......

.............................................. *cana* (Walker)
16. *Thosea divergens* (Moore)


*Material examined* : Sikkim, 2exs., ix. 1897 (G.C. Dudgeon Coll.)

*Wing expanse* : 35 mm.


17. *Thosea cervina* Moore


*Material examined* : Sikkim, 5 exs., v–viii. 1897 (G.C. Dudgeon Coll.)

*Wing expanse* : 36-45mm.


18. *Thosea sinensis* Walker


*Material examined* : Sikkim, 4 exs., vi. 1896, ix. 1897 (G.C. Dudgeon Coll.)

*Wing expanse* : 35–38 mm.


19. *Thosea tripartita* (Moore)


*Material examined* : Sikkim, 5exs., vi. 1896-97 (G.C. Dudgeon Coll.)

*Wing expanse* : 25–27mm.

*Distribution* : India : Sikkim, Bihar, Dharamsala, Jabbalpur, Manipur and Mhow.

20. *Thosea cana* (Walker)


*Material examined* : Sikkim, 2exs, 20. viii. 1890, viii. 97. (G.C. Dudgeon Coll.).

*Wing expanse* : 28mm.


Genus *Parasa* Moore


**Key to species**

1. Antennae of male serrated throughout ...........
   .................................................................. *dentata* Hampson
   – Antennae of male bipectinate, the distal half serrated .............................................. 2

2. Head and thorax pea green ......................... 3
   – Head and thorax not pea green ............... 4

3. Forewing pea green with brown speck between vein 2A and 2c another between vein M2 and M3 .............................................. *bicolor* (Walker)
   – Forewing basal two thirds purplish brown in male and dark reddish brown in female and without speck ............... *herbifera* (Walker)

4. Forewing with green patch .............................................. 6
   .................................................................. *dharma* Moore
   – Forewing without green patch ................... 5

5. Thorax with brown stripe ................................ 6
   – Thorax without brown stripe.......................... *hilaris* (Westwood)

6. Forewing with basal patch ................................ 7
   – Forewing without basal patch ....................... 8

   .................................................................. *argentilinea* Hampson
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7. Forewing with a silvery white line on marginal area .................................................. repanda (Walker)
– Forewing without silvery white line ...................... .................................................. pastoralis Butler

21. Parasa dentata Hampson

Wing expanse : 30 – 44 mm.
Distribution : India : Sikkim and Nagas

22. Parasa bicolor (Walker)

Material examined : Sikkim, 2 exs., vii. ix.
1897. (G.C. Dudgeon Coll.).
Wing expanse : 36 mm.

23. Parasa herbifera (Walker)

Material examined : Sikkim, 13 exs., VI, VII, IX, 1897 (G.C. Dudgeon Coll.).
Wing expanse : 28-36 mm.

24. Parasa dharma Moore

Material examined : Sikkim, 1 ex., 17. vi. 1875. (G.C. Dudgeon Coll.)
Wing expanse : 28 mm.
Distribution : India : Sikkim, Elsewhere : Java and Rangoon.
Remarks : The species is new to India.

25. Parasa hilaris (Westwood)

1848. Limacodes hilaris Westwood, Cab. Cor. Ent., : 50, pl. 24, fig. 3.
1892. Parasa hilaris (Westwood), Hampson, Fauna Brit. India Moths, 1 : 389.
Material examined : Sikkim, 8 exs., v. 1896, v. vii, ix, 1897 (G.C. Dudgeon Coll.)
Wing expanse : 25-32 mm.

26. Parasa angentilinea Hampson

Material examined : Sikkim, 1 ex., ix. 1892 (G.C. Dudgeon Coll.)
Wing expanse : 25 mm.
Distribution : India : Sikkim and Assam.

27. Parasa repanda (Walker)

Wing expanse : 52 mm.
Distribution : India : Sikkim and Assam.

28. Parasa pastoralis Butler

1892. Parasa pastoralis Butler : Hampson, Fauna Brit India, Moths, 1 : 389.
Material examined : Sikkim, 3 exs, ix. 1896-97 (G.C. Dudgeon Coll.)
Wing expanse: 42 mm.


Genus Monema Walker


29. Monema sp.

Material examined: Sikkim, 12exs., 7.8, 20-22 vi, 16, viii. 1888, 7, 10, vi, 1890, 23. v, viii, 1845 (G. C. Dudgeon Coll.)

Genus Araeogyia Hampson


Key to species

Thorax purplish black. Forewing black irrorated with few leaden scale .............................................. spatulata Hampson
- Thorax chestnut. Forewing chestnut with blackish patch .......... castanea Hampson

30. Araeogyia spatulata Hampson


Wing expanse: 16 mm.
Distribution: India: Sikkim.
Remarks: The species is endemic to Sikkim.

31. Araeogyia castanea Hampson

1892. Araeogyia castanea Hampson, Fauna Brit India, Moths, 1: 395.

Material examined: Sikkim, 2exs., V. VIII 1887 (G.C. Dudgeon Coll.)

Wing expanse: 20 mm.
Distribution: India: Sikkim.
Remarks: The species is endemic to Sikkim.

32. Araeogyia pheopasta Hampson


Wing expanse: 22 mm

Distribution: India: Sikkim and Darjeeling.

Genus Triplophleps Hampson

1898. Triplophleps Hampson, Fauna Brit India, Moths 1: 392.

33. Triplophleps inferma (Swinhoe)


Diagnostic characters: Head, thorax, abdomen and wings greyish fuscous. Forewing with black antemedial curved line which are not reaching either the coasta or termen, another black line from lower angle of cell to vein 2A, an oblique curved line from costa before the apex to above outer angle.

Material examined: Sikkim, lex., ix, 1897 (G.C. Dudgeon Coll.)

Wing expanse: 24 mm.


Remarks: The species is recorded for the first time from Sikkim.

Genus Ceratonema Hampson

1892. Ceratonema Hampson, Fauna Brit. India Moths, 1: 393.

Key to species

1. Head and thorax red brown with purplish suffusion............... pallidinota Hampson
- Head and thorax ochreous without purplish suffusion...........................
2. Forewing suffused with whitish along inner and outer margin. Hindwing whitish ........................................... \textit{albifusum} Hampson

- Forewing without white margin. Hindwing pale yellow ........................................... \textit{retractum} Walker

34 \textit{Ceratonema pallidinota} Hampson


\textit{Wing expanse} : 22 mm.

\textit{Distribution} : India : Sikkim.

\textit{Remarks} : The species is endemic to Sikkim.

35. \textit{Ceratonema albifusum} Hampson

1892. \textit{Ceratonema albifusum} Hampson, \textit{Fauna Brit India, Moths}, 1 : 394.

\textit{Material examined} : Sikkim, 1ex., 10 vi. 1890 (G.C. Dudgeon Coll.)

\textit{Wing expanse} : 25 mm.

\textit{Distribution} : India : Sikkim and Nagas.

\textit{Remarks} : The species is new for Sikkim.

36. \textit{Ceratonema retractum} (Walker)


\textit{Material examined} : Sikkim, 1ex., 1895. (J.G. Pilcher Coll.)

\textit{Wing expanse} : 22mm.

\textit{Distribution} : India : Sikkim and Darjeeling.

37. \textit{Ceratonema fusca} Swinhoe


\textit{Wing expanse} : 22-26 mm.


38. \textit{Narosa conspersa} Walker


\textbf{Key to species}

Head and thorax white. Forewing yellowish white, spotted, and streaked with red brown. Hindwing pale yellow ........................................... \textit{conspersa} walker.

- Head and thorax white. Forewing pale brown irrorated with fuscous. Hindwing silky fuscous ........................................... \textit{doenia} (Moore)

39. \textit{Narosa doenia} (Moore)


\textit{Material examined} : Sikkim, 7 exs., VII. 1896. (G. C. Dudgeon Coll).

\textit{Wing expanse} : 18-24mm.


\textit{Remarks} : The species is new to Sikkim.

40. \textit{Narosa} sp.

\textit{Material examined} : Sikkim, 1ex., 20.v.1880 (G.C.Dudgeon Coll).

\textbf{Genus Cania} Walker

41. **Cania bilinea** Walker


**Diagnostic characters**: Head, thorax and forewing reddish, the latter with two oblique lines from costa before apex to near centre of inner margin, cilia brownish. Hindwing ochreous.

**Material examined**: Sikkim, 5 exs, vi. 1896, V, VII, 1897 (G.C. Dudgeon Coll).

**Wing expanse**: 30-32 mm.

**Distribution**: India, Sikkim, Bihar, Manipur and South India. Elsewhere: China, Java, Malacca.

Genus **Altha** Walker


**Key to species**

1. Forewing vein R₃ stalked with R₃ and R₄ ....

   .......................................................................................... 2

   - Forewing vein R₃ from the cell ..................

   .............................................................................. *rufotessellata* (Moore)

2. Antennae of male bipectinate up to tip. Forewing with large chestnut subbasal irregular patch with a blue grey line across the middle from median nervure to inner margin ........

   .............................................................................. *castaneipars* (Moore)

   - Antennae of male serrated up to distal half. Forewing without patch ........... *nivea* Walker

42. **Altha rufotessellata** (Moore)


**Wing expanse**: 34 mm.

**Distribution**: India: Sikkim. Darjeeling and Himachal Pradesh.

43. **Altha castaneipars** (Moore)


**Material examined**: Sikkim, 1ex, 10.VIII. 1884 (G. C. Dudgeon Coll).

**Wing expanse**: 37 mm.

**Distribution**: India, Sikkim, Darjiling and Nagas.

44. **Altha nivea** Walker


**Material examined**: Sikkim, 4exs, VII. 1896, V. 1897 (G. C. Dudgeon Coll).

**Wing expanse**: 28-30 mm.


**List of species of moths from Sikkim**

Family **CTENUCHIDAE**

1. *Ceryx hyalina* (Moore, 1879)

2. *Ceryx godartii* (Boisduval, 1829)

3. *Ceryx imaan* (Cramer, 1780)

4. *Eressa confinis* (Walker, 1854)

5. *E. multigutta* (Walker, 1854)

6. *E. lepcha* (Moore, 1879)

7. *Trichaeta teneiformis* (Walker, 1856)

8. *Syntomis serrata* Hampson, 1892.

9. *S. unifascia* Hampson, 1892.

10. *S. lucina* Butler, 1876.

11. *S. cysssea* (Stoll, 1872)

12. *S. bicincta* (Kollar, 1844.)

13. *S. sperbius* (Fabricius, 1787)

14. *S. hydatina* Butler, 1876

17. *S. malaena* (Walker, 1854)
20. *Callitomis multifasciata* Hampson, 1892.

**Family LIMACODIDAE**

22. *Scopelodes sericea* Butler, 1880.
30. *N. velutina* (Kollar, 1848).
31. *N. ocellata* (Moore, 1879)
32. *Tetraphleps brevilinea* (Walker, 1865)
33. *T. crispa* Swinhoe, 1880.
34. *Thosea divergens* (Moore, 1879)
35. *T. cervina* Moore, 1877
37. *T. tripartita* (Moore, 1884)
38. *T. cana* (Walker, 1865)
39. *Parasa dentata* Hampson, 1892.
40. *P. bicolor* (Walker, 1855)
41. *P. herbifera* (Walker, 1855)
44. *P. dharma* Moore, 1859.
45. *P. hilaris* (Westwood, 1848)
46. *P. argentiniae* Hampson, 1892.
47. *P. repanda* (Walker, 1855)
49. *Monema* sp.
50. *Araeogyia spatulata* Hampson, 1892
51. *A. castanea* Hampson, 1892.
52. *A. phaeopasta* Hampson, 1892.
53. *Triplophleps inferma* (Swinhoe, 1890)
54. *Ceratonema pallidinota* Hampson, 1895.
55. *C. albifusum* Hampson, 1892.
56. *C. retractum* (Walker, 1865)
57. *C. fusca* Swinhoe, 1905.
59. *N. doenia* (Moore, 1859)
60. *Narosa* sp.
62. *Altha rufotessellata* (Moore, 1879)
63. *A. castaneipars* (Moore, 1865)
64. *A. nivea* Walker, 1862.

*Species marked with asterisks are not represented in collected material.

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**HAMPSON, G. F. 1898. Catalogue of the Lepidoptera Phalaenae in the British Museum 1 : XXI+559+20.**
INSECTA : LEPIDOPTERA : PIERIDAE AND HESPERIIDAE

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INTRODUCTION

The paper deals with the faunistic account of species of butterflies of families Pieridae and Hesperiidae from Sikkim. The important works on butterflies of India, including Sikkim, are by Seitz (1927), Evans (1932) and Wynterblith (1957), on Pieridae by deNiceville (1902), Talbot (1939) and on Hesperiidae by Watson (1891), Evans (1949). Haribal (1992) dealt with all species known from Sikkim. The families Pieridae and Hesperiidae have also been studied from West Bengal and Meghalaya (neighbouring states of Sikkim) by Ghosh and Chaudhury (1997 a, band also 1998 a, b).

Altogether 227 species of butterflies of families Pieridae and Hesperiidae have been dealt with. The family Hesperiidae constitutes major share of 176 species belonging to 68 genera and three subfamilies where as Pieridae has other 51 species representing 18 genera and two subfamilies, viz., Pierinae and Coliadinae.

The studies are based on the material collected by various survey parties of the department. The specimens of butterflies available in the National Zoological Collections of Zoological Survey of India have also been examined. Of the 225 species, 115 spp. have been reviewed from literature. Two species of the family Pieridae and four of the family Hesperiidae marked with asterisk (*) constitute first locality records for Sikkim, where as two hesperiid, Halpe kusala Fruhstorfer and Pirdana distanti distanti Staudinger are a new locality record from India also. Two species namely Aeromachus jhora jhora (deNiceville) and Sovia lucasii separata (Moore) are endemic to Sikkim.

Key to species, genera and subfamilies of available material belonging to families Pieridae and Hesperiidae have been provided. The geographical distribution and wing expanse of each species have been given. A list of species reviewed from literature has also been appended each for family Pieridae and Hesperiidae.

Family PIERIDAE

Key to subfamilies
Palpi always with hair. Hindwing with well developed precostal vein curved distad........
............................................... PIERINAE

– Palpi without hair. Hindwing without precostal vein or if present, very short directed basal
............................................... COLIADINAE

Subfamily PIERINAE

Key to genera
1. Forewing vein R₂ absent .... Delias Huebner
   – Forewing vein R₂ present ....................... 2
2. Forewing vein R₃ emitted from vein R₄ + R₅, the latter very close to apex, stalk long ....
   ............................................... Pieris Schrank
   – Forewing vein R₃ emitted from vein R₄ + R₅, the latter further from apex, stalk short ..... 3
3. Male with a tuft of hair arising between the 7th and 8th abdominal segment ............
   ............................................... Appias Huebner
   – Male without any tuft of hair .............. 4
4. Forewing vein R₃, R₄ + R₅ and M₁ stalked...........................................Ixias Huebner
- Forewing vein M₁ not stalked...........................................Hebomoia Huebner.

Genus *Delias* Huebner


Key to species of the genus *Delias* Huebner

1. Hindwing underside with red patch ............ 2
- Hindwing underside without red patch ............

2. Hindwing underside with red subbasal band, upperside of both wings with bluish grey discal band ............................................. *pasithoe* (Linnaeus)
- Hindwing underside with red subcostal area in area R₅, upperside of wings without bluish grey discal band............... *descombesi* (Boisduval)

1. *Delias belladona* (Fabricius) (Hill Jezebel)


1a. *Delias belladona* *ithiela* (Butler)


*Expanse* : 70 mm.

*Distribution* : India : Sikkim (North Sikkim), Meghalaya and Assam.

2. *Delias pasithoe* (Linnaeus) (Red Base Jezebel)


*Expanse* : 63 mm.

*Distribution* : India : Sikkim (East Sikkim) and Meghalaya. *Elsewhere* : South West China, Hainan to Himalayas; Myanmar, South and East to Malaya Peninsula, the Philippines and Java.

3. *Delias descombesi* (Boisduval) (Red Spot Jezebel)


*Expanse* : 65 mm.


Genus *Pieris* Schrank


Key to species of the genus *Pieris* Schrank

Forewing dorsally with inner edge of black area dentate...................... *canidia* (Sparrman)
- Forewing upperside with inner edge of black area not dentate............. *brassicae* (Linnaeus)

4. *Pieris canidia* (Sparrman) (Indian Cabbage White)


*Expanse* : 65 mm.


4a. *Pieris canidia* *canis* Evans


**Expanse**: 45-62 mm.

**Distribution**: India: Sikkim (North, South, East and West Sikkim), Meghalaya and West Bengal, extending to China, the Loochoo Island and Malaya Peninsula.

5. **Pieris brassicae** (Linnaeus)


5a. **Pieris brassicae nepalensis** Doubleday


**Expanse**: 63 mm.

**Distribution**: India: (Sikkim, Meghalaya, Assam, West Bengal and N. W. Himalaya). Elsewhere: Tibet and Yunnan.

**Genus Appias** Huebner


**Key to species of the genus Appias**

1. Forewing underside with a yellow spot in subapical area **lynceda** (Cramer).
   - Forewing underside without yellow spot in subapical area ........................................ 2

2. Hindwing underside pearly bluish white ......... .............................................. **wardi** (Moore)
   - Hindwing underside not pearly bluish white ........................................................................ 3

3. Forewing underside with a large black spot at end of cell ............... **pandione** (Geyer)
   - Forewing underside without black spot at end of cell ........................................... **indra** (Moore)

6. **Appias lyncida** (Cramer)
   (Chocolate Albatross)


6a. **Appias lyncida eleonora** (Boisduval)


**Expanse**: 55-60 mm.

**Distribution**: India: Sikkim (North and South Sikkim) and West Bengal. Elsewhere: Myanmar extending to Hainan, Tonkin, Thailand and Annam.
7. *Appias wardi* (Moore)  
(Lesser Albatross)


**Expanse**: 28 mm.

**Distribution**: India: Sikkim (South Sikkim), West Bengal and Peninsular India, Tamil Nadu.

8. *Appias pandione* (Geyer)  
(Spot Puffin)


**Expanse**: 48-55 mm.

**Distribution**: India: Sikkim, North and East Sikkim, Meghalaya, United Provinces, Mussoree to Southern Myanmar). Tonkin, Hainan, South China, Malay Peninsula and Cochin China.

9. *Appias indra* (Moore)  
(Plain Puffin)


9a. *Appias indra indra* (Moore)


10. *Ixias pyrene* (Linnaeus)  
(Yellow Orange Tip)


10a. *Ixias pyrene sesia* (Fabricius)


**Diagnostic characters**: Forewing upperside yellow with broad orange band, costal and outer area black which is reaching up to area Cuia. Hindwing upperside with outer black area broad, underside pale yellow with fuscous brown strigae.


**Expanse**: 48-60 mm.

**Distribution**: Peninsular India including Sikkim (South and West Sikkim) and West Bengal.

Genus *Hebomoia* Huebner

11. *Hebomoia glaucippe* (Linnaeus)  
(Great Orange Tip)


11a. *Hebomomia glaucippe glaucippe* (Linnaeus)


**Diagnostic Characters**: Wings upperside white, occupying large black edged orange patch on the apical portion of forewing, hindwing with few marginal black spots, underside of both wings mottled with brownish red.


**Expanse**: 70 mm.


Subfamily **COLIADINAE**

**Key to genera of the subfamily COLIADINAE**


- Hindwing with precostal vein absent or obsolete. Male without sex patch .................. 2

2. Forewing vein, R₂ arising from stalk of R₄ + R₃ and R₃ .................. *Colias* Fabricius

- Forewing vein R₂ arising from the cell ......

......................... *Eurema* Huebner

**Genus Catopsilia** Huebner


**Key to species of the genus Catopsilia Huebner**

Antennae red. Forewing underside with transverse reddish brown strigae, upperside with continuous narrow apical and terminal black spots .......................... *florella* (Fabricius)

- Antennae black. Forewing underside without reddish brown strigae, upperside with apical and terminal black border ..........................

................................. *crocale* (Cramer)

12. *Catopsilia florella* (Fabricius)  
(African Emigrant)


*12a. Catopsilia florella gnoma* (Fabricius)


**Distribution**: India: Sikkim, (South Sikkim), Meghalaya, West Bengal and Andamans. Elsewhere: Myammar to Indochina, Hainan to South China, Africa to Arabia, Persia and Sri Lanka.

13. *Catopsilia crocale* (Cramer)  
(Common Emigrant)


13a. *Catopsilia crocale crocale* (Cramer)


**Distribution**: India Sikkim, (South Sikkim) Meghalaya and West Bengal, Sri Lanka to Andaman Island to South China, Myanmar, the Philippines, Borneo, Sumatra and Java.

Genus **Colias** Fabricius


14. **Colias electo** (Linnaeus) (Dark Crouded Yellow)


14a. **Colias electo fieldi** Menetries


**Diagnostic Characters**: Male upperside deep orange yellow with broad black outer border, prominent black cell spot on forewing. Hindwing with basal yellow band. Female: hindwing heavily dusted with black scales.


**Expanse**: 38-43 mm.

**Distribution**: India: Sikkim, (North Sikkim), West Bengal, N. W. Himalaya, Uttar Pradesh and Maharashatra, Meghalaya. **Elsewhere**: Myanmar, Nepal and Tibet.

Genus **Eurema** Huebner


**Key to species of the genus Eurema Huebner**

Forewing upperside with black border not extending to vein 1A, underside with numerous spots. ......................... **hecabe** (Linnaeus)

- Forewing upperside with black border extending to vein 1A, underside pale .........................

.............................. **laeta** (Boisduval)

15. **Eurema hecabe** (Linnaeus) (Common Grass Yellow)


15a. **Eurema hecabe contubernalis** (Moore)


**Expanse**: 30-55 mm.

**Distribution**: Sikkim (North, South and East Sikkim). Meghalaya, Assam, Gujarat, West Bengal **Elsewhere**: Myanmar, Malaya Peninsula and Singapore.

16. **Eurema laeta** (Boisduval) (Spotless Grass yellow)


16. *Eurema laeta laeta* (Boisduval)


*Expanse*: 43 mm.

*Distribution*: India including Sikkim (North and East Sikkim), Meghalaya and West Bengal. Peninsular to western Himalayas. *Elsewhere*: Sri Lanka.

**List of species reviewed from literature**

1. *Leptosia nina nina* (Fabricius) (Psyche)
2. *Baltia butleri sikkima* Fruhstorfer (Butler’s Dwarf)
3. *Aporia peloria* (Hewitson) (Great Black Vein)
4. *A. agathon agathon* (Gray) (Great Black Vein)
5. *Pieris dubernardi chumbiensis* (de Niceville) (Chumbi white)
6. *P. napi montana* Verity (Green Veined White)
7. *P. napi melaina* Rober (Chumbi Green Veined White)
8. *Prioneris thestylis thestylis* (Doubleday) (Spotted Sawtooth)
9. *P. clementhe clementhe* (Doubleday) (Red Spot Sawtooth)
10. *Anaphaeis aurota aurota* (Fabr.) (Pioneer)
11. *Appias nero galba* (Wallace) (Orange Albatross)
12. *A. albina darada* (Felder) (Common Albatross)
13. *Pareronia valeria hippia* (Fabricius) (Common Wonderer)
14. *P. avatar avatar* (Moore) (Pale Wonderer)
15. *Cepora nerissa nerissa* (Fabricius) (Common Gull)
16. *C. nadina nadina* (Lucas) (Lesser Gull)

17. *Delias eucharis* (Drury) (Common Jezebel)
18. *D. agostina agostina* (Hewitson) (Yellow Jezebel)
19. *D. sanaca areas* Talbot (Pale Jezebel)
20. *D. berinda boyleae* (Butler) (Dark Jezebel)
22. *D. hyparte indica* (Wallace) (Painted Jezebel)
23. *Catopsilia pyranthe* (Linnaeus) (Mottled Emigrant)
24. *Dercas verhuelli doubledavi* (Moore) (Tailed Sulphur)
25. *Dercas lycorias lycorias* (Doubleday) (Plain Sulphur)
26. *Gonepteryx rhamni nepalensis* (Doubleday) (Common Brimstone)
27. *Gandaca harina assamica* (Moore) (Trey Yellow)
28. *Eurema brigitta rubella* (Wallace) (Small Grass yellow)
29. *E. bleda silhetana* (Wallace) (Three Spot Grass yellow)
30. *E. jordani* (Corbet & Pendulburey) (Jordan’s Grass Yellow)
31. *E. andersoni andersoni* (Moore) (One Spot Grass Yellow)
32. *E. sari sodalis* (Moore) (Chocolate, Grass Yellow)
33. *Colias stoliczakana miranda* (Fruhstorfer) (Orange Clouded Yellow)
34. *C. berylla* (Faweett) (Everest Clouded yellow)
35. *C. nina nina* (Faweett) (Faweett’s Clouded Yellow)
36. *C. dubia* (Elwes) (Dwarf Clouded Yellow)

Family HESPERIIDAE

**Key to subfamilies**

1. Forewing vein $M_2$ closer to $M_1$ than to $M_3$ at origin of cell. Abdomen shorter than anal margin of hindwing ................................. 2
1. Forewing vein M₂ closer to M₃ than to M₁ at origin of cell. Abdomen more or less equal to the anal margin of hindwing .......................... HESPERIINAE

2. Labial palpi with second joint upturned, third joint porrect, long and awl shaped............... COELIADINAE

3. Labial palpi with these joints showing variable orientation, third joint may be long but never awl shaped .................. PYRGINAE

Subfamily HESPERIINAE

Key to groups of the subfamily HESPERIINAE

1. Antennal club not constricted before the apiculus. Forewing vein M₂ usually straight at its origin. Hindwing vein M₂ well marked .... .............................. 2

   - Antennal club constricted before the apiculus. Forewing vein M₂ decurved at its origin. Hindwing vein M₂ not traceable .................. 4

2. Antennal apiculus finely pointed .............. 3

   - Antennal apiculus not finely pointed ............ ASTICTOPTEROUS Group

3. Hindwing vein M₂ decurved at origin ............ ANCISTROIDES Group

   - Hindwing vein M₂ not decurved at origin .... PLASTINGIA Group

4. Apiculus absent or minute, Fascis yellow or orange. Forewing with discal white spots .......... TARACTOCERA Group


Group ASTICTOPTEROUS

Key to genera of the group ASTICTOPTEROUS

1. Forewing vein M₂ after or opposite vein R₁ and never far away from vein Cula .......................... 2

2. Wings broad. Costa of forewing always arched .......................................................... 3

   - Wings produced at apex of forewing. Costa of forewing straight .................................. 4

3. Hindwing cell equal to half of the wing .... AEROMACHUS deNiceville

   - Hindwing cell shorter than half of the wing ......................................................... OCHUS deNiceville

4. Antennal apiculus absent or short .............. Ampittia Moore

   - Antennal apiculus present ....................... 5

5. Forewing upper end cell not produced, vein M₂ straight ................ Sebastonyma Watson

   - Forewing upper end cell produced, vein M₂ decurved at origin ................................. 6

6. Uncus undivided .......................... Sovia -Evans

   - Uncus divided .................................................. 7

7. Antennal apiculus long and thin, as long as width of club ........................................ PITHAURIA Moore

   - Antennal apiculus not longer than twice width of club ............................................ 8

8. Antennal apiculus obtuse, rather short and blunt ...................................................... PEDESTES Hemming

   - Antennal apiculus hooked ........................................... 9


   - Palpi generally erect and flattened. Apiculus like fish-hook. Gnathos absent or incomplete Halpe Moore.

Genus ASTICTOPTEROUS Felder


1. Astictopterus jama Felder (Forest Hopper)


1a. Astictopterus jama olivascens Moore


Diagnostic characters: Wings : apex of forewing and tornus of hindwing more produced, underside amber brown. Male without hyaline spot but female usually with hyaline spots in cells, and on veins R₄, R₅ and M₁.

Material examined: 5 exs., Sikkim (No other data).

Expanse: 38 mm.

Distribution: Oriental region including Sikkim, Assam, Nagaland, Meghalaya, West Bengal and Andamans. Elsewhere: Bhutan; Thailand and Indochina.

Genus Aeromachus deNiceville


Key to species of the genus Aeromachus deNiceville

1. Forewing upperside with prominent spot. Hindwing underside with purple marking, the central marking narrow and broken ............... .......................................................... kali (deNiceville)
   - Forewing upperside with the spot faint of absent. Hindwing underside with grey or white marking, the central marking neither narrow nor broken .......................................................... 2

2. Forewing underside the veins towards termen more or less paler. Hindwing vein R₂ and M₁ hair pinned .................... stigmata (Moore)
   - Forewing underside the veins towards termen not paler.
      Hindwing vein R₂ and M₁ not hair pinned .......................................................... jhora (deNiceville)

2. Aeromachus kali (deNiceville)
   (Blue Spotted Scrub Hopper)

1885. Thanaos kali deNiceville, J. As. Soc. Bengal. : 123. pl. 2, fig. 3.


Expanse: 25 mm.

Distribution: India (Sikkim and Assam). Elsewhere: North Myanmar to Shan States.

3. Aeromachus stigmata (Moore)
   (Veined Scrub Hopper)


3a. Aeromachus stigmata stigmata (Moore)


Material examined: 17 exs., Sikkim, (coll. deNiceville).

Expanse: 22-32 mm.

Distribution: India (Sikkim, N. W. Himalayas and Mussorie). Elsewhere: Bhutan.

4. Aeromachus jhora (deNiceville)
   (Grey Scrup Happer)


4a. Aeromachus jhora jhora (deNiceville)


**Expanse**: 26 mm.

**Distribution**: India (Sikkim).

**Genus Ochus deNiceville**


5. *Ochus subvittatus* (Moore)  
(Tiger Hopper)


5a. *Ochus subvittatus subradiatus* (Moore)


**Diagnostic characters**: Wings upperside black with a yellow spot at apex of forwing, costa of fore and hindwing bright yellow with numerous black markings.

**Material examined**: 8 exs., Sikkim, (no other data).

**Expanse**: 22 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya).

**Genus Ampittia** (Moore)


6. *Ampittia dioscorides* Fabricius  
(Bush Hopper)


**Diagnostic characters**: Forewing upperside with a large spot in area 2A, basal half of the wing and cell yellow, discal spot yellow.

**Material examined**: 1ex., Sikkim dt. nil (coll. deNiceville); 1ex., North Sikkim, along the side of river Lachungchu, up stream jungle, 22. iv. 1991 (coll. K.P’S.)

**Expanse**: 22 mm.

**Distribution**: India (Sikkim (North Sikkim) Assam, Kangra, Bengal and South India). **Elsewhere**: North Myanmar.

**Genus Sebastonyma** Watson


7. *Sebastonyma dolopia* (Hewitson)  
(Tufted Ace)


**Diagnostic characters**: Antenna club brown above. Forewing with three apical spots. Hindwing underside chocolate, a long white streak at base of space between vein R₄ and R₅.

**Material examined**: 11exs., Sikkim, (coll. deNiceville).

**Expanse**: 36 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). **Elsewhere**: North Myanmar.

**Genus Sovia** Evans


8. *Sovia lucasii* (Mabille)  
(Lucas Ace)

MAJUMDAR: Insecta: Lepidoptera: Pieridae & Hesperiidae


8a. Sovia lucassi separata (Moore)


Diagnostic characters: Palpi clothed with long hair. Forewing upperside with hyaline spots in cell, in area Cu_{ia}, Cu_{ib} and at apex. Hindwing underside with olive or ochreous scaling.

Material examined: 11 exs., Sikkim, (Moore’s collins).

Expanse: 34 mm.

Distribution: India (Sikkim). Elsewhere: Bhutan.

Genus Pithauria (Moore)


Key to species of the genus Pithauria Moore

Male upperside covered with pale to dark ochrous scale, underside forewing without white area on mid dorsum ...........................................muradeva (Moore)

– Male upperside covered with bluish green scale, underside of forewing with a conspicuous, yellowish white area on mid dorsum............. stramineipennis Wood-Mason and deNiceville

9. Pithauria muradeva (Moore) (Dark Straw Ace)


Material examined: 4 exs., Sikkim (no other data).

Expanse: 43 mm.

Distribution: India (Sikkim, Assam and West Bengal). Elsewhere: Myanmar, Thailand, Indochina, Malaya and Borneo.

10. Pithauria stramineipennis Wood-Mason & de Niceville (Light Straw Ace)

1886. Pithauria stramineipennis Wood-Mason & deNiceville, J. As. Soc. Bengal, p. 388, pl. 15, fig. 5.


10a. Pithauria stramineipennis stramineipennis Wood-Mason & deNiceville


Material examined: 11 exs., Sikkim (no other data).

Expanse: 42-55 mm.

Distribution: India (Sikkim and Assam). Elsewhere: Myanmar, Hainan Malaya and Sumatra.

Genus Pedestes Hemming


Key to species of the genus Pedeste Hemming

Wings upperside bluish purple brown and forewing upperside with a spot in area Cu_{ib} overlap the spots in cell and Cu_{ia}........................masurienisis (Moore)

– Wings upperside brown and forewing upperside with a spot in area Cu_{ib} widely separated from the cell spot..................................................

11. Pedestes masuriensis (Moore) (Mussoorie Bush Bob)


11a. **Pedestes masuriensis masuriensis** (Moore)


*Material examined*: 1 ex., Sikkim (no other data).

*Expanse*: 32 mm.

*Distribution*: India (Sikkim, Assam and N.W. Himalayas).

12. **Pedestes pandita** (deNiceville)

(Brown Bush Bob)


*Expanse*: 30 mm.

*Distribution*: India (Sikkim and Naga Hills).

*Elsewhere*: North Myanmar to North Shan State and Tonkin.

Genus **Thoressa** Swinhoe


**Key to species of the genus Thoressa Swinhoe**

1. Antennal club not ringed with pale yellow before apiculus. Forewing upperside with separate spots in spaces Cu_{ia}, Cu_{ib}, and cell .............................. cerata (Hewitson)

   - Antennal club ringed with pale yellow before apiculus. Forewing upperside with spots in spaces Cu_{ia}, Cu_{ib} over lapping ............... 2

2. Forewing upperside cell spot absent or faint. Hindwing cilia whitish.... gupta (deNiceville)

   - Forewing upperside with two cell spots. Hindwing cilia reddish ochreous, unchequered .............................. aina (deNiceville)

12. **Thoressa cerata** (Hewitson)

(Northern Spotted Ace)


*Material examined*: 3 exs., Sikkim, (no other data).

*Expanse*: 40 mm.

*Distribution*: India (Sikkim and Meghalaya).

*Elsewhere*: Myanmar, Thailand and Indochina.

12. **Thoressa gupta** (deNiceville)

(Olive Ace)


13a. **Thoressa gupta gupta** (deNiceville)


*Expanse*: 32 mm.

*Distribution*: India (Sikkim, Meghalaya and Uttar Pradesh).

14. **Thoressa aina** (deNiceville)

(Garhwal Ace)


*Material examined*: 5 exs., Sikkim, (no other data).

*Expanse*: 35 mm.

*Distribution*: India (Sikkim and Garhwal).
Genus *Halpe* Moore


**Key to species of the genus *Pedestes* Hemming**

1. Antennal club above with white or pale yellow ringed before apiculus ...... *zema* (Hewitson)
   - Antennal club above without white ringed before apiculus .............................................. 2

2. Forewing termen convex and equal to dorsum .................................................. *homolea* Hewitson
   - Forewing termen straight and shorter than dorsum .............................................. *kusala* Fruhstorfer

15. *Halpe zema* (Hewitson) (Banded Ace)


15a. *Halpe zema zema* (Hewitson)


*Material examined*: 9 exs., Sikkim, (no other data).

*Expanse*: 40 mm.

*Distribution*: India (Sikkim, Meghalaya and Andaman). *Elsewhere*: North Myanmar and Indo-China.

16. *Halpe homolea* Hewitson (Indian Ace)


*16a. Halpe homolea aucma* Swinhoe


Genus *Koruthailos* Watson

18. **Koruthailos butleri** (deNiceville)  
(Dark Velvet Bob)

1883. *Astictopterus butleri* deNiceville *J. As. Soc. Bengal.*, 52 (2) : 98, pl. x, fig. 3.


**Diagnostic characters**: Palpi with the third segment short, blunt not protruding. Wings unmarked. End of uncus divergent.

**Material examined**: 5 exs., Sikkim, (no other data).

**Expanse**: 35 mm.

**Distribution**: India (Sikkim and Assam).

**Elsewhere**: North and South Shan States and Ataran.

Genus **Ancistroides** Butler


19 **Ancistroides nigrita** (Latreille)  
(Chocolate Demon)


19a **Ancistroides nigrita diocles** (Moore)


**Diagnostic characters**: Forewing upperside brown, unmarked, underside, apex of forewing and termen of hindwing broadly paler.

**Material examined**: 7 exs., Sikkim, (no other data).

**Expanse**: 55 mm.

**Distribution**: India (Sikkim Assam and Meghalaya). **Elsewhere**: Bhutan and Myanmar.

20. **Notocrypta paralysos** (Wood-Manson & deNiceville) (Common Banded Demon)


20a. **Notocrypta paralysos asawa** Frushtorfer


**Material examined**: 4exs., Sikkim, (no other data).

**Expanse**: 35 mm.

**Distribution**: India (Sikkim and Assam).

**Elsewhere**: Myanmar, Thailand, Indochina, Hainan, Foochow and Longkawi Islands.
21. **Notocrypta curvifascia** (Felder)  
(Restricted Demon)  


21a. **Notocrypta curvifascia curvifascia** (Felder)  

**Material examined**: 12 exs., Sikkim, no other data; lex., East Sikkim, Tumin, 1475 m., 1.x.1988 (Coll V.C. Agrawal).  

**Expanse**: 40-50 mm.  
**Distribution**: Palaeartctic and oriental region including India (Sikkim (East Sikkim), Assam, Meghalaya, West Bengal, South India and Andaman Islands).  

22. **Notocrypta feisthamelii** Boisduval  
(Spotted Demon)  


22a. **Notocrypta feisthamelii alysos** (Moore)  

**Material examined**: 3 exs., Sikkim, (no other data).  

**Expanse**: 40 mm.  
**Distribution**: India (Sikkim, Assam and N. W. Himalayas). *Elsewhere* : Myanmar, Thailand, Indochina and Malaya.  

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23. **Udaspes folus** (Cramer)  
(Grass Demon)  


**Diagnostic characters**: Wings upperside with marginal white spots. Forewing upperside with large white marking and underside with variegated white patches, brown patches present between vein Cu_{1b} to M_{3'}, another small and white spot present between R_{5} and SC + R_{1}.  


**Expanse**: 42 mm.  
**Distribution**: Palaeartctic and oriental region including India (Sikkim (North Sikkim), Assam Meghalaya, West Bengal, Orissa, South India and North West Himalayas).  

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**Genus Udaspes** Moore  

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**Group PLASTINGIA**  

**Key to genera of the group PLASTINGIA**  

1. Antennal apiculus not longer than twice width of the club, shortly or moderately hooked, palpi generally with second segment, slender, third pointed or protruding more or less .............2  
   - Antennal apiculus longer than twice width of the club. Palpi generally with second segment stout and quadrantic, third short and stout, bluntly conical, not protruding ......................7  

2. Hindwing dorsum not longer than costa. Palpi variable ..........................3  
   - Hindwing dorsum longer than costa. Palpi third segment short ....................6  

3. Palpi third segment long and thin. Forewing vein M_{2} straight ..................4  
   - Palpi third segment very short. Forewing vein M_{2} decurved .........................Cupitha Moore
4. Forewing vein $M_3$ nearer to vein $Cu_{1a}$ than to vein $M_2$, veins Sc and $R_1$ close .................... 5
   - Forewing vein $M_3$ midway between vein $M_2$ and $Cu_{1a}$, vein Sc and $R_1$ apart ..................... Suastus Moore

5. Forewing vein 1A straight, apex not produced, both sides with white spots. Hindwing upper side with white spots ............................................. Scobura Elwes & Edwards
   - Forewing vein 1A more or less bowed, apex produced, only upper side with white spots. Hindwing upper side partly white but underside straited with white .......... Suada deNiceville

6. Forewing vein $M_2$ decurved, upper side with white spots .................. Zographetus Watson
   - Forewing vein $M_2$ straight, upper side either with hyaline spots unmarked ..................................... Hyarotis Moore

7. Antennae longer than half of the costa. Forewing cell apex not produced, vein $M_3$ not opposite to vein $R_3$ .......... Erionota Mabille
   - Antennae shorter than half of the costa. Forewing cell apex produced, vein $M_3$ opposite to vein $R_3$ .................. 8

8. Hindwing with lower angle of discocellular cell abnormally produced, vein $M_1$ opposite to vein $Cu_{1a}$. Eyes red. Wings unmarked ................
   - Hindwing with lower angle of discocellular normally produced, vein $M_1$ opposite to vein $Cu_{1a}$. Eyes not red. Wings unmarked ............. Matapa Moore

   - Palpi abnormal, third segment very long and stout. Hindwing underside not green and cilia orange .................. Cyrina Hemming

Genus *Cupitha* (Moore)


Genus *Cupitha purrea* (Moore) (Wax Dart)


*Diagnostic characters*: Body brown. Forewing upper side with yellow streak along costa and a broad central irregular yellow band from base of below cell towards apex. Hindwing upper side with broad central yellow band.

*Material examined*: 2 exs., Sikkim, (no other data).

*Expanse*: 32 mm.

*Distribution*: India (Sikkim, Assam, Meghalaya, South India and Andamans). Elsewhere: Indochina, Thailand, Malayan subregion.

Genus *Suastus* (Moore)


25. *Suastus gremius* (Fabricius)


25a. *Suastus gremius gremius* (Fabricius)


*Diagnostic characters*: Forewing upper side with white spot, underside sometimes with tornus dark beyond a central white in space 2A. Hindwing with conspicuous black cell spot, which is large as any discal spot.

*Material examined*: 1 exs., Sikkim, (no other data).

*Expanse*: 30 mm.

*Distribution*: Oriental region including India (Sikkim, Assam, Meghalaya, South India, Central India and North West Himalayas).
Genus **Scobura** Elwes & Edwards


26. *Scobura cephalia* (Hewitson)  
(Forest Bob)


**Diagnostic characters**: Forewing upperside with white spot in space Cu_{lb} and M_{3}. Hindwing upperside with two hyaline spots, underside with conspicuous rectangular white spot in area 2A in continuation of the spot in spaces Cu_{lb} and Cu_{ib}, beyond the discal spot the yellow colour becomes ferruginous.

**Material examined**: 12 exs., Sikkim (no other data).

**Expanse**: 32-35 mm.

**Distribution**: India, Sikkim, Assam and Meghalaya. Elsewhere: Myanmar.

Genus **Suada** deNiceville


27. *Suada swerga* (de Niceville)  
(Grass Bob)


27a. *Suada swerga swerga* (de Niceville Ic)


**Diagnostic characters**: Wings upperside brown with well marked discal and apical spots and also a short streak in space 2A. Hindwing uniformly brown.

**Material examined**: 9 exs., Sikkim, (coll. deNiceville).

**Expanse**: 37 mm.

**Distribution**: India (Sikkim and Assam).

Genus **Zographetus** Watson


**Key to species of the genus**  
**Zographetus** Watson

Upperside of forewing vein Cu_{ib} nearer to base than to vein Cu_{is}, brands short and well marked, not extending to base of vein Cu_{is}, placed under cubitus above and below vein 1A and Cu_{ib}  
.................................................. *satwa* (deNiceville).

- Upperside of forewing vein Cu_{ib} not nearer to base than to vein Cu_{is}, brands long and narrow, over and under basal part of vein Cu_{ib} and a corresponding streak over vein 1A ..............  
.................................................. *ogygia* Hewitson.

28. *Zographetus satwa* (de Niceville)  
(Purple and Gold Flitter)


**Diagnostic characters**: Forewing upperside with two subapical spots and spot in space 2A, underside costa yellow up to the subapical spots. Hindwing underside basal half yellow with a few black spots, outer half dark brown with purple washed.

**Material examined**: 12 exs., Sikkim (no other data).

**Expanse**: 34 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). Elsewhere: Myanmar, Thailand, Malaya and Java.

29. *Zographetus ogygia* Hewitson  
(Purple Spotted Flitter)


29a. Zographetus ogygia ogygia Hewitson


Material examined: 5 exs., Sikkim (no other data).

Expanse: 32 mm.

Distribution: India (Sikkim and Assam).
Elsewhere: Thailand, Malaya, Sumatra, Nias, Banka and Borneo.

Genus Hyarotis Moore


30. Hyarotis adrastus (Stoll) (Tree Flitter)


30a. Hyarotis adrastus praba (Moore)


Diagnostic characters: Forewing upperside with a spot between 1A and Cu1b immediately below and adjoining the cell spot. Hindwing underside with central white band in wet season form.

Material examined: 2 exs., Sikkim, (no other data).

Expanse: 40 mm.

Distribution: Oriental region including India (Sikkim, Assam, West Bengal, North West Himalayas and Andamans Islands).

Genus Erionota Mabille


31 Erionota thrax (Linnaeus) (Palm Red Eye)


31a. Erionota thrax thrax (Linnaeus)


Diagnostic characters: Antennae only basal half or two thirds of club white in both sexes. Forewing upperside without spot between vein Cu1a, Cu1b and 1A, apical spot absent or inconspicuous, underside with a pale area over the spot in spaces between Cu1a and Cu1b, apex acute and termen straight in both sexes, vein 1A equal to Rs.

Material examined: 3 exs., Sikkim (no other data).

Expanse: 70 mm.

Distribution: Oriental region including India (Sikkim, Assam and West Bengal).

Genus Matapa Moore


Key to species of the genus Matapa Moore

1. Upperside of forewing stigma grey and conspicuous.......................... druna (Moore)
   - Upperside of forewing stigma black and inconspicuous.......................... 2

2. Upperside of forewing uniform dark brown with bluish green metallic stinge on the thorax and wing bases, underside fuliginous with black veins.......................... sasivarana (Moore)
   - Upperside of forewing uniform dark with purple gloss, underside uniform brown .................
     ................. purpurascens Elwes & Edwards
32. *Matapa druna* (Moore)  
(Dark Banded Red Eye)  

**Material examined:** 13 exs., Sikkim, (no other data).  
**Expanse:** 42-46 mm.  
**Distribution:** India (Sikkim Assam, Meghalaya). **Elsewhere:** Myanmar, Indochina and Malayan Sub-region.  

33. *Matapa sasivarana* (Moore)  
(Black veined Red Eye)  

**Material examined:** 8 exs., Sikkim, (no other data).  
**Expanse:** 42 mm.  
**Distribution:** India (Sikkim Assam, and Meghalaya). **Elsewhere:** Myanmar, Indochina and Malayan Sumatra.  

34. *Matapa purpurascens* Elwes & Edwards  
(Purple Red Eye)  

**Material examined:** 2 exs., Sikkim, (no other data).  
**Expanse:** 43 mm.  
**Distribution:** India (Sikkim Assam, and Meghalaya). **Elsewhere:** Myanmar.  

Genus *Pirdana* Distant  


35. *Pirdana distanti* Staudinger  
(Plain Green Palmer)  

**35a. Pirdana distanti distanti** Staudinger  
**Diagnostic characters:** Wings underside with prominent shining blue of green. Upperside of hindwing with orange tornal area.  
**Material examined:** 1ex., Sikkim, (no other data).  
**Expanse:** 45 mm.  
**Distribution:** India (Sikkim). **Elsewhere:** Malaya.  

Genus *Cyrina* Hemming  


36. *Cyrina cyrina* (Hewitson)  


36a. *Cyrina cyrina cyrina* (Hewitson)  
**Diagnostic characters:** Palpi black, legs densely fringed with yellow at ends. Wings with large conspicuous hyaline spots. Hindwing underside submarginal yellow borders.  
**Material examined:** 1ex., Sikkim, (no other data).  
**Expanse:** 44 mm.
Distribution: India (Sikkim, Assam and Meghalaya). Elsewhere: Bhutan.

Group TARACTOCERA

Key to genera of the group TARACTOCERA

1. Antennae equal to half costa, apiculus hooked and not longer than width of club, upper side of forewing generally with a brand......................Potanthus Scudder

- Antennae larger than half costa, apiculus more obtuse and larger. Forewing without brand .......................................................... 2

2. Forewing vein Cu_{1b} nearer to end cell than to base, upper side of forewing always with an unbroken discal stigma in male. Uncus divided ..........Telicota Moore

- Forewing vein Cu_{1b} nearer to base than to base, upper side of forewing without discal stigma. Uncus undivided.............................. Cephrenes Waterhouse & Lyell

Genus Potanthus Scudder


Key to species of the genus Potanthus Scudder

1. Forewing upperside with a conjoined band in space M_{2} and M_{3}. Cuillar of clasper slender and pointed ......................mingo (Edwards)

- Forewing upperside without band in space M_{2} and M_{3}, cuillar of clasper not slender but with a projection ........................................2

2. Forewing upperside with yellow marking. Uncus tapered to a sharp triangular point..............pallida (Evans)

- Forewing upperside marking not yellow. Uncus tapered to a blunt triangular print.................. trachala (Mabille)

37. Potanthus mingo (Edwards)

1866. Hesperia mingo Edwards,


*37a. Potanthus mingo ajax Evans


Material examined: 2 exs., Sikkim, (no other data).

Expanse: 26 mm.

Distribution: India (Sikkim and Assam).


38. Potanthus pallida (Evans)

(Common Dart)


Expanse: 30 mm.

Distribution: India (Sikkim North Sikkim, Assam South India and N. W. Himalayas).

Elsewhere: Bhutan, Myanmar, Thailand, Yunnan.

39. Potanthus trachala (Mabille)

(Broad Bident Dart)


39a. *Potanthus trachala tytleri* (Evans)


**Material examined**: 2 exs., Sikkim, (no other data).

**Expanse**: 33 mm.

**Distribution**: India (Sikkim, Assam and Manipur). **Elsewhere**: Myanmar, Thailand, Indochina and Malaya.

**Genus* Telicota* Moore


40. *Telicota ohara* Plotz.


40a. *Telicota ohara jix* Evans

(Dark Palm Dart)


**Diagnostic characters**: Forewing upperside with spots in area M₂ and M₃ more conjoined than other. Hindwing underside without dark veins.

**Material examined**: 1 ex., Sikkim, (no other data).

**Expanse**: 34 mm.

**Distribution**: India (Sikkim and Assam). **Elsewhere**: Myanmar, Thailand, Indochina and Malaya.

**Genus* Cephrenes* Waterhouse & Lyell


41. *Cephrenes chrysozona* (Plotz)

(Plain Palm Dart)


41a. *Cephrenes chrysozona oceanica* (Mabille)


**Diagnostic characters**: Forewing upperside tawny coloured with central dark band solid throughout in male, tawny marking suffused with a dark scaling in female. Hindwing underside yellow to ochreous brown.

**Material examined**: 2 exs., Sikkim (no other data).

**Expanse**: 38 mm.

**Distribution**: Oriental region including (Sikkim, Assam, West Bengal and the Andamans). **Elsewhere**: Myanmar, Yunnan, Indochina and Hainan.

**Group* GEGENES* Key to genera of the group GEGENES

1. Forewing vein Cu₁b nearer to upper end cell than to base..........................2
   - Forewing vein Cu₁b nearer to base than to upper end of cell ............... *Iton* deNiceville

2. Antennae with more segments of nudum on club than to apiculus ........... *Parnara* Moore
   - Antennae with at least as many as segment on apiculus as on club...........3

3. Antennae not reaching to mid costa. Forewing vein Cu₁b arising opposite to vein R ..........4
   - Antennae equal to half costa. Forewing vein Cu₁b arising before origin of vein R ..........5

4. Underside of hindwing without cell spot. Mid tibiae unspined ......................... *Borbo* Evans
   - Underside of hind wing with cell spot, Mid tibia heavily spined .......... *Pelopidas* Walker
5. Antennal apiculus more obtuse. Palpi less flattened ........................................ Polytremis Mabille
   – Antennal apiculus right angled. Palpi much stouter .............................................. 6

6. Mid tibiae unspined .............. Caltoris Swinhoe
   – Mid tibiae heavily spined ........ Baoris Moore

Genus Iton deNiceville


42. Iton semamora (Moore) (Common Wight)


42a. Iton semamora semamora (Moore)


Diagnostic characters: Forewing underside with a tuft of upturned hairs from near the base of dorsum. Upperside tornal part of hindwing white.

Material examined: 2 exs., Sikkim (no other data). 1ex., Runjeet Valley (coll. deNiceville).

Expanse: 38 mm.

Distribution: India (Sikkim, Meghalaya and West Bengal). Elsewhere: Myanmar, Thailand and Malaya.

Genus Parnara Moore


43. Parnara naso (Fabricius) (Straight Sift)


43a. Parnara naso bada (Moore)


Diagnostic characters: Forewing underside with the inner edge of the spot in space between Cu₁ₐ and Cu₁ₖ lying beneath or after the origin of Cu₁ₖ apical spot present. Hindwing underside generally with spots.

Material examined: 1ex., Sikkim (no other data).

Expanse: 35 mm.

Distribution: Palearctic and oriental region including India (Sikkim, West Bengal, South India, Central India and Kashmir).

Genus Borbo Evans


44.

Key to species of the genus Borbo Evans

Wings produced. Antennal club angled. Palpi appressed, third segment short, stout, erect inconspicuous. Forewing underside with one spot in space 2A. Hindwing underside with one or two dots .......... cinnara (Wallace)

– Wings broad. Antennal club obtuse. Palpi semierect, hairy, third segment longer, pointed and conspicuous. Forewing underside with two spots in space 2A. Hindwing underside with dots in spaces M₁ to M₃................................. bevani (Moore)

44. Borbo cinnara (Wallace) (Rice Switt)


Material examined: 2 exs., Sikkim, (coll. deNiceville).

Distribution: Palacaretic, oriental including India (Sikkim, Manipur, West Bengal, South India, Madhya Pradesh, Himachal Pradesh, the Andaman and Nicobars). Elsewhere: Papuan and Australian region.

45. *Borbo bevani* (Moore) (Bevan's Swift)


Material examined: 1 ex., Sikkim (no other data).

Expanse: 28 mm.

Distribution: India (Sikkim, Assam, Meghalaya and Kashmir to Kumaon). Elsewhere: Bhutan, Indochina, Malayan Subregion, Myanmar, Peninsular, Thailand.

Genus *Pelopidas* Walker


Key to species of the *Pelopidas* Walker

1. Upperside of forewing with discal stigma .... ............................................. *assamensis*  
   (Wood manson & de Niceville)  
   - Upperside of forewing without discal stigma ................................................. 2

2. Lower end of stigma not nearer to base, more or less under origin of vein Cuₙa .................................................................  
   .................................................. *sinensis* (Mabille)  
   - Lower end of stigma nearer to base and well before origin of vein Cuₙa .................................................................  
     .............................................. *mathias* (Fabricius)

46. *Pelopidas assamensis*  
   (Wood Manson and de Niceville)  
   (Great Swift)


Material examined: 6 exs., Sikkim (no other data).

Expanse: 48 mm.

Distribution: India (Sikkim, Assam and Meghalaya). Elsewhere: Myanmar, Thailand, Indochina and Malaya.

47. *Pelopidas sinensis* (Mabille)  
   (Large Banded Swift)


Material examined: 5 exs., Sikkim. (no other data).

Expanse: 36 mm.

Distribution: India (Sikkim, Assam, Meghalaya and N.W. Himalaya), Elsewhere: S. W. China and Myanmar.

48. *Pelopidas mathias* (Fabricius)  
   (Small Banded Swift)


48a. *Pelopidas mathias mathias* (Fabricius)


Material examined: 5 exs., Sikkim (no other data).

Expanse: 36 mm.

Distribution: Oriental including India (Sikkim, (South Sikkim), Assam, West Bengal, South India, Central India, Rajasthan, Punjab, Himachal Pradesh, Jammu and Kashmir and the Central Nicobars). Elsewhere: Australian region.
Genus *Polytremis* Mabille


**Key to species of the genus *Polytremis* Mabille**

1. Palpi third segment slender, protruding, semi-erect, antennal club obtuse, upperside of hindwings with inconspicuous hyaline spots ........................................... lubricans (Herrich-Schaffer)
   - Palpi third segment short, stout and erect, antennal club angled, upperside of hindwing with conspicuous spots ........................................... 2

2. Hindwing tornal cilia white, uncus and gnathos convergent ..... discreta (Elwes & Edwards)
   - Hindwing tornal cilia yellow; uncus and gnathos divergent ................... eltola (Hewitson)

49. *Polytremis lubricans* (Herrich-Schaffer) (Swift)


49a. *Polytremis lubricans lubricans* (Herrich Schaffer)


   **Material examined**: 2 exs., Sikkim, (no other data).

   **Expans**: 38 mm.

   **Distribution**: India (Sikkim, Assam, Meghalaya, and N. W. Himalayas). Elsewhere: Myanmar, North Thailand, Malaya and China.

50. *Polytremis discreta* (Elwes and Edwards) (Himalayan Swift)


50a. *Polytremis discreta discreta* (Elwes & Edwards)


   **Material examined**: 4 exs., Sikkim, (no other data).

   **Expans**: 44 mm.

   **Distribution**: India (Sikkim, Assam, Meghalaya, and N. W. Himalayas). Elsewhere: Myanmar, North Thailand, Malaya and China.

51. *Polytremis eltola* (Hewitson) (Yellow spot swift)


51a. *Polytremis eltola eltola* (Hewitson)


   **Material examined**: 16 exs., Sikkim, (no other data).

   **Expans**: 36-40 mm.

   **Distribution**: India (Sikkim, Assam, West Bengal, and N. W. Himalayas). Elsewhere: Myanmar.

Genus *Caltoris* Swinhoe


**Key to species of the genus *Caltoris* Swinhoe**

1. Upperside of forewing with more or less well marked cell spots ........................................... 2
   - Upperside of forewing without cell spots.... 3

2. Antennal club aberrant ........................................... aurociliata (Elwes & Edwards)
MAJUMDAR: Insecta: Lepidoptera: Pieridae & Hesperiidae

- Antennal club normal.  
  3. Underside of forewing without tuft.  
  - Underside of forewing with an upturned tuft of dark hair from dorsum near base.  

  Antennal club normal  
  cahira (Moore)  
  3. Underside of forewing without tuft.  
  - Underside of forewing with an upturned tuft of dark hair from dorsum near base.  

  Antennal club normal  
  cahira (Moore)  

4. Underside of hindwing densely overlaid with ochreous brown scale.  
  Underside of hindwing not densely overlaid with ochreous brown scale.  

- Underside of hindwing densely overlaid with ochreous brown scale.  
  kumara (Moore)  
  Underside of hindwing not densely overlaid with ochreous brown scale.  
  tulsi (deNiceville)  

52. Caltoris aurociliata (Elwes & Edwards)  
(Yellow Fringed Swift)  
Material examined: 1 ex., Sikkim, (no other data).  
Expanse: 42 mm.  
Distribution: India (Sikkim, Meghalaya, Manipur and Nagaland).

53. Caltoris cahira (Moore)  
(Austen's Swift)  

53a. Caltoris cahira austeni (Moore)  
Material examined: 16 exs., Sikkim, (no other data).  
Expanse: 34-38 mm.  
Distribution: India (Sikkim, Assam, Meghalaya and Manipur). Elsewhere: Taiwan, Myanmar, Thailand, Indochina and Malaya.

54. Caltoris plebia (deNiceville)  
(Tufted Swift)  
Material examined: 7 exs., Sikkim, (no other data).  
Expanse: 38 mm.  
Distribution: India (Sikkim and Meghalaya). Elsewhere: Myanmar, Malayan subregion.

55. Caltoris kumara (Moore)  
(Black Swift)  

55a. Caltoris kumara moorei (Evans)  
Material examined: 34 exs., Sikkim, (no other data).  
Expanse: 40-46 mm.  
Distribution: India (Sikkim, Assam and Meghalaya). Elsewhere: Myanmar.

56. Caltoris tulsi (deNiceville)  
(Purple Swift)  
1889. Parnara tulsi deNiceville, J. Asiat. Soc. Bengal, 52 (2) : 86, np. 30, pl. x, fig. 1.  

56a. Caltoris tulsi tulsi (deNiceville)  
Material examined: 6 exs., Sikkim, (no other data).

Expanse: 44 mm.

Distribution: India (Sikkim, Assam and Meghalaya). Elsewhere: Bhutan, Myanmar, Thailand and Malaya.

Genus Baoris Moore


Key to species of the genus Baoris Moore

Male with secondary sexual character.
Upperside of forewing with hyaline white spots, cell spot more than one

.................................................. farri (Moore)

- Male without secondary sexual character.
Upperside of forewing with yellow spots, cell spot single

57. Boaris farri (Moore)
(Paint Brush Swift)


57a. Boaris farri farri (Moore)


Material examined: 2 exs., Sikkim, (no other data).

Expanse: 36 mm.

Distribution: Oriental region including (Sikkim, Assam, Meghalaya. West Bengal, South India, Central India. Uttar Pradesh, Andaman and Nicobars).

58. Boaris pagana (deNiceville)
(Figure of 8 Swift)


Material examined: 14exs., Sikkim, (no other data).

Expanse: 46 mm.

Distribution: India (Sikkim and Bengal). Elsewhere: Myanmar and Borneo.

Subfamily COELIADINAE

Key to genera of the subfamily COELIADINAE

1. Forewing cell shorter than dorsum ............ 2

- Forewing cell not shorter than dorsum ...... 3

2. Forewing vein 1A slightly bisinuate, usually without hyaline spot dorsally

................................................ Bibasis Moore

- Forewing vein 1A acutely bisinuate near base, often with hyaline spot dorsally

............................................. Hasora Moore

3. Wings upperside more or less blue or green, without hyaline spot ....... Choaspes Moore

- Wings upperside neither blue nor green, with hyaline spot

Badamia Moore

Genus Bibasis Moore


Key to species of the genus Bibasis Moore

1. Hindwing underside more or less striped, small black spot at base of space R₄ ........... 2

- Hindwing underside without stripe, and spot in space R₄ .................... sena (Moore)

2. Underside of forewing with discal striping not reaching termen at apex ...................... 3

- Underside of forewing with discal striping reaching upto termen at apex ................. 4

3. Forewing vein Cuₐ nearer to origin of vein Cu₁b than to origin of vein M₃ ..............

............................................. jaina (Moore)
- Forewing vein Cu$_{1b}$ nearer to origin of vein M$_3$ than to origin of vein Cu$_{1a}$........................................harisa (Moore)

4. Hindwing cilia ochreaous........................................vasutana (Moore)

- Hindwing cilia white ........................................5

5. Forewing vein Cu$_{1a}$ nearer to origin of vein M$_3$ than to vein Cu$_{1b}$. Hindwing underside brown with green veins and stripe .......... amara (Moore)

- Forewing vein Cu$_{1a}$ nearer to origin of vein M$_3$ than to vein Cu$_{1b}$. Hindwing underside greenish with broad pale green stripes between in the veins ...................................gomata (Moore)

59. Bibasis sena sena (Moore)
(Orange Tail Awl)


59a. Bibasis sena sena (Moore)


Material examined : 7 exs., Sikkim, (no other data).

Expanse : 55 mm.

Distribution : India (Sikkim, Assam, Meghalaya and N. W. Himalayas). Elsewhere : Myanmar.

61. Bibasis harisa (Moore)
(Orange Awlet)


61a. Bibasis harisa harisa (Moore)


Material examined : 10exs., Sikkim, (coll. deNiceville).

Distribution : Oriental region including India (Sikkim, Assam, Meghalaya and Andamans).

62. Bibasis vasutana (Moore)
(Green Awl)


Material examined : 8 exs., Sikkim, (no other data).

Expanse : 58 mm.

Distribution : India (Sikkim, Assam and Meghalaya). Elsewhere : Sri Lanka, Myanmar, Thailand and China.

63. Bibasis amara (Moore)
(Small Green Awl)


Material examined : 10 exs., Sikkim. (coll. deNiceville).

Expanse : 52 mm.
**Distribution**: India (Sikkim, Assam Meghalaya, West Bengal and Andamans). Elsewhere: Myanmar, Thailand and China.

64. **Bibasis gomata** (Moore)  
(Pale Green Awl)


64a. **Bibasis gomata gomata** (Moore)  
(Small Green Awl)


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**Genus Hasora** (Moore)


**Key to species of the genus Hasora Moore**

1. Underside of hindwing without dark tornal lobe ................................. **anura** deNicèville
   - Underside of hindwing with more or less dark tornal lobe .......................... 2

2. Style of clasper undivided ........................................... 3
   - Style of clasper divided ........................................... 4

3. Upperside bases paler. Forewing dorsum equal to termen, upperside with white spots in space **Cu**₁₄ and **Cu**₁₇ ................................ **chromus** (Cramer)
   - Upperside uniform. Forewing dorsum greater than termen, upperside with one or two rounded spots .................. **taminatus** Huebner

4. Underside of hindwing with two pale spots ........................................... **badra** (Moore)
   - Underside of hindwing without spot ................. ........................................... **vitta** Butler

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65. **Hasora anura** deNicèville  
(State Awl)


65a. **Hasora anura anura** deNicèville


**Material examined**: 4exs., Sikkim, (coll. deNicèville).

**Expans**: 48 mm.

**Distribution**: India (Sikkim, Meghalaya, Nagaland and Manipur). Elsewhere: North Myanmar.

66. **Hasora chrous** (Cramer)  
(Common Banded Awl)


66a. **Hasora chromus chromus** (Cramer)


**Material examined**: 3 exs., Sikkim, (coll. deNicèville).

**Expans**: 45 mm.

**Distribution**: Palaearctic, Oriental, Papuan, Australian and Hawaiian region.

67. **Hasora taminatus** Huebner  
(White Banded Awl)


**67a. Hasora taminatus bhava ra** Fruhstorfer


**Material examined**: 6 exs., Sikkim, (coll. deNiceville).

**Expanse**: 47 mm.

**Distribution**: Oriental region including (Sikkim, Assam, Meghalaya, West Bengal and South India).

**Genus Choaspes** Moore


**Key to species of the genus Choaspes Moore**

1. Upperside of forewing of male with a brand ......................................................... *plateni* (Staudinger)
   - Male without brand .................................................... 2

2. Cuiller of clasper with rounded tip and a beak .................................................. *benjamini* (Guerin)
   - Cuiller of clasper without beak on ventral side .................................. *hemixanthus* Rothschild & Jordan

**70. Choaspes plateni** (Staudinger)

(Branded Awl king)


**70a. Choapes plateni stigmata** Evans


**Material examined**: 2 exs., Sikkim, (no other data).

**Expanse**: 50 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). *Elsewhere*: Tonkin and Taiwan.

71a. Choapes benjamini japonica (Murray)


Material examined : 1 ex., Sikkim, (no other data).

Expans : 51 mm.

Distribution : India (Sikkim, Assam and N. W. Himalayas). Elsewhere : Nepal, Japan, West China, Yunnan.

72. Choaspes hemixanthus Rothschild & Jordan (Awl King)

1903. Choaspes hemixanthus Rothschild & Jordan, Nov. zool., pl. xi, fig. 3.


72a. Choaspes hemixanthus furcata Evans


Material examined : 1 ex., Sikkim, (no other data).

Expans : 50 mm.

Distribution : India (Sikkim, Assam and Meghalaya). Elsewhere : Bhutan, Perak, Thailand and North China.

Genus Badamia Moore


73. Badamia exclamationis (Fabricius) (Brown Awl)


Diagnostic characters : Wings upperside dark brown with pale base. Forewing upperside with large whitish hyaline spot in spaces M3 and Cu1, Cu2 and also in cell. Hindwing underside pale brown with a dark brown tornus surmounted by a whitish subtornal spot.

Material examined : 8 exs., Sikkim, (Purchased Moore’s collns.) (No other data).

Expans : 60 mm.

Distribution : Oriental including India (Sikkim, Assam, Meghalaya, West Bengal and Andamans). Elsewhere : Papuan, Australian Hawaiian region.

Subfamily PYRGINAE

Key to the groups of the subfamily PYRGINAE

Forewing cell generally long, palpi 2nd segment erect .............................................................. 
Forewing cell generally short, palpi 2nd segment porrect ..............................................................

- Forewing cell generally short, palpi 2nd segment porrect .............................................................. TAGIADIES group

Group CELAENORRHINUS

Key to the genus of the group CELAENORRHINUS

Hindwing vein M1 tubular. Hind tibiae with hair pencil ......................................................... Capila Moore

- Hindwing vein M1 not tubular. Hind tibiae without hair pencil ......................................................... Calañorrhinus Huebner

Genus Capila Moore


Key to species of the genus Capila Moore

Forewing dorsum as long as termen; head,
MAJUMDAR : Insecta : Lepidoptera : Pieridae & Hesperiidae

thorax and base of wings orange; wings produced ....................... jayaveda (Moore)

— Forewing dorsum longer than termen; head, thorax and base of wings brown; wings not produced ....................... zennara (Moore)

74. Capila jayaveda Moore (Striped Dawn Fly)


Material examined : 6 exs., Sikkim, (No other data).

Expanse : 64 mm.

Distribution : Oriental region including India (Sikkim, Assam, Meghalaya and West Bengal).

75. Capila zennara (Moore) (Pale Striped Dawn Fly)


Material examined : 8 exs., Sikkim, (No other data).

Expanse : 67 mm.

Distribution : Oriental region including India (Sikkim, Manipur and West Bengal).

Genus Celaenorrhinus Huebner


Key to species of the genus Celaenorrhinus Huebner

1. Upperside of forewing with white central spot or band ........................................ 2

— Upperside of forewing with yellowish orange central spot or band ...... dhanada (Moore)

2. Upperside of forewing with cell spot prominently nearer to apex than to base ...... ....................................................... 3

— Upperside of forewing with the cell spot placed midway between the base and the apex of the wing ........................................ 4

3. Upperside of forewing with the central white band narrow. Hindwing cilia broadly yellow, unchequered ........... badia (Hewitson)

— Upperside of forewing with the central white band compact. Hindwing cilia brown ........ ............................................ asmara (Butler)

4. Antennal shaft chequered ...................... 5

— Antennal shaft white ...................... 6

5. Upperside of hindwing with conspicuous and cell spot .......... plagifera deNiceville

— Upperside of hindwing without cellspot ........ ............................................ Sumita (Moore)

6. Abdomen striped. Upperside of forewing cell spot not continued above radius. Hindwing cilia yellow ......................... patula deNiceville

— Abdomen unstriped. Upperside of forewing cell spot continued above radius. Hindwing cilia outwardly white, basally yellow .................. leucocera (Kollar)

76. Celaenorrhinus dhanada (Moore) (Himalayan Yellow Flat)


76a. Celaenorrhinus dhanada dhanada (Moore)


Material examined : 2 exs., Sikkim (no other data).

Expanse : 42 mm.

Distribution : India (Sikkim and N.W. Himalaya). Elsewhere : Bhutan.
77. *Celaenorrhinus badia* (Hewitson)  
(Scarce Banded Flat)


**Material examined**: 1 ex., Sikkim (no other data).

**Expanse**: 55 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). Elsewhere : Bhutan, Myanmar, Tempang and Sadan.

78. *Celaenorrhinus asmara* (Butler)  
(White Banded Flat)


**Expanse**: 55 mm.

**Distribution**: India (Sikkim and Manipur). Elsewhere : N. Shan States.

*78a. Celaenorrhinus asmara consertus* deNiceville


**Material examined**: 2 exs., Sikkim (no other data).

**Expanse**: 40 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). Elsewhere : Rangoon, Ataran, Tavoy, Thailand, Indo-China.

79. *Celaenorrhinus plagifera* deNiceville  
(DeNiceville’s Spotted Flat)


**Material examined**: 4 exs., Sikkim (no other data).

**Expanse**: 55 mm.

**Distribution**: India (Sikkim and Assam). Elsewhere : Bhutan, Myanmar, Tempang and Sadan.

80. *Celaenorrhinus sumitra* (Moore)  
(Moore’s Spotted Flat)


**Expanse**: 55 mm.

**Distribution**: India (Sikkim and Manipur). Elsewhere : N. Shan States.

81. *Celaenorrhinus patula* deNiceville  
(Large Spotted Flat)


**Material examined**: 5 exs., Sikkim, (no other data).

**Expanse**: 46 mm.


82. *Celaenorrhinus leucocera* (Kollar)  
(Common Spotted Flat)


Material examined: 12 exs., Sikkim (no other data), 1 ex., East Sikkim, Tumin, 1475 m, 1.x.1988, (coll. V.C. Agrawal); 1 ex., Simsim, Naya Bazar, 3.vi.1994 (coll. L.C. Das).

Distribution: Oriental region including India (Sikkim, East Sikkim), Assam, Meghalaya, West Bengal, Madhya Pradesh, South India, North West Himalayas and Andamans).

Group TAGIADES

Key to genera of the group TAGIADES

1. Apiculus tapered to a fine point. Forewing vein Sc usually ending over end cell ................... 3
   – Apiculus blunt. Forewing vein Sc usually ending before end cell .............................................. 2

2. Apiculus arcuate and tapered. Male with recumbent hair pencil on the hind tibiae. Wings brown with numerous hyaline spots ............. .............................................. Ctenoptilum deNiceville
   – Apiculus stout and untapered. Male with short hair pencil on fore coxae, Wings brown. Upperside of forewing with dark areas and hyaline spot small or absent. Upperside of hindwing variegated with white lines ............. .............................................. Odontoptilum deNiceville

3. Hindwing dorsum greater than costa .......... 4
   – Hindwing dorsum not greater than costa.... 6

4. Hind tibiae with hair pencil ......................... .................................................. Satarupa Moore.
   – Hind tibiae without hair pencil ........... 5

5. Antennal club angled or hooked to apiculus beyond thickest part of the club ......................... .................................................. Darpa Moore
   – Antennal club arcuate or obtuse from thickest part of the club ............. Sesaria Matsumara

6. Upperside of hindwing with spot .......... 7
   – Upperside of hindwing without spot ........... .................................................. Chamunda Evans

7. Hind tibiae with a recumbent hair pencil..... 8
   – Hind tibiae without hair pencil ............................... Tagiades Huebner

8. Upperside of hindwing with dark spot ........... .............................................. Coladenia Moore
   – Upperside of hindwing without dark spot .... .............................................. Daimio Murray

Genus Ctenoptilum deNiceville


83. Ctenoptilum vasava (Moore) (Tawnn Angle)


83a. Ctenoptilum vasava vasava (Moore)


Diagnostic characters: Upperside of forewing with hyaline spot at apex and in space R₃ elongate, borders bright chestnut, contrasting with the darker bases.

Material examined: 10 exs., Sikkim, (no other data).

Expanse : 35 mm.

Distribution: India (Sikkim and Assam).

Elsewhere: Myanmar to Tavoy and Thailand.

Genus Odontoptilum deNiceville


84. Odontoptilum angulata Felder


84a. *Odontoptilum angulata angulata* Felder


**Diagnostic characters**: Upperside of forewing without white lines, ground colour more or less variegated. Hindwing cilia pale brown never entirely white.

**Material examined**: 1 ex., Sikkim (no other data).

**Expanse**: 40 mm.

**Distribution**: India (Sikkim, Assam, Meghalaya, N. W. Himalayas and South India). *Elsewhere*: Bhutan, Nepal, Myanmar, Sri Lanka, Thailand, Indochina and Malayan subregion.

Genus *Satarupa* Moore


85. *Satarupa gopala* Moore

(Large White Flat)


**Diagnostic characters**: Forewing cell spot absent or small, not larger than the spot in space Cu₁, spot in space 2A narrower than spots in spaces Cu₁ and Cu₂, underside of hindwing with black discal spot reduced which separated in white veins, which penetrate to termen and a prominent spot present in area Rs'.

**Material examined**: 12 exs., Sikkim (no other data).

**Expanse**: 55 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). *Elsewhere*: Myanmar, China, Malaya and Sumatra.

Genus *Darpa* Moore.


86. *Darpa hanria* Moore (Hairy Angle)


**Diagnostic characters**: Both wings termen highly crenulate, forewing cell spot peculiar, continued upwards above vein Sc, downwards branched to two spots in space Cu₁ and Cu₁b.

**Material examined**: 4 exs., Sikkim (no other data).

**Expanse**: 35 mm.

**Distribution**: India (Sikkim, Assam and Meghalaya). *Elsewhere*: Myanmar.

Genus *Sesaria* Matsumara


87. *Sesaria sambara* (Moore) (Sikkim White Flat)


87a. *Sesaria sambara sambara* (Moore)


**Diagnostic characters**: Forewing with narrow dorsal white spots between Cu₁ and Cu₁b which is outwardly excavated. Abdomen entirely white.

**Material examined**: 2 exs., Sikkim (no other data).

**Expanse**: 45 mm.

**Distribution**: Oriental region including India (Sikkim, Assam, Meghalaya, Manipur and West Bengal).

Genus *Chamunda* Evans

88. Chamunda chamunda (Moore)  
(Olive Flat)


Diagnostic characters: Wings upperside dark brown, base of forewing and whole of hindwing except exterior margin dark olive brown, Cilia brown.

Material examined: 1 ex., Sikkim (no other data).

Expanse: 50 mm.

Distribution: India (Sikkim, Assam and Meghalaya). Elsewhere: Myanmar and Thailand.

Genus Tagiades Huebner


Key to species of the genus Tagiades Huebner

Forewing without hyaline spot in space R₁ and over cell spot. Hind tibiae without hair pencil. End of uncus bilobate ............... gana (Moore)

— Forewing with hyaline spot in space R₁ over cell spot. Hind tibiae with short recumbent hair pencil. End of uncus undivided ..................... .............................................. menaka Moore.

89. Tagiades gana (Moore)  
(Large Snow Flat)


89a. Tagiades gana athos Plotz


Material examined: 3 exs., Sikkim (no other data).

Expanse: 42 mm.

Distribution: India (Sikkim, Assam and Orissa). Elsewhere: Nepal, Thailand.

90. Tagiades menaka (Moore)  
(Spotted Snow Flat)


90a. Tagiades menaka menaka (Moore)


Material examined: 12 exs., Sikkim (no other data).

Expanse: 40 mm.

Distribution: India (Sikkim, Assam and N. W. Himalayas). Elsewhere: Bhutan, Myanmar, Thailand, Indochina and Hainan.

Genus Coladenia Moore


Key to species of the genus Coladenia Moore

1. Underside of hindwing dark brown, more or less suffused with tawny spots, hindtibiae fringed. Uncus widely divided..................

.............................................. dan (Fabricius)

— Underside of hindwing not dark brown but with tawny spots, hindtibiae with recumbent hair pencil. Uncus undivided .....................

2. Wings upperside with more or less developed ochreous shading or spotting. Forewing underside always with an ochreous discal spot in space 2A, a similar spot beyond termen and cilia white ................... indrani (Moore)
Wings without ochreous spots. Forewing underside without spot in space 2A, cilia dark brown ......................... agni (de Niceville)

91. Coladenia dan (Fabricius)  
(Fuluous Pied Flat)


91a. Coladenia dan festa Kollar


Material examined : 7 exs., Sikkim, (no other data).

Expanse : 40 mm.


92. Coladenia indrani (Moore)  
(Tricoloured Pied Flat)


92a. Coladenia indrani indrani (Moore)


Material examined : 7 exs., Sikkim (no other data).

Expanse : 40 mm.

Distribution : Oriental region including India (Sikkim, Assam, West Bengal, Uttar Pradesh and Himachal Pradesh).

93. Coladenia agni (deNiceville)  
(Brown Pied Flat)

1883. Plesioneura agni deNiceville, J. Asiat. Soc. Bengal, 52 (2) : 87, pl. 10. fig. 4.

93a. Coladenia agni agni (deNiceville)


Expanse : 38 mm.

Distribution : India (Sikkim and Assam). Elsewhere : Myanmar to Tavoy, Thailand, Hainan.

Genus Daimio Murray


Key to species of the genus Daimio Murray

Abdomen upperside centrally white, brawn at ends. End of uncus bulbous ..... sinica Felder

Abdomen upperside narrowly striped. End of uncus tapered to a point ... Phisara (Moore)

94. Daimio sinica  
(White Yellow Brest Flat)


94a. Daimio sinica narada  
(Moore)


Material examined : 26 exs., Sikkim, (coll. deNiceville).

Expanse : 36-40 mm.

Distribution : India (Sikkim, Assam and Meghalaya). Elsewhere : Myanmar.

95. Daimio phisara  
(Dusky Yellow Brest Flat)


95a. *Daimio phisara phisara* (Moore)


**Material examined:** 19 exs., Sikkim (no other data).

**Expanses:** 36-40 mm.

**Distribution:** India (Sikkim, Assam, Meghalaya and Manipur). Elsewhere : Myanmar and Thailand.

**List of species reviewed from literature**

1. *Bibasis odipodea belesia* Mabille (Branded Orange Awlet)
2. *B. anadi* deNiceville (Plain Orange Awlet)
3. *Choaspes xanthopogon* Kollar (Awlking)
4. *Capila lidderdalei* Elwes (Lidderdale’s Dawnfly)
5. *Lobocla liliana liliana* (Atkinson) (Marbled Flat)
6. *Celaenorrhinus flavocincta* (deNiceville) (Bhutan Flat)
7. *C. pyrrha* deNiceville (Double Spotted Flat)
8. *C. ratna daphne* Evans
9. *C. ratna tytleri* Evans
10. *C. pulomaya pulomaya* Moore (Multi Spotted Flat)
11. *C. pero lucofera* Leech (Mussouri Pied Flat)
12. *C. morena* Evans (Pied Flat)
13. *C. putra putra* Moore (Common Spotted Flat)
14. *C. munda munda* Moore (Himalayan Spotted Flat)
15. *C. munda maculicornis* Elwes & Edwards (Himalayan Spotted Flat)
16. *Celaenorrhinus nigricans* deNiceville (Small Banded Flat)
17. *C. zea* Swinhoe (Swinhoe’s Flat)
18. *Odina decoratus* Hewitson (Zigzag Flat)
19. *Coladenia dan fatua* Evans (Fulvous Pied Flat).
20. *C. dan fabia* Evans (Fulvous Pied Flat)
21. *Sarangesa dasahara dasahara* Moore (Small Common Flat)
22. *Statarupa zulla zulla* Tytler (Tytler’s White Flat)
23. *Sesaria dohertyi dohertyi* Watson (Himalayan White Flat)
24. *Tagiades japerus ravi* Moore
25. *T. para gala* Evans (Large Snow Flat)
26. *T. litigiosa litigiosa* Moschler (Water Snow Flat)
27. *T. cohaerens cynthia* Evans (Flat)
28. *Moorena trichoneura pralaya* (Moore) (Yellow Flat)
29. *Spialia galba* (Fabricius) (Indian Skipper)
30. *Caprona agama agama* (Moore) (Spotted Angle)
31. *Pyrgus dejeani* Oberthur
32. *Carterocephalus avanti* deNiceville
33. *Arnetta atkinsoni* Moore (Atkinson’s Bob)
34. *Baracus vittatus septenttrionam* Wood-Mason & de-Niceville (Hedge Hopper)
35. *Sovia grahami* Evans (Grahm’s Ace)
36. *Halpe kumara* de-Niceville (Plain Ace)
37. *H. knyvetti* Elwes & Edwards (Knyvetti’s Ace)
38. *H. sikkima* Moore (Sikkim Ace)
39. *H. homolea molta* Evans (Indian Ace)
40. *H. homolea filda* Evans (Indian Ace)
41. *H. arcuata* Evans (Ace)
42. *Pithaueria marsena* Hewitson (Branded Straw Ace)
43. *Iambrix salsala salsala* Moore (Chestnut Bob)
44. *Scobura isota* Swinhoe (Forest Bob)
45. *Stimula swinhoei* Elwes & Edwards (Watson’s Demon)
46. *Suastus minuta aditia* Evans (Ceylon Palm Bob)
47. *Plastingia noemi* deNiceville (Spotted Yellow Lancer)
48. *Gangara thyrisis thyrisis* (Fabricius) (Giant Red Eye)
49. *C. lebadea lebadea* Hewitson (Banded Red Eye)
50. *Erionota torus* Evans (Palm Red Eye)
51. *E. acroleucus apex* Semper (Red Eye)
52. *Pirdana hyela major* Evans (Green Striped Palmer)
53. *Matapa cresta* Evans (Grey Brand Red Eye)
54. *Ochlodes subhyalina pasca* Evans (Sub Hyaline Darter)
55. *O. siva siva* Moore (Assam Darter)
56. *O. brahma* Moore (Himalayan Darter)
57. *Pudicitia pholus* (deNiceville) (Spotted Red Eye)
58. *Taractocera danna* Moore (Himalayan Dark Dart)
59. *T. maevis sagara* Moore (Common grass Dart)
60. *Oriens goloides* Moore (Common Dartlet)
61. *O. gola pseudolus* (Mabille) (Common Dartlet)
62. *Potanthus pseudomaesa clio* Evans (Common Dart)
63. *P. rectifasciata* (El. & Ed.) (Branded Dart)
64. *P. sita* Evans (Common Dart)
65. *P. mara mara* Evans (Sikkim Dart)
66. *P. confucius dushta* Fruhstorfer (Chinese Dart)
67. *P. nesta nesta* Evans (Dart)
68. *P. pava pava* Fruhstorfer (Dart)
69. *P. palnia palnia* Evans
70. *Telicota linna linna* Evans (Dark Palm Dart)
71. *T. ancilla bambusae* Moore
72. *T. colon colon* (Palm Dart)
73. *Parnara guttatus mangala* Moore (Straight Swift)
74. *P. thrax masta* Evans (Small Branded Swift)
75. *Pelopidas agna agna* Moore (Small Branded Swift)
76. *P. subochracea subochracea* Moore (Large Branded Swift)
77. *Baoris penicillata unicolor* Moore (Paintbrush Swift)
78. *Caltoris confusa* Evans (Confusing Swift)
79. *C. philippina philippina* Hewitson (Philippine Swift)

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**REFERENCES**


INSECTA : LEPIDOPTERA : SATURNIIDAE

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INTRODUCTION

The family Saturniidae is represented in the world by more than 1100 species of moths grouped under seven subfamilies. They are known as wild silkmoths, non-mulberry silkmoths, giant silkmoth or emperor silkmoths. Forty species belonging to 18 genera and two subfamilies—Saturniinae and Salassinae, occur in India. The state of Sikkim abounds 26 species, accounting for 65% of Indian satumiids, distributed over 14 genera and two subfamilies.

They are usually of large size and beautifully coloured. Females of ‘Atlas Moth’—Attacus atlas (Linnaeus) and ‘Edward Moth’—Archaeoattacus edwardsii (White) are well known for their wing expanse of more than 270 mm and also for the largest wing area of all the Lepidoptera. The larvae or caterpillars of many species are polyphagous as they feed upon species of plants of different families.

Saturniids moths are of great economic importance as some of their species are exploited for obtaining silk of commercial value. India occupies unique position in the world regarding production of all the three varieties of non-mulberry silks, viz., tasar, eri and muga on a large scale. Three species yielding these silks are: Antheraea paphia (Linnaeus)—Tasar silkmoth providing tasar, Samia cynthia (Drury)—Eri silkmoth producing eri and Antheraea assamensis (Helfer)—Muga silkmoth yielding muga. India ranks first and second in the world in the production of eri and tasar silks, respectively, but it has monopoly in the yield of muga silk.

The earlier significant contributions to the studies on species of Indian Saturniidae are by Wardle (1881), Cotes (1888, 1889), Hampson (1892, 1894), Packard (1914), Seitz (1924), Draudt (1930) and Cooper (1942). Schuessler (1933-36) catalogued the species of Saturniidae of World under three subfamilies. Michener (1954) is credited for providing the sound classification of the family into seven subfamilies. Sen Sarma (1956) listed the species of wild silkmoths represented in the collection of the Forest Research Institute, Dehra Dun. Arora and Gupta (1979) contributed to the taxonomical studies of subfamily Saturniinae. Chowdhury (1982 a,b) provided information on Muga and Eri silk industries facing various problems and suggested measures for their improvement. Gupta (1997, 2000) studied these moths from the states of West Bengal and Meghalaya.

Present studies on Saturniide are based on the material collected during recent faunistic surveys of Sikkim by various parties or individuals of the Zoological Survey of India. The specimens available in the old collection of Zoological Survey of India have also been examined. The species known from Sikkim not available for study have been reviewed from literature.

Wild silkmoths as the name indicates flourished in forests where they had a large number of species of food plants. The increasing human population pressure has led to deforestation for human needs of settlements, urbanisation, industrialisation, construction of dams, hydroelectric projects etc. Consequently, there has been shrinkage in their natural habitats and decrease in
food plants. Thus, the population and diversity of species of these moths have also been adversely affected. Their poor representation in the material collected during recent faunistic surveys indicates their occurrence as very rare. Gupta (1997, 2000) suggested for the protection of these moths and habitats by legislation under the Wildlife Protection Act.

For identification, keys to species and genera of these moths from Sikkim have been given. Measurement of fore wing length/wing expanse, geographical distribution and remarks have been provided for the species. The diagnostic characters have been given for genera, viz., Rinaca Walker, Caligula More, Solus Watson and Eriogyna Jordan which have not been included in the key to genera of subfamily Saturniinae. Key to three species of Salassa has not been given but their salient features have been provided. An appendix listing species known from Sikkim has been included.

Key to subfamilies of family SATURNIIDAE

1. Fore wing with vein \( R_5 \) arising well before from apex of discal cell ........ SATURNIINAE
   - Fore wing with vein \( R_5 \) arising from apex of discal cell .................. SALASSINAE

Subfamily SATURNIINAE

Of the 36 species in 17 genera known from India, 23 species belonging to 13 genera are found in Sikkim.

Key to genera

1. Both the fore-and hind wing each with the cell completely or partly closed .................. 2
   - Both the fore-and hind wing each with the cell completely open ............................ 7
2. Hind wing tailed ........................................ 3
   - Hind wing tailless ..................................... 4
3. Fore wing with five radials present. Hind wing tail shorter than the costa of fore wing in male ........................................ ACTIAS Macleay
   - Fore wing with four radials present. Hind wing tail longer than the costa of fore wing in male ........................................ SAMIA Huebner

4. In fore wing vein \( R_5 \) stalked with \( M_1 \) beyond the upper angle of cell. Cell partly closed in fore and hind wing ...... RHODINIA Staudinger
   - In fore wing vein \( R_5 \) not stalked with \( M_1 \). Cell completely closed in fore and hind wing ....... 5
5. Fore wing with four radials .................. ANTHERAEA Huebner
   - Fore wing with five radials .................. 6
6. Frons convex and raised above the level of eyes. Antennae with distal ramii of one segment close to the basal ramii of the succeeding segment .......... LOEPA Moore
   - Frons flat and at level of eyes. Antennae with distal ramii of one segment well separated from basal ramii of the succeeding segment ........................................ CRICULIJA Walker

7. Frons flat, labial palpi one segmented. Fore wing with a slender reddish streak between veins \( R_4 \) and \( R_5 \); antemedial line not sending spurs along veins \( Cu_1 a \) and \( Cu_1 b \). Mid and hind tibiae without terminal spurs ........................................... attacus Linnaeus
   - Frons convex; labial palpi three segmented. Fore wing without reddish streak between veins \( R_4 \) and \( R_5 \); antemedial line sending whitish spurs at bases of \( Cu_1 a \) and \( Cu_1 b \). Mid and hind tibiae with terminal spurs .......... 2
8. Fore wing with a short blackish patch between veins \( R_4 \) and \( R_5 \); discocellular spot large and triangular ............. ARCHAEAATTACUS Watson
   - Fore wing with a short ocellate spot between veins \( R_4 \) and \( R_5 \); discocellular spot narrow and lunate ........................................ samia Huebner

I. Genus ACTIAS Macleay 1815


This genus is represented in India by a single species, ACTIAS SELENE (Huebner) which is presently dealt with from Sikkim.
I. Actias selene (Huebner)


1892. Actias selene (Huebner) : Hampson, Fauna of British India (Moths), 1 : 13.


Material examined: Sikkim, 1 ♂, no date (G. C. Dudgeon Coll.); 1 ♂, 31.iii.1888 (no coll), 1 ♀, no date, (O. Mochller Coll.).

Fore wing length: Male 74 - 76 mm, female 80 mm.

Distribution: India: Sikkim, Assam, Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Tamil Nadu and Uttar Pradesh.

Remarks: This moth is popularly known as Indian Moon-moth. Fresh specimens are beautifully coloured apple green. Hind wing is tailed. The species has a large number of food plants.

II. Genus Sonthonnaxia Watson 1912


A single species of Sonthonnaxia maenas (Doubleday) is dealt with from Sikkim.

2. Sonthonnaxia maenas (Doubleday)


1892. Actias maenas Doubleday Hampson, Fauna of British India (Moths), 1 : 14.


Material examined: Sikkim, 1 ♂, no further data, Sikkim 2 ♂♂, no date (J. C. Jordan Coll), Sikkim, 3 ♂♂ 3-iii-1888, 1 ♂, 7-iii-1888 (O. Mochller Coll.).

Fore wing length: Male 58-70 mm, female 72 mm.

Distribution: India: Sikkim, Assam, Meghalaya and South Andamans, Sikkim.

Elsewhere: Bangladesh, Bhutan, China, Indonesia, Myanmar, N. Vietnam and Thailand.

III. Genus Rhodinia Staudinger 1892


The genus is represented in India by a single species, i.e. Rhodinia newara (Moore).

3. Rhodinia newara (Moore)


1892. Loepa newara (Moore) : Hampson, Fauna of British India (Moths), 1 : 26, No. 27.


Material Examined: Sikkim, 152 m., 1 ♂, 16-xi-1855, 1 ♂, 20. xi. 1855, 1 ♂, (no date), (G. C. Dudgeon Coll.).

Fore wing length: Males 60-65mm, female 67 mm.

Distribution: India: Sikkim; Meghalaya and West Bengal. Elsewhere: Nepal.

IV. Genus Antheraea Huebner 1816


Ten species are known from India, of which seven are dealt with from Sikkim.

Key to species of the genus Antheraea

1. Fore wing with vein R, stalked with R_{2+3} and R_{4} .................................................. 2

   – Fore wing with vein R, free and arising from the cell ................................. 4

2. Antennae in female with distal ramii more than half the length of the basal ramii. Hind wing with submarginal line from much below the costa to inner margin; ocellus filled with black
on inner one third, with hyaline spot reduced or absent .................... assamensis (Helfer)

- Antennae in female with distal ramii less than half the length of basal ramii. Hind wing with submarginal line nearly from costa to inner margin, ocellus not filled with black .......... 3

3. Hind wing with submarginal line single, smoothly curved, pinkish red and outlined by white; ocellus large .......... paphia (Linnaeus)

- Hind wing with submarginal line double, highly angulated; ocellus small .................................................. frithi Moore

4. Hind wing with submarginal lines black and straight; ocellus filled with black on inner half, hyaline spot obsolescent .................................................. compta Rothschild

- Hind wing with submarginal line not black, straight or wavy; ocellus without black on the inner side, hyaline spot reduced or well developed ........................................ 5

5. Fore wing with costal fascia extending upto basal half; hind wing with antemedial line not touching ocellus .................... roylei Moore

- Fore wing with costal fascia extending upto basal two thirds; hind wing with antemedial line farther from base and touching or nearly touching ocellus ........................................ 6

6. Hind wing with submarginal line double, wavy, the inner line curved inwards and touching the antemedial line; ocellus with a well developed black blotch above .................................................. helferi Moore

- Hind wing with submarginal line single, not wavy, and not touching antemedial line; ocellus without blotch above or very much reduced ........................................ knyvetti Hampson

4. Antheraea assamensis (Helfer)


6. Antheraea frithi Moore


Material examined : Sikkim, 4 ♀♂ (no further data).

Fore wing length : 58-62 mm


Remarks : This species is known to have preference for food plant of species Shorea robusta (Sal).

7. Antheraea compta Rothschild

1899 Antheraea compta Rothschild, Novit. zool., 6 (3) : 431-432.


Material examined : Meghalaya : 1220-1524mm, 1 ♂, 24. vii. 1931 (no coll).

Wing expanse : Male 166 mm.

Distribution : India : Sikkim, Meghalaya and Assam.

8. Antheraea roylei Moore


Material examined : Sikkim 2♂♂, 5 ♀♀ (no further data).

Fore wing length : Males 70-71mm, females 72-76 mm.

Distribution : India : Sikkim (Darjiling), Assam, Himachal Pradesh, Meghalayal, Uttar Pradesh and West Bengal.

Remarks : This moth is commonly called ‘The Oak Tasar Moth’ Its larvae spin double layered cocoons. Hybrids obtained by crossing A. roylei with a chinese species A. pernyi, yield Oak Tasar Silk of commercial value.

9. Antheraea helferi Moore


Material examined : Sikkim 7♂♂, 2♀♀ (no further data).

Fore wing length : Males 62-70mm, females 70-73mm.

Distribution : India : Sikkim, West Bengal and Manipur.

10. Antheraea knyvetti Hampson


Material examined : India : Sikkim, 1ex, (damaged), reared in Museum (no further data).

Fore wing length : 75 mm.

Distribution : India : Sikkim.

Remarks : The species is represented in the collection of Zoological Survey of India by a single (damaged) specimen.

V. Genus Loepa Moore 1858


This genus is represented in India by two species i.e. Loepa anthera Jordan and L. katinka (Moore), of which the latter is dealt with from Sikkim.

11. Loepa katinka (Westwood)


*Fore wing length*: Male 40 mm.


VI. Genus *Cricula* Walker 1855


Two species, *Cricula andrei* Jordan and *C. trifenestrata* (Helfer) represent this genus in India.

**Key to species**

Fore and hind wings usually reddish brown; in male fore wing more falcate .......................................................... ....*andreii* Jordan

Fore and hind wings usually yellowish brown to brown and area beyond post-medial line may be grey brown; in male fore-wing less falcate .................................................. *trifenestrata* (Helfer)

12. *Cricula andrei* Jordan


*Material examined*: India: Nil.

*Wing expanse*: Males 70-77 mm; female 68mm.


*Remarks*: Since the specimens were not available for study, this species has been reviewed from literature.

13. *Cricula trifenestrata* (Helfer)


*Material examined*: Sikkim, 1♂ no date (Long coll.) 1♀ (O. Moeller coll.). Sikkim, 1♂, (no further data).

*Wing expanse*: 61-112 mm.

*Distribution*: India: Sikkim, Andamans; Assam; Bihar, Kerala; Meghalaya; Tamil Nadu and West Bengal. *Elsewhere*: Bangladesh, Indonesia, Myanmar and Sri Lanka.

VII. Genus *Attacus* Linnaeus 1767


Only a single species i.e. *Attacus atlas* (Linnaeus) occurs in India.

14. *Attacus atlas* (Linnaeus)


*Material examined*: Sikkim, 1♀ – – (O. Moeller coll.), 1♂, – – 1888 (Jordan coll), 1♂, 1♀, – – 1889 (G.C. Dudgeon coll.). Sikkim, 1♂ (no further data).

*Fore wing length*: Males 95 – 110 mm, Females 110-120mm.

*Distribution*: India: Sikkim, Andamans,
Assam, Bihar, Gujarat, Karnataka, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal. 
Elsewhere: Bangladesh, Indonesia, Myanmar, Singapore, Sri Lanka, South Asia and Western Malaysia.

Remarks: This moth is popularly known as 'Indian Atlas Moth'. It has the largest wing-area of all the known Lepidoptera. It feeds on several species of plants. The cocoons of these moths yield "Fagara" silk.

VIII. Genus Archaeoattacus Watson 1914


The genus is represented in India by a single species Archaeoattacus edwardsii (White).

15. Archaeoattacus edwardsii (White)


1892. Attacus edwardsi White: (Sic) Hampson, Fauna Brit. India., (Moths), 1 : 16.


Material examined: Sikkim, 2♂♂, 5♀♀ (no further data), 1♂, 1♀ no date, (O. Moeller coll.); 1♂, -- 1887 (G.C. Dudgeon coll.).

Fore wing length: Males 42-67 mm, females 50-70 mm.

Distribution: India: Sikkim, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Meghalaya, Nilgiri Hills, South Andamans, Uttar Pradesh and West Bengal. Elsewhere: Australia, Bangladesh, Myanmar, China, Indonesia, Sri Lanka and U.K.

Remarks: This moth is popularly known as Eri Silkmoth or Ailanthus Silkmoth and it feeds on a large number of species of plants. Its cocoons yield 'Eri Silk'.

IX. Genus Samia Huebner 1820


The genus is represented by only a single species i.e. Samia cynthia (Drury).

16. Samia cynthia (Drury)


1892. Attacus cynthia (Drury): Hampson, Fauna of British India (Moths), 1 : 16.


Material examined: Sikkim, 2♂♂, 5♀♀ (no further data), 1♂, 1♀ no date, (O. Moeller coll.); 1♂, -- 1887 (G.C. Dudgeon coll.).

Fore wing length: Males 42-67 mm, females 50-70 mm.

Distribution: India: Sikkim, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Meghalaya, Nilgiri Hills, South Andamans, Uttar Pradesh and West Bengal. Elsewhere: Australia, Bangladesh, Myanmar, China, Indonesia, Sri Lanka and U.K.

Remarks: This moth is popularly known as Eri Silkmoth or Ailanthus Silkmoth and it feeds on a large number of species of plants. Its cocoons yield 'Eri Silk'.

X. Genus Rinaca Walker 1855


Diagnostic characters: Antennae much longer than the thorax; in male, antennae very deeply pectinated, branches ciliated and in pairs, the latter equal in length; in female, antennae with fewer joints than those of male, branches in pairs, the latter unequal in length. Labial palpi very short. Wings long and moderately broad; ocellus truncate lunate, with a curved discal vitreous line. Fore wings almost straight in front, rounded at tips; outer margin oblique. Fore wing slightly falcate, concave along outer margin.
The genus is represented in India by a single species i.e. *Rinaca zuleika* (Hope).

17. *Rinaca zuleika* (Hope)


*Material examined* : Nil.

*Wing expanse* : 136 mm.


*Remarks* : Jordan (1911) reported a form *orites* of this species from Sikkim.

XI. Genus *Caligula* Moore 1862


*Diagnostic characters* : Antennae of male densely quadripectinate and feathered to the apex. Fore and hind wings ample; fore wing apex falcate in male but rounded in female.

This genus is represented in India by four species.

**Key to species**

1. Palpi of moderate size; in male, ramii of antennae long ................................................. 2
   - Palpi very short; in male, ramii of antennae short ....................................................... 3

2. Head, thorax and abdomen brown .............. ................................................................. 2
   - Head, thorax and abdomen ochreous (pale brown or buff) slightly with grey brown ........ cards.......................... *thibeta* (Westwood)

3. Ground colour of fore and hind wings brown ................................................................. *grotei* (Moore)
   - Ground colour of fore and hind wings grey ........................................................................ *india* (Moore)

18. *Caligula anna* (Moore)


*Material examined* : Nil.

*Wing expanse* : 110-120 mm.


19. *Caligula thibeta extensa* (Butler)


*Material examined* : Nil.

*Wing expanse* : 124-146 mm.

*Remarks* : Schuessler (1936) treated two subspecies, *Caligula thibeta* (Westwood) with its nominate subspecies found in Uttar Pradesh (Kumaon), North-West Himalaya and Tibet and other *C. thibeta extensa* Butler occurring in West Bengal, Sikkim and Assam.


20. *Caligula grotei* (Moore)


*Material examined* : Nil.
Wing expanse: Male 80 mm, female 88 mm.


Remarks: However, Schuessler (1936) did not refer to its occurrence in Tibet but Hampson (1892) included its distribution in Tibet also.

21. Caligula lindia Moore


1892. Saturnia lindia (Moore): Hampson, Fauna of British India (Moths), 1: 23.


Material examined: Nil.

Wing expanse: 86 mm.


XII. Genus Solus Watson 1913

1913. Solus Watson, Notes Leyden Mus., 35: 181, t. 8, Fig. 1.

Diagnostic characters: Antennae with distal ten segments produced ventrally at apex but without distinct sensory cones. Fore wing with only two subcostal veins; hind wing with costal vein strongly approaching subcostal distally or sometimes uniting with it for a short distance and terminating in the costal margin. Abdomen of female thickened at apex and densely clothed with anal wool.

The genus is represented in India by a single species, Eriogyna pyretorum (Westwood).

23. Eriogyna pyretorum cidosa (Moore)


Fore wing largely dark at base, medial area whitish, postmedial area heavily suffused with fuscous, the latter obliterating the dentate lines, a white submarginal line, outer margin fuscous, ocellus dark with a streak and ringed with yellow and black, two deep red subapical patches present. Hind wing almost like fore wing, whitish medial area broader, waved lines and a red subapical patch being obsolete. Female with a large tuft of hair at end of abdomen.

Material examined: Nil.

Wing expanse: 103 mm.

Distribution: India: Sikkim and North-East India.

Remarks: Schuessler (1936) treated this taxon occurring in India as subspecies Eriogyna pyretorum cidosa (Moore).
Subfamily SALASSINAE

This subfamily is represented by a single genus, *Salassa* Moore occurring in Southern Asia.

**XIV. Genus Salassa Moore 1859**


The genus is represented in India by four species, of which three are dealt with from Sikkim.

24. *Salassa lola* (Westwood)


*Material Examined*: Nil.

*Wing expanse*: Male 116 mm, female 120-158 mm.

*Distribution*: India: Sikkim and West Bengal. Elsewhere: Bangladesh.

*Remarks*: The head, thorax and abdomen are coloured brick red. The fore wing beyond cell, has a hyaline spot which is variable in shape and size, and a postmedial line bearing a series of hyaline striae on it. The hind wing has a ocellus which is ringed black, white and deep red exteriorly. The female is brown with its fore and hind wings clothed with dark and reddish hair.

25. *Salassa royi* (Elwes)


1892. *Salassa royi* (Elwes) : Hampson, Fauna of British India, (Moths), 1 : 27.


*Material examined*: Nil.

*Wing expanse*: Male 149 mm, female 154 mm.

*Distribution*: India: Sikkim, Himalaya and West Bengal.

*Remarks*: The male of this species differs from that of *Salassa lola* (Westwood) by its head, thorax and abdomen being purplish red brown, fore wing with a large and round hyaline spot, postmedial line without any hyaline striae on it, hind wing with outer ring of ocellus being narrow and black instead of broad and deep red. The female is paler but head and thorax yellow; the fore and hind wing being clothed with olive yellow hair.

26. *Salassa iris* Jordan


*Material examined*: Nil.

*Wing expanse*: Not given Jordan (1911).

*Distribution*: India: Sikkim.

*Remarks*: The male of this species differs from other species by its a little more paler ferruginous colouration, fore wing much longer and narrower; underside drab or cinnamomeus drab paler in female.

Jordan (1911) described this species from Sikkim on the basis of several males but two females.

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APPENDIX

A list of species of the family Saturniidae from Sikkim

Family SATURNIIDAE
Subfamily SATURNIIINAE
Genus Actias Macleay
1. Actias selene (Huebner)
   Genus Sonthonnaxia Watson
2. Sonthonnaxia maenas (Doubleday)
   Genus Rhodinia Staudinger
3. Rhodinia newara Moore
   Genus Antheraea Huebner
4. Antheraea assamensis (Helfer)
5. A paphia (Linnaeus)
6. A. frithi Moore
7. A. compta Rothschild
8. A. roylei Moore
9. A. helferi Moore
10. A. knyvetti Hampson
    Genus Loepa Moore
11. Loepa katinka (Westwood)
    Genus Cricula Walker
12. Cricula andrei Jordan
13. C. trifenestrata (Helfer)
    Genus Attacus Linnaeus
14. Attacus atlas (Linnaeus)
    Genus Archaeoattacus Watson
15. Archaeoattacus edwardsii (White)
    Genus Samia Huebner
16. Samia cynthia (Drury)
    Genus Rinaca Walker
17. Rinaca zuleika (Hope)
    Genus Caligula Moore
18. Caligula anna (Moore)
19. C. thibeta (Westwood)
20. C. grotei (Moore)
21. C. lindia (Moore)
    Genus Solus Watson
22. Solus drepanoides (Moore)
    Genus : Eriogyna Jordan
23. Eriogyna pyretorum cidosa (Moore)
    Subfamily SALASSINAE
    Genus Salassa Moore
24. Salassa lola (Westwood)
25. S. royi (Elwes)
26. S. iris Jordan
INTRODUCTION

The family Zygaenidae includes four subfamilies of which Zygaeninae, Chalcosiinae and Phaudinae are well represented in Sikkim and the distribution of the species, *Himantopterus caudatus* (Moore) under Himantopterinae from Sikkim has been considered doubtful by Fletcher (1925). Butler (1881-1886) in *Illustrations of Heterocera in the British Museum*, dealt with the moths of Sikkim including Zygaenidae. Elwes (1890) recorded some 20 species, while Hampson (1892, 96) in *Fauna of British India, Moths*, reported 53 species of zygaenids from Sikkim. Dudgeon (1899) noted 23 species and subspecies of Zygaenidae from Darjiling and Sikkim. Jordan (1908) and Fletcher (1925) reported nearly 60 species and subspecies of Zygaenidae from this area. Barlow (1982) in his work on the *Illustrations to the Moths of South East Asia*, included the zygaenids of Indian region also.

The present work includes systematic account of 66 species and subspecies under 29 genera with their keys and distribution. Of these, 21 species and subspecies have been appended on the basis of literature review, as these are not represented in the collection under study.

Two zygaenine species, *Phacusa properta* (Swinhoe) and *Illiberis fuliginosa* (Moore) and another couple of chalcosine, *Corma maculata maculata* Hampson and *Eterusia pulchella pulchella* (Kollar) are new locality records for Sikkim. One species *Eterusia nigribasalis* (Hampson) is the topotype representative of Sikkim. As many as six species, *Artona flaviciliata* Hampson, *Artona postalba* Elwes (12000 ft.), *Artona posthyalina* (Hampson), *Artona sikkimensis* Elwes (12000 ft.), *Artona zebra* Elwes (11000 ft.) and *Pidorus truncatus* Jordan, are hitherto known as endemic to Sikkim. The keys and descriptions are mainly based on those given in Hampson (1892).

Family ZYGAENIDAE

Key to the subfamilies of ZYGAENIDAE

1. Mouth parts present ........................................ 2
   - Mouth parts wanting .................................... 3
2. Antennae not flabellate at tip .......................... ZYGAENINAE
   - Antennae flabellate at tip ........................... CHALCOSIINAE
3. Hind wing with the outer margin produced into a long tail ........... HIMANTOPTERINAE
   - Hind wing with the outer margin not produced into a long tail ........ PHAUDINAE

Key to the genera of ZYGAENINAE

1. Hind wing with *M*₁ absent ............................... 2
   - Hind wing with *M*₁ present ........................... 4
2. Fore wing long and narrow ..................................... 3
   - Fore wing produced at apex and broad .................. Phacusa
3. Hind wing *M*₂ remote from *R*₂ .................. Artona
   - Hind wing *M*₂ arising close to *R*₂ ...................... Arachotia
4. Abdomen tufted at end ................................. Lophosoma
   - Abdomen not tufted at end .............................. 5
5. Hind wing long and narrow .......... *Illiberis*
- Hind wing broad and rounded .......... *Clelea*

**Genus Artona** Walker


Seventeen species and subspecies under this genus are known from India of which seven species and subspecies are known from Sikkim. Two species and subspecies are dealt with hereunder, other five have been appended at the end after reviewing the literature.

**Key to the species of Artona**

Fore wing postmedial spots small and double .............................................................. *zebraica*

Fore wing postmedial spots very large and single ............................................................. *walkeri*

1. *Artona zebraica zebraica* Butler


*Material examined*: Two exs., Sikkim, No date. (O. Moller coll.); 1ex., Sikkim, No date, Knyvett coll.). Wing exp. 20-24 mm.

*Distribution*: India : Sikkim, Himachal Pradesh, North-West India, Uttar Pradesh, (Kumaon).

*Remarks*: Barlow (1982) described the subspecies under the genus *Zeuxippa* with its distribution restricted mainly to north-west India and Sikkim.

2. *Artona walkeri nigrescens* Butler


*Material examined*: One ex., Sikkim, No date. (O. Moller coll.) and 1ex., Sikkim, 10.v.1888 (Dudgeon’s coll.). Wing exp. 26 mm.

*Distribution*: India : Sikkim (Raitdong), North-West Himalaya and Punjab hills.

*Remarks*: The distribution of the subspecies *nigrescens* is restricted to the north-west Himalaya and Sikkim.

**Genus Clelea** Walker


Eight species under this genus are recorded from India while three species are known from Sikkim.

**Key to the species of Clelea**

1. Hind wing spotted ........................................... *stipata*
   Hind wing not spotted ...................................... 2

2. Fore wing with streaks from the base metallic blue ............................................ *sapphirina*
   Fore wing with streaks from the base green ......................................................... *discriminis*

3. *Clelea sapphirina* Walker


*Material examined*: One ex., Sikkim, No date. (O. Moller coll.), 1ex., Sikkim, 6.vi.1888 and 1 ex., Sikkim, 28.v.1888 (Dudgeon’s coll.). Wing exp. 24, 30 mm.

*Distribution*: India : Sikkim, North India, Meghalaya; also Central, Southern and Western China; Hong Kong and Myanmar.

*Remarks*: In India, the distribution of the species is restricted mainly to the North Eastern part.

4. *Clelea discriminis* Swinhoe


Material examined: One ex., Sikkim, 2.vi.1888 (O. Moller coll.). Wing exp. 27 mm.

Distribution: India: Sikkim, North India, Meghalaya, Nagaland and West Bengal.

Remarks: The distribution of the species is restricted to North East India.

5. Clelea stipata (Walker)


Material examined: One ex., Sikkim, July, 1897, 1 ex., Sikkim, Aug., 1889 (Dudgeon’s coll.) and 1 ex., Sikkim, No date, (O. Moller coll.). Wing exp. $\sigma$ 18 mm, $\varphi$ 20 mm.

Distribution: India: Sikkim: Himachal Pradesh, Meghalaya: also West China, Java and Myanmar.

Remarks: The distribution of the species in India is restricted to the north eastern and western parts of the Himalayan region.

6. Phacusa properta (Swinhoe)


Material examined: One ex. Sikkim, May, 1897 (Dudgeon’s coll.). Wing exp. 30 mm.

Distribution: India: Sikkim, North India, Nagaland, Nicobar Islands; also Myanmar.

Remarks: The species is recorded for the first time from Sikkim.

Genus Illiberis Walker


Two species under this genus are known from India of which one is recorded for the first time from Sikkim.

7. Illiberis fuliginosa (Moore)


Material examined: One ex., Sikkim, 9. vi.1888 (Dudgeon’s coll.). Wing exp. $\sigma$ 15 mm, $\varphi$ 17 mm.

Diagnostic characters: Dark brown in colour. Fore wing, antennae, palpi, costa and discocellulars black.

Distribution: Sikkim and West Bengal.

Remarks: This is the first locality record of the species from Sikkim.

Genus Lophosoma Swinhoe


Two species under this genus are recorded from India of which one species is known from Sikkim.

8. Lophosoma cuprea (Walker)

1925. Lophosoma cuprea, Fletcher, Cat. Indian Ins., Zygaenidae. pt. 9: 16.

Material examined: 1 ex. Sikkim, L.M., No date, (O. Moller coll.). Wing exp. 24 mm.

Distribution: India: Sikkim, Andamans, North India, Himachal Pradesh and Meghalaya.

Remarks: The distribution of the species is restricted to the Himalayan region and Andamans.

Genus Arachotia Moore

Three species under this genus are recorded from India of which one species is known from Sikkim.

9. *Arachotia flavipilaga* Moore


*Material examined*: One ex., Sikkim, No date, (O. Moller coll.). Wing exp. 35 mm, 44 mm.

*Distribution*: India: Sikkim, Meghalaya, Nagaland and West Bengal.

*Remarks*: The distribution of the species is restricted to north east India.

Subfamily CHALCOSIINAE

Key to the genera of CHALCOSIINAE

1. Wings uniformly semi-transparent ............ 2
   Wings not uniformly semi-transparent ........ 3
2. Fore wing with R\(_1\) anastomosing with Sc ... .............................................. *Philopator*
   Fore wing with R\(_1\) not anastomosing with Sc ........................................... *Agalope*
3. Fore wing with cell long ..................... 4
   Fore wing with cell short .................. *Psaphis*
4. Fore wing with no veinlet between Sc and costa ........................................... 5
   Fore wing with veinlets between Sc and costa ................................................ 15
5. Both wings normal in form .................... 6
   Both wings not normal in form ................ 8
6. Fore wing R\(_1\) anastomosing with Sc ....... .............................................. *Cyclosia*
   Fore wing R\(_1\) not anastomosing with Sc ..... .............................................. 7
7. Hind wing M\(_2\) and M\(_3\) stalked ............ ................................. *Chalcodina*
   Hind wing M\(_2\) and M\(_3\) not stalked ........ .............................................. *Corina*
8. Wings zygaeniform ................................................................. *Trypanophora*
   Wings not zygaeniform ......................... 9
9. Wings moderately long and broad ............. 10
   Wings very long and broad .................... 13
10. Fore wing with R\(_5\) given off farther from cell than R\(_3\) ......................... *qHerpa*
    Fore wing with R\(_5\) given off nearer from cell than R\(_3\) ......................... 11
11. Fore wing with M\(_2\) and M\(_3\) from cell .. .............................................. *Pidorus*
    Fore wing with M\(_2\) and M\(_3\) stalked ..................................................... 12
12. Fore wing with M\(_1\) absent .................. .............................................. *Phlebohiecta*
    Fore wing with M\(_1\) present ............................................................... *Etesiusa*
13. Fore wing with Cu\(_ia\) not stalked with M\(_2\) and M\(_3\) ................................ 14
    Fore wing with Cu\(_ia\) stalked with M\(_2\) and M\(_3\) ................................ .. *Campylotes*
14. Fore wing with R\(_2\) not stalked with R\(_5\), R\(_4\) and R\(_3\) ......................... *Erasmia*
    Fore wing with R\(_2\) stalked with R\(_5\), R\(_4\) and R\(_3\) ......................... *Cadphises*
15. Hind wing with outer margin rounded ........ .............................................. *Gynaurocera*
    Hind wing with outer margin extremely produced .................................. *Histia*

Genus *Trypanophora* Kollar


Three species under this genus are known from India of which one is dealt with from Sikkim.

10. *Trypanophora semihyalina* Kollar


*Material examined*: Two exs., Sikkim, March.
Bhattacharya: Insecta: Lepidoptera: Zygaenidae

1896; 1 ex., Sikkim, July. 1896 and 1 ex., Sikkim, Jan. 1897 (Dudgeon’s coll.). Wing exp. 31-36 mm.

Distribution: India: Sikkim, Himachal Pradesh, Jammu and Kashmir, Meghalaya, South India and West Bengal; also Bangladesh (Dacca); East Pegu and Hong Kong.

Remarks: The spots and colours are very variable in different forms of this species. In typical semi hyalina the discal hyaline patches of the fore wing are large while in numeralis these are much reduced and when the colour of frons and tegulae is orange in these two forms, it is white in the form argyrospila (Hampson, 1892).

Genus Cyclosia Hübner


Five species and subspecies are recorded under this genus from India of which four are known from Sikkim.

Key to the species of Cyclosia

1. Fore wing with numerous veinlets from Sc to costa ............................................................... 2
- Fore wing without numerous veinlets from Sc to costa .......................................................... 3

2. Fore wing with veins R₃, R₄, R₅ and M₁ all much curved .......................................................... imitans
- Fore wing with veins R₃, R₄, R₅ and M₁ all not much curved, straight ........................................ midamina

3. Abdomen banded with blue and white .......................................................... papilionaris
- Abdomen not banded, entirely blue-green ........................................................................ panthona

11. Cyclosia imitans (Butler)


Material examined: One ex., Sikkim, 30.III.1888 and 2 exs., Sikkim, 6.IV.1884 (O. Moller coll.). Wing exp. 72 mm.

Distribution: India: Sikkim. Meghalaya; also Bhutan and Myanmar.

Remarks: The species is an excellent mimic of the butterfly, Danaus aglea.

12. Cyclosia midamina (Herrich-Schaffer)

1853. Epyrgis midamina Herrich-Schaffer, Ausserer. Schmett. 1, pl. 2, fig. 7.


Distribution: India: Sikkim, Assam, Meghalaya, Nagaland, West Bengal; also Bangladesh; Bhutan; Borneo; Java; Malacca; Myanmar; Singapore; Sri Lanka; Sumatra; Thailand and Vietnam.

Remarks: The colour and spots of the species are much variable and it is a beautiful mimic of the blue Euploeas.

13. Cyclosia panthona (Cramer)


Material examined: One ex., Sikkim. No date, (O. Moller coll.) and 3 exs., Sikkim, May, 1893, (Dudgeons coll.). Wing exp. 40-60 mm.

Distribution: India: Sikkim (Nagrishpur). Assam, Meghalaya, also China (Hong-Kong): Malacca; Myanmar; Sri Lanka and Thailand.

Remarks: In India, the distribution of the species is restricted to north east India.

14. Cyclosia papilionaris (Drury)


1 ex., 7.viii.1890. 1 ex., June, 1897. 2 exs., 1895. 1 ex., Aug. 1898. 1 ex., 16.viii.1888. 1 ex., Aug. 1896 (Dudgeon's coll.), 2 exs., No date, and 2 exs., 30.iii.1888, (O. Moller coll.). All old collections from Sikkim. Wing exp. 46–70 mm.

**Distribution**: India: Sikkim, Andamans, Assam, Kerala, Meghalaya, Nicobars, South India, Tamil Nadu; also Bangladesh; Bhutan; China; Java; Malacca; Myanmar and Sumatra.

**Remarks**: According to Fletcher (1925) the species *papilionaris* has seven subspecies. Hampson (1892) in *Fauna British India* described the male as *Pintia ferrea* Walker, while the female as *Cyclosia papilionaris* Drury.

**Genus Gynautocera** Guerin


The single species known under this genus from India is dealt with from Sikkim.

15. **Gynautocera papilionaria** Guerin


**Material examined**: Three exs., Sikkim, No date, (O. Moller coll.), Wing exp. 84–96.

**Distribution**: India: Sikkim, Assam, Jammu and Kashmir, Meghalaya, Nagaland, Uttar Pradesh, West Bengal and The Himalaya; also Annam; Bangladesh; Bhutan; China; Myanmar and Vietnam (Tong-King).

**Remarks**: In India, the distribution of the species is restricted mostly to the Himalayan region.

**Genus Histia** Hübner


One species with two subspecies, under this genus, are known from India of which nominate subspecies occurs in Sikkim.

16. **Histia rhodope rhodope** (Cramer)


**Material examined**: One ex., Sikkim. May, 1893, (G.C. Dudgeon's coll.), 4 exs., No date. (O. Moller coll.) and 1 ex., 1888. (No coll. Name) (all old NZ Collection). Wing exp. 70–80 mm.

**Distribution**: India: Sikkim, Assam, Meghalaya, Nagaland and West Bengal (Darjiling); also Bhutan; China (Hong-Kong) and Myanmar.

**Remarks**: There are two subspecies, *rhodope* is with ab. *albinacula*, from Meghalaya (India) and Myanmar, and others *nilgira* from Nilgiris (India).

**Genus Campylotes** Westwood


Three species known under this genus from India are also dealt with from Sikkim.

**Key to the species**

1. Fore wing with all the spots towards apex yellow........................................... *sikkimensis*

Fore wing with all the spots towards apex not yellow............................................. 2

2. Fore wing with a series of six white spots beyond the cell.................................. *histrionicus*

Fore wing with a series of four white spots beyond the cell.................................... *atkinsoni*

17. **Campylotes histrionicus** Westwood


**Material examined**: Five exs., Sikkim, No date. (O. Moller coll.), 1 ex., North Sikkim, Bob, 3 kms. of Chungthang, 1.x.1978 (T.K. Pal and party coll.). Wing exp. 51–56 mm.
Distribution: India: Sikkim, (Lebong, Raitdong), Jammu and Kashmir, Uttar Pradesh, Meghalaya, throughout the Himalaya; also Afghanistan and West China.

Remarks: The size and colour of the spots are variable in different forms of the species.

18. Campylotes sikkimensis Elwes


Distribution: India: Sikkim, Assam and Meghalaya at high altitudes.

Remarks: The species is recorded only from the high altitudes of Sikkim, Assam and Meghalaya.

19. Campylotes atkinsoni Moore


Material examined: 1ex., Sikkim, 6.ix.1896, (Dudgeon’s coll.), 11exs., No date, (O. Moller coll.), all old collection from NZC. Wing exp. 72 mm.

Distribution: India: Sikkim and West Bengal (Darjiling) high altitudes.

Remarks: The species is known to occur in the high altitudes of Sikkim and West Bengal.

Genus Erasmia Hope


Three species and subspecies under this genus are known from India and are dealt with from Sikkim.

Key to the species of Erasmia

1. Hind wing black ............................................ 2
   Hind wing pale yellow .................. pulchella

2. Fore wing with the veins broadly edged with vinous red .................. sanguiflua
   Fore wing with the veins not broadly edged with vinous red .................. aliris

20. Erasmia aliris aliris (Doubleday)


Material examined: Three exs., Sikkim. No other data. Wing exp. 86-92 mm.

Distribution: India: Sikkim, Assam, Nagaland, West Bengal and North India; also Bangladesh and Myanmar (Karen hills).

Remarks: The species aliris has two subspecies, the other aliris analis Jordan is recorded from Tenasserim, South Myanmar.

21. Erasmia sanguiflua sanguiflua (Drury)


1925. Erasmia sanguiflua, Fletcher, Cat. Indian Ins., Zygadenidae. pt. 9 : 44.

Material examined: One ex., Sikkim. 15.viii.1889 and 1 ex., Aug. 1897 (Dudgeon’s coll.). Wing exp. 100 – 110 mm.

Distribution: India: Sikkim, Meghalaya. West Bengal (Darjiling); also Bangladesh and Myanmar.

Remarks: In India, the distribution of this subspecies is restricted to north east India.

22. Erasmia pulchella pulchella Hope

1840. Erasmia pulchella Hope, Trans. Linn. Soc., 18 : 446. pl. 31, fig. 5.

Material examined: Three exs, Sikkim, October, Year? (O. Moller coll.). Wing exp. 80-90 mm.

Distribution: India: Sikkim, Assam, Meghalaya, Nagaland, West Bengal (Darjiling); also Myanmar and Nepal (Khatmandu).

Remarks: In India, the distribution of the subspecies is restricted in the north eastern region.

Genus Agalope Walker


Five species and subspecies under this genus are recorded from India and also from Sikkim of which four are represented here, the reviewed from literature.

Key to the species of Agalope

1. Fore wing shorter.......................... hyalina
   Fore wing longer............................. 2

2. Fore wing vein M1 given off close to R5....................... 3
   Fore wing vein M1 given away from R5.......................... bifasciata

3. Fore wing a subbasal orange band edged with black................... eronioides
   Fore wing a subbasal brown band not edged with black............... glacialis

23. Agalope bifasciata (Hope)


Material examined: One male Sikkim, Deorali, 1500 m, 23. ix.1978 (A.N.T. Joseph and party coll.) and 1 ex., No date, (O. Moller coll.). Wing exp. 90 mm.

Distribution: India: Sikkim, Assam, Meghalaya, Uttar Pradesh (Nainital); also Bhutan; Myanmar and Nepal.

24. Agalope eronioides eronioides (Moore)


Material examined: Seven exs., Sikkim, No date, (O. Moller coll), 1 ex., 30.ix.1888. 1 ex., 6.v.1889 (Dudgeon’s coll). Wing exp. 42-50 mm.

Distribution: India: Sikkim, Himachal Pradesh (Simla), Uttar Pradesh (Mussouri) to Sikkim, West Bengal (Darjiling); also Afghanistan; Bhutan and Myanmar.

Genus Philopator Moore


Two species under this genus are known from India and are also recorded from Sikkim.

Key to the species of Philopator

1. Wings large and produced..........................
   ................................................................ basimaculata
- Wings shorter and rounded .......... rotunda

27. Philopator basimaculata Moore


*Matter examined*: Two exs., Sikkim, No date, (O. Moller coll.), lex., Oct., 1888 (Dudgeon’s coll.). Wing exp. 50 m., 44–58 mm.

*Distribution*: India: Sikkim (Raitong), Manipur, Meghalaya, Nagaland and West Bengal (Darjiling).

*Remarks*: The distribution of the species is restricted to the north-eastern hills of India.

28. Philopator rotunda Hampson


*Distribution*: India: Sikkim, Manipur, Meghalaya and Nagaland.

*Remarks*: The distribution of the species is restricted to the north-eastern region of India only.

Genus Cadphises Moore


Three species and subspecies under this genus are known from India of which one sp. is recorded from Sikkim.

29. Cadphises maculata Moore


*Matter examined*: One ex., Sikkim, No other data. Wing exp. 70 mm.

*Distribution*: India: Sikkim, Meghalaya and West Bengal (Darjiling).

*Remarks*: The distribution of the species is restricted to north-east India.

Genus Corma Walker


*Matter examined*: One ex., Sikkim. May, 1897 (Dudgeon’s coll.). Wing exp. 40-45 mm.

*Diagnostic characters*: Fore wing with a fuscous band along the basal half of costa, a spot at middle of cell and one on vein 1c, post medial and marginal maculate bands. Hind wing with a fuscous spot on the costa, near end of cell and a maculate apical band.

*Distribution*: India: Sikkim, Meghalaya; also West Myanmar (Chin hills).

*Remarks*: This is the first specific locality record of the species from Sikkim.

Genus Psaphis Walker


The single species with the nominotypical subspecies known from India, under this genus, is also treated from Sikkim.

31. Psaphis euscheloides euscheloides (Moore)

Material examined: One ex., Sikkim, 10.iii.1890, (Dudgeon’s coll.). Wing exp. 62 mm.

Distribution: India: Sikkim; also Bangladesh and East Pegu.

Remarks: From India the species is recorded from Sikkim only. It is a beautiful mimic of the geometrid moth *Euschemas* of the *bellona* group.

Genus *Eterusia* Hope


Thirteen species and subspecies under this genus are known from India of which nine species and subspecies are recorded from Sikkim. Seven species and subspecies are dealt with hereunder, other two have been appended at the end.

Key to the species of *Eterusia*

1. Abdomen black ............................................. 2
   Abdomen not black ....................................... 5

2. Hind wing not bright golden yellow ............. 3
   Hind wing bright golden yellow ................... 4

3. Hind wing with the inner area below the median nervure shot with metallic blue ..........
   .................................................................... repleta
   Hind wing with the inner area below the median nervure not shot with metallic blue ...........
   ..................................................................... circinata

4. Hind wing with the base black .................... ..
   ......................................................................... nigribasalis
   Hind wing with the base yellow .................... ...
   .......................................................................... pulchella

5. Abdomen blue-green ...............................
   Abdomen yellow ........................................... 6

6. Fore wing with the spots of the medial band longer and superposed ................ aedea
   Fore wing with the spots of the medial band small and well separated .................. tricolor

32. *Eterusia aedea edocla* (Doubleday)


Material examined: Three exs., Sikkim. No date, (O. Moller coll.); 1 ex., No date, (H.J. Elwes coll.). 2 exs., No date, 3 exs., 22.iii.1888, (O. Moller coll.), 1 ex., 17.iii.1889, 1 ex., 22.viii.1890, 1 ex., 30.iv.1887 and 1 ex., May, 1897 (Dudgeon’s coll.). Wing exp. 65-80 mm.

Distribution: India: Sikkim, Assam, Meghalaya, Nagaland, West Bengal; also Myanmar and Nepal.

Remarks: The distribution of the species and subspecies is restricted to the eastern part of the Indian subregion.

33. *Eterusia tricolor* Hope


Material examined: One ex., Sikkim, 10.iii.1889, 1 ex., 18.vii.1888, 1 ex., v.1894, 7.ix.1888, and 1 ex., 20.vi.1894 (all Dudgeon’s coll.). Wing exp. 60-75 mm.

Distribution: India: Sikkim, Assam, Meghalaya, Nagaland; also Bangladesh; Bhutan; West China; Nepal; East Pegu and East Tibet border (Omei-shan).

Remarks: In India, the distribution of the species is restricted to the north eastern region only.

34. *Eterusia repleta* Walker


Material examined: One ex., Sikkim. No other data. Wing exp. 72-62-86 mm.

Distribution: India: Sikkim, Assam, Nagaland; also Bhutan; Cambodia and Myanmar.

Remarks: In India, the distribution of the species is restricted to the north eastern region only.
35. *Eterusia raja* Moore


*Material examined*: One ex., Sikkim, No other data. Wing exp. 72-62-86 mm.

*Distribution*: India: Sikkim, Assam, Nagaland; also Bhutan; Cambodia and Myanmar.

*Remarks*: In India, the distribution of the species is restricted to the north eastern region only.

36. *Eterusia pulchella pulchella* (Kollar)


*Material examined*: One ex., Sikkim, 2.v.1888, 1 ex., Oct. 1888, 1 ex., 7.x.1888, 1 ex., x.1897 (all Dudgeon's coll.); 4 exs., No other data, 1 ex., No date, (O. Moller coll.). Wing exp. 34-50 mm.

*Distribution*: India: Sikkim, Jammu and Kashmir, Meghalaya, Uttar Pradesh hills, West Bengal (Darjiling); also Afghanistan; China and Myanmar.

*Remarks*: This is the first specific locality record of the subspecies from Sikkim.

37. *Eterusia nigribasalis* (Hampson)


*Material examined*: One ex., Sikkim, 5.x.1888 and 1 ex., 25.iv.1888 (Dudgeon's coll.). Wing exp. 44 mm.

*Distribution*: India: Sikkim, Meghalaya (Cherrapunji).

*Remarks*: Type locality of the species is Sikkim.

38. *Eterusia circinata* (Herrich-Schaffer)


*Material examined*: One ex., Sikkim, l.x.1887 and 1 ex., Sikkim, l.x.1888 (Dudgeon's coll.) and 5 exs., No date, (O. Moller coll.). Wing exp. 61-63 mm.

*Distribution*: India: Sikkim, Assam and Meghalaya (Khasis, Shillong).

*Remarks*: The distribution of the species is restricted to Eastern India only.

Genus *Pidorus* Walker


Seven species and subspecies under this genus are known from India of which five are recorded from Sikkim. The species *Pidorus circumdata* is now transferred under the genus *Pseudoscaptesyle*. Two species are described here, other three have been appended at the end due to paucity of material at hand from Sikkim.

**Key to the species of Pidorus**

Smaller in size, 30-40 mm.............. *gemina*  
Larger in size, 50-60 mm............ *glaucopis*.

39. *Pidorus gemina* (Walker)


*Material examined*: One ex., Sikkim, No date, (O. Moller coll.), and 1ex.. Sikkim, No date, (Dudgeon's coll.) Wing exp. 32-40 mm.

*Distribution*: India: Sikkim and Meghalaya (Khasis); also Bangladesh (Sylhet); Bhutan; Borneo; Cambodia; China and Myanmar.

*Remarks*: In India the distribution of the species is restricted to the north eastern region only.
40. *Pidorus glaucopis glaucopis* (Drury)


*Material examined*: One ex., Sikkim, July, 1897, 1 ex., Sikkim, 14.x.1890 (Dudgeon’s coll.), 3 exs., Sikkim, No date, 1 ex., Sikkim, l.xi.1885 and 1 Pakyong, 10.x.1995 (S.C. Mitra and party coll.). Wing exp. 50-60 mm.

*Distribution*: India: Sikkim, Assam, Meghalaya, Nagaland and West Bengal; also Bangladesh; Bhutan, Myanmar and Vietnam (Tong King).

*Remarks*: In India, the distribution of the species is restricted to the north eastern region only.

Genus *Chalcosia* Hubner


Four species and subspecies under this genus are known from India of which two are reported from Sikkim. Only nominate subspecies is treated here, the other is appended at the end due to paucity of material in hand.

41. *Chalcosia adalifa adalifa* (Doubleday)


*Material examined*: One ex., Sikkim, No date, (Old NZ Collection). Wing exp. 62 mm.

*Distribution*: India: Sikkim, Meghalaya, West Bengal; also Bangladesh; Bhutan; West China; Myanmar and Vietnam (Tong King).

*Remarks*: The distribution of the species is restricted to the north eastern part of India only.

Genus *Retina* Walker


One species under this genus is known from India and is also recorded from Sikkim. The genus is not included in the key of the subfamily *Chalcosiinae*.

42. *Chalcophaedra zuleika* (Doubleday)


*Material examined*: One ex., Sikkim, l.ix.1887, and 1 ex., Sikkim, July, 1897, (Dudgeon’s coll.) also 3 exs., 28.xi.1888 (O. Moller coll.). Wing exp. 50 – 60 mm.

*Distribution*: India: Sikkim, Meghalaya; also Bangladesh; Bhutan and Myanmar.

*Remarks*: The distribution of the species in India is restricted to the north eastern part only.

Genus *Pseudoscaptesyle* Hering


One species under this genus known from India is dealt with from Sikkim. This genus is not included in the key of the subfamily *Chalcosiinae*.
44. Pseudoscaptesyle circumdata

Material examined: One ex., Sikkim, July, 1889, (Dudgeon's coll.) and 2 exs., No date, (O. Moller coll.). Wing expo 38 mm.

Distribution: India: Sikkim.

Remarks: The subspecies circumdata is endemic to Sikkim.

Subfamily ZYGAENINAE

1. Artona flaviciliata Hampson

1925. Artona flaviciliata, Fletcher, Cat. Indian Ins., Zygaenidae, pt. 9: 3.

Distribution: India: Sikkim.

Remarks: The species is endemic to Sikkim.

2. Artona postalba Elwes


Distribution: India: Sikkim.

Remarks: The species is endemic to Sikkim.

3. Artona posthyalina Hampson


Distribution: India: Sikkim.

Remarks: The species is endemic to Sikkim.

4. Artona postvitta Moore


Distribution: India: Sikkim and West Bengal (Darjiling).

Remarks: The distribution of the species in India is restricted to north eastern part only.

5. Artona sikkimensis Elwes

1925. Artona sikkimensis, Fletcher, Cat. Indian Ins., Zygaenidae, pt. 9: 5.

Distribution: India: Sikkim.
Remarks: The species is endemic to Sikkim.

6. Artona zebra Elwes

1890. Artona zebra Elwes, Proc. zool. Soc. Lond., p. 379, pl. 32, fig. 11.

Distribution: India: Sikkim.

Remarks: This endemic species has been recorded at the high altitude of Sikkim (11000 ft.).

7. Platyzugaena molleri (Elwes)


Distribution: India: Sikkim (Chengtong) and Assam.

Remarks: The distribution of the species in India is restricted to north eastern part only.

Subfamily CHALCOSIINAE

8. Arbudas bicolor Moore


Distribution: India: Sikkim, Meghalaya, West Bengal; also Bhutan.

Remarks: The distribution of the species in India is restricted in the north eastern part only.

9. Agalope basiflava (Moore)

1925. Agalope basiflava, Fletcher, Cat. Indian Ins., Zygaenidae, pt. 9 : 45.

Distribution: India: Sikkim and West Bengal (Darjiling).

Remarks: The distribution of the species in India is restricted to the north eastern part, specially in the high altitudes.

10. Cadphises moorei moorei Butler


Distribution: India: Sikkim, Meghalaya, Nagaland, West Bengal; also Bhutan.

Remarks: The distribution of the species in India is restricted to the north eastern part only.

11. Herpa subhyalina Moore


Distribution: India: Sikkim (Lachung Valley), Assam; also Tse-Kou (East Tibet border).

Remarks: The distribution of the species in India is restricted in the north eastern part only.

12. Eterusia lativitta Moore


Distribution: India: Sikkim, Meghalaya, Nagaland, West Bengal; also Myanmar.

Remarks: The distribution of the species in India is restricted to the north eastern part only.

13. Eterusia shahama Moore


Distribution: India: Sikkim and West Bengal (Darjiling).

Remarks: The distribution of the species is restricted in the high altitudes of Sikkim and West Bengal, north-eastern states of India.

14. Pidorus circe (Herrich-Schaffer)

BHATTACHARYA : *Insecta : Lepidoptera : Zygaenidae*


**Distribution** : India : Sikkim, Assam, Meghalaya, Nagaland; also Bangladesh (Sylhet).

15. *Pidorus miles* (Butler)


**Distribution** : India : Sikkim, West Bengal (Darjeeling); also Bhutan.

**Remarks** : The distribution of the species is restricted in the north eastern part of India only.

16. *Pidorus truncatus* Jordan

1902. *Pidorus truncatus* Jordan, Seitz's *MacroLep. World.*, 3 : 36, pl. 6, fig. g.


**Distribution** : India : Sikkim.

**Remarks** : The species is endemic to Sikkim.

17. *Chalcosia pectinicornis argentata* Moore


**Distribution** : India : Sikkim, north east Assam and Meghalaya.

**Remarks** : The distribution of this subspecies is restricted in the north-east part of India.

18. *Phlebohecta fuscascens* (Moore)


**Distribution** : India : Sikkim, Meghalaya, West Bengal (Darjiling); also Bhutan.

**Remarks** : The distribution of the species is restricted to the north eastern region of India.

19. *Phlebohecta lithosina flavicosta* (Elwes)


**Distribution** : India : Sikkim; also Myanmar.

**Remarks** : In India, this subspecies is recorded from Sikkim only.

**Subfamily PHAUDINAE**

20. *Phauda fuscalis* Swinhoe


**Distribution** : India : Sikkim and Assam.

**Remarks** : The distribution of the species is restricted to the north eastern region of India.

**Subfamily HIMANTOPTERINAE**

21. *Himantopterus caudatus* (Moore)


**Distribution** : India : Sikkim (Pankabari ?), Assam, North India (?), South India (Nilgiris); also Bababudin hills Wynaad and Myanmar.

**Remarks** : The distribution of the species for Sikkim is doubtful. Pankabary previously under Sikkim is now in West Bengal near Darjiling.

**SUMMARY**

The present work includes systematic account of a total of 66 species and subspecies under 9 genera of zygaenids with keys, diagnostic characters, distribution etc. of four species and subspecies are new locality records and six species are endemic to Sikkim. The type locality of a single species, *Eterusia nigribasalis*, is also reported from Sikkim.

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INTRODUCTION

The present work includes a comprehensive account of moths of the family Arctiidae from Sikkim. This is based on the moths collected by different survey parties of Zoological Survey of India and also the specimens available in old National Zoological Collection of Zoological Survey of India.

The moths of this family have generally stout body, brightly coloured wings bearing long, narrow to moderately broad and prominent spots. So far, 3500 species of moths of Arctiidae are known from world, including 450 species occurring in India. The state of Sikkim account for 182 species (40%) of total Arctiids species found in India.

Cotes & Swinhoe (1887-89) Catalogued species of moths of several families including Arctiidae from India, followed on their studies by Hampson (1894, 1900, 1901, 1905, 1914), Seitz (1913), Draudt (1914), Rothschild (1914) and Roepke (1944). Strand (1919-1922) and Bryk (1937) also catalogued species of moths of the family Arctiidae from Sikkim and adjoining areas.

The contributions to the studies on these moths from North Eastern States of India are by Dudgeon (1903), Arora and Chaudhury (1982), Ghosh & and Chaudhury (1997, 1998).

The classification and nomenclature of species of family Arctiidae have been followed mainly after Hampson (1900, 1901).

Altogether, 182 species have been dealt with from Sikkim. The species represented in eight subfamilies are Nolinae (27 spp), Arctiinae (15 spp), Rhodogastriinae (1sp), Nyctemerini (4 spp), Callimorphinae (4 spp) Spilosominae (14 spp), Lithosiinae (113 spp) and Micrarctiinae (4 spp). These studies have brought to light 40 species (marked with y) endemic to Sikkim and nine species (marked with *) as first records.

The keys to identification of species, genera and subfamilies have been given. The wing expanse and distribution of each species have also been provided.

SYSTEMATIC LIST

Family ARCTIIDAE
A. Subfamily NOLINAЕ

Genus I Cleama Walker

+y1. Celama lativitatta (Moore)
+2. Celama encausta (Hampson)
3. Celama fasciata (Hampson)
+4. Celama astigma (Hampson)
+y5. Celama duplicilenea (Hampson)
+y6. Celama suffusa (Hampson)
+7. Celama marginata (Hampson)
8. Celama squalida (Staudinger)
9. Celama pumila (Snellen)
+10. Celama phaeochroa Hampson
+11. Celama flexuosa (Pouj)
+y12. Celama polia (Hampson)

Genus II Roesalia Huebner

+13. Roesalia scripta Moore
+y14. Roesalia strigivena (Hampson)
+y15. Roesalia denticulata Moore
16. *Roesalia orgyria* (Hampson)
+17. *Roesalia argentescens* (Hampson)
+18. *Roesalia semirufa* (Hampson)
+19. *Roesalia cuneifera* (Walker)

Genus III *Nola* Leach

+20. *Nola brunella* (Hampson)
+21. *Nola loxoscia* Hampson
+22. *Nola argentalis* (Moore)
+23. *Nola melanota* (Hampson)
+24. *Nola tristicta* (Hampson)
+25. *Nola distributa* (Walker)

Genus IV *Melanographia* Hampson

+26. *Melanographia tympanistis* Dudgeon

Genus V *Dialithoptera* (Hampson)

+27. *Dialithoptera gemmata* (Hampson)

Subfamily ARCTIINAE

Genus VI *Baroa* Moore

+28. *Baroa vatala* Swinhoe

Genus VII *Arctia* Schrank

*29. Arctia tibetica* Felder

Genus VIII *Maenas* Huebner

+30. *Maenas venosa* (Moore)

Genus IX *Diacrisia* Huebner

31. *Diacrisia rhodophila* (Walker)
+32. *Diacrisia multivittata* (Moore)
+33. *Diacrisia punctata* (Moore)
+34. *Diacrisia flavalis* (Moore)
+35. *Diacrisia stigmata* (Moore)
+36. *Diacrisia multiguttata* (Walker)
+37. *Diacrisia gopara* (Moore)
+38. *Diacrisia dentilinea* (Moore)
+39. *Diacrisia sordidescens* (Moore)
+40. *Diacrisia sikkimensis* (Moore)

41. *Diacrisia fulvohirta* (Walker)
42. *Diacrisia impleta* (Walker)

Subfamily RHODOGASTRIINAE

Genus X *Rhodogastria* Huebner

*43. Rhodogastria astreus* (Drury)

Genus XI *Dilemera* Huebner

44. *Dilemera arctata* (Walker)

Genus XII *Nyctemera* Huebner

45. *Nyctemera varians* Walker
46. *Nyctemera cenis* (Cramer)
47. *Nyctemera adversata* (Schaller)

Subfamily CALLIMORPHINAE

Genus XIII *Callimorpha* Latreille

*48. Callimorpha plagiata* (Walker)
49. *Callimorpha nyctemerata* (Moore)
50. *Callimorpha principalis* (Kollar)
51. *Callimorpha equitalis* (Kollar)

Subfamily SPILOSOMINAE

Genus XIV *Phissama* Moore

52. *Phissama transiens* (Walker)

Genus XV *Creatonotos* Huebner

53. *Creatonotos gangis* (Linnaeus)

Genus XVI *Alphaea* Walker

+54. *Alphaea quadriramosa* (Kollar)

Genus XVII *Spilarctia* Butler

55. *Spilarctia lubricipeda* (Linnaeus)
+56. *Spilarctia nigrifrons* (Walker)
+57. *Spilarctia melanosoma* (Hampson)
+58. *Spilarctia obliquivitta* Moore
59. *Spilarctia flavens* (Moore)
60. Spilarctia rubitincta (Moore)
61. Spilarctia casigneta (Kollar)
62. Spilarctia obliqua (Walker)

Genus XVIII Areas Walker
63. Areas imperialis Walker
64. Areas galactina (Hoeven)

Genus XIX Olepa Watson
65. Olepa ricini (Fabricius)

Subfamily LITHOSIINAE
Genus XX Neoblavia Hampson
y+66. Neoblavia scoteola Hampson

Genus XXI Lexis Wallengren
67. Lexis fulveola Hampson

Genus XXII Poliosia Hampson
68. Poliosia muricolor parva (Moore)
y+69. Poliosia punctivena (Hampson)
+70. Poliosia brunnea (Moore)
+71. Poliosia cubitifera (Hampson)

Genus XXIII Lobobasis Hampson
+72. Lobobasis niveimaculata Hampson

Genus XXIV Chrysorabdia Butler
73. Chrysorabdia viridata (Walker)

Genus XXV Mithuna Moore
+74. Mithuna quadriplaga Moore
y+75. Mithuna strigifera Hampson

Genus XXVI Strysopha Arora & Chaudhury
76. Strysopha tortricoides (Walker)

Genus XXVII Eilema Huebner
+77. Eilema tumida (Walker)
78. Eilema tetragona (walker)
+79. Eilema plumbeomicans (Hampson)
y+80. Eilema brunnea (Moore)
81. Eilema vagessa (Moore)
+82. Eilema oblitterans (Felder)
+83. Eilema conformis (Walker)
+84. Eilema auriflua (Moore)
85. Eilema reticulata (Moore)
y+86. Eilema quadriseignata (Moore)
y+87. Eilema terminalis (Moore)
+88. Eilema nigripars (Walker)
y+89. Eilema varana (Moore)
+90. Eilema nigripes (Hampson)
y+91. Eilema xanthocrasps (Hampson)
92. Eilema fumidiscia (Hampson)
+93. Eilema vicaria (Walker)

Genus XXVIII Teulisina Walker
+94. Teulisina protuberans (Moore)

Genus XXIX Prabhasa (Moore)
+95. Prabhasa venosa (Moore)

Genus XXX Zadadra Moore
96. Zadadra distorta (Moore)

Genus XXXI Chrysaeglia Butler
97. Chrysaeglia magnifica (Walker)

Genus XXXII Hemonia Walker
+98. Hemonia orbiferana Walker

Genus XXXIII Agrisius Walker
99. Agrisius guttivitta Walker

Genus XXXIV Agylla Walker
y+100. Agylla apicalis (Moore)
101. Agylla divisa (Moore)
y+102. Agylla beema (Moore)
y+103. Agylla rufifrons (Moore)
y+104. Agylla albocinerea (Moore)
+105. Agylla prasena (Moore) 106. Agylla maculata (Moore)
+107. Agylla bipars (Moore) 108. Agylla ramelana (Moore)
*109. Agylla alboluteola Rothschild

Genus XXXV Cyclomilta Hampson

+110. Cyclomilta melanolepia Hampson

Genus XXXVI Cyana Walker

111. Cyana alborosea (Walker) +112. Cyana effracta (Walker)
*113. Cyana signa (Walker) 114. Cyana adita (Moore)
115. Cyana guttifera (Walker) 116. Cyana molleri (Elwes)
117. Cyana perornata (Walker) +118. Cyana arama (Moore)
+119. Cyana candida (Feeder) 120. Cyana detrita (Walker)
+121. Cyana sikkimensis (Elwes) 122. Cyana puer (Elwes)
+123. Cyana dohertyi (Elwes)

+124. Cyana divakara (Moore) 125. Cyana bellissima (Moore)
+126. Cyana dudgeoni Hampson 127. Cyana gelidla (Walker)
128. Cyana gazella (Moore) 129. Cyana coccinea (Moore)
+130. Cyana bianca (Walker)

Genus XXXVII Siccia Walker

+131. Siccia taprobanis (Walker) +132. Siccia sagittifera (Moore)

Genus XXXVIII Oxacme Hampson

133. Oxacme dissimilis Hampson

Genus XXXIX Ovipennis Hampson

+134. Ovipennis dudgeoni (Elwes)

Genus XL Stictane Hampson

+135. Stictane fractilinea Hampson

Genus XLI Asura Walker

136. Asura nubifascia (Walker) +137. Asura melanoleuca (Hampson)
+138. Asura dasara (Moore) 139. Asura undulosa (Walker)
+140. Asura obsoleta (Moore)
+141. Asura frigida (Walker) 142. Asura euprepioides (Walker)
+143. Asura conjunctana (Walker) 144. Asura flavivenosa (Moore)
+145. Asura humilis (Walker) 146. Asura nebulosa (Moore)
147. Asura strigipennis (Herrich-Schaffer)
*148. Asura arcuata (Moore) +149. Asura floccosa (Walker)
+150. Asura rubricosa (Moore) 151. Asura congérens (Felder)
+152. Asura anomala (Elwes) +153. Asura rubrimargo (Hampson)

Genus XLII Asuridia Hampson

+154. Asuridia metaphoea (Hampson)

Genus Parasiccia Hampson

+155. Parasiccia maculifascia (Moore)

Genus XLIV Miltochrista Huebner

+156. Miltochrista flavicollis (Moore) 157. Miltochrista cardinalis (Hampson)
+158. Miltochrista postnigra (Hampson) 159. Miltochrista punicea (Moore)
160. Miltochrista cuneonotata (Walker) 161. Miltochrista cruciata (Walker)
162. Miltochrista inflexa (Moore)
163. Miltochrista roseata (Walker)
164. Miltochrista gratiosa (Guerin & Meneville)
165. Miltochrista linga (Moore)
*166. Miltochrista eccentrica (Meyrick)
+167. Miltochrista radians (Moore)
+Y 168. Miltochrista delicata (Moore)
+Y 169. Miltochrista proleuca (Hampson)
+170. Miltochrista spilosomoides (Moore)
*171. Miltochrista magna (Hampson)
+Y 172. Miltochrista perpollida (Hampson)

Genus XLV Hemispilia Hampson

+Y 173. Hemispilia coa-vestis (Hampson)

Genus XLVI Nudaria Hawarth

+174. Nudaria fumidisca (Hampson)
+175. Nudaria suffusa (Hampson)
+176. Nudaria fasciata (Moore)
+177. Nudaria margritiacea (Walker)

Genus XLVII Stigmatophora Staudinger

*178. Stigmatophora palmata (Moore)

Subfamily MICRACTINAE

Genus XLVIII Argina Huebner

179. Argina argus (Kollar)
+180. Argina syringa (Cramer)
181. Argina astrea (Drury)

Genus XLIX Utetheisa Huebner

182. Utetheisa pulchella (Linnaeus)

(Systems marked with plus (+) are reviewed from literature)

SYSTEMATIC ACCOUNT

Key to subfamilies

1. Fore wing with tufts of raised scales .......
   ................................. NOLINÆ
   - Fore wing without tufts of raised scales .2
   2. Body stoutly built in one or both sexes ...3
   - Body slenderly built in one or both sexes
   3. Proboscis not always functional .............
      ........................................... ARCTIINÆ
   - Proboscis always functional ..................4
   4. Palpi upturned...... RHODOGASTRIINÆ
   - Palpi prorect .............................5
   5. Antennae bipectinate, wings usually white
      ........................................ NYCTEMERINÆ
   - Antennae variable, wings usually blackish,
      ........................................6
   6. Fore wing markings in form of bands......
      ........................................ CALLIMORPHINÆ
   - Fore wing markings reduced to dots........
      ........................................ SPilosominæ
   7. Head usually broad. Fore wing very long
      and hindwing uncommonly large ............
      ........................................ LITHOSIINÆ
   - Head not so broad. Fore wing and hindwing
      moderately large ........ MICRARCTINÆ

Subfamily NOLINAE

Key to genera

1. Fore wing vein R2 absent ....................
   ........................................... Celama Walker
   - Fore wing vein R2 present ................. 2
   2. Fore wing vein R3 absent. .................3
   - Fore wing vein R3 present ................
      ........................................... Roesalla Hubner
   3. Hind wing vein M3 absent ....... Nola Leech
   - Hind wing vein M3 present .............. 4
   4. Fore wing vein R5 given off from R4 after
      R2 ........................................ Melanographia Hampson
   - Fore wing vein R5 given off from R4 before
      R2 ........................................ Dialithoptera Hampson.

I. Genus Celama Walker


Key to species

1. Antennae of male bipectinate ............... 2.
   - Antennae of male ciliated .................. 6
2. Fore wing with medial band .................. 3.
   - Fore wing without medial band ................ 4
3. Fore wing medial black band not confluent with the postmedial dots ........................................... lativittata (Moore)
   - Fore wing medial black band confluent with the postmedial series of dots below the cell .................. encausta Hampson
4. Fore wing with large oblique elliptical brownish antemedial and medial costal stigmata .......................... fasciata (Walker)
   - Fore wing without large antemedial and medial costal stigmata ............................................. 5
5. Fore wing antemedial line strongly defined by black ....................... astigma (Hampson)
   - Fore wing antemedial line not defined by black .................. duplicilinea Hampson
6. Fore wing with prominent blackish band or suffusion on inner side of postmedial line .................... suffusa Hampson
   - Fore wing without blackish band or suffusion ................................................................. 7
7. Fore wing with large fan shaped medial and postmedial tufts of scales .............................. marginata (Hampson)
   - Fore wing with small tufts of scales .......... 8
8. Fore wing with tufts of scales at middle and end of cell ................................................... 9
   - Fore wing without tufts of scales at middle and end of cell ............................................. 10
9. Fore wing with medial area whitish ................ squalida (Staudinger)
   - Fore wing uniform brownish ..................... pumila (Snellen)
10. Fore wing postmedial line strongly excurved below costa to vein cula ...................... 11.
    - Fore wing postmedial line slightly curved

State Fauna Series 9, Fauna of Sikkim

1. Celama lativittata (Moore)

Wing expanse : 20 mm.
Distribution : India (Sikkim.).

2. Celama encausta Hampson

Wing expanse : 18 mm.
Distribution : India : Sikkim. Assam and Nagaland.

3. Celama fasciata (Walker)

1900. Celama fasciata (Walker) ; Hampson, Cat. Lep. Phal. Brit. Mus., 2 : 10
Material examined — 2 exs : Sikkim, 549 m., July' 1897 (Coll. G.C. Dudgeon)
Wing expanse : 20-22 mm.
Distribution : India : Sikkim. Tamil Nadu Elsewhere : Borneo, Nawalapitya, Queensland, Sarawak and Sula

4. Celama astigma (Hampson)

1894. Nola astigma Hampson, Fauna Brit. India, Moths, 2 : 140
1894. Nola astigma (Hampson), Hampson Cat. Lep. Phal. Brit. Mus., 2 : 12, pl. 18, fig. 7.
Wing expanse : 18-22 mm.
Distribution : India : Sikkim. Assam and Nagaland
5. *Celama duplicilinea* Hampson


**Wing expanse**: 22 mm

**Distribution**: India : Sikkim.

6. *Celama suffusa* Hampson


**Wing expanse**: 18 mm.

**Distribution**: India : Sikkim

7. *Celama marginata* (Hampson)


**Material examined**: 2 exs; Sikkim, 549 m., July' 1897 (coll. G. C. Dudgeon)

**Wing expanse**: 18 mm.


8. *Celama squalida* (Staudinger)


**Wing expanse**: 14 mm.

**Distribution**: India: Sikkim. Maharashtra, N.W. Himalaya. Elsewhere : Beirut, Bhutan, China, Frankfort, Java, Madagascar, Malaya, Pakistan, Pulo Lout, Queensland, Sind, Spain, Srilanka, Syria and Tonga.

9. *Celama pumila* (Snellen)

1874. *Nola pumila* Snellen, *Tijd. V. Ent.*, 17 : 68, pl.6, fig. 4.


**Wing expanse**: 14 mm.

**Distribution**: India : Sikkim. Assam, Maharashtra, Meghalaya, Tamil Nadu. Elsewhere: Burneo, Celebes, China, Myanmar, New Guineas Portmoresby, Shanghai, Sarawak, Sukotra and Taiwan.

10. *Celama phaeochroa* Hampson


**Wing expanse**: 21-23 mm.

**Distribution**: India : Sikkim. Elsewhere : Java and Mt. Arjuna.

11. *Celama flexuosa* (Pouj)


**Wing expanse**: 16-20 mm.


12. *Celama polia* Hampson


**Wing expanse**: 18-20 mm.

**Distribution**: India : Sikkim.

II Genus *Roesalia* Huebner


**Key to species**

1. Fore wing with a prominent irregular dentate postmedial line ............................................. 2.

   – Fore wing without dentate postmedial line ................................................................. 4.

2. Forewing with double postmedial line.......................... scriptu Moore.

   – Forewing with single postmedial line ...... 3.

3. Hindwing brown, vein M3 stalked with Cula strigivena (Hampson) ............................... 2.

   – Hindwing brownish white, vein M3 absent .......................... denticulata Moore.
4. Forewing ground colour silvery white .....5.
   Forewing ground colour not silvery white ........................................6.
5. Forewing with prominent black spot below middle of cell ...............argyria (Hampson).
   Fore wing without black spot below middle of cell ......................argentescens (Hampson).
6. Forewing apical half bright rufous .................. selniru/a (Hampson).
   Forewing with triangular rufous patch from costa to lower angle of cell .................cuneifera (Walker)

13. **Roesalia scripta** Moore


*Wing expanse* : 22-24mm

*Distribution* : India : Sikkim, Dalhousie, Himachal Pradesh and N.W. Himalaya.
*Elsewhere* : Pakistan.

14. **Roesalia strigivena** (Hampson)


*Wing expanse* : 22mm

*Distribution* : India : Sikkim.

15. **Roesalia denticulata** Moore


*Wing expanse* : 24mm

*Distribution* : India : Sikkim.

16. **Roesalia argyria** (Hampson)


*Wing expanse* : 26mm

*Distribution* : India : Sikkim, Assam and Meghalaya.

17. **Roesalia argentescens** (Hampson)


*Wing expanse* : 28mm

*Distribution* : India : Sikkim.

18. **Roesalia semirufa** (Hampson)


*Wing expanse* : 28mm

*Distribution* : India : Sikkim.

19. **Roesalia cuneifera** (Walker)


*Wing expanse* : 32mm

*Distribution* : India : Sikkim.
*Elsewhere* : Bhutan, Borneo and Sarawak.

### III Genus **Nola** Leach


**Key to species**

1. Fore wing with red brown suffusion ......2.
   – Fore wing without red brown suffusion ...3.
2. Head and thorax whitish. Palpi very long. Wings with black points.................................
   ........................................brunella (Hampson)
   – Head and thorax reddish brown. Palpi moderate. Wings with black streaks ............
Insecta: Lepidoptera: Arctiidae

3. Fore wing with blackish patch subquadrate and large ........................................ 4.
   - Fore wing with blackish patch subtriangular and small ........................................ 5.
4. Fore wing with the postmedial line continuous and dentate .................. argentalis (Moore)
   - Forewing with the postmedial line punctiform ........................................ melanota Hampson.
5. Fore wing with black spot on inner margin at the postmedial line .................. tristicta Hampson
   - Fore wing without black spot on inner margin at the postmedial line .................. distributa (Walker)

20. Nola brunella (Hampson)

1893. Rhyncopalpus brunellus Hampson. III. Het., 9: 89, pl. 158.
   Wing expanse : 20mm

21. Nola loxoscia Hampson

   Wing expanse : 22mm
   Distribution : India : Sikkim.

22. Nola argentalis (Moore)

   Material examined : 2exs : Sikkim, No other data (Coll. O. Moller)
   Wing expanse : 35mm
   Distribution : India : Sikkim.

23. Nola melanota Hampson

1900. Nola melanota Hampson, Cat. Lep. Phal. Brit. Mus., 2: 35-36, pl. 19, fig. 3:
   Wing expanse : 22-24mm
   Distribution : India : Sikkim. Assam and Meghalaya.

24. Nola tristicta Hampson

   Wing expanse : 18-20mm
   Distribution : India : Sikkim. Assam and Meghalaya.

25. Nola distributa (Walker)

   Wing expanse : d' -18-20mm, 9'-26-28mm.

IV Genus Melanographia Hampson


26. Melanographia tympanistis Dudgeon

   Wing expanse : 20 mm
Distribution: India: Sikkim.

V Genus *Dialithoptera* Hampson


27. *Dialithoptera gemmata* (Hampson)


Wing expanse: 20 mm

Distribution: India: Sikkim.

Subfamily ARCTIINAE

Key to genera

1. Proboscis more or less aborted ............... 2.
   - Proboscis fully developed ...... *Baroa* Moore

2. Forewing vein R₃ from R₂ and anastomosing with R₄ to form the areole .................
   - Forewing without areole ........... 3

3. Fore tibiae with curved apical claws, hind tibiae without medial spur *Maenas* Huebner
   - Foretibiae without apical claw, hind tibiae with medial spur ............ *Diacrisia* Huebner

VI Genus *Baroa* Moore


28. *Baroa vatala* Swinhoe


Wing expanse: 36 mm


VII Genus *Arctia* Schrank


* 29. *Arctia tibetica* Felder


Diagnostic Characters: Head and thorax red brown, collar crimson, abdomen dark red brown with crimson sides. Fore wing red brown with a yellow streak from the base below median nervure. Hind wing crimson, the basal and costal areas black.

Material examined: lex, Sikkim. No other data (coll. O. Moller).

Wing expanse: 48 mm.


Remarks: The species is recorded as new to Sikkim.

VIII Genus *Maenas* Huebner


30. *Maenas venosa* (Moore)


Wing expanse: 36 mm.


IX Genus *Diacrisia* Huebner


Key to species

1. Fore wing ground colour pure white ........... 2.
   - Fore wing ground colour not white ........... 3

2. Abdomen crimson above except base and extremity. Fore wing with postmedial series of points ................... *rhodophila* (Walker)
   - Abdomen orange above except base and extremity. Fore wing with postmedial maculate band ............ *multivittata* (Moore)
   - Abdomen crimson above ..................... 5.
4. Fore wing whitish buff ........................
   ................................................ punctata (Moore)
   - Fore wing orange ......................... flavalis (Moore)
5. Hind wing whitish ............................
   - Hind wing not whitish ................... 7
6. Fore wing yellowish white ................
   ................................................ stigmata (Moore)
   - Fore wing orange not yellowish white ..... 9.
7. Hindwing orange or yellow ................
   - Hindwing crimson or strongly tinged with
     crimson .............................. dentilinea (Moore)
8. Fore wing white ..............................
   ............................................... multiguttata (Walker)
   - Fore wing brownish buff .................. gopara (Moore)
9. Fore wing pale dull reddish brown ....
   ............................................... sordidescens (Moore)
   - Fore wing grey brown or black .......... 10.
10........ Fore wing with series of white spots
    .......................................... sikkimensis (Moore)
   - Fore wing without series of white spots11.
11. Hindwing ground colour white ...........
    ............................................... fulvohirta (Walker)
   - Hindwing ground colour pale yellow.....
    ...............................................impleta (Walker)

31. Diacrisia rhodophila (Walker)

       Mus., 294.
1901. Diacrisia rhodophila (Walker) : Hampson, Cat.

Material examined : 5 exs., Sikkim, No other data (Coll. O. Moller)
Wing expanse : 42-48mm.

Distribution : India : Sikkim. Himachal Pradesh and
N. W. Himalaya. Elsewhere : Chanyang, Moupin, Omei. Shan, Putsufeng and
W. China.

32. Diacrisia multivittata (Moore)

       : 808.
1901. Diacrisia multivittata (Moore) : Hampson, Cat.

Material examined : 2 exs., Sikkim, No other data (Coll. O. Moller)
Wing expanse : 40mm.

Distribution : India : Sikkim.

33. Diacrisia punctata (Moore)

1859. Spilosoma punctata Moore, Lep. East India. Comp,
       : 355.
1901. Diacrisia punctata (Moore) : Hampson, Cat. Lep.

Material examined : 12 exs., Sikkim, 2.vi. 1888 (coll. O. Moller); lex; Thombyak, 3879m.,
1.vi. 1959, lex; Talayampa, 2934m, 3. iv. 1959, lex;
Chunghang, 1977m, 30. iv. 1959, 4exs :
Lachung, 2727m, 30. vi, 4. vii. 1959, 2exs, East
Sikkim, Tunim. 1800m., 23. ix. 1898 (Coll. V.
C. Agarwal); lex: East Sikkim, Jadong,
I.C.A.R. Rest House Compound, 30. viii. 1994
(Coll. G.C.Sen).

Wing expanse : 35-42mm.

Distribution : India : Sikkim. Assam and
Nagaland. Elsewhere : Bassein, Java, Myanmar
and Thetmyo.

34. Diacrisia flavalis (Moore)

       : 809.
1901. Diacrisia flavalis (Moore) : Hampson, Cat. Lep.
       Phal. Brit. Mus., 3 : 283, pl. 65, fig.3.

Wing expanse : 42mm.

Distribution : India : Sikkim

35. Diacrisia stigmata (Moore)

       : 809.


Wing expanse : 50-54mm.


36. *Diacrisia multiguttata* (Walker)


Material examined : lex : Sikkim, No other data, lex : N. Sikkim, Akrathang, 970m, 12.VII.1959 (Coll. A. G. K. Menon)

Wing expanse : 50mm.

Distribution : India : Sikkim, Meghalaya, N. W. Himalayas and West Bengal.

37. *Diacrisia gopara* (Moore)


Material examined : lex : Sikkim, No other data, lex : N. Sikkim, Akrathang, 970m, 12.VII.1959 (Coll. O. Moller)

Wing expanse : 40mm.

Distribution : India : Sikkim, Assam and Meghalaya.

38. *Diacrisia dentilinea* (Moore)


Wing expanse : 42mm.

Distribution : India : Sikkim.

39. *Diacrisia sordidescens* (Moore)


Wing expanse : $\sigma$ 34mm., $\varphi$ 40mm.

Distribution : India : Sikkim.

40. *Diacrisia sikkimensis* (Moore)


Wing expanse : $\sigma$ -34mm., $\varphi$ -40mm

Distribution : India : Sikkim, Assam and Meghalaya.

41. *Diacrisia fulvohirta* (Walker)


Wing expanse : 52mm.


42. *Diacrisia impleta* (Walker)


**Material examined**: 4exs : Sikkim, No other data. (Coll. O. Moller).

**Wing expanse**: 55mm.

**Distribution**: India : Sikkim. Assam, Meghalaya and West Bengal.

**Subfamily RHODOGASTRIINAE**

X **Genus *Rhodogastria* Huebner**


*43. *Rhodogastria astreus* (Drury)


**Diagnostic Characters**: Head, thorax and tegulae marked with black. Fore wing brownish, semidiaphanous except costa, discocellular and apical areas, a black mark on base legs tinged with crimson.

**Material examined**: lex : Sikkim, vii. 1893, 3 exs : Sikkim, No other data.

**Wing expanse**: 70mm.

**Distribution**: India : Sikkim. Manipur, Meghalaya and Nagaland.

XI **Genus *Dilemera* Huebner**


44. *Dilemera arctata* (Walker)


*State Fauna Series 4. Fauna of Meghalaya* (6) : 353

**Diagnostic Characters**: Head, thorax and abdomen yellow with black spots and bands. Fore wing white with some black spots near base, broad fuscous streak along costa and inner margin from base to medial maculate band, a broad marginal fuscous band of more or less conjoined streaks. Hindwing white with marginal series of rounded fuscous spots which are elongated towards and angle.

**Material examined**: lex : Sikkim, 3.vii. 1889 No other data.

**Wing expanse**: 58mm.

**Distribution**: India : Sikkim. Manipur, Meghalaya and Nagaland.

XII **Genus *Nyctemera* Huebner**


**Key to species**

1. Antennae of male with short pectination.
   Hindwing with veins Rs and M₁ not stalked ........................................... *variants* Walker

   – Antennae of male with long pectination.
   Hindwing with veins Rs and M₁ stalked ... ......................................... 2.

2. Abdomen yellowish with transverse black band on each segments. Wings without discocellular spot............... *cenis* (Cramer)

   – Abdomen whitish with dorsal and lateral rows of black spots. Wings with discocellular spot ................. *adversata* (Schaller)
45. *Nyctemera varians* Walker


*Material examined*: 3exs, Sikkim, 550m. viii. 1896, vi. 1897, 5exs : Sikkim, No other data (Coll. O. Moller)

*Wing expanse*: 50-54mm.


46. *Nyctemera cenis* (Cramer)

1779. *Phalaena cenis* Cramer, *Pap. exot.*, 2 : 82, pl. 147, fig. E.


*Material examined*: 7exs, Sikkim, No other data (Coll. O. Moller)

*Wing expanse*: 40-45mm.


47. *Nyctemera adversata* (Schaller)


*Material examined*: 1ex, Sikkim, 550m., x. 1896; 2exs : Sikkim, No other data (Coll. O. Moller); 1ex : N. Sikkim, Yamthung, 3650m, 16.vi. 1959, 1ex : Naga, 1515m, 2-v. 1959, 1ex : Chetang, 2485m, 17.vii. 1959, 1ex : Manasthung, 1576m, 26 vii. 1959 (Coll. A. G. K. Menon); 2exs : S. Sikkim, Jorethang, CCBF.

*Wing expanse*: 45-50mm.

*Distribution*: Throughout India including Sikkim. Elsewhere : Bangladesh, Hongkong, Indochina, Japan, Malaysia, South China, Sumatra and Tonkin.

Subfamily CALLIMORPHINAE

XIII Genus *Callimorpha* Latreille


**Key to species**

1. Head and abdomen orange ......................... 2.
   - Head and abdomen not orange .................. 2.

2. Hind wing orange, without black streaks on veins....................... *plagiata* (Walker)
   - Hind wing pure white, veins slightly tinged with black .......... *nyctemera* (Moore)

3. Fore wing metallic green with numerous yellow spots, hindwing orange, the veins streaked with black .... *principalis* (Kollar)
   - Fore wing fuscous with tittle tinged of green, hindwing pure white, the veins fuscous ..... *equitalis* Kollar

*48 Callimorpha plagiata* (Walker)


*Material Examine*: lex : Sikkim, 16.v. 1887, 7exs; Sikkim, No other data, lex : Sikkim, 10.iii. 1887 (Coll. O. Moller); 2exs. N. Sikkim, Tumin, 1800m., 22. ix. 1988 (Coll. V.C. Agarwal); lex : Tankung, 6km. N. of Teri, 21. v. 1994 (Coll L. K. Ghosh).

*Wing expanse*: 80mm.

*Distribution*: India; Sikkim. Arunachal Pradesh, Assam, Jammu & Kashmir, Meghalaya.
and West Bengal. Elsewhere: Bangladesh and China.

Remarks: The species is recorded as new to this area.

49 Callimorpha nyctemerata (Moore)


Material Examined: lex: Sikkim, No other data, 1889 (Coll. Pilcher); lex: No other data (Coll. O. Moller); 3 exs; Sikkim, Rabangla, 2010m., 24. x. 1988 (Coll. V.C. Agarwal);

Wing expanse: 50mm.

Distribution: India; Sikkim. West Bengal.

50 Callimorpha principalis (Kollar)


Wing expanse: 80-85mm.


51 Callimorpha equitalis (Kollar)


Material Examined: 2exs: Sikkim, 1825m., vi. 1889 (Coll Nil)

Wing expanse: 75mm.


Subfamily SPILOSOMINAE

Key to genera

1. Antennae ciliated in both sexes. Fore tibia without curved apical claw. Hind legs with one pair of tibial spurs ........................................ .......................... 2.

- Antennae minutely serrate or pectinate in male. Foretibiae with or without curved apical claw. Hind legs with two pairs of tibial spurs, rarely the middle pair extremely reduced ........................................ .......................... 3.

2. Thorax unmarked. Legs with coxae and femora yellow, tibiae and tarsi ivory white, marked with dark brown stripe ..................... Phissama Moore

- Thorax marked. Legs with coxae and femora pale yellow above, tibiae and tarsi dark brown, unmarked ... Creatonotos Huebner.

3. Foretibiae with curved apical claw ..................... Alphaea Walker.

- Fore tibiae without curved apical claw ...4.

4. Head, thorax and abdomen with large woolly hair, Antennae about half the length of costa. Proboscis extremely short not extending the width of head ............ Spilarctia Butler.

- Head, thorax and abdomen smoothly scaled Antennae less than half the length of costa. Proboscis extending the width of head ...5.

5. Labial palpi long and porrect, projecting beyond frons. Proboscis twice the width of head .................. Areas Walker

- Labial palpi short and porrect, not projecting beyond frons. Proboscis not twice the width of head .................. Olepa Watson.

XIV Genus Phissama Moore

52. Phissama transiens (Walker)


Diagnostic Characters: Head and thorax dirty white. Palpi and femora orange. Fore wing very pale fuscous, the costa and base of inner margin ivory white, black spots in and just beyond each angle of cell. Hindwing pale fuscous. Abdomen orange above, white below.

Material examined: 1ex: Sikkim, 11. vi. 1890 (No coll)

Wing expanse: 42mm.


XV Genus Creatonotos Huebner


53. Creatonotos gangis (Linnaeus)


Diagnostic Characters: Head and thorax pale pinkish ochreous. Palpi and legs smoky black, the femora yellow. Fore wing with a broad black fascia below median nervure, two black spots at end of cell and a broad streak beyond the lower angle. Hindwing pale fuscous. Abdomen crimson above with dorsal and lateral series of black spots.


Wing expanse: 40mm.


XVI Genus Alphaea Walker


54. Alphaea quadriramosa (Kollar)

1844. Euprepia quadriramosa Kollar, In Hugel’s kashmir und das Reich der siek. 4 (2) : 468.


Wing expanse: 36mm.


XVII Genus Spilarctia Butler


Key to species

1. Fore wing with ground colour pure white .................................................................2.
   – Fore wing ground colour not white ..........4.

   – Wings thickly and smoothly scaled ................. lubricipeda (Linnaeus)

3. Tegulae wholly orange ..................................
   – Tegulae without orange ....................... nigrifrons (Walker)

4. Abdomen orange above ..................................
   – Abdomen crimson above .......................5

5. Fore wing with oblique maculate band from apex to middle of inner margin ................. obliquivittata Moore.
   – Fore wing without maculate band to middle of inner margin .......... flavens (Moore)

6. Fore wing orange tinged with crimson .......
   – Fore wing orange tinged with crimson .......... rubitincta (Moore)
7. Palpi dark at base. Antennae dark but strongly pectinated ....... casigneta (Kollar)

55. Spilarctia lubricipeda (Linnaeus)


Material examined lex : Sikkim, 1887 (Coll. O. Moller)

Wing expanse : 35mm.


56. Spilarctia nigrifrons (Walker)


Wing expanse : 40 mm.


57. Spilarctia melanosoma (Hampson)


Wing expanse : ♂ 36 mm., ♀ 46mm.


58. Spilarctia obliquivitta Moore

1879. Spilarctia obliquivitta Moore, : Lep. Atk., : 40 pl.2. fig. 20.

Wing expanse : 36-42 mm.

Distribution : India : Sikkim.

59. Spilarctia flavens Moore


Material examined : lex : Sikkim, No other data (Coll. O. Moller.)

Wing expanse : 40 mm.


60. Spilarctia rubitincta (Moore)


Wing expanse : 46 mm.


61. Spilarctia casigneta (Kollar)


Material examined : 4exs; Sikkim, No other data (Coll. O. Moller)

Wing expanse : 42 mm.

62. **Spilarctia obliqua** (Walker)


*Material examined:* 2 exs; Sikkim, No other data (Coll. O. Moller)

*Wing expanse:* 40 mm.

*Distribution:* Throughout India including Sikkim. *Elsewhere:* Asia, Bhutan, China, Eastern Asia and Nepal.

XVIII Genus **Areas** Walker


**Key to species**

1. Thorax black. Fore wing black with white fascia above median nervure and vein M₂ .................................................. **imperialis** (Kollar)

   - Thorax white above crimson below. Fore wing white with the veins brown .............. .................................................. **galactina** (Hoeven)

63. **Areas imperialis** (Kollar)


*Material examined:* 1 ex; Sikkim, No other data; lex: Mangaon, 29.v. 1994 (Coll. B.C. Das)

*Wing expanse:* 82 mm.


64. **Areas galactina** (Hoeven)


*Material examined:* 7 exs; Sikkim 550m, vi. 1890, v. 1896, 1897 (Coll. nil); lex : Yamthung, 3475m., 1.vii. 1989 (Coll. S.S. Saha).

*Wing expanse:* 75-82 mm.


XIX Genus **Olepa** Watson


65. **Olepa ricini** (Fabricius)


*Diagnostic Characters:* Head and thorax dark grey brown, collar tringed with crimson. Fore wing fuscous brown with numerous pale ringed black spots in the interspaces. Hindwing crimson with antemedial, medial, postmedial and marginal bands. Abdomen crimson with black bands.

*Material examined:* 2 exs; Sikkim, No other data.

*Wing expanse:* 48 mm.


Subfamily LITHOSIINAE

**Key to genera**

1. Fore wing vein M₂ absent ......................... 2

   - Fore wing vein M₂ present ....................... 12

2. Fore wing vein M₃ present ......................... 3

   - Fore wing vein M₃ absent .......................... .......................... **Neoblavia** Wallengren

3. Fore wing vein Culb curved at base ............ .......................... **Lexis** Wallengren
- Fore wing vein Culb oblique .......................... 4

4. Hindwing vein $M_3$ absent .......................... 5

- Hindwing vein $M_3$ present .......................... 6

5. Fore wing vein $R_1$ anastomosing with Sc.. .......................... *Poliosia* Hampson

- Fore wing vein $R_1$ free .......................... 7

6. Hindwing cell open, a recurrent vein in cell .......................... *Chrysorabdia* Butler.

- Hindwing cell closed, no recurrent vein in cell .......................... 8

7. Fore wing vein $R_2$ stalked with $R_3$ $R_5$ .......................... *Mithuna* Moore

- Fore wing vein $R_2$ free .......................... 9


- Bothwings in male with secondary sexual character .......................... 11.

9. Male genitalia with scaphium .......................... *Strysopha* Arora & Chaudhury

- Male genitalia without scaphium .......................... *Eilema* Huebner

10. Fore wing cell half the lengths of wing. Uncus broad .......................... *Teulisna* Walker

- Fore wing cell more than half the length of wing. Uncus long and narrow .......................... 11.

11. Fore wing cell a little over half the length of wing and tufts on fore wing about half the length of cell .......................... *Prabhasa* Moore

- Fore wing cell about two thirds the length of wing, tufts of fore wing two thirds the length of cell .......................... *Zadadra* Moore


- Hindwing vein $M_2$ absent .......................... 14.

13. Fore wing vein $M_1$ from upper angle of cell not stalked with vein $R_3$ .......................... *Chrysaeglia* Butler

- Fore wing vein $M_2$ stalked with $R_3$ .......................... 15

- Fore wing with an areole .......................... 16

14. Fore wing without areole .......................... 17

15. Fore wing veins $R_2$ and $R_3$ anastomosing with $R_4$ to form the areole .......................... *Agrisius* Walker

- Fore wing veins $R_2$ arises from $R_3$ and then anastomosing with $R_4$ to form the areole .......................... *Agylla* Walker

16. Fore wing veins $R_3$ from $R_4$ after $R_1$ .......................... 18

- Fore wing veins $R_3$ from $R_4$ before $R_3$ .......................... 19

17. Fore wing veins $M_1$ from cell, $R_3$ $R_2$ stalked .......................... *Cyclomilta* Hampson

- Fore wing veins $M_1$ and $R_2$ from cell .......................... 20

18. Hindwing vein $M_2$ obsolescent from just below angle of discocellular .......................... *Cyana* Walker

- Hindwing vein $M_2$ fully developed from well below angle of discocellular .......................... 21

19. Palpi upturned .......................... *Sicia* Walker

- Palpi posrex .......................... 22

20. Fore wing costa exceed towards apex .......................... *Oxacme* Hampson

- Fore wing normal shape .......................... 23

21. Fore wing vein $R_2$ closed to vein $R_1$ .......................... *Ovipennis* Hampson

- Fore wing vein $R_2$ from towards end of cell .......................... *Stictane* Hampson

22. Fore wing vein $R_1$ anastomosing with Sc .......................... 24

- Fore wing vein $R_1$ not anastomosing with Sc .......................... 25

23. Fore wing vein $R_2$ free .......................... *Asura* Walker

- Fore wing vein $R_3$ not free .......................... *Asuridia* Hampson
24. Palpi upturned .............................................. 25
   - Palpi porrect ............................................. 26
25. Palpi reaching vertex of head ................................. Parasicea Hampson
   - Palpi not reaching vertex of head ................................ Miltochrista Huebner
26. Fore wing vein R₁ become coincident with R₂..................... Hemispilia Hampson
   - Fore wing vein R₁ free ..................................... 27.
27. Fore wing vein R₃ present ........................................ Nudaria Haworth
   - Fore wing vein R₃ absent ....................................... Stigmatophora Staudinger

XX Genus Neoblia Hampson

66 Neoblia scoteola Hampson
1900 Neoblia scoteola Hampson. Cat. Lep. Phil. Brit. Mus., 2 : 105, fig. 45
Wing expanse: 18 mm.
Distribution: India: Sikkim.

XXI Genus Lexis Wallengren

67. Lexis fulveola Hampson
Wing expanse: 22 mm.
Distribution: India: Sikkim. West Bengal.

XXII Genus Poliosia Hampson

Key to species
1. Fore wing with yellow costal fascia .............. muricola Walker
   - Fore wing without yellow costal fascia .............. 2
2. Head and tegulae yellow ................................. punctivena Hampson
   - Head and tegulae not yellow ............................. 3
3. Fore wing thickly and uniformly irrorated with dark brown hindwing grey brown suffused with yellow brown towards base ................................ brunnea (Moore)
   - Fore wing not irrorated with brown, Hindwing pale yellow ...... cubitifera (Hampson)

68. Poliosia muricola parva (Moore)
   Wing expanse: 7 - 20 mm., 9 - 24 mm.
Distribution: India: Sikkim. Assam and Meghalaya.

69. Poliosia punctivena (Hampson)
   Wing expanse: 18 mm
   Distribution: India: Sikkim.

70. Poliosia brunnea (Moore)
   Wing expanse: 24 mm.
   Distribution: India: Sikkim. Assam and Meghalaya.

71. Poliosia cubitifera (Hampson)
   Wing expanse: 24-28 mm.


**Distribution**: India: Sikkim, Assam and Nagaland.

**XXIII Genus Lobobasis** Hampson


**72. Lobobasis niveimaculata** Hampson


**Wing expanse**: 20 mm.

**Distribution**: India: Sikkim. Elsewhere: Bhutan, Perak and Sumatra.

**XXIV Genus Chrysorabdia** Butler


**73. Chrysorabdia viridata** (Walker)


**Material examined**: 3exs, Sikkim, 29 IX. 1888 (Coll. O. Moller) 2exs N. of Lachung, 4 VII, 1989; 2exs: N. W. of Lachen, 30. VII. 1989 (Coll. S. S. Saha); lex: Dikchu, 9 IX. 1993 (Coll. S. Chatterjee); Lex: Lachung, 2700m, 6.V. 1994 (Coll. S. Chatterjee).

**Wing expanse**: 40-42 mm.


**XXV Mithuna** Moore


**Key to species**

- Fore wing vein R₃ arising before vein R₂.
  - *Mithuna quadriplaga* Moore
  - Fore wing vein R₃ arising after vein R₂.
  - *Mithuna strigifera* Hampson

**74. Mithuna quadriplaga** Moore


**Wing expanse**: 22-26 mm.


**75. Mithuna strigifera** Hampson


**Wing expanse**: 28 mm.

**Distribution**: India: Sikkim.

**XXVI Genus Strysopha** Arora & Chaudhury


**76. Strysopha tortricoides** (Walker)


**Diagnostic Characters**: Fore wing slightly suffused with fuscous, costal area yellow, except apex which is black, the veins streaked with black, a triangular black spot on costa beyond middle. Hindwing pale yellow, tinged with fuscous towards apex. Abdomen grey, extremity yellow.

**Material examined**: lex, Sikkim, No other data (Coll. O. Moller)

**Wing expanse**: 24 mm.

**Distribution**: India: Sikkim. Arunachal Pradesh, Meghalaya, Tamil Nadu. Elsewhere: Bhutan, China, Indonesia and Malaysia.

**XXVII Genus Eilema** Huebner

1816 *Eilam* Huebner, Verz. bek. Schmett.: 165.
Key to species

1. Fore wing with secondary sexual character .................................................. 2
   - Fore wing without secondary sexual character ........................................... 9

2. Fore wing of male with a fold in cell, subcostal and median nervure closely approximate tumida (Walker)
   - Fore wing of male without fold in cell, subcostal and median nervure not approximate .................................................. 3

3. Fore wing with large quadrate postmedial black mark below the cell ............... tetragona (Walker)
   - Fore wing without postmedical black mark below the cell .......................... 4

4. Fore wing with postmedial black spot on costa ............ plumeheomicans (Hampson)
   - Fore wing without postmedial black spot .............................................. 5

5. Fore wing of male with large fringe of scale in the cell .......... brunnea (Moore)
   - Fore wing of male with slight fringe of scale in the cell ......................... 6

6. Fore wing orange yellow ......................... vagessa (Moore)
   - Fore wing not orange yellow ............................................................... 7

7. Fore wing with fuscous postmedial line angled out words at middle ................ oblitterans (Felder)
   - Fore wing without postmedial line .......................................................... 8

8. Fore wing whitish with pink tinge, the termen orange yellow ......................... conformis (Walker)
   - Fore wing uniform pale straw yellow ...................................................... auriflua (Moore)

9. Fore wing with prominent lines ................................................................. reticulata (Moore)
   - Fore wing without lines ............................................................... 10

10. Fore wing with antemedial blackspot on costa ......................................... quadrisignata (Moore)
    - Fore wing without black spot on costa .............................................. 11

11. Fore wing with black band on terminal area ........................................... terminalis (Moore)
    - Fore wing without black band on terminal area .................................... 12

12. Fore wing white ............................................................... 13
    - Fore wing not white ............................................................... 14

13. Hind wing pale yellow ................................................................. nigripers (Walker)
    - Hind wing white .......... varana (Moore)

14. Fore wing vein R, free ................................................................. 15
    - Fore wing vein R, anastomosing with SC ........................................... 16

15. Fore wing fulvous orange, abdomen ventrally with black bands .................... nigripes Hampson
    - Fore wing yellowish white, abdomen fuscous, clothed with white hair, extermity orange xanthocraspis Hampson

16. Fore wing dark brown with terminal yellow band, hind wing yellow ................ fumidisca (Hampson)
    - Fore wing dark grey without yellow band, hind wing pale yellow .............. vicaria (Walker)

77 Eilema tumida (Walker)

1922. Eilema tumida (Walker) : Strand, lep. Catalogus, pars 26:
   Wing expanse : 28 mm.

78. *Eilema tetragona* (Walker)


*Material examined*: 1 ex: Sikkim, No other data (Coll. O. Moller); 1 ex: Mangaon, 31.V. 1994 (Coll. B. C. Das).

*Wing expanse*: 25 mm.


79. *Eilema plumbeomicans* (Hampson)

1894 *Prabhasa plumbeomicans* Hampson, *Fauna Brit. India, Moths*. 2: 77


*Wing expanse*: 30 mm.

*Distribution*: India: Sikkim. Assam and Nagaland.

80. *Eilema brunnea* (Moore)


*Wing expanse*: 32 mm.

*Distribution*: India: Sikkim.

81. *Eilema vagessa* (Moore)


*Material examined*: 4 exs: Sikkim, No other data (Coll. O. Moller)

*Wing expanse*: 36 mm.

*Distribution*: India: Sikkim. Assam, Meghalaya, N. W. Himalayas, and West Bengal.

Elsewhere: Myanmar, Nepal.

82. *Eilema obliterans* (Felder)


*Wing expanse*: 26 mm ♀-30 mm.


83. *Eilema conformis* (Walker)


*Wing expanse*: 30-40 mm.


84. *Eilema auriflua* (Moore)


*Wing expanse*: 26 mm.

*Distribution*: India: Sikkim. Assam, Meghalaya and West Bengal.

85. *Eilema reticulata* (Moore)


*Material examined*: 1 ex: Sikkim, No other data, 1886 (Coll. O. Moller).

*Wing expanse*: 32 mm.

*Distribution*: India: Sikkim. N. W. Himalayas.
86. *Eilema quadrisingata* (Moore)


Wing expanse : 32 mm

Distribution : India : Sikkim.

87. *Eilema terminalis* (Moore)


Wing expanse : 34 mm.

Distribution : India : Sikkim.

88. *Eilema nigripars* (Walker)


Wing expanse : 42 mm.


89. *Eilema varana* (Moore)


Material examined. Sexs : Sikkim, No other data (Coll O. Moller).

Wing expanse : 34 mm.

Distribution : India : Sikkim.

90. *Eilema nigripes* (Hampson)


Wing expanse : $\sigma$ - 42, $\varphi$ - 46 mm.

Distribution : India : Sikkim. Assam and Meghalaya.

91. *Eilema xanthocrispis* (Hampson)


Wing expanse : 32 mm.

Distribution : India : Sikkim.

92. *Eilema fumidisca* (Hampson)


Wing expanse : 24 mm.


93. *Eilema vicaria* (Walker)


Wing expanse : 26–34 mm.


XXVIII Genus *Teluisna* Walker


94. *Teluisna protuberans* (Moore)


Wing expanse : 32 mm.

MAJUMDAR (CHAUDHURY) : Insecta : Lepidoptera : Arctiidae

XXIX Genus Prabhasa Moore


95. Prabhasa venosa (Moore)


Wing expanse : 9.30, 9.34 mm.


XXX Genus Zadadra Moore


96. Zadadra distorta (Moore)


Diagnostic characters : Fore wing fuscous grey, the costal area ochreous suffused with fulvous, with a round black spot beyond middle. Hindwing pale yellow and in male a large patch of androconia below the middle portion of costa.

Material examined : 4 exs : Sikkim, No other data (Coll O. Moller); 6 exs : Tumin, 1800m, 28 IX. 1988 (Coll. V. C. Agarwal); 1exs : Mangaon, 31.V.1994 (Coll. B. C. Das).

Wing expanse : 36 mm.


XXXI Genus Chrysaegilia Butler


97. Chrysaegilia magnifica (Walker)


Diagnostic Characters : Golden yellow. Palpi with deep metallic green spot at sides. Fore wing with broad green costal fascia on basal area, then narrowing, an oblique patch on basal inner area, a medial band expanding below the cell, a broad terminal band with purple suffusion. Hindwing cilia fuscous towards apex.

Material examined : 2exs : Sikkim, 1100m., Vi. 1897 (Coll O. Moller).

Wing Expanse : 52mm.


XXXII Genus Hemonia Walker


98. Hemonia orbiferana Walker


Wing expanse : 18 20 mm.


XXXIII Genus Agrisius Walker


99. Agrisius guttivilla Walker


Diagnostic Characters : Wings whitish, veins in both wings streaked with black in the
apical half, the basal half of the fore wing marked with series of spots.

Material examined: 3exs: Sikkim, No. other data (Coll O. Moller)

Wing expanse: 43 mm.


XXXIV. Genus Agylla Walker


Key to species

1. Antennae of male bipectinate .........................2
   – Antennae of male ciliate ...........................5

2. Fore wing with apical white patch ............... apicalis (Moore)
   – Fore wing without apical white patch ...........3

3. Fore wing with the costal half yellowish, inner half purplish fuscous ................... divisia (Moore)
   – Fore wing brown ..................................4

4. Hindwing orange yellow with large brown patch on inner area not reaching termen .. beema (Moore)
   – Hindwing wholly orange ................................. rufifrons (Moore)

5. Fore wing silky white, inner area brown .......... albocinerea (Moore)
   – Fore wing white or pale yellow, inner area not brown ........................................6

6. Tegulae orange .................. prasena (Moore)
   – Tegulae not orange ...................................7

7. Hindwing pale orange, the terminal area white ......................... maculata (Moore)
   – Hindwing not orange, the terminal area not white .............................................8

8. Fore wing with basal half dirty white and the terminal half black brown ............... bipars (Moore)

   – Fore wing fully white.................................9

9. Hindwing whitish ............. ramelana (Moore)
   – Hindwing yellowish ........................................ alboluteola Rothschild

100. Agylla apicalis (Moore)

1878. Sidxyma apicalis Moore, Proc. Zool. Soc. Lond., 9, Pl. 1. Fig. 2

Wing expanse: 42-44 mm.

Distribution: India: Sikkim.

101. Agylla divisa (Moore)


Material examined: 4 exs: Sikkim, No other data (Coll. O. Moller)

Wing expanse: 40 mm.


102. Agylla beema (Moore)


Material examined: 2 exs: Sikkim, Yumthung 3830m., 17.VI. 1959, 2 exs: Lachung, 2727m., 6 VII. 1959, 3 exs: Dampong, 2985m., 10. VIi. 1959 (Coll. A. G. K. Menon)

Wing expanse: 47-50 mm.

Distribution: India: Sikkim.

103. Agylla rufifrons (Moore)

1900. Agylla rufifrons (Moore) : Hampson, Cat. Lep.

**Wing expanse**:♂-56 mm, ♀-60 mm.

**Distribution**: India : Sikkim.


**Wing expanse**:♂-56 mm, ♀-60 mm.

**Distribution**: India : Sikkim.


**Wing expanse**:♂-36 mm, ♀-40 mm.

**Distribution**: India : Sikkim, Assam, Himachal Pradesh, Nagaland and N. W. Himalaya.


**Wing expanse**: 45 mm.


**Wing expanse**: 54 mm.

**Distribution**: India : Sikkim.


**Wing expanse**: 32-36 mm.


**Wing expanse**: 42 mm.

**Distribution**: India : Sikkim, Arunachal Pradesh and Assam. Elsewhere : Malaysia. Remarks: The species is recorded as new to Sikkim.


**Wing expanse**: 28 mm.

**Distribution**: India : Sikkim.


**Key to species**

1. Fore wing in female with vein M₂ and M₄ stalked...
1. Fore wing in female with vein M₁ and M₃ from cell ........................................3
2. Fore wing in female with vein M₁ stalked with R₄-R₅, R₃ absent alborosea (Walker)
   - Fore wing in female with vein M₁ from cell, R₃, arises from R₂ effracta (Walker)
3. Fore wing of male with the lobe trifid .........4
   - Fore wing of male with the lobe not trifid ............................................................7
4. Fore wing with the lines scarlet ..............5
   - Fore wing with the lines yellow .............6
5. Fore wing of male with two discoidal spots conjoined into a bar, female with the postmedial line not bent outwards to costa ........................................ signa (Walker)
   - Fore wing of male with two discoidal spots separate, female with the postmedial line bent outwards to costa adita (Moore)
6. Hindwing yellow ........ guttifera (Walker)
   - Hindwing white ........ mottleri (Elwes)
7. Fore wing with the lobe bifid ..............8
   - Fore wing with the lobe single ...........15
8. Fore wing with inner part lobe large and elongate, the costal fringe long and strongly developed .................. perornata (Walker)
   - Forewing with the lobes small and closely attached, the costal fringe much slighter. 9
9. Abdomen with the terminal half of the dorsum crimson ................ arama (Moore)
   - Abdomen wholly white ..................10
10. Fore wing with bands .....................11
    - Fore wing without bands ................ candida (Felder)
11. Fore wing with black spot at end of cell .............................................................12
    - Fore wing with fuscous spot at end of cell ....................................................... detrita (Walker)
12. Fore wing with subterminal orange band .............................................................13
    - Fore wing without subterminal band ...........

................................. sikkimensis (Elwes)
13. Fore wing in both sexes with three black spots in cell .........................................14
    - Fore wing in male with three and in female with two black spots in cell ................ puer (Elwes)
14. Fore wing with antemedial and postmedial bands separate ....... dohertyi (Elwes)
    - Fore wing with antemedial and postmedial bands conjoined below cell .................... divakara (Moore)
15. Fore wing with three black spots at end of cell in both sexes ..................................16
    - Fore wing with two black spots at end of cell in both sexes ................................19
16. Fore wing with terminal band not dentate ............................................................17
    - Fore wing with terminal band dentate ........18
17. Fore wing with orange subterminal band .................. bellissima (Moore)
    - Fore wing with scarlet subterminal band ............ dudgeoni Hampson
18. Fore wing with obscure fuscous annuli at end of cell .......... gelida (Walker)
    - Fore wing without spot at end of cell .......... gazella (Moore)
19. Fore wing with black edged postmedial band straight .......... coccinea (Moore)
    - Fore wing with black edged postmedical band sinuous ........ bianca (Walker)

111. Cyana alborosea (Walker)


Material examined. : 1 ex : Sikkim, No other data.

Wing expanse : 26 mm.

112 Cyana effracta (Walker)

1894. Cyana effracta (Walker): Hampson, Fauna Brit. India, Moths., 2 : 57

Wing expanse: 24 mm.


* 113. Cyana signa (Walker)


Material examined: 9 exs: Sikkim, No other data, 10.X.1884 (Coll. O. Moller); lex : Dampong, 2985m., 10.VII.1959 (Coll A. G. K. Meron).

Wing expanse: 42 48 mm.


Remarks: The species is recorded as new to Sikkim.

114. Cyana adita (Moore)


Wing expanse: 34-40 mm.


115. Cyana guttifera (Walker)


Material examined: 5exs: Sikkim, No other data (Coll. O. Moller); lex: East Sikkim, Doragon, 8 km North of Jadong, 13.111.1994 (Coll L. K. Ghosh).

Wing expanse: 32-35 mm.


116. Cyana molleri (Elwes)

1894. Cyana molleri (Elwes) : Hampson. Fauna Brit. India, Moths. 2 : 60

Material examined: lex. Sikkim, No other data (Coll. O. Moller).

Wing expanse: 32 mm.


117. Cyana perornata (Walker)


Material examined: 4exs: Sikkim No other data (Coll. O. Moller).

Wing expanse: 45 mm.


118. Cyana arama (Moore)

119. **Cyana candida** (Felder)


**Wing expanse**: 40 mm.

**Distribution**: India : Sikkim. Dalhousie, Himachal Pradesh and N.W. Himalayas.

120. **Cyana detrita** Walker


**Material examined**: lex : Sikkim, No other data (Coll. O. Moller).

**Wing expanse**: 30 mm.

**Distribution**: India : Sikkim. Assam, Himachal Pradesh, Meghalaya, Nagaland, N.W. Himalayas and Uttar Pradesh.

121. **Cyana sikkimensis** (Elwes)


**Wing expanse**: &-42 mm, &-46 mm.

**Distribution**: India : Sikkim. Himachal Pradesh and N.W. Himalayas.

122. **Cyana puer** (Elwes)


**Material examined**: lex : East Sikkim, Tumin. Panchayet Bhawan, 1470 m., 30 IX.

1988. (Coll. V. C. Agarwal).

**Wing expanse**: 42 mm.

**Distribution**: India : Sikkim. Assam and Meghalaya.

123. **Cyana dohertyi** (Elwes)


**Wing expanse**: 34 mm.

**Distribution**: India : Sikkim. Assam, Meghalaya and N. W. Himalayas.

124. **Cyana divakara** (Moore)


**Material examined**: 2 exs : Sikkim, Lachung, 2727 m., 4. VII. 1959, lex : Dampong, 2985 m., 10. VII. 1959 (Coll. A.G.K. Menon)

**Wing expanse**: 48 mm.

**Distribution**: India : Sikkim.

125. **Cyana bellissima** (Moore)


**Material examined**: lex : Sikkim, No other data (Coll. O. Moller).

**Wing expanse**: 54 mm.


126. **Cyana dudgeoni** Hampson


**Wing expanse**: &-20 mm, &-34 mm.

**Distribution**: India : Sikkim. Arunachal
XXXVII Genus *Siccia* Walker

127. *Cyana gelida* (Walker)


*Material examined.*: lex: Sikkim, No other data (Coll. O. Moller)

*Wing expanse*: 32 mm.


128. *Cyana gazella* (Moore)


*Material examined.*: lex: Sikkim, No other data (Coll. O. Moller).

*Wing expanse*: 35 mm.

*Distribution*: India: Sikkim. N. W. Himalayas.

129. *Cyana coccinea* (Moore)


*Wing expanse*: 30-32 mm.


130. *Cyana bianca* (Walker)


*Material examined.*: 5exs: Sikkim, No other data (Coll. O. Moller).

XXXVIII. Genus *Oxacme* Hampson

133. *Oxacme dissimilis* Hampson

Wing expanse: 22 mm.

Distribution: India: Sikkim.

XXXIX. Genus Ovipennis Hampson


134. Ovipennis dudgeoni (Elwes)


Wing expanse: 26 mm.

Distribution: India: Sikkim.

XL Genus Stictane Hampson


135. Stictane fractilinea (Snellen)

Wing expanse: 13-18 mm.


XLI Genus Asura Walker


Key to species

1. Antennae of male with moderate branches...2
   - Antennae of male with bristle and cilia...3
2. Fore wing yellow, hindwing yellowish white. Abdomen whitish without marking .................. nubifascia (Walker)
   - Fore wing yellowish white, hindwing with fuscous spot in and below cell. Abdomen with blackish band towards extremity ...... melanoleuca (Hampson)
3. Fore wing with the cell very narrow.......... dasara (Moore)
   - Fore wing with the cell normal ............. 4
4. Fore wing with very highly and irregularly dentate postmedial line ....................... 5
   - Fore wing without highly dentate postmedial line ............................................. 6
5. Fore wing with terminal black point .......... undulosa (Walker)
   - Fore wing without terminal black points .. 7
6. Fore wing white with brown markings ..... frigida (Walker)
   - Fore wing not white but with brown markings ................................................. 7
7. Fore wing with postmedial line.............. 8
   - Fore wing with or without postmedial line .......................................................... 10
8. Fore wing with medial and postmedial line connected by a streak at upper angle of cell. euprepioides (Walker)
   - Fore wing with medial and postmedial line not connected by a streak at upper angle of cell ......................................................... 9
9. Fore wing with terminal black line ........ conjunctana (Walker)
   - Fore wing without terminal black line .... flavivenosa (Moore)
10. Fore wing with postmedial series of spots, streaks, often conjoined into an irregular band .. 11
   - Fore wing without postmedial line, streak or spots........................................... 17
11. Fore wing with medial line ................... 12
   - Fore wing without medial line .............. humilis (Walker)
12. Fore wing with antemedial line or diffused band ................................................. 13
   - Fore wing with antemedial series of well separated points .................................... 14.
13. Fore wing with medial line strongly excurved below the costa and than confluent with the antemedial line ............................................. nebulosa (Moore)
- Fore wing with medial line more or less straight and oblique ............................................. 15
14. Fore wing with medial line not excurved below the cell ............................................. strigipennis (Herrich-Schaffer)
- Fore wing with medial line straight or slightly excurved at middle ................ arcuata (Moore)
15. Fore wing with postmedial series of well separated short streaks or points .......................... floccosa (Walker)
- Fore wing with postmedial band composed of short confluent streaks ............................................. congerens (Felder)
16. Fore wing with postmedial band not confluent with the medial line at inner margin ................ rubricosa (Moore)
- Fore wing with postmedial band confluent with the medial line at inner margin .......................... 16
17. Fore wing crimson ........ anomalula (Elwes)
- Fore wing greyish with crimson streaks at inner margin .......... rubrimargo (Hampson)

136. Asura nubifascia (Walker)
Wing expanse: 38 mm.

137. Asura melanoleuca (Hampson)
1894. Miltochrista melanoleuca Hampson, Fauna Brit. India. Moths, 2 : 120.
1900. Asura melanoleuca (Hampson) : Hampson, Cat.

Wing expanse: 36 mm.
Distribution: India : Sikkim.

138. Asura dasara (Moore)
Wing expanse: 26 mm., -30mm.

139. Asura undulosa (Walker)
Wing expanse: 26 mm.

140. Asura obsoleta (Moore)
Material examined: Lex; Sikkim, No other data (Coll. O. Moller); 8exs :, E. Sikkim, Tumin, 1800m., 28. IX.1988 (Coll V. C. Agarwal).
Wing expanse: 20 mm.

141. Asura frigida (Walker)
Wing expanse: 20 mm.


142. *Asura euprepioides* (Walker)


Material examined: 2exs: Sikkim, No other data.

Wing expanse: 32 mm.


143. *Asura conjunctana* (Walker)


Wing expanse: 20 mm.


144. *Asura flavivenosa* (Moore)


Wing expanse: σ-18 mm, φ-24 mm.


145. *Asura humilis* (Walker)


Wing expanse: 22 mm.


146. *Asura nebulosa* (Moore)


Wing expanse: 34 mm.


147. *Asura strigipennis* (Herrich-Schaffer)


Wing expanse: 30 mm.


* 148. *Asura arcuata* (Moore)


Material examined: 11exs., Sikkim, No other data (Coll O. Moller).

Wing expanse: 22-27 mm.


Remarks: The species is recorded as new to Sikkim.

149. *Asura floccosa* (Walker)


Wing expanse: \( \sigma - 20 \text{ mm.}, \quad \varphi - 22 \text{ mm.} \)


150. *Asura rubricosa* (Moore)


Wing expanse: 22 – 26 mm.


151. *Asura congernes* (Felder)


Wing expanse: 20 – 26 mm.

**Distribution**: India: Sikkim. N. W. Himalayas and West Bengal.

152. *Asura anomala* (Elwes)


Wing expanse: 26 mm.

**Distribution**: India: Sikkim.

153. *Asura rubrimargo* (Hampson)


Wing expanse: 28 mm

**Distribution**: India: Sikkim.

XLII Genus *Asuridia* Hampson


154. *Asuridia metaphaea* Hampson


Wing expanse: 28 mm.

**Distribution**: India: Sikkim. Meghalaya.

XLIII Genus *Parasiccia* Hampson,


155. *Parasiccia maculifascia* (Moore)


Wing expanse: 30 mm.

**Distribution**: India: Sikkim.

XLIV Genus *Miltochrista* Huebner


**Key to species**

1. Antennae of male serrated with long bristle and fascicles of cilia .........................................................

   - Antennae of male with moderate bristle and cilia ............................................................................ 2.

2. Fore wing cilia blackish ........................................... 3

   - Fore wing cilia not blackish ...................................... 8

3. Fore wing cilia black near middle only ......

   - Hindwing black with yellow fascia on basal half of costa ............ *postnigrila* Hampson

   - Fore wing cilia wholly black .................................. 4

4. Hindwing black with yellow fascia on basal half of costa ............ *punicea* (Moore)

5. Hindwing with terminal fuscous band. ..

   - Antennae of male with moderate bristle and cilia ............................................................................ 2.
Hindwing without terminal fuscous band, the veins on terminal area often streaked with black .............................................................. 6

Fore wing with medial line strongly angled in words in submedian fold .............................................................. \textit{cuneonotata} (Walker)

Fore wing with medial line not angled inwards in submedian fold .............................................................. 7

Fore wing suffused with crimson .............................................................. \textit{cruciata} (Walker)

Fore wing yellow with crimson streaks in the interspaces .............................................................. \textit{inflexa} (Moore)

Fore wing fuscous with yellow spots .............................................................. \textit{roseata} (Walker)

Fore wing not fuscous .............................................................. 9

Fore wing with crimson streaks in the interspaces .............................................................. \textit{gratiosa} (Guerin & Menev.)

Fore wing without crimson streak .............................................................. 10

Fore wing with the veins on terminal area streaked with black .............................................................. 11

Fore wing with the veins on terminal area not streaked with black .............................................................. 14

Fore wing with subbasal series of spots .............................................................. \textit{linga} (Moore)

Fore wing without subbasal series of spots .............................................................. 12

Fore wing white.............................................................. \textit{eccentropis} Meyrick

Fore wing not white .............................................................. 13

Fore wing with medial series of spots .............................................................. \textit{radians} (Moore)

Fore wing with continuous medial line .............................................................. \textit{delicata} (Moore)

Fore wing with medial line .............................................................. \textit{proleuca} Hampson

Fore wing without medial line .............................................................. 15

Fore wing with postmedial series of points .............................................................. 16

Fore wing without series of points .............................................................. \textit{perpallida} Hampson

16. Patagia and base of fore wing with black spots .............................................................. \textit{spilosomoides} Moore

Patagia and base of fore wing without black spot .............................................................. \textit{magna} Hampson

156. \textit{Miltochrista flavicollis} (Moore)


\textit{Wing expanse} : 36 mm.

\textit{Distribution} : India : Sikkim.

157. \textit{Miltochrista cardinalis} Hampson


\textit{Wing expanse} : 22 mm.


158. \textit{Miltochrista postnigra} Hampson


\textit{Wing expanse} : 18 mm.

\textit{Distribution} : India : Sikkim.

159. \textit{Miltochrista punicea} (Moore)


\textit{Wing expanse} : 26 mm.

160. Miltochrista cuneonotata (Walker)


Wing expanse : 30 mm


161. Miltochrista cruciata (Walker)


Material examined : 2exs., Sikkim. No other data (Coll. O. Moller).

Wing expanse : 30 mm


162. Miltochrista inflexa (Moore)


Wing expanse : 30 mm.

Distribution : India : Sikkim. Arunachal Pradesh, Assam, Meghalaya and West Bengal.

163. Miltochrista roseata (Walker)


Wing expanse : $\sigma$-52 mm., $\sigma$-56 mm.

Distribution : India : Sikkim.

164. Miltochrista gratiosa (Guerin & Meneville)


Wing expanse : 38 mm.


165. Miltochrista linga (Moore)

1859. Barsine linga Moore, Lep. East India Comp., 301.


Material examined : 2exs., Sikkim. No other data (Coll. O. Moller).

Wing expanse : 44 mm.


*166. Miltochrista, eccentropis* Meyrick


Wing expanse : 22 mm.


Remarks : The species is recorded as new to Sikkim.

167. Miltochrista radians (Moore)


Wing expanse : 22 mm.


Remarks : The species is recorded as new to Sikkim.

168. Miltochrista delicata (Moore)


Wing expanse : 30 mm.

Distribution : India : Sikkim.

169. Miltochrista proleuca Hampson.


Wing expanse : 24 mm.

Distribution : India : Sikkim.

170. Miltochrista spilosomoides (Moore)


Wing expanse : σ-44 mm, φ-50mm.

Distribution : India : Sikkim. Assam, Meghalaya and N. W. India.

*171. Miltochrista magna Hampson.

1894. Miltochrista magna Hampson, Fauna Brit. India, Moths, 2 : 112.


Material examined. : 2exs. Tumin, 1800, 28.IX.1988. (Coll. V. C. Agarwal.)

Wing expanse : 45 mm.


Remarks : The species is recorded as new to Sikkim.

172. Miltochrista perpallida (Hampson)


Wing expanse : σ-40 mm, φ-54 mm.

Distribution : India : Sikkim.

XLV Genus Hemispilia Hampson


173. Hemispilia coa-vestis (Hampson)


**Wing expanse**: 20 mm.

**Distribution**: India: Sikkim.

**XLVI Genus Nudaria** Hawarth


**Key to species**

1. Fore wing with dark wedge shaped patch above tornus ............... *fumidisca* Hampson
   - Fore wing without dark wedge shaped patch above tornus .................... 2

2. Fore wing with postmedial line .................. 3
   - Forwing without post medial line .............. ............................................. *suffusa* Hampson

3. Forwing with postmedial line oblique from median nervure to inner margin ........ ............................................. *fasciata* Moore
   - Forwing with postmedial line bent outwards to inner margin....... *margaritacea* Walker

176. *Nudaria fasciata* (Moore)


**Wing expanse**: 24 – 26 mm.


177. *Nudaria margaritacea* Walker


**Wing expanse**: 22-26mm.


**XLVII Genus Stigmatophora Staudiniger**


* 178. *Stigmatophora palmata* (Moore)


**Diagnostic characters**: Thorax: mesothorax with a pair of black spots; tibia; fore tibiae banded with black; fore wing: costa and termen rather deeper yellow, a blue black spot at base of costa and a subbasal spot on median nervure, an antemedial series of three spots, a medial series of three strigae, two purplish streak on end of cell; hindwing: with three subterminal short streaks below apex followed by four and five spots.

**Material examined**: leg., N. Sikkim, Lachen, 2727m., 6.vi. 1959 (Coll. A.G.K. Menon).

**Wing expanse**: 35mm.
Distribution: India: Sikkim, Assam, Meghalaya and N.W. Himalayas.

Remarks: The species is recorded for the first time from Sikkim.

Subfamily MICRACTINAE

Key to genera

Palpi porrect. Antennae of male serrate. Tibiae with minute spurs. Hindwing with a fold on inner margin containing a glandular patch near base and with a tuft of long hair beyond it .................................. Argina Huebner.


XLVIII Genus Argina Huebner


Key to species

1. Head, thorax and fore wing scarlet or brownish red .................. argus (Kollar)

- Head, thorax and fore wing not scarlet or brownish .................. 2.

2. Head, thorax and fore wing pale pinkish brown, abdomen and hindwing crimson ..... syringa (Cramer).

- Head, thorax and fore wing orange yellow or whitish, abdomen and hindwing bright orange ................ astrea (Drury).

179. Argina argus (Kollar)

1844. Euprepia argus Kollar, in Hugel's Kashmir und das Reich der siek., 4 : 467, pl. 21, fig. 3.


Wing expanse: 35-38mm.


180. Argina syringa (Cramer)


Material examined: lex., Sikkim, No other data.

Wing expanse: 59mm.


181. Argina astrea (Drury)


Material examined: lex., Sikkim, 550m., viii.1897 (Coll. G.C. Dudgeon).

Wing expanse: 42 mm.


XLIX Genus Utetheisa Huebner


182. Utetheisa pulchella (Linnaeus)

1758. Tinea pulchella Linnaeus. Syst. Nat., 1 : 534

Diagnostic Characters: Fore wing: white with five interrupted scarlet band and with series of black spots between them, and marginal series of black spots, hind wing: semidiaphanous
**J. Majumdar (Chaudhury)**: *Insecta: Lepidoptera: Arctiidae*

**White, a very irregular black submarginal band at apical area and between veins cu₁ₙ and 2A.**

**Material examined**: 5exs, Sikkim. No other data.

**Wing expanse**: 30mm.

**Distribution**: Throughout India including Sikkim. Elsewhere: Africa, Australia, Europe, Malay Archipelago, New Guinea, Pacific group, the Philippines and Sri Lanka.

**Acknowledgement**

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INSECTA : LEPIDOTTERA : HETEROCERA : GEOMETRIDAE

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INTRODUCTION

Sikkim is situated on inner range of Himalayas approximately between 27°-28°N and 88°-89°E. The state is predominantly rural, moutainous with a little plain valleys and picturesque.

Valuable timbers grown in the dense forest in the south. Fern, Sal and Bamboos are grown below 2250 m. other plants are oak, chestnut, fur, maple etc. are grown between 2250-5000 m. More than 30 varities of rhododendron, 4000 varities of flowers and 700 varities of orchids are found in the state. The states has only 12 per cent of cultivated land (Bhatt, 1998).

Lepidoptera, one of the orders of Insecta, fall within Endopterygota, Holometabola. It passes through a complex metamorphosis i.e. egg, larva (caterpillar), crysalis (pupa) and imago (adult).

Moths can be easily differentiated from butterflies by their antennae and wing coupling apparatus. The antennae of moths may be ciliate, fasciculate or pectinate etc. in most of the moths wing coupling is by frenulum and in a very small number of species it is jugate or wing coupling is amplexiform but antennae are complex, moths, in general, night visitors, at repose moths spread their wings whereas butterflies have simple antennae clubbed at apex, wings coupling are amplexiform, they are day fliers and at repose they keep their wings erect.

The Geometridae is one of the largest families of the order Lepidoptera. It includes 21,144 species in the world fauna (Holloway, 1997). they are distributed throughout the world, where vegetations available, even some of the species are found in arctic region.

These moths are commonly called ‘Carpets’, ‘Pugs’ ‘Waves’ ‘Emereld’ etc. and larvae are called loopers.

The family Geometridae is characterised by its cylinder build, fore wing with second median ($M_2$) nearer the first ($M_1$) than the third ($M_3$) at the origin, hind wing with a precostal spur at the extreme base and abdomen with anter-ventral tympanal organs. Both proboscis and frenulum are present in most of the species. In many species hind tibia is dilated and with a hair pencil. For more details of morphological features, habits etc. refer to Mondal and Ghosh (1997,1998).

Sexual dimorphism is noticed in some species of Geometrid moths. Males have bipectinate antenna, hind tibia dilated, frenulum is single bristle, thicker, some times with fovea, fascia more prominent, where as females posses simple or smaller pectination, hind tibia not dilated, frenulum composed of bundle of thinner bristles, fovea absent in female, in size comparatively bigger, fascia less prominent. In Holarctic regions, in cold countries, during winter some of the females are wingless, called winter moth.

They are weak flier and diurno-nocturnal habits. Wings are wholly extended pressed out flat against the object on which they rest, often mistaken for a spot or scar. Fascia of Wings look continuous on both the wings when at rest. They can be readily differentiated from
Pyralidae by their glossy wings, longer legs and sitting posture.

The egg is generally flat. Two or three pairs of ventral prolegs of larva are reduced or absent. The larva of most species prefers leaves of trees or shrubs as food than low vegetation. They change colour with the host plant. Some groups pass their larval stages in seed or buds. For defence many larvae produce green secrertion from the mouth parts. They puppate under or on the surface of the ground or in leaves of the food plant. Certain Larentiinae from Hawaii are carnivorous, catching files and other active prey. The Geomatridae of a few genera from S.E. Asia are attracted to saline secretions around the eyes of larger mammals, and to sweat and some even reported sucking blood (Burlow, 1982).

Collection of the Geometridae is very easy for the experienced worker with trained eye. They are attracted to light and sit on the wall.

For collection a 200 W lighted bulb is placed outside the room close to wall to attract specimens. The specimens picked up from the wall are dropped in killing bottle. For temporary storage specimens after killing are placed in paper packets which should be dried in sun.

Specimens are pinned after proper relaxation to make them ready for study.

During dark nights more specimens are attracted to light and sometimes it is observed that specimens are drifted by high velocity of wind. Often specimens take shelter in shadow on rocks and foliage. They are weak fliers and when disturbed, settle to nearby suitable spot after short flight.

Through the available collection data for preserved specimens and field trips suitable period for the collection ranges from May to October with peak period in July. Mostly specimens are collected between 7 to 10 pm and 3 to 4 am. Occasionally a large number of specimens of *Abraxaphantes perampla* (Swinhoe) were collected during day time in the forest canopy in Manipur.

The Geometridae comprises of 525 species under 182 genera belonging to five subfamilies from the state.

The material studied contain 580 exs. belonging to 265 species which represent a little over 50% of the total Geometrid fauna from the state. Most studied metarials is old, the faunal resources should be legally protected in their natural habitats of the country.

Besides the catalogue of Swinhoe (1900), the pioneering work from Sikkim is after Warren (1893) and Hampson (1895-96).

The present work is an attempt to provide a consolidated account of Geometridae from Sikkim along with generic and specific distribution and keys to subfamilies, genera and species studied.

Out of 525 species 43 are endemic to Sikkim and 70 are distributed within N. E. India, 73 in North India and 83 through India. These include species, viz. *Electrophaes aliena* (Butler), *Loxaspilates unidiluta* Inoue and *Opisthograptis rumiformis* (Hampson) reported for the first time, from India (Sikkim). It may be mentioned that Butler (1886), Cotes and Swinhoe (1887-88) and Moore (1888) have reported a few species from Darjiling then includes as part of Sikkim which were reported from Sikkim by Hampson (1885-86) omitting Darjiling.

In old collection locality was mentioned as 'Sikkim' only but in recent collections district-wise data is given. Wing measurement is from the apex of fore wing to the base of the wing where it meets the thorax. The classification followed is after Hampson (1895-96). Prout (1912, '13, '14, '15, '34 and '35) along with modification by Inoue (1982-87).

Subfamily wise diversity of Geometridae from Sikkim relation to India, Oriental and World fauna is summarised below after (Hollow, 1997)

<table>
<thead>
<tr>
<th>Subfamily</th>
<th>Sikkim</th>
<th>India</th>
<th>Oriental</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oenochrominae</td>
<td>19</td>
<td>29</td>
<td>136</td>
<td>610</td>
</tr>
<tr>
<td>Larentiinae</td>
<td>112</td>
<td>241</td>
<td>1,042</td>
<td>5,749</td>
</tr>
<tr>
<td>Sterrhinae</td>
<td>94</td>
<td>124</td>
<td>543</td>
<td>2,763</td>
</tr>
<tr>
<td>Geometrinae</td>
<td>27</td>
<td>129</td>
<td>584</td>
<td>2,296</td>
</tr>
<tr>
<td>Ennominae</td>
<td>273</td>
<td>577</td>
<td>1,846</td>
<td>9,710</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>525</strong></td>
<td><strong>1,100</strong></td>
<td><strong>4,151</strong></td>
<td><strong>21,128</strong></td>
</tr>
</tbody>
</table>
Following is state-wise distribution of Geometrid fauna in N. E. India.

Sikkim 525
Assam 29
Meghalaya 460
Negaland 98
Manipur 18
Tripura 07
W.Bengal (Darjiling) 260

Larentiinae is predominant over other groups of Geometridae with the increase in latitude. in the tropics similar trends is observed with increase in altitude (Holloway, 1997).

SYSTEMATIC ACCOUNT

Class INSECTA
Order LEPIDOPTERA
Suborder HETEROCERA
Superfamily GEOMETROIDEA
Family GEOMETRIDAE
Subfamily OENOCHROMINAE

1. Genus Sarcinodes Guenée
   1. carnearia Guenée
   2. aequilinearia (Walker)
   3. debitaria (Walker)
   4. restitutaria (Walker)

2. Genus Palaeomystis Warren
   5. falcataaria (Moore)
   *3 Genus Doratoptera Hampson
   6. nicevillei Hampson

4. Genus Eumelia Duncan
   7. aureliata Guenee
   8. florinata Guenee
   9. rosalia (Cramer)
   *10. vulpenaria Stoll

5. Genus Derambila Walker
   11. lumenaria (Geyer)
   12. satellitaria Walker

6. Genus Noreia Walker

7. Genus Conolophia Warren
   14. helicola (Swinhoe)

8. Genus Nexa Walker
   15. textilis Walker
   9. Genus Ozola Walker
   16. impedita (Walker)
   17. microniaria Walker
   18. picaria (Swinhoe)

10. Genus Celerena Walker

19. divisa Walker
   11. Genus Archaeobalbis Prout

20. subteps Walker
   *21. cristata (Warren)
   *22. usneata (Felder)

12. Genus Actenochroma Warren

23. muscicoloraria (Walker)

13. Genus Ebipristis Meyrick

24. mininaria (Guenée)

14. Genus Pingasa Moore

25. chlora (Stoll)
26. ruginaria (Guenée)
*27. lariaria (Walker)
*28. venusta Warren

15. Genus Terpna Herrich-Schaffer

*29. crocina (Butler)
*30. haemataria Herr.-Sch.
*31. leopardinata (Moore)
*32. molleri (Warren)
33. similis (Moore)
*34. subornata Warren
35. vigens Butler

16. Genus Dindica Moore

36. polyphaenaria (Guenée)

17. Genus Spagnoidea Warren

37. lucida Warren

18. Genus Dysphania Hübner

38. bellona (walker)
*39. militaris (Linnaeus)

19. Genus Agathia Guenée

40. arcuta Moore
*41. gigantea Butler
*22. Genus *Helicopage* Warren
*20. Genus *Chlorodontopera* Warren
*43. *hirudinalis* Warren

21. Genus *Tanaorhinus* Butler
*46. *rafflesii* (Moore)
*47. *reciprocata* (Walker)
*48. *vittata* (Moore)

*23. Genus *Chlorozancla* Prout

*49. *falcatus* (Hampson)

*24. Genus *Hipparchus* Leach

50. *smargadus* (Butler)
51. *vallata* (Butler)

25. Genus *Iotaphora* Warren

*52. *iridiclor* (Butler)

26. Genus *Ornithospila* Warren

*53. *avicaria* (Guenée)

*54. *lineata* (Moore)

27. Genus *Anisozygus* Prout

*55. *gavissima* (Walker)

28. Genus *Opisthotia* Warren

*56. *tumidilinea* (Moore)

*29. Genus *Osteosema* Warren

57. *sanguilineata* (Moore)

30. Genus *Rhomborista* Warren

*58. *devaxata* (Walker)

*31. Genus *Comibaena* Hübner

59. *albimarginata* (Warren)
60. *delineata* (Warren)

32. Genus *Thalassodes* Guenée

*61. *curiosa* Swinhoe

62. *quadraria* Guenée

33. Genus *Jodis* Hübner

63. *caudularia* (Guenée)

34. Genus *Berta* Walker

64. *chrysolineata* Walker

*65. *acte* (Swinhoe)

35. Genus *Gelasma* Warren

66. *goniaria* (Felder)

*67. *glaucaria* (Walker)

68. *griseoviridis* Warren

69. *inaptaria* (Walker)

36. Genus *Spaniocentra* Prout

70. *pannosa* (Moore)

37. Genus *Oenospila* Swinhoe

71. *flavifusata* (Walker)

*72. *strix* (Butler)

38. Genus *Maxates* Moore

73. *coelatoria* (Walker)

*74. *macariata* (Walker)


75. *polygrapharia* (Walker)

*76. *vegata* (Walker)

40. Genus *Omphacodes* Warren

77. *directa* (Walker)

41. Genus *Episothalma* Swinhoe

78. *robustaria* (Guenée)

42. Genus *Hemithia* Duponchel

*79. *distinctaria* (Walker)

*80. *rubripicta* (Warren)

81. *tritonaria* (Walker)

43. Genus *Cyclothea* Prout

82. *disjuncta* (Walker)

44. Genus *Hemistola* Warren

83. *detracta* (walker)

*84. *dispartita* (Walker)

*85. *rubriinargo* Warren

86. *devaxata* (Walker)

45. Genus *Comostola* Meyrick

87. *ovifera* (Warren)

46. Genus *Pyrhorachis* Warren

88. *haematozona* Hampson

89. *chrysolineata* Walker
Insecta: Lepidoptera: Heterocera: Geometridae

*89. olivaceae Warren
90. similata (Moore)
91. vinacea (Moore)

48. Genus Tanaotrichia Warren
92. prasonaria (Swinhoe)

*49. Genus Discoglypha Warren
93. punctimargo (Hampson)
94. genuflexus (Hampson)
95. auricifloris (Warren)

50. Genus Dithecodes Warren
96. idaea (Swinhoe)

*51. Genus Organopoda Hampson
97. annulifera Butler

52. Genus Metallaxis Prout
98. semipurpurascens (Hampson)

53. Genus Synegiodes Swinhoe

*99. diffusifascia Swinhoe
*100. histrionareus Swinhoe
*101. sanguinarius (Moore)
102. hyriaria (Walker)

*54. Genus Chrysocraspeda Hampson
103. conspicuaria Swinhoe

55. Genus Timandra Duponchel
104. conveotraria Walker

56. Genus Gnamptaloma Warren
105. aventiaria (Guèneé)

57. Genus Anisodes Guèneé

*106. sarawackarius Guèneé
*107. absconditaria Walker
*108. intermixtaria Swinhoe
109. decretarius Walker
110. flavispila (Warren)
*111. perscripta (Warren)
112. denticulata Hampson

58. Genus Somatina Guèneé
113. plynusaria (walker)
114. subsusta Warren

59. Genus Problepsis Lederer
115. vulgaris Butler
116. conjunctiva Warren

60. Genus Zythos Fletcher

117. turbata (Walker)

*61. Genus Antitrygodes Warren
118. vicina (Th-Mieg)

62. Genus Scopula Schrank
119. emissaria (Walker)
120. fibulata (Guèneé)
121. ferrilineata (Moore)
122. Pulchellata (Fabricius)
123. extimaria (Walker)
124. moorei (Cotes and Swinhoe)
125. eulomata Snellen
126. mecsyga (Swinhoe)
*127. violacea (Warren)
*128. pallida (Warren)
*129. butyroga (Warren)
130. actuaria (Walker)
131. aspilataria (Walker)
132. attenta (Walker)

63. Genus Idaea Treitschke
133. chotaria Swinhoe
*134. mathaemaria Hampson
*135. vacillata (Walker)

*64. Genus Sterrhia Hübner
136. grisescens Warren
137. obliquilinea (warren)
138. falcipennis (Warren)
139. acuminata (Moore)
140. informis (Warren)

Subfamily LARENTIINAE

*65. Genus Leptostegna Christ
141. tenerata Christ

66. Genus Naxidia Hampson
142. punctata (Butler)
143. irrorata (Moore)

*67. Genus Dysethia Warren
144. bicommtaria Warren
145. ocyptaria Swinhoe
146. straminea Warren

68. Genus Stamnodes Guèneé
147. pamphilata Felder
69. Genus **Brabira** Moore

148. *artimidora* Oberthür

70. Genus **Sauris** Guenée

*149. normis* Hampson
*150. *olivacea* Warren
151. *interruptata* (Moore)
*152. *lineosa* (Moore)

71. Genus **Cambogia** Guenée

153. *memorata* (walker)
154. *marginata* Warren
*155. pulchella* Hampson
156. *lunulosa* (Moore)
157. *grataria* (Walker)

72. Genus **Cryptoloba** Warren

159. *aerata* (Moore)
160. *cinerea* (Butler)
161. *bifasciata* Warren
*162. *trinitata* Warren

*73. Genus **Syzeuxis** Hampson

163. *trinitaria* (Moore)

*74. Genus **Goniopteroloba** Hampson

164. *zalaska* (Swinhoe)

75. Genus **Hastina** Moore

165. *geminifera* (Moore)

76. Genus **Anaïtes** Duponchel

*166. *pubicata* Guenée
167. *fulgurata* Guenée
*168. *roseifascia* Hampson

77. Genus **Eubolia** Duponchel

169. *duplicata* Warren

*78. Genus **Triphosa** Stephen

170. *dubiosata* (Walker)
171. *rubrodotata* (Walker)

79. Genus **Electrophaes** Prout

172. *aliena* (Butler)

80. Genus **Photoscosotis** Warren

173. *multilinea* Warren
174. *atromarginata* Warren

175. *metachriseis* Hampson
176. *miniosata* (Walker)
*177. *fulgurites* Warren
*178. *venipicta* Warren
*179. *aurantiaria* (Moore)

*81. Genus **Gymnoescelis** Mabille

180. *ectochlora* Hampson
181. *polyodonta* Swinhoe

82. Genus **Cidaria** Treitschke

*182. *chalybearia* Moore
*183. *lativittaria* (Moore)
*184. *albapex* Hampson
*185. *scortea* Swinhoe
*186. *interplagata* Warren
*187. *aurata* Moore
*188. *dentistrigata* Warren
*189. *mediovittaria* (Moore)
*190. *interplagata* Guenée
*191. *mixtilineata* Hampson
*192. *relata* Butler
*193. *inextricata* Walker
*194. *aurigena* Butler
*195. *chalcoptera* Hampson
196. *viridata* Moore
*197. *obfuscata* Warren

83. Genus **Larentia** Treitschke

*198. *argentilineata* (Moore)
*199. *punctatissima* Warren
*200. *stellata* (Warren)
*201. *hypolopha* Hampson
*202. *abraxidia* Hampson
*203. *lacteiguttata* (Warren)
204. *bicolor* (Warren)
205. *apicistrigata* (Warren)
206. *variabilis* (Warren)
*207. *minuata* Butler
*208. *fasciata* (Warren)
*209. *interrupta* (Warren)
*210. *niveopicta* (Warren)
*211. *albiseriata* Warren
*212. comis Butler
213. *siderifera* (Moore)
214. *olivacea* Warren

*84. Genus **Gnamptopteryx** Hampson

215. *cymatia* (hampson)
*85. Genus **Ecliptopera** Warren
216. *rectilinea* Warren
   86. Genus *Dysstroma* Hübner
217. *dentiferum* (Warren)
218. *sikkimense* Heydemann
87. Genus *Venusia* Curtis

*219. *sikkimensis* Elwees
*220. *lilacina* Warren
221. *obliguisigna* Moore
88. Genus *Hydrelia* Hübner

*222. *rufigrisea* Warren
*223. *marginipunctata* Warren
224. *flavilinea* Warren
*225. *rhodoptera* Hampson
*226. *plumbeolineata* Hampson
*227. *rufinota* Hampson
*228. *cingulata* Hampson
*229. *crocearia* Hampson
*230. *sanguiflua* Hampson
231. *pictaria* (Moore)
232. *recurvilineata* (Moore)
89. Genus *Asthena* Hübner

*233. *plurilinearia* (Moore)
234. *albosignata* (Moore)
90. Genus *Polynesia* Warren
235. *sunandeva* (Walker)
*236. *truncapex* Swinhoe
91. Genus *Xanthorhoe* Hübner

237. *albigirata* (Kollar)
*92. Genus *Horisme* Hübner
238. *hypperythra* (Hampson)
*93. Genus *Chloroclystis* Hübner

239. *rubrinotata* Warren
240. *xanthocomes* (Prout)
241. *filicata* Swinhoe
242. *spissidentata* Warren
243. *lucinda* (Butler)
244. *modesta* Warren
*94. Genus *Eupithecia* Curtis

245. *costipicta* Warren
246. *rufipicta* Hampson
247. *irambarata* Warren
248. *rubridorsata* Hampson

*95. Genus *Trichopterigia* Hampson
249. *sanguinipunctata* (Warren)
*96. Genus *Trichopteryx* Hübner
250. *sikkima* (Moore)
251. *viretata* Hübner
*97. genus *Microloba* Hampson
252. *bella* (Butler)

Subfamily ENNOMINAE
98. Genus *Abraxas* Leach

253. *sylvata* (Scopoli)
254. *irrorata* Moore
*255. *fulvosparsa* Hampson
*256. *spontaneata* Walker
*257. *fasciata* Swinhoe
258. *martaria* Guenée
*259. *metamorpha* Warren
*260. *alpestris* Warren
*261. *diaphana* Warren
262. *nigrivena* Warren

99. Genus *Peratophyga* Warren

263. *aerata* (Moore)
*264. *xanthyala* (Hampson)

100. Genus *Heterostegane* Hampson
265. *subtessellata* (Walker)
*101. Genus *Cassyma* Guenée
266. *heteroneurata* Guenée
102. Genus *Zamarada* Moore
267. *scriptifasciata* (Walker)

103. Genus *Patalia* Herrich-Schäffer
268. *medardaria* Herrich-Schäffer
*269. *capitata* (Walker)
*270. *immaculata* Hampson
271. *fasciata* (Moore)
272. *riobearia* (Walker)

104. Genus *Myrteca* Walker

*273. *planaria* Walker
274. *sericea* Butler
*275. *subvitrea* Hampson
*276. *subpunctata* Warren
*277. *simpliciata* Moore
*105. Genus *Tasta* Walker
278. *micaceata* Walker
*106. Genus *Bapta* Stephen
279. *platyleucata* (Walker)
280. *mytylata* Guenée

107. Genus *Stegania* Guenée
281. *marginata* Warren
*282. strigata* (Warren)
283. *ubrica* (Swinhoe)
284. *rectifascia* Hampson
*285. latifasciata* Moore
286. *trilineata* (Moore)

108. Genus *Synegia* Guenée
287. *erythra* Hampson
288. *lidderdalii* (Butler)
289. *camptogrammaria* (Guenée)
*290. lunulosa* (Moore)
*291. pardaria* (Guenee)

109. Genus *Parasynegia* Warren
292. *pluristriaria* (Walker)
293. *diffusaria* (Moore)

110. Genus *Hyperythra* Guenée
294. *lutea* (Stoll)
295. *phoenix* Swinhoe

111. Genus *Kranarda* Moore
296. *semihyalina* Moore

112. Genus *Gonodontis* Hübner
297. *clelia* (Cramer)

113. Genus *Luxiaria* Walker
298. *contigaria* (Walker)
299. *exclusa* (Walker)
*300. obliguata* Moore
301. *phyllosaria* (Walker)
*302. acutaria* (Snellen)
*303. mitorrhaps* Prout

*114. Genus *Tephrina* Duponchel
304. *purpurascens* (Moore)

115. Genus *Oxymacaria* Warren
305. *palliata* Hampson

*116. Genus *Zeheba* Moore
306. *lucidata* (Walker)

117. Genus *Macaria* Curtis
307. *fasciata* (Fabricius)
308. *nora* Walker
309. *xanthonora* Walker
310. *elevirata* Guenée
311. *odataria* Swinhoe
*312. ozararia* Walker
313. *pulviata* (Fabricius)
314. *azataria* Swinhoe
315. *pervolgata* Walker
316. *effusata* Guenée
317. *acutaria* Walker
318. *emersaria* Walker
319. *perfusaria* Walker
*320. avitusaria* (Walker)

*118. Genus *Calletaera* Warren
321. *subexpressa* (Walker)

119. Genus *Obeidia* Walker
322. *tigrata* (Guenée)
*323. millepunctata* Warren

120. Genus *Vithora* Moore
324. *indrasana* Moore

121. Genus *Percnia* Guenée
*325. ductaria* Walker
*326. coryneta* Swinhoe
*327. tincta* Hampson
*328. felinaria* Guenée
329. *belluaria* Guenée
330. *maculata* (Moore)

122. Genus *Arichanna* Moore
*331. maculata* Moore
332. *transectata* (Walker)
333. *lapsariata* (Walker)
334. *rubrivena* Warren
*335. violacea* Warren
*336. transfasciata* Warren
*337. marginata* Warren
338. *rmosa* (Walker)
339. *biquadrata* Warren
*340. albovittata* Moore
341. *plagifera* (Walker)
342. *tenebraria* (Moore)
*343. subaenescens* Warren
344. *negans* Prout
123. Genus *Pardarisa* Warren

345. *comparataria* (Walker)

124. Genus *Alcis* Curtis

346. *nigridorsaria* (Guenèe)

*347. *tenea* (Warren)

125. Genus *Cleora* Curtis

348. *fraterna* (Moore)

*349. *inoffensa* (Swinhoe)

*126. Genus *Diplurodes* Warren

350. *parvularia* (Leach)

127. Genus *Ectropis* Hübner

351. *rubrifusa* (Warren)

352. *duplex* (Moore)

128. Genus *Boarmia* Treitschke

353. *denticolor* (Warren)

*354. *conspurcata* (Walker)

*355. *cervina* Hampson

356. *conifer* (Moore)

357. *idaeoides* (Moore)

*358. *marmorata* Moore

359. *crepuscularia* Hübner

360. *bhumitra* Walker

361. *boarmiaria* (Guennèe)

*362. *bisonuata* Hampson

363. *propulsaria* Walker

364. *variegata* (Moore)

*365. *melanosticta* Hampson

*366. *nigrabata* (Warren)

367. *semiclarata* (Walker)

*368. *atrostipata* Walker

*369. *trispinaria* Walker

370. *cineracea* (Moore)

371. *sublavaaria* Guennèe

372. *transcissa* Walker

373. *fuliginea* Hampson

374. *niligirica* Hampson

375. *nigreceans* Warren

376. *subplagiata* (Walker)

377. *delineata* Walker

378. *separata* Walker

*379. *dentilinea* Warren

*380. *albibasis* Hampson

*381. *albibicta* (Warren)

*382. *sericea* (Warren)

383. *vi rescens* (Butler)

*384. *euryzona* (Hampson)

*385. *in colorata* Warren

*386. *linicicolor* Warren

*387. *thricophora* Hampson

*129. Genus *Hirasa* Moore

388. *scripturaria* Walker

130. Genus *Phthonandria* Warren

389. *atrilineata* (Butler)

131. Genus *Ruttellerona* Swinhoe

390. *cessaria* (Walker)

*132. Genus *Menophra* Moore

391. *subterminalis* (Prout)

133. Genus *Amblychia* Guennèe

392. *angeronaria* Guennèe

134. Genus *Chorodna* Walker

*393. *pal lidularia* Moore

394. *adambrata* Moore

395. *metaphaeria* (Walker)

396. *erebusaria* Walker

135. Genus *Srinopteryx* Butler

397. *rufivinctata* (Walker)

398. *undulifera* Warren

136. Genus *Ourapteryx* Leach

399. *ebuleata* Guennèe

400. *picticaudata* Walker

*401. *clara* Butler

402. *podaliriata* Guennèe

403. *primularis* Butler

*404. *sciticaudaria* Walker

*405. *margaritata* Moore

137. Genus *Thinopteryx* Butler

*406. *citrina* Warren

407. *crocoptera* (Kollar)

138. Genus *Xeropteryx* Butler

408. *columbicola* (Walker)

139. Genus *Biston* Leach

409. *falcata* (Warren)

410. *regalis* (Moore)
140. Genus *Elphos* Guenée
411. *sinuata* Hampson
412. *contectaria* (Walker)
141. Genus *Xandrames* Moore
413. *hymenaria* Guenée
414. *pardicelata* Walker
142. Genus *Gnophas* Treitschke
415. *albofasciata* Moore
416. *muscosaria* Walker
143. Genus *Ophthalomodes* Guenée
417. *eolaria* Guenée
418. *licheneus* Oberthür
*144. Genus *Buzura* Walker
419. *herbidaria* Guenée
420. *cordularia* Swinhoe
145. Genus *Erebomorpha* Walker
421. *suppressaria* (Guenée)
422. *fulgurita* Walker
423. *fulguraria* Walker
146. Genus *Micrabraxas* Butler
424. *compositata* (Guenée)
425. *punctigera* Butler
426. *melanodonta* (Hampson)
147. Genus *Psyra* Walker
427. *spurcataria* (Walker)
428. *angulifera* (Walker)
148. Genus *Medasina* Moore
429. *similis* Moore
430. *striaria* (Guenée)
431. *muscidaria* (Walker)
432. *basistrigaria* (Moore)
433. *contaminata* (Moore)
*434. *quadrinotata* Warren
*435. *livida* Warren
*436. *creataria* (Guenée)
437. *albidaria* (Walker)
438. *combustaria* (Walker)
439. *interruptaria* (Moore)
440. *scotosiaria* Warren
441. * nigroviitata* (Moore)
*442. *reticulata* Hampson
149. Genus *Loxaspilates* Warren
443. *obliquaria* (Moore)
444. *hastigera* (Butler)
*445. *dispar* Warren
446. *unidiluta* Inoue
150. Genus *Scardamia* Guenée
447. *metallaria* Guenée
151. Genus *Tanaoctenia* Warren
448. *haliaria* (Walker)
*152. Genus *Metrocampa* Latreille
449. *biseriata* (Moore)
153. Genus *Aplochlora* Warren
450. *dentisignata* (Moore)
*451. *vivilaca* (Walker)
*452. *viridis* Warren
*154. Genus *Caberodes* Guenée
453. *cinerascens* (Moore)
454. *costalis* (Moore)
155. Genus *Plutodes* Guenée
*455. *prasina* (Swinhoe)
*456. *delphinaria* (Swinhoe)
*457. *subcaudata* Butler
458. *costatus* (Butler)
459. *discigera* Butler
460. *exquisita* Butler
156. Genus *Odontopera* Stephens
461. *bilinearia* (Swinhoe)
*157. Genus *Crocallis* Treitschke
462. *cervinaria* (Moore)
158. Genus *Hyposidra* Guenée
463. *talaca* (Walker)
464. *violescens* Hampson
*465. *aqualaria* (Walker)
466. *infixaria* (Walker)
467. *megaspila* (Moore)
159. Genus *Dalima* Moore
468. *trucataria* (Moore)
*469. *apicata* Moore
*470. *lucens* (Warren)
471. *patularia* (Walker)
*472. latitans Warren
160. Genus *Eurymene* Duponchel
*473. inustaria* Moore
474. reticulata (Warren)
161. Genus *Prionia* Hübner
475. squalidaria Hübner
*476. lithosia*aria (Walker)
477. incitata (Walker)
162. Genus *Aonychia* Warren
478. grisea (Butler)
479. lativitta (Moore)
163. Genus *Heterolocha* Lederer
480. falconaria (Walker)
164. Genus *Fascellina* Walker
481. hypochryseis Swinhoe
482. plagiata (Walker)
*483. vinosa* Warren
*484. subsignata* Warren
485. porphyreofusa Hampson
*486. inornata* Warren
165. Genus *Mimochroa* Warren
487. lugens (Butler)
*488. gynopteridia* (Butler)
166. Genus *Garaeus* Moore
*489. cruentatus* Butler
*490. coloratus* (Warren)
*491. muscorarius* Hampson
492. discolor Warren
493. apicata (Moore)
494. argillaceus Butler
495. absona (Swinhoe)
167. Genus *Pseudopanthera* Hübner
496. himalayica (Kollar)
168. Genus *Spilopera* Warren
*497. fuscomarginata* (Warren)
498. ferrifera (Moore)
169. Genus *Callerinns* Warren
*499. combusta* (Warren)
500. obliquilinea (Moore)
170. Genus *Leptomiza* Warren
501. decorata (Moore)
502. translineata (Walker)
*503. amethystina* (Warren)
*504. calcearia* (Walker)
*171. Genus *Pseudomiza* Butler
505. castanearia (Moore)
172. Genus *Hypochrosis* Guenée
506. pachiaaria (Walker)
*507. iris* (Butler)
508. hyadaria Guenée
*509. festivaria* (Fabricius)
510. pyrrhularia (Guenée)
*511. rufescens* Butler
173. Genus *Corymica* Walker
512. arnearia Walker
*513. specularia* (Moore)
*174. Genus *Millonia* Walker
514. pulchrinervis Felder
515. zonea Moore
*175. Genus *Eilicrinia* Hübner
516. *flava* (Moore)
176. Genus *Eurytaphria* Warren
517. undilineata Warren
518. bisinuata Hampson
519. pachyceras Hampson
*177. Genus *Peetula* Moore
520. exanthemata Moore
*178. Genus *Xenographia* Warren
521. lignataria Warren
*179. Genus *Hypulia* Swinhoe
522. dirempta (Walker)
*180. Genus *Rhynchobapta* Hampson
523. cervinaria (Moore)
181. Genus *Psilalcis* Warren
524. inceptaria (Walker)
182. Genus *Opisthograptis* Hübner
525. rumiformis (Hampson)
SYSTEMATIC ACCOUNT

Key to the subfamilies

M₂ present in Hind wing ........................................ 1
M₂ absent in Hind wing ...... ENNOMINAE

1. Hind wing M₂ much near to M₁ than M₃ Green ................. colour specimens.
   Areole absent ................. GEOMETRINAE
   Hind wing M₂ from middle of cell or near to
   M₁ ......................................................... 2

2. Hind wing Sₐ + R₁ approximated to Rs near middle of cell or connected by a bar near base
   .................................................. OENOCHROMINAE
   Hind wing Sₐ + R₁ anastomosing with R₁ beyond
   middle of cell or at base ......................... 3

3. Hind wing Sₐ + R₁ anastomosing with R₁ beyond middle of cell, sometimes running closely and
   connected with each other by a bar beyond middle of cell .......... LARENTIINAE
   Hind wing Sₐ + R₁, bent down and touching R₁
   at base, then rapidly diverging .................... 4
   ........................................................... STERRHINAE

Key to genera of the subfamily

OENOCHROMINAE

Sₐ + R₁ approximtely near middle of
discocellular .................................................. 1
Sₐ + R₁ connected by a bar near base of
discocellular .................................................. 2

1. Palpi upturned, M₁-Rₛ stalked, Hindwing M₁ + M₂ stalked .......... Sarcinodes Guenée
   Palpi porrect, R₁ Rₛ stalked, Hindwing M₁ from angle of cell, M₂ from middle of
   discocellulars ....... Palæomytis Warren.

2. Palpi very minute, Forewing rounded at apex,
   Rₛ stalked ............................................. Naxa Walker
   Palpi of moderate size ................................ 3

3. Palpi porrect ........................................... 4
   Palpi upturned ........................................ 5

4. Hind tibia dilated, containing hair pencil ...... 6
   Hind tibia not dilated ................................ 7

5. Antennae and legs of moderate size, Rs of
   Hindwing before upper angle ....................... Noreia Walker
   Antennae and legs long, Rs and M₁ of
   Hindwing stalked .............................. Eumelia Duncan

6. Rs of Hindwing before upper angle ................ Celerena Walker
   Rs of Forewing absent, Rs and M₁ of
   Hindwing from upper angle of cell ................. Ozola Walker

7. Rs of Hindwing before upper angle ................ Conolophia Warren
   Rs and M₁ of Hindwing stalked .................... Derambila Walker

1. Genus sarcinodes Guenée


Diagnosis : As per key.

Distributional range : India : Sikkim, Meghalaya and West Bengal. Elsewhere :
     Mayanmar, West China, Malay, Indonesia
     (Sumatra, Borneo) and Newguinea.

Key to the species of genus Sarcinodes

Forewing with oblique line from apex........ 1

Forewing with oblique lines from apex and other
   part of costa ........................................... 2

1. Wing pale pink, a double line from apex of Fore
   wing to middle of inner margin of Hindwing, no
   speck at end of cell .......... restitutaria (Walker)

   Wing yellowish, a single line from near apex
   of Forewing to middle of inner margin of
   Hindwing a speck at end of cell ............... debitaria(Walker)

2. Wing pale-pink, Two oblique, to some extent
   parallel lines, one from apex of Fore
   wing to middle of costa to inner margin of
   Hindwing. Both the lines continue to
   antemedian and post median lines of
   Hindwings. Angular lines join the spots on
   postmedian area of both wings .................
   carnearia Guenée

   Wing pink grey. Three equidistant, parallel
   lines arise, one from apex, one from
   antemedian, one from postmedian area of
custa reach inner magim of hun wuing. The lines arise from apex and antemedial continue with hindwing parallel lines. aequilinearia (Walker)

1. Sarcinodes carneaaria Guenée


1992. Sarcinodes carneaaria : Inoue, Lep. checklist Taiwan, 1(2) : 111

Material Examined : One \( \delta \), vi. 1897, Sikkim, G.C. Dudgeon Coll. (Old Collection).

Length of Forewing : \( \delta \) 25 mm.

Diagnosis : As per key.

Distribution : India : Sikkim, Meghalaya and West Bengal (Darjiling). Elsewhere : Myanmar and Taiwan.

2. Sarcinodes aequilinearia (Walker)


Material Examined : Two \( \delta \), Sikkim, (Old Collection).

Fore wing length : \( \delta \) 27 mm.

Diagnosis : As per key.

Distribution : India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). Elsewhere : Bangladesh (Sylhet), West China, Indonesia (Sumatra and Java) Holloway (1976).

Remarks : The species does not occur in Assam. It was earlier recorded from Khasi Hills (Meghalaya). It is commonly found only on foot hills (Holloway 1976).

3. Sarcinodes debitaria (Walker)


Material examined : One \( \delta \), 1888, Sikkim alt Ca 650 m, G.C. Dudgeon coll. (Old Collection).

Length of Forewing : \( \delta \) 25 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim, Khasis and West Bengal (Darjiling). Elsewhere : Indonesia (Sumatra).

Remarks : Prout (1912) has pointed out that occurrence of the species in Sumatra is doubtful.

4. Sarcinodes restitutaria (Walker)


Material Examined : One \( \delta \), Sikkim, 1889, G.C. Dudgeon coll.

Length of Forewing : \( \delta \) 33 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling) Cotes and Swinhoe (1888). Elsewhere : Myanmar, Malaya and Indoensia (Sumatra and Borneo).

Remarks : The Specimens is smaller in size than the one described by Hampson (1895).

2. Genus Palaeomyestes Warren


Diagnosis : Refer Key.

Distributional range : India : Sikkim and West Bengal (Darjiling). Elsewhere : Tibet, West China and Japan.

There are only two species under this genus. Both the species occurring just within the Palearctic Region but probably Indo-Australian rather than
Palearctic in their origin Prout (1912). Out of these one species occurs in India.

5. *Palaeomystis falcataria* (Moore)


*Material examined*: One ♂, Sikkim, x.1888, G.C. Dudgeon coll.

*Length of Forewing*: ♂ 20 mm.

*Diagnosis*: Wing white with slight yellowish tinge, Fore wing apex produced with four transverse lines second and third meeting at inner margin of Hindwing with the transverse lines. The Hindwing with three transverse lines. The third, submarginal line is curved.

*Distribution*: India: Sikkim and West Bengal (Derjiling). Elsewhere: Tibet and West China.

*Remarks*: Under the genus there are 21 species, out these four species are represented in India. All the four species occur in Sikkim.

6. *Doratoptera Nicevillei* Hampson


*Distributional range*: India: Sikkim.

*Remarks*: This species is not reported after Hampson (1895).

4. *Genus Eumelia* Duncan


*Diagnosis*: Refer Key.

*Distributional range*: Indo-Australian region.

*Remarks*: Inoue 1992 synonymised this species under *ludovicata* Guèneé.

7. *Eumelea aureliata* Guèneé


*Material examined*: 2 ♂ ♀ and 3 ♂♀, Sikkim, Ca 550 m. vii-xii. 1897, G.C. Dudgeon coll.

*Length of Forewing*: ♂ 22 mm, ♀ 25 mm.

*Diagnosis*: Refer Key.

*Distribution*: India: Sikkim, Assam, South India and Andaman & Nicobar Islands. Elsewhere: Sri Lanka, Myanmar, Taiwan, Indonesia (Borneo) and Solomons Island.

*Remarks*: Under the genus there are 21 species, out these four species are represented in India. All the four species occur in Sikkim.

8. *Eumelea florinata* Guèneé


*Material examined*: One ♂, Sikkim, viii.1889, G.C. Dudgeon coll.

*Length of Forewing*: ♂ 26 mm.
Diagnosis: Refer Key.

Distribution: India: Sikkim, Elsewhere: Malaya (Perak) and Indonesia (Sunda Insland).

Remarks: This species was synonymised by Hampson (1895) but Prout (1912) treated this as good species.

9. Eumelia rosalia (Stoll)


Material examined: One σ, Sikkim, iii.1896, c 1800 ft. G.C. Dudgeon Coll.

Length of forewing: σ 24mm.

Diagnosis: Refer key.

Distribution: India: Sikkim and Coromandel coast, West India. Elsewhere: Sri Lanka and Indonesia (Sumatra, Borneo, Java and Lombok).

Remarks: Hampson (1895) stated that it occurs in Taiwan (Formosa), but it is not reflected in catalogue of Inoue (1992). Burlow 1982 omitted it from China.

*10. Eumelea vulpenaria* Stoll


Distribution: India: Sikkim and Coromandel coast, West India. Elsewhere: Sri Lanka and Indonesia (Sumatra, Borneo, Java and Lombok).

Remarks: Prout 1912 synonymised this species under *Olivacea* Hampson and reported from West India and Sumatra. It was further reported from sikkim and Nilgiris by Hampson (1895). Cotes and Swinhoe (1888) had given its distribution from Coromandel coast and Sri Lanka (Ceylon).

5. Genus Derambila Walker

Distribution: India: Sikkim, Meghalaya (Cherra Punji) and West Bengal (Darjiling). Elsewhere: Taiwan, Malacca, Indonesia (Sula) and Newguinea.

6. Genus Noreia Walker


Distribution: Indo-Australian upto Neuginea.

Remarks: Out of 11 species, only one species occurs in India.

13. Noreia perdensata Walker


Material examined: One ♂, Sikkim, 17.viii.1889, G. C. Dudgeon coll.

Length of Forewing: ♂ 15 mm.

Diagnosis: Purple grey, an oblique line from apex of forewing to inner margin at postmedian area present. End cell speck on both fore and hind wings.


Remarks: The specimen is much smaller than the description provided by Hampson (1895).

7. Genus Conolophia Warren


Distributional range: West, Central and South Africa, India, Sri Lanka, Myanmar and Indonesia (Borneo).

Remarks: Out of five species, only two species occur in India. Here one species dealt with.

14. Conolophia helicola (Swinhoe)


Material examined: One ♀, Sikkim, 1-1897, Ca 550 m. G. C. Dudgeon coll.

Length of Forewing: ♀ 19 mm.

Diagnosis: Yellowish brown. A ferrugenus line starts from apex to meet inner margin medially, the line is continues to hindwing at antemedian area. The postmedian dotted band is more proment at hind wing. Post median line of underside of forewing upto M3 and entire in hindwing.

Distribution: India: Sikkim and Meghalaya (Khasi Hills).

Remarks: Hampson (1895) described this species under the genus Alex.

8. Genus Naxa Walker


Diagnosis: As per key.

Distributional range: India, Bangladesh, Indonesia (Borneo, Sumatra). Philippines, China, Amur and Japan.

Remarks: Out of five species two species are recorded from India. Here only one species is described. Hampson (1895) recorded seviaria Motsch from Nagas. But Prout (1912) reported it from China, Amur and Japan.

15. Naxa textiles Walker


Length of forewing: ♂ 20 mm.

Diagnosis: Wings white, Forewing with three antemedial black spots on nervures. Ocellated cell spots on both wings. Marginal and submarginal black spots on both wings.

Distribution: India: Sikkim, Assam(Cachar, Sibsagar) and Bihar (Buxar). Elsewhere:
Bangladesh (Sylhet), Bhutan, Myanmar, Nepal and Taiwan.

**Remarks** : Prout (1912 and 1912a) mentioned its distribution as Indian and throughout India.

9. Genus **Ozola** Walker


**Distributional range** : India : Sri Lanka, Myanmar, Nepal, Malayan and Austro Malayan subregions.

**Key to the species of genus *Ozola***

- Forewing outer margin excised below apex.
  - Wings with fuscous pots *...picaria* (Swinhoe)
  - Antemedial double line of forewing angled below the costa, a diamond shaped patch at end of cell. Hindwing with a double post medial line and a cell spot *....impedita* (Walker)

16. *Ozola impedita* (Walker)


**Material examined** : One *♂* Sikkim, x.1889, G.C. Dudgeon coll.

**Diagnosis** : Refer Key.

**Distribution** : India : Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling and Calcutta), W. Himalaya (Dharmasala), Ganjam and Nilgiris. Elsewhere : Sri Lanka and Philippines.

**Remarks** : The specimens are much smaller in size than the specimens described by Hampson (1895). The specimens feed on *Premna latifolia*. Some Australian species feed on *Eucalyptus* (Sevastopulo 1948).

17. *Ozola microniaria* Walker


**Material examined** : 2 *♂* 2 ♀, Ca 550 m (one *♂* v.1896, ♀ ♀ v.1897) Sikkim, G.C. Dudgeon coll.

**Length of Forewing** : *♂ ♀ 11 mm.

**Diagnosis** : Refer key.

**Distribution** : India : Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling and Calcutta), W. Himalaya (Dharmasala), Ganjam and Nilgiris. Elsewhere : Sri Lanka and Philippines.

**Remarks** : The specimens agree well with *biangulifera* (Moore), description of which is given by Hampson (1895). But Inoue (1982) reported this species as *Ozola impedita biangulifera* (Moore).

18. *Ozola picaria* (Swinhoe)


**Material Examined** : One example, Sikkim x.1889, G.C. Dudgeon coll.

**Diagnosis** : Refer Key.

**Distribution** : India : Sikkim and Meghalaya (Khasi Hills).

**Remarks** : The specimen is damaged.

10. Genus **Celerena** Walker


**Distributional range** : India : Sikkim, Assam and Andamans. Elsewhere : Bangladesh (Sylhet), Myanmar, Moluccas and Austro-Malayan subregion.
Remarks: Two species are found in India. Here only one species is dealt with.

19. Celerena divisa Walker


Material examined: Three ♀♂, Sikkim 10-14.iii.1890, one ♂ 12.xi.1890, G.C. Dudgeon coll.

Length of Forewing: ♂ 31-33 mm.

Diagnosis: Wings bright yellow. From medial area of costa to base of wing grey. The medial black band is continuous with the costal grey band. The medial black band angled at cell and terminates at Excurication black post medial band on both wings. After that the both wings grey.

Distribution: India: Sikkim, Assam (Sibsagar) and West Bengal (Darjiling). Elsewhere: Bangladesh (Sylhet), Malayan, 'Halbinsel' Indonesia (Borneo).

Remarks: The specimens are smaller in size in comparison to those of Hampson (1895).

Key to the genera of Geometrinae

R₁ of Forewing arising separately from the cell [Abdominal crest small, S₂ + R₁ diverging well before one half] ............ Archaeobalbis Prout
R₁ of Forewing not arising separately from the cell .......................................................... 2

2. Hindwing without basal expansion ............... 3
Hindwing with basal expansion ..................... 15

3. Forewing with strong fovea, wing much elongated ........................................ Dysphania Hübner
Forewing without fovea .................................. 4

4. Hind tibia without median spur ................... 5
Hind tibia with median spurs ........................ 11

5. Forewing apex falcate, termen smooth, Palpus moderate to long, 3rd joint elongated ................. Tanaorhinus Butler
Forewing apex not falcate, termen smooth ... ................................................................. 6

6. Forewing with R₁ arising after R₄ ............... 7
Forewing with R₁ arising before R₄ ............... 8

7. Abdomen crested, Sc of Forewing from cell Dc of Hindwing straight ................................................. 8

Abdomen not crested, Sc of Forewing stalked Hindwing Dc angled ............................................... Ornithospila Guenee

8. Antennae in ♂ bipectinate .......................... 9
Antennae of ♂ ♂ simple. Hindwing pointed at M₃ ................................................ Agathia Guenee

9. Bothwings with termen strongly dentate ...... ........................................ Chlorodenbtopera Warren
Wings are not strongly dentate ..................... 10

10. Hindwing crenulate and angled at M₃ .......... ........................................ Anisozzyga Prout

Not angled at M₃ margin crenulate, iridescent colour ........................................... Iotaphora Warren

11. Metathorax crested strongly ....................... ........................................ Dindica Moore
Metathorax without crest or with small crest ........................................................................ 12

12. Hindwing with tufts of raised scale, Cell of Hindwing short .................. Pingasa Moore
Hindwing without tuft of scale ....................... 13

13. Hindwing Sc + R₁ approximated to cell ...... ........................................ Sphagnodela Warren
Hindwing Sc + R₁ diverging before one half near base ....................................................... 14

14. Pectus densely hairy, Hind femora densely hairy, ♂ antennae bipectinate to two third length ............................................ Terpna Guenee

Pectus not densely hairy, femora glabrous, antennae simple .................. Epipristis Meyrick

15. Frenulum present in ♂ ................................ 16
Frenulum absent in ♂ .................................. 24

16. Forewing with R₁ arising after R₄ ............ 17
Forewing with R₁ arising before R₄ ............... 18

17. Dc smaller, outer margin of Hindwing dentate at veins M₁ and M₃, median spurs present ... ........................................ Rhomborista Warren
Dc bigger, outer margin of Hindwing not so,
median spurs absent. ... Spaniocentra Prout

18. Hind tibia with one pair of spur .......... 19
   - Hind tibia with all spurs ................. 22

19. Hind tibia with terminal spur, Abdomen crested antennae ciliate ... Cyclothea Prout
   - ♀ Hind tibia with median spurs .......... 20

20. Forewing costa straight, abdomen not crested ........................................... Oenospila Swinhoe
   - Forewing costa arched, abdomen crested .... 21

21. Hindwing termen crenulate or excised between veins M₁ and M₃ ... Episothalma Swinhoe.
   - Hindwing termen neither crenulate nor excised, angled or tailed at vein M₃ ................ 21

22. Hindwing Dc oblique ... Thalassodes Guenée
   - Hindwing Dc not so, rather curvud .......... 23

23. Hindwing termen dentate, long tail at vein M₃ ........................................... Maxates Moore
   - Hindwing termen entire or weekly subcrenulate ............................................. Gelsasma Warren

24. Both wings termen strongly crenulate ...................................................... Paramaxates Warren
   - Both wings termen not so .................... 25

25. Hindwings Sc approximated to cell for long distance, both wings Cula widely separate ....

   - Hindwing Sc diverging near base Cula approximated or stalked ................................ Hemistola Warren

26. Dc straight [Sc stalked with R₁-R₄] ............................................................ Jodis Hübner
   - Dc curved.................................................. 27

27. Hindwing termen crenulated with tail at M₃ and M₁, it is toothed ............... Beria Walker
   - Hindwing termen rounded not toothed or tailed ........................................... Comostola Meyrick

11. Genus Archaeobalbis Prout

1912. Archaeobalbis Prout, Gen. Ins., 129 : 24

Diagnosis : Refer key.

Distributional range : India (Northeast and Northwest India), Elsewhere : Sri Lanka, Nepal, Bhutan, Indonesia (Borneo), Taiwan, West and Southwest China, Kazak and Uzbek.

Remarks : Out of seven Indian species, three species occur in Sikkim. Here only one species dealt with.

20. Archaeobalbis subtepens (Walker)


Length of Forewing : ≈ 24 mm.

Diagnosis : Forewing with waved antemedian line, one postmedial line and submarginal series of black specks. Under side cell-spots black and with a post medial band. Wings margin crenulated.

Distribution : India : Sikkim and Meghalaya (Khasis). Elsewhere : Indonesia (Borneo and Sulawesi).

*21. Archaeobalbis cristata (Warren)


Remarks : The species cristata, was considered as synonym of the former species by Hampson (1895). Holloway (1976) treated this as good species.

*22. Archaeobalbis usneata (Felder)


Distribution : India : Sikkim. Elsewhere : Eastern Nepal (Late, 2400 m. near Nilgiri, Kalbani 2400 m, Kaligandaki).
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Renzarks : Inoue (1992) put this species as synonym of *Anlontana* (Bastelberger 1911). He also noted there *usneta* Inoue, 1978 (not Felder and Rogenhofer, 1875). ‘usneta’ may be mispelt.

12. Genus *Actenochroma* Warren


*Distributional range* : North Indian : Sikkim, West Bengal (Darjiling), Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala).

*Remarks* : This genus is endemic to N. India.

23. *Actenochroma muscicoloraria* (Walker)


*Material examined* : Two ♂, Sikkim, Old colln.

*Length of Forewing* : 25 mm.

*Diagnosis* : Fresh specimens bright yellowish green fades in course of time. Forewing with crenulate postmedial and dentate submarginal lines. Cell spot on both wings. Underside with cell spot and fuscous submarginal band on both wings.

*Distribution* : North India : Sikkim, West Bengal (Darjiling), Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala).

*Remarks* : The specimens are bigger in size than that of Hampson (1895).

13. Genus *Epipristis* Meyrick


*Diagnosis* : Refer Key.

*Distributional range* : Indo-Australian region.

*Remarks* : Out of two species of the genus one occur in India.

24. *Epipristes minimaria* (Guenée)


*Length of forewing* : 24-25 mm.

*Diagnosis* : Vide Mondal and Ghosh (1997).


14. Genus *Pingasa* Moore


*Diagnosis* : Refer key.

*Distributional range* : Indo-Australian and Aethiopian Regions, scarcely spreading into the Palearctic.

*Remarks* : Out of seven Indian species four species found in Sikkim.

**Key to the species Pingasa**

Crenulate antemedial line on forewing, postmedial line is less crenulate, beyond this line of both wings suffused with brown. Outer area of under side of both wings with broad black band, a black band on cell of forewing only .......................... ruginaria (Guenée)

Post medial line of both wings very much crenulate, beyond this line is not suffused with brown. Outer area of underside of both wings a thinner black band, on both wings black streak on cell but the forewing band is bigger, the hindwing band is very small..................

chiora (stoll)

25. *Pingasa chlora* (Stoll)


Material examined: One ♀ 24. vi. 1890, One ♀ iv. 1896, One ♀ ix. 1896, One ♀ iii. 1897 alt c 550 m, one ♂ iii. 1896, one ♂ 1.viii. 1897, Sikkim, G.C. Dudgeon coll.

Length of forewing: ♂ 18-23 mm, ♀ 19 mm.

Diagnosis: Refer key.

Distribution: India: Sikkim. Elsewhere: Malaya, Indonesia (Sumatra, Borneo, Bali), Philippines, Sulawesi to Queensland and Solomon Inlands.


26. Pingasa ruginaria (Guèneè)


Length of Forewing: ♂ 19 mm.

Diagnosis: Refer key.


Remarks: Hampson (1895) treated this species as synonym of chlora. Prout (1912) treated this species as good species. This is an upper montane element Holloway (1976).

*28. Pingasa venusta Warren


Diagnosis: Refer key.


15. Genus Terpna Herrich-Schaffer


Diagnosis: Refer key.

Distributional range: Indo-Australian.

Remarks: Out of 16 Indian species seven species available in Sikkim.

Key to the species of genus Terpna

Grey, irrorated with olive green, Forewing with subbasal and antemedial waved lines, Underside whitish, the base of wing orange .................

................................................. similis (Moore)

Entire green, No subbasal line, in Forewing there is one sinuons antemedial line, underside ochreons white ...................... vigenes (Butler)

*29. Terpna crocina (Butler)


Distribution: India: Sikkim.
30. *Terpna haemataria* Herrich-Schäffer


*Distribution* : India : Sikkim and Assam (Sibsagar) Cotes and Swinhoe (1888).

*31. Terpna leopardinata* (Moore)


*Distribution* : India : Sikkim Hampson (1895) and Bengal Cotes and Swinhoe (1888). *Elsewhere* : Tibet, Prout (1912).

*32. Terpna molleri* (Warren)


*Distribution* : India : Sikkim.

33. *Terpna similis* (Moore)


*Length of Forewing* : ♀ 20 mm.

*Diagnosis* : Refer Key.

*Distribution* : India : Sikkim, Meghalaya (Khasi Hills) Assam (Sibsagar), West Bengal, Maharashtra and Nilgiris.

*Remarks* : The specimen is smaller in size if compared with Hampson (1895) specimen. The ♂ specimen is badly damaged.

*34. Terpna subornata* Warren


*Distribution* : India : Sikkim.

35. *Terpna vigens* (Butler)


*Material examined* : One ♂, vii.1897, Ca 550 m, Sikkim, G. C. Dudgeon coll.

*Length of Forewing* : ♂ 19 mm.

*Diagnosis* : Refer Key.

*Distribution* : India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). *Elsewhere* : Malaya and Indonesia (Sumatra, Borneo) Holloway (1976).

*Remarks* : Holloway (1976) reported that species is confined to lower montane region only.

16. Genus *Dindica* Moore


*Diagnosis* : Refer Key.

*Distributional range* : North India to Philippines, Celebes one species occurs in Japan and Korea.

*Remarks* : Out of seven known species only four species occur in India. Here only one species dealt with.

36. *Dindica polyphaenaria* (Gueneè)


*Material examined* : One ♂ , vii.1896, Ca 550 m, Sikkim, G. C. Dudgeon coll.

*Length of forewing* : ♂ 19 mm.

*Diagnosis* : Antenna of male bipectinate up
to first two thirds, a large tuft on metathoracic segment present. A black cell end spot on forewing only. The submarginal black band diffuses towards forewing costa. Under side orange, pale patches on margin.

Distribution: India: Sikkim and Himachal Pradesh (Dharmsala). Elsewhere: Myanmar, Malaya, Taiwan and Indonesia (Java, Sumatra, Borneo).


17. Genus *Sphagnodela* Warren


Diagnosis: Refer Key.

Distributional range: Sikkim to Tibet.

Remarks: This genus contains single species distribution of which is restricted to Sikkim and Tibet only.

37. *Sphagnodela lucida* Warren


Materia examined: One ♂, one ♀, viii.1885, ca 3000 m, Sikkim, G.C. Dudgeon coll.

Length of Forewing: ♂ 21 mm, ♀ 21.5 mm.

Diagnosis: Green, irrorated with black, side of palpi black, forewing with waved antemedial and crenulate post medial lines, lines thick, a dentate lunule at cell. Hindwing paler, the distal margin concolours with forewing, Underside of hindwings almost as upper of forewing which almost throughout dark greyish.


Remarks: Only species of the genus is restricted to Sikkim to Tibet.

18. Genus *Dysphania* Hübner


Diagnosis: Refer key.

Distributional range: Indo- Australian.

Remarks: Out of Three Indian species, two species occur in Sikkim. Here only one species is dealt with.

38. *Dysphania bellona* (Walker)


Materia examined: One ♂, one ♀, viii.1896, ca 550 m, Sikkim, G.C. Dudgeon coll.

Length of Forewing: ♂ 43 mm, ♀ 41 mm.

Diagnosis: Head, thorax and abdomen yellow intercepted by purple bands. Outer area of forewing with thin maculate bands. Outer area of hindwing purple with short yellow band from inner margin extended upto Culb.


*39. Dysphania militaris* (Linne)


Distribution: India: Sikkim, Assam (Cachar, Sibsagar), Meghalaya (Cherrapunji, Shillong), Naga Hills, West Bengal (Darjiling), Maharashtra (Matheran), Andaman and Nicobar Islands (Andaman, Nicobar, Nancowry). Elsewhere: Myanmar, Indonesia (Java) and China.

19. Genus *Agathia* Guenée


Diagnosis: Refer Key.

Distributional range: This Indo-Australian genus, straggling into the Palaearctic and Aethiopian Regions, Prout (1912).

Remarks: Out of 13 Indian species six occurring in Sikkim, here only one species is dealt with.
40. *Agathia arcuta* Moore


*MATERIAL EXAMINED*: One ♀, viii.1891, Sikkim, G.C.Dudgeon coll.

*LENGTH OF FOREWING*: 17 mm.

*DIAGNOSIS*: No green on thorax and abdomen. Forewing costa rufous, medial band oblique, conjoined below vein Culb to outer area, which is rufous, further it runs along inner margin. Markings of underside purplish fuscous.

*DISTRICTION*: India: Sikkim and Meghalaya (Khasi Hills), Cotes & Swinhoe reported its distribution in Bengal, however, it is doubtful.

*41. *Agathia gigantea* (Butler)


*DISTRICTION*: India: Sikkim, Assam to Indonesia (Java).

*42. *Agathia lycaenaria* (Koller)


*DISTRICTION*: and other details vide Mandal and Ghosh,

*20. Genus *Helicopage* Warren


*DISTRICTION*: India: Sikkim and Meghalaya (Khasi Hills).

21 *Genus Chlorodontopera* Warren


*DISTRICTIONAL RANGE*: North East India to Taiwan straggling into Central China.

*REMARKS*: Out of four species of the genus two occur in India both of which are dealt with.

*KEY TO THE SPECIES*

Frons rufous, cilia pinkish, large, black discal spots on both wings, under side orange with black iroration.......... *discospilata* (Moore)

Frons black, black markings on base of cilia, forewing discal spot smaller, underside purplish brown.......................... *chalybrata* (Moore)

*44. Chlorodontopera chalybeata* (Moore)


*MATERIAL EXAMINED*: One ♂, iii.1896, Ca 550 m, Sikkim, G. C. Dudgeon coll.

*LENGTH OF FOREWING*: 17 mm.

*DIAGNOSIS*: Refer Key.

*DISTRICTION*: India: Sikkim and Meghalaya (Khasi Hills).

*REMARKS*: The specimen is smaller in size as compare to Hampson’s (1895) description.

*45. Chlorodontopera discospilata* (Moore)


*MATERIAL EXAMINED*: One example, 15.v.1897, Sikkim, G.C.dudgeon coll., one ♂, 5.x.1988,
**Rabangla, S. Sikkim, alt. Ca 2010 m, V.C.Agrawal coll.**

**Length of Forewing**: 22 mm.

**Diagnosis**: As per key.

**Remarks**: One specimen is badly damaged, Length of Forewing, sex can not be determined for that specimen. The specimen examined has a smaller wing than that mentioned by Hampson (1895).

**22. Genus Tanaorhinus Butler**


**Diagnosis**: Refer key.

**Distribution range**: India and China to Neuguinea.

**Remarks**: Out of five Indian species under this genus three species are found in Sikkim, here only two species are dealt with.

**Key to the species**

Dark blue green. Fore wing ante- and postmedial lines closer and two cell-specks between them. No lunulate mark ..............................

- Bright green, suffused with silvery white. Forewing with ante- and postmedial bands, no cell speck, a lunule at end of cell ..........................

**46. Tanaorhinus rafflesii** (Moore)


**Material examined**: One  1♂, 12.vii.1889, Sikkim. G. C. Dudgeon coll., one  1♀, 1.x.1988, Tumin, E. Sikkim, alt. 1475 m., coll. V. C. Agarawal.

**Length of Forewing**: 23-29 mm.

**Diagnosis**: Refer key.

**Distribution**: N. E. India : Sikkim, Meghalaya (Khasi Hills) and west Bengal. Elsewhere : S.China, Taiwan, Malaya, Indonesia (Sumatra, Java, Borneo), Philippines and Sulawesi.

**Remarks**: Swinhoe (1900) considered this Hampson's (1895) synonym as good species. Burlow (1982) found larvae in the leaf of *Quercus* sp. (Cupuliferae).

*47. Tanaorhinus reciprocata* (Walker)


**Distribution**: India : Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Dharmsala, Simla) and Khasmir. Elsewhere : Japan, North and Westren China, Taiwan and Myanmar.

**48. Tanaorhinus vittata** (Moore)


**Material examined**: One  1♂, 22.viii.1890, ca 550 m, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 20 mm.

**Diagnosis**: Refer Key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling) and Himachal Pradesh (Solan, Kulu). Elsewhere : Japan and Indonesia (Sumatra).

**Remarks**: Sivastopulo (1948) reported a pupa from the curl leaf of *Quercus* sp. (mihi).

*23 Genus Chlorozancla Prout*


**Distributional range**: Sikkim.

**49. Chlorozancla falcatus** (Hampson)


*Distribution*: India: Sikkim.

*24. Genus Hipparchus* Leach


*Distribution*: Eastern Palearctic and North India.

*Remarks*: Out of five Indian species two species recorded from Sikkim. Although the genus is E. Palearctic and type species *Papilionaria* (L.) is described from Europe.

50. *Hipparchus smargadus* (Butler)


*Distribution*: India: Sikkim.

194. *Hipparchus vallata* (Butler)


*Distribution*: India: Sikkim.

*Remarks*: Specimens are common in Japan from June to August. Prout (1912a) and Inoue (1992) put this species under the genus *Neohipparchus* Inoue and he recorded *vallatus* (Butler) from Japan.

52. *Iotaphora iridicolor* (Butler)


*Material examined*: One ♀, vi. 1897, Sikkim, c 2200 m, G. C. Dudgeon coll.

*Length of Forewing*: 29 mm.

*Diagnosis*: Colour of wing light orange; Forewing with curved antemedial line, a medial band broader towards costa, a postmedial thinner band, a lunulate cell speck which is black on both wings, submarginal streaks in between veins. The streaks are black.

*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).

*Remarks*: Hampson (1895) cited ‘Tibet’ in distributional list which may be for *admirabilis* (Oberth.) species.

25. Genus *Iotaphora* Warren


*Diagnosis*: Refer Key.

*Distribution*: North-East India to Amur.

*Remarks*: Two species are described under this genus and only one species is found in N. E. India, which is dealt with. Hampson (1895) described this genus under the subfamily Orthostixinae, later on Prout (1912) transferred it under the subfamily Hemitheinae which is named as Geometrinae.
54. Ornithospila lineata  (Moore)


**Distribution** : India : Sikkim.

**Remarks** : Distribution shown by Hampson (1895) as Myanmar is not supported by any other worker. Hampson (1895) kept both these species under the genus Thalassodes Guenee.

27. Genus Anisozyga Prout


**Diagnosis** : Refer key.

**Distributional range** : Mostly Oceanian stragglers in Singapore, Sri Lanka and India.

55. Anisozyga gavissima  (Walker)


**Material examined** : One ♂, viii. 1897, ca 550 m, Sikkim, G. C. Dudgeon coll.

**Length of Forewing** : 19 mm.

**Diagnosis** : Yellowish-green, palpi and vertex white, thorax, abdomen and wings with white markings. Forewing having waved antemedial band with spot on inner edge below cell, two end cell spots, dentate postmedial band merges purplish patch on costa. White spots on the basal area of hindwing, a waved medial band, under side white, black brown patches near apex, patches larger on hindwing.

**Distribution** : India : Sikkim and Himachal Pradesh (Solan). Elsewhere : Sri Lanka, Taiwan and Sarawak.


28. Genus Opisthotia Warren


**Diagnosis** : Refer key.

**Distributional range** : Sikkim.

56. Opisthotia tumidilinea  (Moore)


**Material examined** : One ♂, ix. 1887, Sikkim, G. C. Dudgeon coll.

**Length of Forewing** : 18 mm.

**Diagnosis** : Head, thorax and abdomen purple, vertex of head and wing green. Costa of Forewing with black specks. Antemedial line of Forewing rufous and oblique, sinous post medial line expanded into inner margin, hind wing expanding into a patch between Cula and M3. Both wings having discocellular lunule.

**Distribution** : India : Sikkim.

**Remarks** : The specimen examined is smaller than that mentioned by Hampson (1895). The species is restricted to Sikkim only, although Prout (1912a, 1913a) mentioned its distribution as North India.

*29. Genus Osteosema Warren


**Distributional range** : North-east India and Bangladesh (Sylhet), Nepal and Bornean.

57. Osteosema sanguilineata  (Moore)


**Distribution** : India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). Elsewhere : Nepal.

**Remarks** : Food plant of species is Maesa chisia (mihi) Sevastopulo (1948).

30. Genus Rhomborista Warren

1897. Rhomborista Warren, nov. zool., 4 : 44.
Diagnosis: Refer Key

Distributional range: India to Sunda Island, and Newguinea.

58. Rhomborista devexata (Walker)

Material examined: One ♀, iv. 1897, Sikkim, ca 550 m, G. C. Dudgeon coll.

Length of Forewing: 18 mm.

Diagnosis: Vertex and shaft of antennae white, two end cell specks on both wings, outer angle with irregular patch, the marginal line rufous with white diamond shaped marking. Margin of hindwing very much dentate at M₁ and M₃. Short band of underside is rufous.

Distribution: India: Sikkim, Darjiling, Meghalaya (Khasi Hills), Uttar Pradesh (Mussoorie), Himachal Pradesh (Simla) and Kerala (Travancore). Elsewhere: Indonesia (Borneo), Hampson (1895).

31. Genus Comibaena Hübner

Distributional range: Chiefly of Eastern Palaearctic and Indo-Australian, but rarely found in Western Europe and Africa.

59. Comibaena albimarginata (Moore)

Distribution: India: Sikkim and Assam. Elsewhere: Indonesia (Borneo) and Japan (Hampson 1895).

Remarks: Distribution of the species cited as Japan by Hampson is doubtful.

60. Comibaena delineata (Warren)


32. Genus Thalassodes Guenée

Diagnosis: Refer key.

Distributional range: Mainly Indo-Australian, stragglers to Aethiopian region.

Remarks: A total of six species are found in India. Out of these only two species are reported from Sikkim. Here only one species is studied.

61. Thalassodes curiosa Swinhoe

Distribution: India: Sikkim. Elsewhere: Malaya, Indonesia (Borneo, Java, Sulawesi), Ceram and Buru.

Remarks: It is reported from both upper and lower montane ranges, Holloway (1976).

62. Thalassodes quadraria Guenée


Length of Forewing: ♂, 17-22 mm, ♀, 20 mm.
33. Genus Jodis Hübner


**Diagnosis**: Refer Key.

**Distributional range**: Europe, Asia and Africa.

**Remarks**: This was misspelt *lodis*: Mandal and Ghosh (1997).

63. *Jodis caudularia* (Guenée)  
[ *lodis caudularia* (Guenée)]


**Material examined**: One ♂, one ♀, 7.ix.1891, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: ♂ 12 mm ♀ 13 mm.

**Diagnosis**: ♂ antennae bipectinated to two-thirds length. Vertex of head white, antemedial and postmedial dentate lines on both wings, postmedial lines curved between culb and M 3 of hindwing. Underside of both wings white.

**Distribution**: India: Sikkim and Nilgiris.  
Elsewhere: Sri Lanka.

64. *Berta chrysolineata* Walker


**Material examined**: One ♂, 7.ix.1891, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: ♂ 12 mm ♀ 13 mm.

**Diagnosis**: Palpi minute, ♂ antennae bipectinate, hind tibia dilated with a fold and a long tuft of hair. Hindwing excised, on both wings, antemedial, medial and submarginal spots. On hindwing medial series are curved whereas on fore wing these are oblique. Under side of both wings white. The hind wing is excised.

**Distribution**: India: Sikkim, Assam, West Bengal and Karnatakka (Kanara).  
Elsewhere: Taiwan, Malaya and Indonesia (Sumatra, Borneo).

**Remarks**: Inoue (1992) synonymised this species under *Zygophyxia* Prout 1912, described from Singapore. He also noted *Chrysolineata* auct. part (not Walker, 1862)

*65. Berta acte* (Swinhoe)


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland.  
Elsewhere: Sri Lanka and West China.

35. Genus *Gelasma* Warren


**Diagnosis**: Refer key.

**Distribution**: Indo-Australian (Stragging into
Eastern Palaearctic), Malagassy (Madagascar)

Remarks: Out of six Indian species four occur in Sikkim three of which are dealt with.

Key to the species

Outer margin of hindwing angled at $M_3$. Frons rufons, vertex white, waved antemedial line at forewing, on hindwing postmedial line angled at Cula. Both wing with lunulate dark spot on cell ............... *griseoviridis* Warren

Outer margin of hindwing produced to a long point at $M$ ........................................ 1

1. Frons crimson, Forewing costa ochreous, an oblique antemedial pale line, both wings with pale oblique postmedial line .......................... .

66. *Gelasma goniaria* (Felder)


Material examined: One $\odot$, Yatang, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 15 mm.

Distribution: Refer key.

Remarks: The specimen is larger in size in comparison to that of Hampson’s (1895) specimen.

69. *Gelasma inaptaria* (Walker)


Material examined: One $\odot$, Sikkim Old Coll.

Length of Forewing : 23 mm.

Diagnosis: Refer Key.

Distribution: India : Sikkim and Assam. Elsewhere: Bangladesh (Sylhet).

Remarks: This species is closer to *korintjiensis* Prout (Sumatra) and *submacularia* Leech (W. China) Holloway (1976).

36. Genus *Spaniocentra* Prout


Diagnosis: Refer key.

Distributional range: India and China to Indonesia [Sulawesi (Celebes)].

Remarks: This genus is very close to *Rhomborista* differs by the presence or absence of median spur. Only single Indian species of the genus is studied and reported in the text (Median spur absent in *Spaniocentra*).

70. *Spaniocentra pannosa* (Moore)


**Material examined**: One ♂, 18.vi.1890, one ♀, vi.1895, one ♂, vii.1896, alt. c 550 m, two ♀ vii.1897, Sikkim, three examples (damaged) viii, ix-x. 1897, alt. ca 550 m. G. C. Dudgeon coll.

**Length of Forewing**: ♂ 12-13 mm, ♀ 14-19 mm.

**Diagnosis**: Fresh specimens bright green costa of forewing white, then narrowly purple-brown. Purple-brown white central blotch at anal angle, on hindwing a smaller blotch at apical region. Underside blotches are pale.


**Remarks**: One ♀ (19 mm) specimen examined has a larger wing than that mentioned by Hampson (1895). the food plant of the larva is *Loranthus* sp. Hampson (1895).

37. Genus **Oenospila** Swinhoe


**Diagnosis**: Refer key.

**Distributional range**: India to N. Australia, enters Palaearctic region in Kashmir.

**Remarks**: Amongst two Indian species one species is dealt with here.

71. **Oenospila flavifusata** (Walker)


**Material examined**: One ♂ (?), vii.1897, Sikkim alt. ca 550 m. G.C.Dudgeon coll.

**Length of Forewing**: 15 mm.

**Diagnosis**: Emeral green (fresh specimens), vertex of head white, costa white except base, indistinct dentate antemedial line forms by reddish dots ended in a spot on the inner margin, crimson spot at end of cell on both wings, under side white.

**Distribution**: India: Sikkim and Bengal Swinhoe (1900). Elsewhere: Sri Lanka, Taiwan, Indonesia (Java, Borneo) and N. Australia.

**Remarks**: The specimen is damaged. Determination of sex is very difficult for this damage specimen. Larvae feed on *Barringtonia* sp. and *Eugenia jambos*, [Sevastopulo (1948)].

*72. Oenospila strix* (Butler)


**Distribution**: N. India: Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Dharmsala) and Kashmir. Elsewhere: Indonesia (Sumatra, Java, Bali).

38. Genus **Maxates** Moore


**Diagnosis**: Refer key.

**Distributional range**: India, Sri Lanka to Queensland.

73. **Maxates coelataria** (Walker)


**Material examined**: One ♂, Sikkim, alt. ca 550 m. J.G.Pilcher coll. (Old collection).

**Length of Forewing**: 18 mm.

**Diagnosis**: Frons blackish, vertex of head white, forewing costa ochreous, irrorated with fuscos, post medial area of this with dark lunule at outer angle, there is an ochreous crescent shaped patch, a smaller patch also at hindwing apex and a white patch postmedial at costal region. Under side pale with broad submarginal fuscos band diminishes towards costa of fore wing and inner margin of hindwing.
Distribution: India: Sikkim, West Bengal (Darjiling) and Karnataka (N. Kanara). Elsewhere: Sri Lanka, Singapore and Indonesia (Borneo).

*74. Maxates macariata (Walker)


Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Bangladesh (Sylhet), Cotes and Swinhoe (1888).

39. Genus Paramaxates Warren


Diagnosis: Refer key.

Distributional range: Indo-Malayan, China and Taiwan.

Remarks: This genus is restricted to North-Eastern states of India.

75. Paramaxates polygrapharia (Walker)


Material examined: One ♂, viii. 1895, Sikkim, alt. ca 600 m. J. G. Pilcher coll.

Length of Forewing: 20 mm.

Diagnosis: Yellow patch at the base of forewing, waved antemedial and postmedial lines indistinct, at the end of cell a hyaline speck, dark striae on costal and inner medial areas. Hindwing with subbasal and postmedial band, outer area yellowish. Underside white, submarginal band of forewing starts from M2 to inner margin of hindwing. Yellow patches at forewing apex and beyond cell.

Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Singapore and Indonesia [Borneo (Sarawak), South Sulawesi] (Swinhoe, 1900).


*76. Paramaxates vagata (Walker)


Distribution: India: Sikkim. Elsewhere: Bangladesh (Sylhet), Cotes and Swinhoe (1888), Bhutan, Myanmar, Taiwan, Malaya and Indonesia Sumatra, Borneo, Java and Sulawesi.

Remarks: Holloway (1976) considered this, Hampsonian synonym under Polygrapharia (Walker) as good species.

*40. Genus Omphacodes Warren


Distributional range: Mainly confined to East and South African countries and then enters into Northern part of India.

Remarks: Prout (1913) dealt with this genus in his catalogue. Thereafter this species has not yet been recorded.

77. Omphacodes directa (Walker)


Distribution: India: Sikkim and Himachal Pradesh (Simla and Dharmsala).

41. Genus Episothalma Swinhoe


Diagnosis: Refer key.

Distributional range: India to Neuguinea.

78. Episothalma robustaria (Guène)


*Material examined*: One ♀, 10.vii.1888, one ♂, viii.1896, alt. ca 550 m., one ♂, ix.1897, Sikkim, G.C. Dudgeon coll.

*Length of Forewing*: ♀ 17 mm, ♂ 21 mm.

*Diagnosis*: Fresh specimens blue-green, both wings' crenulated olive postmedial line angled at M₂, both wings with brown discocellular speck, underside whitish with pale postmedial line and cell specks which is faded.


42. Genus *Hemithea* Duponchel


*Diagnosis*: Refer key.

*Distributional range*: Palaeartic and Indo-Australian.

*Remarks*: Three species of genus are hitherto known from Sikkim, here only one species dealt with.

*79. Hemithea distinctaria* (Walker)


For other details Mandal and Ghosh (1997).

*80. Hemithea rubripicta* Warren


*Distribution*: India: Sikkim.

*Remarks*: Prout (1913) dealt this species thereafter no record is available.

81. **Hemithea tritonaria** (Walker)


*Material examined*: One example (sex in det), vii.1896 and one example vii.1997, alt. ca 550 m. Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 12 mm.

*Diagnosis*: Fresh specimen yellow green, red specks on 3rd to 5th segments of abdomen. Forewing costa ochreous, antemedial line waved and whitish, postmedial line white, waved, on both wigs, marginal line dark with venal specks. Underside white.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling) and Nilgiris. *Elsewhere*: China, Sri Lanka, Indonesia (Borneo, Java) and Philippines.


43. Genus *Cyclothea* Prout


*Diagnosis*: Refer key.

*Distributional range*: India, Sri Lanka, Taiwan, and Indonesia (Sumatra).

*Remarks*: It is known from Taiwan (Formosa) Prout (1913) but Inoue (1992) did not reported this genus from there.

82. **Cyclothea disjuncta** (Walker)


*Material examined*: One ♂, vii.1896, Sikkim, alt. ca 550 m. G.C. Dudgeon coll.

*Length of Forewing*: 14 mm.

*Diagnosis*: Frons, palpi red, vertex of head white, Forewing costa white, striated with dark specks, discocellular spots on both wings, white specks on veins, wings margin with dark line, underside of wings whitish.
**Distribution** : India: Sikkim, Meghalaya (Khasi Hills), and S. India (Ganjam, Canara, Nilgiris). Elsewhere: Sri Lanka, Indonesia (Sumatra) and Taiwan.

**Remarks** : Hampson (1895) has pointed out that its occurrence in Japan is doubtful.

44. Genus *Hemistola* Warren


**Diagnosis** : Refer key.

**Distributional range** : Mainly European and Asian region some African species are also placed in this genus.

83. *Hemistola detracta* (Walker)


**Material examined** : One ♂, vi. 1896, Sikkim, alt. ca 550 m, G. C. Dudgeon coll.

**Length of Forewing** : 14 mm.

**Diagnosis** : Semi hyaline, vertex of head white, white dentate postmedial line on both wings, a white ring on centre of both wings, costal edge of forewing ochreous. Underside pale and without any mark.

**Distribution** : India: Sikkim, Nagaland, Himachal Pradesh (Kulu, Simla) and Kashmir.

*84. *Hemistola disparita* (Walker)


*85. *Hemistola rubrimargo* Warren


**Remarks** : Inoue (1992) put this species under *simplex* Warren (1899) as synonym.

45. Genus *Comostola* Meyrick


**Diagnosis** : Refer key.

**Distributional range** : Indo-Australian region but a few species are Palaearctic in distribution.

86. *Comostola ovifera* (Warren)


**Material examined** : One ♂, Gnatang, alto ca 350 m, G. C. Dudgeon coll. (Old Collection). Due to damaged condition measurement could not be taken.

**Diagnosis** : Frons pinkish shaft of antennae whitish, white speck on median, white cell spot, postmedial area of both wings with curved series of spot. Underside pale green, most of the part of fore wing covered with grey.

**Distribution** : India: Sikkim. Elsewhere: Nepal (E. Nepal) and Tibet.

**Remarks** : Prout 1913 (1912-15) reported that “the species was first discovered by Elwis in July at Tonglo, Sikkim, at an elevation of 3000 m, but has since been taken at Yatang, Tibet, perhaps not Palaearctic”

*46. Genus *Pyrrhorachis* Warren


**Distributional range** : India to Australia.

87. *Pyrrhorachis caerulea* Warren


**Distribution** : India: Sikkim.
Remarks: In Prout (1913) it is mentioned that type of this species is last catalogued, after that none has studied this species.

Key to the subfamily Sterrhinae

Palpi slender, porrect and do not reaching beyond frons .................................................. 1
- Second joint of palpi oblique and reaches beyond frons, third joint long and porrect [♂ antennae bipectinate R₁-R₅ stalked with a small aerole at their base] .................................................. Anisodes Guenée

1. Single aerole in Forewing ............................ 2
- Double aerole in Forewing ............................ 6

2. Rs and M₁ stalked in hindwing ..................... .......................... Idaea Treitschke
Rs and M₁ from the cell .............................. 3

3. Outer margin of Hindwing not produced at M₃ .............................. 4
- Outer margin of Hindwing produced to a point at M₃ .............................. 5

4. M₂ of both wings from the middle of cell .... .......................... Scopula Schrank
- M₂ of both wings above the middle of cell, Hindwing outer margin evenly round .......................... Problepsis Lederar

5. Forewing apex produced and acute, M₃ and Cula from cell .......................... Tirandra Duponchel
- Forewing apex excised from apex to M₂, M₃ and cula stalked .......................... Gnamptoloma Warren

6. Rs and M₁ of Hindwing from cell .......................... 7
- Rs and M₁ of Hindwing stalked .......................... Rhodostrophia Hübner

7. Both wings M₂ from middle of cell .......................... 8
- Both wings M₂ nearer to M₁ than M₃ .......................... 9

8. Antennae of male serrate and fasciculate ... .......................... Dithecodes Warren
- Antennae of male bipectinate upto three-fourth length .......................... 10

9. Antennae of male serrated with tufts of cilia, hind legs reduced with a strong tibial hair-pencil, first tarsal joint long and densely tufted with hair .................................................. Zythos Fletcher
Antennae of male ciliated, male hind leg small, tibia dilated with a fold and tuft of long hair .................................................. Somatina Guenée

10. Male hind-tibia with all spurs, wings margin cremulated and angled at M₃ .................................................. Synegiodes Swinhoe
Male hind-tibia with terminal pair of spurs, Hindwing outer margin rounded .................................................. Tanaotrichia Warren

47. Genus Rhodostrophia Hübner


Diagnosis: Refer Key.

Distributional range: Palaearctic, Himalayan, Meghalaya (Khasi Hills), Myanmar, Taiwan, North Africa, S. America (Chile).

*88. Rhodostrophia haematozona Hampson


Distribution: India: Sikkim (Chumbi Valley).

Remarks: Hampson (1895) described this endemic species, after that none dealt with this species.

*89. Rhodostrophia olivacea Warren


*90. Rhodostrophia similata (Moore)


91. *Rhodostrophia vinacearia* (Moore)


*Material examined:* One ♂ one ♀ one (damaged), iv to ix.1896, Sikkim, alt. ca 550 m. G. C. Dudgeon coll.

*Length of Forewing:* ♂ ♀ 15 mm.

*Diagnosis:* Ground colour reddish ochreous, forewing costa pinkish, antemedial line curved, postmedian and submarginal lines sinous, all the lines faded, a dark cell spot. Hindwing with subbasal, medial and postmedian lines, cell speck dark. Underside yellowish.

*Distribution:* India, Sikkim and Bengal. [Cotes and Swinhoe (1888)]. Elsewhere: Tibet.

48. Genus *Tanaotrichia* Warren


*Diagnosis:* Refer key.

*Distributional range:* India, Bhutan and West China.

*Remarks:* Out of three species one species occurring in India.

92. *Tanaotrichia prasonaria* (Swinhoe)


*Material examined:* 13 examples, 2.x.1889, one ♂, xi.1895, one example, iii.1896, alt. ca 550 m, nine examples, xi. 1896, alt. c. 550 m, one example vi.1897, alt. 550 m, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* 16 mm.

*Diagnosis:* Pale rufous specimens irrorated with red, vertex of head white, fuscous line on forewing, medial on hindwing, submarginal line of both wing curved between M1 and cubl, forewing with a cell speck, marginal line dark.

*Distribution:* India: Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Kangra Valley) and North-west India [trilineata Warren (1893)]

*Remarks:* Most of the collection was damaged, so sex can not be determined.

*49. Genus *Discoglypha* Warren


*Distributional range:* Mainly North-East India and Sri Lanka.

93. *Discoglypha punctimargo* (Hampson)


*Distribution:* India: Sikkim and Assam.

94. *Discoglypha genuflexus* (Hampson)


*Distribution:* India; Sikkim and Meshalaya (Khasi Hills)

95. *Discoglypha aureifloris* Warren


*Distribution:* India: Sikkim and Meghalaya (Khasi Hills)

*Remarks:* Prout (1934) included these three species of the genus in his catalogue.

50. Genus *Dithecodes* Warren


*Diagnosis:* Refer key.

*Distributional range:* Majority of the species are found in Indo-Australian, African and Neotropical Regions, a few species are occurring in Western China, Japan and America.
96. **Dithecodes idaea** (Swinhoe)


**Material examined**: One ♂, vii.1897, Sikkim, alt. ca 550 m, G. C. Dudgeon coll.

**Length of Forewing**: 14 mm.

**Diagnosis**: Frons and costa of Forewing crimson red, wings suffused with crimson, faded sinus antemedial, medial, postmedial and submarginal lines on forewing, a dark end cell speck, which is white and V-Shaped in Hindwing. Under side of Wings white.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and Nagaland. Elsewhere : Pahang and Indonesia (Sumatra, Lombok).

*51. Genus *Organopoda* Hampson


**Distributional range**: Oriental tropics and subtropics east to Queensland and the Bismarck island (Holloway, 1997).

**Remarks**: Out of two Indian species one species was recorded from Sikkim.

97. **Organopoda annulifera** (Butler)


**Distribution**: India : Sikkim and North-west India. Elsewhere : Sri Lanka.

*52. Genus *Metallaxis* Prout


**Distributional range**: Oriental, but three species are included from Malagassy (Holloway, 1997)

**Remarks**: There are only two species recorded from India (North-East India), of Which one species is reported from Sikkim.

98. **Metallaxis semipurpurascens** (Hampson)


**Distribution**: India : Sikkim. Elsewhere : Bhutan, Hong Kong and Malaysia.

53. Genus *Synegiodes* Swinhoe


**Diagnosis**: Refer Key.

**Distributional range**: Tropical and subtropical region extended south-east beyond Indonesia (Borneo).

**Remarks**: Among five Indian species four species are known from sikkim of which one species is studied here.

*99. Synegiodes diffusifascia* Swinhoe


**Distribution**: India : Sikkim and Meghalaya (Khasi Hills). Elsewhere : From N.E.India to Peninsular Malaysia and Indonesia (Borneo).

**Remarks**: The species is rare, Holloway (1997), reported a single ♀ from G. Mulu at 1790m.

*100. Synegiodes histrionaria* Swinhoe


**Distribution**: India : Sikkim and Meghalaya (Khasi Hills). Elsewhere : Tonkin and Taiwan.

**Remarks**: Inoue (1992) treated this species as good species from the Hampson's (1895) synonym list.
*101. Synegiodes sanguinarius (Moore)


**Distribution**: India : Sikkim and Nagaland. **Elsewhere**: E. Nepal (Rele Khola, alt. 2400 m nr. Annapurna).

102. Synegiodes hyriaria (Walker)


**Material examined**: One ♂, one ♀, 11 vi.1888, two examples, ix-x.1896, one example, 15 v.1897, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: ♂ 17 mm, ♀ 18 mm. Most of the specimens are damaged.

For other details : Refer Mandal and Ghosh (1997).

*54. Genus Chrysocraspeda Hampson


**Distributional range**: Throughout the Old World tropics and subtropics, Holloway (1997)

103. Chrysocraspeda conspicuaria Swinhoe


**Distribution**: India : Sikkim and Assam. **Elsewhere**: Sri Lanka.

**Remarks**: After the description of the species Hampson (1907) was the first man who has reported this species. After that Prout (1934) has catalogued this.

55. Genus Timandra Duponchel


**Diagnosis**: Refer key.

**Distributional range**: The genus is chiefly Asian, a few species may be extended towards, Australia and Africa.

**Remarks**: The genus was synomised by Prout (1934), but Inoue (1992) treated this genus as a valid genus.

104. Timandra convectaria Walker


**Material examined**: One ♀, one example, 2 v.1888, one example, 30 VII.1888 alt. ca 1700 m, two examples ix-x.1890, one example i.1897, one example viii.1897, alt. ca 550 m, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: ♀ 15 mm.

**For other details**: Mandal and Ghosh (1997) may be consulted.

**Remarks**: Specimens are damaged, therefore measurement or sex determination was not possible for whole specimens.

This species was put under the genus Timandra instead of Calothysanis Hübner by Inoue (1992) which is its original position.

56. Genus Gnamptoloma Warren


**Diagnosis**: Refer key.

**Distributional range**: India including Sri Lanka, Myanmar and Taiwan to Australia.

**Remarks**: Out of two species of the genus only one species is recorded from Indian region. The same species is also dealt with here from Sikkim.

105. Gnamptoloma avenliaria (Guèneè)


**Material examined**: One ♀, i.1895, alt. ca 550 m. sikkim, G. C. Dudgeon coll.
OBOSH: Insecta: Lepidoptera: Heterocera: Geometridae

Length of Forewing: 18 mm.

Diagnosis: Ochreous, if fresh it is dull green, with red costa, outer margin of forewing excised from apex to M, one Ocellus at end of cell, an oblique line arising near apex from costa to middle of inner margin of hindwing. A cell speck on hindwing. Underside yellow.

Distribution: India: Sikkim and Nilgiri Hills. Elsewhere: Bangladesh (Sylhet), Sri Lanka, Myanmar, Taiwan, Indonesia (Java) and Australia.

57. Genus Anisodes Guenée


Diagnosis: Refer key.

Distributional range: Distribution of the genus is worldwide except Holarctic region.

*106. Anisodes sarawackarius Guenée


Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Perak, Tankin, Taiwan, Indonesia (Borneo), Ceram, Neuguinea and Newmackenberg.

Remarks: The species obscurata Warren was in the synonym list of the species monetaria Guenee by Hampson (1895). But Prout (1934) followed by Inoue (1992) the species is shifted in the synonym list of the species dealt with. The species obscurata is described from Sikkim.

*107 Anisodes absconditaria Walker


Remarks: This species is also recorded from West Bengal (Darjiling) Mondal and Ghosh (1997). For other details vide Mondal and Ghosh (1997).

*108. Anisodes intermixtarius Swinhoe


Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Bhutan, Taiwan and Malaya.


109. Anisodes decretarius Walker


Material examined: Four examples (1 ♂ and 1 ♀).iii and ix.1896 and ii and v.1897. Sikkim, alt. c 550 m. G. C. Dudgeon coll.

Length of Forewing: ♂ 14 mm, ♀ 15 mm.

Diagnosis: Male hind tibia short, rufous specimens with reddish tinge, frons and vertex of head white. On Forewing a cell speck, curved antemedial specks three in number, postmedial line waved and fade. Underside of wings pale.

Distribution: India: Sikkim and Assam. Elsewhere: Sri Lanka, Taiwan, Malay, Indonesia (Borneo, Java, Bali) and Philippines.

Remarks: As the specimens were damaged with great difficulty sex and measurement of two specimens were determined. Holloway (1997) dealt with this species as Perixera dectaria from Borneo. Coffea (Rubiaceae) is its host plant Holloway (1997).

*110. Anisodes flavispila (Warren)


Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: China (Hainan), Hong-kong, Salenger, Mantawi Island and Indonesia (Borneo and Sambawa).
111. *Anisodes perecripta* (Warren)


*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).

*Remarks*: Holloway (1997) reported this species under *Perixera perecripta* Prout from Indonesia (Borneo). But the author have not seen any Indian specimen of the species, that is why the name of the species is not changed.

112. *Anisodes denticulata* Hampson


*Distribution*: India: Sikkim and Nagaland. *Elsewhere*: Indonesia (Sumatra, Borneo, Sulawesi), Ceram and New Guinea.

58. Genus *Somatina* Guenée


*Diagnosis*: Refer key.

*Distribution*: India including Sri Lanka to North Australia, Eastern Palearctic, Malagasy and Africa.

**Key to the species**

Olive brown, Forewing with waved irregular post medial line arises from base, a white cell speck, medial line ends before costa with purple patch. Hindwing with antemedial and medial dark bands, submarginal line grey..... ................................................................. *subusta* Warren

Grey with reddish suffusion, forewing antemedial postmedial and submarginal lines waved and indistinct. Cell-speck black. Hindwing with medial and postmedial lines which are waved and indistinct .......................... ........................................ *plynusaria* (Walker)

113. *Somatina plynusaria* (Walker)


*Material examined*: One ♂, vi.1897, Sikkim, alt. ca 550 m, G. C. Dudgeon coll.

*Length of Forewing*: 16 mm.

*Diagnosis*: Refer key.

*Distribution*: India: Sikkim, Assam, Nilgiris and Canara. *Elsewhere*: Bangladesh (Sylhet), Myanmar, Taiwan and China (Hainan).

114. *Somatina subusta* (Warren)


*Material examined*: One ♂, ix.1897, Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 14 mm.

*Diagnosis*: Refer key.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland. *Elsewhere*: Bhutan, Myanmar (Karen Hills) and Taiwan.

*Remarks*: Now this species is *Lipomelia subusta* Warren, Inoue (1992). Hampson (1895) kept this genus in the synonym list of *Somatina*. The specimen is damaged.

59. Genus *Problepsis* Lederar


*Diagnosis*: Refer key.

*Distributional range*: Old World tropics and subtropics extending up to Eastern Palearctic.

*Remarks*: Out of seven Indian species two species are dealt with here from Sikkim.
Key to the species

Antennae of male bipectinate, ocellus of forewing smaller and to some extent lunulate with black ring, dark markings, extending with medial facia towards inner margin of hindwing. Ocellus with raised silver scale. Hind wing with medial and post medial curved band ......

Antennae of male fasciculate, discal ring shaped ocellus large, inside with a silvery ring and black mark below the centre, a fuscous band from ocellus to inner margin of hind wing. Hindwing ocellus is also bigger and round ..............

vulgaris Butler

115. Proplepsis vulgaris Butler


Material examined : One  ♂ , vii. 1891, one example, vi. 1896, one ♂ , xii. 1897, alt. ca 550 m, one example 10. vi. 1890, Sikkim, G. C. Dudgeon coll.

Length of Forewing : ♂ , 17 mm.

Diagnosis : Refer key.

Distribution and other details : Refer Mondal and Ghosh (1997).

116. Proplepsis conjunctiva Warren


Material examined : One ♀ , vi. 1895, alt. ca 2200 m, one ♂ , 9.x. 1895, alt. ca 1200 m, J. G. Pilcher coll., one ♀ , vii. 1897, alt. ca 550 m. G. C. Dudgeon coll. Sikkim.

Length of Forewing : ♂ ♀ 19 mm.

Diagnosis : Refer key.


Remarks : Now this species is Prolepsis (Prolepsiodes) conjunctiva Inoue (1992).

60. Genus Zythos Fletcher


Diagnosis : Refer key.

Distributional range : India to New Guinea.

Remarks : The genus was studied under the preoccupied name (Fletcher, 1979). Nobilia Walker (1862).

The adults of the genus occur in lowland rain forest, Holloway (1997).

117. Zyhtos turbata (Walker)


Material examined : One ♂ , ix. 1897, Sikkim, alt. ca 550 m. G. C. Dudgeon coll.

Length of Forewing : 20 mm.

Diagnosis : Costa, base and medial area of Forewing olive grey, antemedial triangular patch, and the lunulate cell spot reddish. Hind wing reddish mixed with grey, cell-spot white.

Distribution : India : Sikkim, Assam (Sibsagar) and Andaman Islands. Elsewhere : Indonesia (Borneo), South Myanmar, peninsular Malaysia, Sumatra and Philippines (Mindanao).

*61. Genus Antitrygodes Warren


Distribution : Old World tropics.

Remarks : Out of three Indian species only one species is occurring from Sikkim.

118. Antitrygodes vicina (Thierry-Mieg)


**Distribution**: Sikkim, Meghalaya (Khasi Hills). Elsewhere: South China.

**Remarks**: After the First description of the species Prout (1934) has reported in his catalogue.

62. Genus *Scopula* Schrank


**Diagnosis**: Refer key.

**Distributional range**: This genus is virtually cosmopolitan Holloway (1997). The genus is the only member of the subfamily Sterrhinae to extend into Polynesia, with endemic species on the Marquesas Holloway (1938) and it is the only genus to reach New Zealand Dugdale (1988).

**Remarks**: The genus includes species of both forest and open habitats, the latter adaptation leading to its success at higher latitudes Holloway (1997).

A number of species of the genus have been recorded to attract for drinking lachrymal secretions and body fluids of large mammals in S. E. Asia (Banziger and Fletcher, 1985).

**Key to the species**

Hind legs of amle samllr ...................... 1

Hind legs of male longer, apex of forewing produced, post medial narrow band of forewing reaches apex .................. *emissaria* (Walker)

1. Outer margin of Hindwing agled at M3 ...... 2

   Outer margin of Hindwing rounded ............ 6

2. Curved double antemedial and medial lines on forewing ........................................ 3

   No double lines on forewing ..................... 4

3. Tibial tuft pale, orange patch on post medial line of forewing and fulvous patch on hindwing ........................ moorei (Cotes & Swinhoe)

   Tibial tuft black, dark rufous patch beyond postmedial line of forewing, hindwing having no patch .................. *extimaria* (Walker)

4. Dark grey, no discal spot on wings. [Antemedial and post medial lines of forewing oblique. Antemedial line of hindwing sinuous] ........................................... *mecysma* Swinhoe

   Ochreous, discal spots on both wings ........ 5

5. Brown ochreous, white centred annular discal spot on hindwing, on forewing it is smaller and entire ...................... *eulomata* (Snellen)

   - Ochreous white, discal spots on both wings smaller, two lunular spots on submarginal line of forewing ............... *pulchellata* (Fabricius)

6. Cream colour specimens with bands on wings ........................................................................... 7

   Not cream colour, instead of bands lines on wings ................................................................. 8

7. Wavy antemedial band on forewing, medial, postmedial, submarginal wavy bands on both wings, no cell speck ... *aspilataria* (Walker)

   Wavy bands on both wings thinner, black end cell specks on both wings .............................

   ......................................................... *acturia* (Walker)

8. Grey, antemedial, medial and postmedial dentate dark lines of forewing with olive edge, cell speck edged with olive .................... *

   ........................................................................... *fibulata* (Gueneè)

   White or ochreous, lines are not olive edged, cell-speck dark ........................................ 9

9. White, antemedial line of forewing obliquely curved and rufous, innermargin of postmedial and sub-marginal lines fuscous. Post-medial and sub-marginal lines of hindwing rufous ....

   ......................................................... *ferrilineata* (Moore)

   Ochreous with fuscous irroration, ante-medial line of forewing oblique and reaches upto R1 submarginal line dentate, series of black speck on margin .................... *attentata* (Walker)

119. *Scopula emissaria* (Walker)


   Material examined: One ♂, vi.1897, Sikkim, alt. ca 550 m, G.C. Dudgeon coll.
Length of Forewing : 9 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Dharmsala) and Orissa (Ganjam). Elsewhere : Sri Lanka, Myanmar (Moulmein), Taiwan, China, Japan, Philippines, Indonesia (Sulawesi, Sumatra and Sumbawa).

Remarks : The material is damaged.

120. Scopula fibulata (Guenée)


Material examined : 10 examples (1 ♂, 1 ♀), one example, 10.ix.1890, six examples, vi-x. 1896 and two examples vi.1897, Sikkim, G.C. Dudgeon coll.

Length of Forewing : ♂ 11 mm, ♀ 12 mm (specimens are badly damaged).

For other details : Vide Mondal and Ghosh 1997.

121. Scopula ferrilineata (Moore)


Material examined : One ♂, two ♀ (badly damaged) vii-xl. 1896, Sikkim, alt. ca 550 m. G. C. Dudgeon coll.

Length of Forewing : ♂ 13 mm, ♀ 14 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim, Nagaland and North India (Prout 1934), Elsewhere : Bangladesh (Sylhet).

Remarks : The species stigmata Moore was in the synonym list of the species dealt with. Prout (1934) separated the species and treated as good species named Scopula stigmata. So the species is stigmata Which recorded from N.W. Himalaya not extremaria.

122. Scopula pulchellata (Fabricius)

1794. Phalaena pulchellata Fabricius, Ent. Syst., 3 (2) : 171.


Material examined : One ♀ (damaged), 15.v.1887, Sikkim. G. C. Dudgeon Coll.

For other details : Refer Mondal and Ghosh (1997).

123. Scopula extremaria (Walker)


Material examined : Two ♀, 15.x.1890 and vii.1897, alt. ca 550 m, one example (damaged, sex in det), iii.1896, Sikkim, G. C. Dudgeon coll.

Length of Forewing : ♀ 14 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim, Nagaland and North India (Prout 1934). Elsewhere : Bangladesh (Sylhet).

Remarks : A member of this facies group was reared from Nephelium (Sapindaceae) in Peninsular Malaysia, and S. malayana has been recorded at mammalial lachrymal secretion by Banziger and Fletcher (1985).

124. Scopula moorei (Cotes and Swinhoe)

1888. Anisodes moorei Cotes and Swinhoe, Cat. Moths India, 4 : 532.


Material examined : One ♂, 20.viii.1890, Sikkim, G. C. Dudgeon coll.

Length of Forewing : ♂ 18 mm.

For other details : Refer Mondal and Ghosh (1997).
125. *Scopula eulomata* Snellen


**Material examined**: One example (sex indet), ix.1897, Sikkim, alt. ca 550 m, G.C. Dudgeon coll. (Damaged specimen).

**Diagnosis**: Refer key.


126. *Scopula mecysma* (Swinhoe)


**Material examined**: One ♀, vii.1897, Sikkim, alt. c 550 m, G. C. Dudgeon coll.

**Length of Forewing**: 11 mm.

**Diagnosis**: Refer key.

**Distribution**: India : Sikkim and Meghalaya (Khasi Hills). *Elsewhere*: Nepal, Taiwan, Thailand and Indonesia (Borneo, Java, Bali and Sulawesi).

*127. *Scopula violacea* (Warren)


**Distribution**: India : Sikkim.

**Remarks**: Warren (1897) described this endemic species. After that no record of this species is available in the literature, Prout (1934) had catalogued this species.

*128. *Scopula pallida* (Warren)


*129. *Scopula butyrosoa* (Warren)


130. *Scopula actuaria* (Walker)


**Material examined**: One example (sex indet), 16.vI.1890, one ♀, one ♂, iii.1896, Sikkim, G. C. Dudgeon coll. all three specimens are damaged.

**Length of Forewing**: ♀ 8 mm.

For other details : Refer Mondal and Ghosh (1997).

**Host Plant**: The species feeds on Theobroma (Cocoa, Stercliae) Yunus and Ho (1980).

131. *Scopula aspilataria* (Walker)


**Material examined**: One example (sex indet), 10.v.1889, one ♀, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: ♀ 10 mm.

**Distribution**: Refer Mondal and Ghosh (1997).

132. *Scopula attentata* (Walker)


**Material examined**: Four examples (sex indet), one ♀ xi.1896, two examples (sex indet), ii and v.1897, Sikkim, G. C. Dudgeon coll.
**GHOSH : Insecta : Lepidoptera : Heterocera : Geometridae**

**Length of Forewing :** ♀ 11 mm.

**Diagnosis :** Refer key.

**Distribution :** India : Sikkim, Nilgiri Hills and Andaman and Nicobar Island. Elsewhere : Sri Lanka, Myanmar (Moulmein and Tenasserim), Tonkin, Hainan and Sunda Island.

**Remarks :** Hampson (1895) treated *attentata* in the synonym list of *Craspedia remotata* (Gueneé). But Prout (1934) considered *S. attentata* as a good species, he reasonably separated this from members of the *remotata* Group.

63. **Genus Idaea Treitschke**

1825. *Idaea* Treitschke, Schmett. Eur., 5 (2) : 446.

**Diagnosis :** Refer key.

**Distributional range :** North-East India to Indonesia and Palaearctic Region.

133. **Idaea chotaria** Swinhoe


**Material examined :** Two examples (sex indet), x.1895, two examples (one ♂ 1896 and one ♀, iii.1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

**Length of Forewing :** ♂ 6 mm ♀ 7 mm.

**Diagnosis :** Antemedial, postmedial and subamrginal lines on forewing, antemedial acutely curved and other two waved, black speck on postmedial line at costa and a speck at end of the coll. On hindwing antemedial and submarginal lines are faded.

**Distribution :** India : Sikkim, West and South India. Elsewhere : Sri Lanka, Hainan, Hong Kong, Sunda land and Philippines.

*134. Idaea mathaemaria* (Hampson)


**Distribution :** India : Sikkim. Elsewhere : Taiwan.

*135. Idaea vacillata* (Walker)


**Distribution :** India : Sikkim and Assam. Elsewhere : Indonesia (Borneo) and Peninsular Malaysia, Hong Kong.

*64. Genus Sterrha Hübner*


**Remarks :** The genus is synomised under *Idaea* Inoue (1992). But whether all the species of the genus is transferred to the genus *Idaea* is not clear, moreover the earlier recorded species are not available for study. Therefore undermentioned species are kept here with the earlier genus.

136. **Sterrha grisescens** Warren


**Distribution :** India : Sikkim, Meghalaya (Khasi Hills) and North-West India.

**Remarks :** The species was described from Khasi Hills and the species *chotaria* Hampson (1898) sunk under this species, after that none studied this species but Prout (1934) catalogued.

137. **Sterrha obliquilinea** (Warren)


**Distribution :** India : Sikkim and Meghalaya (Khasi Hills).

138. **Sterrha falcipennis** (Warren)


139. *Serrha acuminata* (Moore)


**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

140. *Serrha informis* (Warren)


**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

**Key to genera of the subfamily Larentiinae**

1. Sc + R₁ of Hindwing connecting with Rs by cross vein near middle of cell .......................... 1

2. Forewing R₁ anastomosing with R₂ and then with R₃ and R₄ to form double areole .......... 3

3. Hindwing costa and Sc + R₁ highly curved [Palpi 3rd joint short and covered with hair, a tuft of long hair below the cell of forewing] ................................. *Photoscotosia* Warren

4. Hindwing M₁ above middle of cell which is oblique .................................................. 5

5. Hindwing M₁ present ........................................ 6

6. Forewing apex much produced and acute, the outer margin oblique, inner area of male, hindwing reduced to a small fold at base ................................. *Anaitis* Duponchel

7. Frons with a sharp frontal tuft ................. 8

8. Apex of hindwing extended beyond outer angle of forewing, outer margin of which is oblique, antennae of male bipectinate ................. *Asthenia* Hübner

9. Antennae of male simple and to some extent thickened ............................................. *Electrophaes* Prout

10. Frons smooth, palpi small and porrect .......... *Stamnodes* Guennè

11. Two pairs of spur present in hind tibia of male .................................................. 12

12. M₃ and Cula of both wings stalked, forewing apex falcate ................................. *Hastina* Moore

13. In hindwing M₃ and Cula Stalked ...................... 14

14. **M**₂ of hindwing from middle of cell which is oblique ..................... *Hydrelia* Hubner
- **M**₂ of hindwing from below middle of cell which is angled ................ *Venusia* Curtis

15. Hindwing of male with a lobe at base, **M**₃ and Cula from angle of cell or short stalked, **R**₃ and **M**₁ on short stalk .............. *Sauris* Guenee
- Hindwing outer margin produced to points at **R**₃ and **M**₃, **R**₂ and **M**₁ and **M**₁ and Cula on long stalk .................. *Polynesia* Swinhoe

*65. Genus Leptostegna* Christ


**Distributional range**: Asiatic.

**Remarks**: Out of two species of the genus one is recorded from Sikkim (Hampson, 1895).

141. *Leptostegna tenerata* Chirst


**Remarks**: Prout (1914) mentioned that the species *tenerata* occurring in Japan, Korea and Siberia, the species *asiatica* Warren occurring in W. China and N. India. Inoue (1982) recorded the species *asiatica* from E. Nepal.

66. Genus *Naxidia* Hampson


**Distributional range**: N. E. India, Nepal, Taiwan and Japan.

142. *Naxidia punctata* (Butler)


**Material examined**: One **♂**, viii.1897, alt. ca 550 m. Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: **♂** 14 mm.

For other details : Refer Mondal and Ghosh (1997).

143. *Naxidia irrorata* (Moore)


**Material examined**: One example, 9.vi.1888, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 18 mm (specimens is badly damaged).

For other details : Refer Mondal and ghosh (1997).

*67. Genus Dysethia* Warren


**Distributional range**: North-East India.

144. *Dysethia bicom mata* Warren


**Distribution**: India : Sikkim and Nagaland.

145. *Dysethia ocyptaria* Swinhoe


**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and Nagaland.

146. *Dysethia straminea* Warren


*Distribution*: India: Sikkim.

*Remarks*: All the three species of the genus were last dealt with by Hampson (1895), after that none studied these species.

68. Genus *Stamnodes* Guèneé


*Distributional range*: Palaeartic Asia and America. India: Western and Eastern Himalaya.

147. *Stamnodes pamphilata* Felder

1874. *Stamnodes pamphilata* Felder, Reise Novara, pl. 132, fig. 34.


*Material examined*: One ♂, one ♀, Thanggou, N. Sikkim, 13.viii.1989, alt. ca 700 m. (Old Collection).

*Length of Forewing*: ♂ 17 mm, ♀ 20 mm.

*Diagnosis*: Costa of forewing fuscous, four elongated white spots from costa, the post median fuscous patch from costa to M3, Apical fuscous area gradually narrowing towards outer angle.

*Distribution*: India: Sikkim and Western Himalaya (Koksar, Kulu and Dharmasala).

*Remarks*: Forewing of the specimens differ by colour being pink instead of yellow. Hindwing brown.

69. Genus *Brabira* Moore


*Distributional range*: India (Sikkim), Peninsular Malaysia, Indonesia (Sumatra and Borneo), Japan, Taiwan and Siberia.

148. *Brabira artimidora* (Oberthur)


*Material examined*: One ♀, 03.x.1988, Rabangla, South Sikkim, alt. ca 2010 m. V. C. Agrawal Coll.

*Length of Forewing*: 14 mm.

*Diagnosis*: Greyish white specimens. In forewing double ante and post medial lines originate from triangular spots of costa, a black end-cell spot, in female all veins present in hindwing, Cula before angle of cell, Rs and M1 on long stalk.

*Distribution*: India: Sikkim. Elsewhere: Japan and Taiwan.

*Remarks*: The species shows sexual variations particularly in respect of the venetians in hindwing, which are more in female than in male.

70. Genus *Sauris* Guèneé


*Distributional range*: Indian subregion to the Pacific as far east and upto Australia. Thirteen species recorded from Indonesia (Borneo) only.

*Remarks*: Out of twelve Indian species four species recorded from Sikkim.

*149. Sauris normis* Hampson


*Distribution*: India: Sikkim.

*Remarks*: Hampson (1895) described the species from Sikkim, after that none dealt with this species.

*150 Sauris olivacea* Warren


*Distribution*: India: Sikkim. Elsewhere: Myanmar (E. Pegu), Hong Kong and Taiwan.
CJHOSH: Insecta: Lepidoptera: Heterocera: Geometridae

151. **Sauris interruptata** (Moore)


**Material examined**: One  ♂ (damaged), ix.1897, Sikkim, alt ca 550 m, G. C. Dudgeon coll.

**Length of Forewing**: ♂ 13 mm.

**Diagnosis**: Forewing elongate, olive green with silvery iroration, one basal, two antemedial three postmedial and one submarginal line, the lines are indistinct. Hindwing pale brown and distally lobed.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills), Tamil Nadu, (Nilgiri hills), West Bengal (Darjiling), and Andamans. **Elsewhere**: Sri Lanka, Ryukyu Is., Taiwan, Myanmar, Peninsular Malaysia, Indonesia (Borneo), Philippines, and probably Moluccas and New Guinea (Holloway, 1997).

The species feeds on *Cinnamomum* (Lauraceae) in Andamans (Holloway, 1997).

*152. Sauris lineosa* (Moore)


**Distribution**: India: Sikkim, Meghalaya (Khasi hills) and West Bengal (Darjiling). **Elsewhere**: Sri Lanka, Malaya, Indonesia (Sumatra and Borneo).

**Remarks**: Occurrence of the species from Sri Lanka by Hampson (1895) not supported by any other author.

71. Genus *Cambogia* Guenée


**Distributional range**: South America, Indo-Australian Region and a Few stragglers in the Palearctic Region. Out of eight Indian species six represented from Sikkim.

Key to the species

Male antennae ciliated, Cula and M₃ of hindwing from angle of cell ......................... 1
Antennae bipectinate in both sexes Cula and M₃ of hindwing stalked ......................... 2

1. Yellow, wings with end-cell speck, several waved lines of forewing formed by minute crimson lunules .......... **memorata** (Walker)

Cinnamon-brown, a subbasal yellow line on forewing, ante and postmedial bands with two waved lines, some specks between bands and lines................. **pluristrigata** (Moore)

2. Yellow, crimson fascia on subcostal area of Forewing, among many fade' lines on both wings, medial and post-medial lines prominent, a less developed marginal crimson band with silvery patch at outer angle .................

................. **lunulosa** (Moore)

Crimson, numerous waved lines on both wings, space between two postmedial waved lines bright yellow ............ **grataria** (Walker)

153. **Cambogia memorata** (Walker)


**Material examined**: One ♂, 15.vi.1895, two examples (sex indet), iv.1896 and iii. 1897, alt ca 550 m, Sikkim, one example (sex indet), Yatang, 1894, G. C. Dudgeon coll.

**Length of Forewing**: ♂ 10 mm.

**Diagnosis**: As per key.

**Distribution**: India: Sikkim (Yatang), Nagaland and Meghalaya (Khasi Hills). **Elsewhere**: Sri Lanka, Myanmar and Indonesia (Borneo).

**Remarks**: Swinhoe (1900) put this species under the genus *Psilocambogia* Hampson.

154. **Cambogia pluristrigata** (Moore)


Material examined: One ♂, Sikkim, viii.1896, alt. ca 550 m. G. C. Dudgeon Coll.

Length of Forewing: ♂ 10 mm.

Diagnosis: Refer key.

Distribution: India: Sikkim.

*155. Cambogia marginata Warren


Remarks: After Hampson (1895) this species is not reported so far.

*156. Cambogia pulchella Hampson


Distribution: India: Sikkim, Meghalaya (Khasi Hills) and Nilgiris Hills. Elsewhere: Japan (Yokohama) Prout (1914).

157. Cambogia lunulosa (Moore)


Material examined: One ♂, Sikkim, 11.vi.1890, G. C. Dudgeon coll.

Length of Forewing: 12 mm.

Diagnosis: Refer Key.


158. Cambogia grataria (Walker)


Material examined: One example, vii.1889, Five ♂ ♀, x-xi.1896, one ♀ xi.1897, Sikkim, alt. ca 550 m, G. C. Dudgeon coll.

Length of Forewing: ♂ 10 mm, ♀ 12-13 mm.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), Maharashtra (Mahableswar and Pune) and Nilgiri Hills. Elsewhere: Sri Lanka and Myanmar (Yangon).

72. Genus Cryptoloba Warren


Distributional range: Himalayas including Bhutan, Nilgiri and just reaches Palaearctic Region.

Remarks: Out of five Indian species four occur in Sikkim.

Key to the species

Forewing with double areole, Oblique antemedial and medial and curved sub-marginal and marginal blue spots, a blue spot at end of cell ........................................ aerata (Moore)

- Forewing with single areole .................. 1

1. Glossy leaden grey, ante and postmedial lines are waved and arising from short black lines arising from costa ............... cinerea (Butler)

Ochreous, ante and post medial lines are neither wavy nor arising from any black line. Black end cell spot and speck on fore and hindwings respectively ......................... bifasciata Warren

159. Cryptoloba aerata (Moore)


Material examined: One ♂, Sikkim, 9.vi.1888, G. C. Dudgeon coll.

Length of Forewing: ♂ 13 mm.
**Diagnosis**: As per key.

**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

160. *Cryptoloba cinerea* (Butler)


*Materiel examined*: One example (sex indet), 14. vi. 1888, alt. ca. 1600 m, one ♀ viii. 1895, alt. ca. 2250 m. Sikkim. G. C. Dudgeon coll.

*Length of Forewing*: ♀ 9 mm.

*Diagnosis*: Refer key.

**Distribution**: India: Sikkim and Himachal Pradesh (Dahrmsala).

161. *Cryptoloba bifasciata* Warren


*Materiel examined*: One ♂, Sikkim, vi. 1888, G. C. Dudgeon coll.

*Length of Forewing*: ♂ 16 mm.

*Diagnosis*: Refer key.

**Distribution**: India: Sikkim.

*162. Cryptoloba trinotata* Warren


**Distribution**: India: Sikkim.

*Remarks*: After Hampson (1895) this species has not been studied so far.

*73. Genus *Syzeuxis* Hampson


**Distribution**: India: Sikkim and Meghalaya.

*Remarks*: This genus was described by Hampson (1895) there after no record of this genus is available.

163. *Syzeuxis trinotaria* (Moore)


*74. Genus *Goniopteroloba* Hampson


**Distributional range**: India: Sikkim and Meghalaya.

*Remarks*: Description of this genus is based on *zalska* Swinhoe from Cherrapunji, Khasi Hills, Meghalaya and deposited in British Museum, Swinhoe (1900).

164. *Goniopteroloba zalska* (Swinhoe)


**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

75. Genus *Hastina* Moore


**Distributional range**: North East India and Japan.

165. *Hastina gemmifera* (Moore)


**Material examined**: One ♂, Sikkim, vi.1895, alt.ca 2200 m, J. G. Pilcher coll.

**Length of Forewing**: 11 mm.

**Diagnosis**: Head and thorax black brown with silvery iroration, medial band of forewing is crimson and wider at M₃, submarginal diffused brown band with white specks, apical area white. In hindwing, postmedial brown band ornamented with white silvery band, margin produced at veins. Underside of both wings with a postmedial bands.

**Distribution**: India : Sikkim and West Bengal (Darjiling).

76. Genus *Anaites* Duponchel


**Distributional range**: India : N. W. Himalaya and Sikkim and Outside India Palaeartic Region.

**Remarks**: Out of six Indian species only three species occur in Sikkim.

*166. *Anaitis pudicata* Guenée*


167. *Anaitis fulgurata* Guenée


**Material examined**: One ♂, vi.1895, alt. ca 2300 m, J. G. Pilcher coll., two ♂ viii-ix.1897, alt. ca 2100 m. Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 18 20 mm.

**Diagnosis**: Two blackish bands (one antemedial and one postmedial) are present in forewing. A grey white straight band present in between these two bands, the antemedial band incurved and postmedial band excurved and the later bordered with black and white lines outwardly, there is one white apical patch. Hindwing whitish.

**Distribution**: India : Sikkim and North-West Himalaya.

*168. *Anaitis roseifascia* Hampson*


**Distribution**: Sikkim.

**Remarks**: Hampson (1895) described this species, after that no body has studied this species.

77. Genus *Eubolia* Duponchel


**Diagnosis**: As per key.

**Distributional range**: Europe, S.Africa, Malagasy and Himalaya, Hampson (1895).

**Remarks**: Janse (1933) treated this genus under *Ortholitha* Hübner.

169. *Eubolia duplicata* Warren


**Material examined**: One example, Yatang, 1894, G. C. Dudgeon coll. (Due to damaged condition of the specimen, Length of forewing or sex cannot be determined).

**Diagnosis**: Dark and white lines on basal area of forewing present, a white band just touching cell from upper angle to inner margin, a submarginal white band beyond that the wing is dark. Hindwing white with dark marks at apex and anal angle. Underside of hindwing with a postmedial line and marginal and submarginal area covered with yellow band.

**Distribution**: India : Sikkim (Yatang). Elsewhere : Tibet (Chumbi).
*78. Genus Triphosa Stephens


Distributional range: Palaearctic Region, India and America to Chili.

170. Triphosa dubiosata (Walker)


1914. Triphosa dubiosata: Prout, Macrobp. World, 4: 198, pl. 11, fig. g.


171. Triphosa rubrodotata (Walker)


Distribution: India: Sikkim and Punjab. Elsewhere: Nepal (Kathmandu), W. China (Kwei-chow) and Taiwan.

79. Genus Electrophaes Prout


Distributional range: India, Bhutan, Nepal and Taiwan.

172. Electrophaes aliena (Butler)


Length of Forewing: 17 mm.

Diagnosis: Base of the wing dark, a dark band covering cell, at costa it is broad and gradually it is thinner, postmedially the edge of the band is very much irregular, antemedially it is crenulated, apical region of costa whitish before that a small dark band along costa, a dark band starting marginally just below costa reaches upto M$_3$ then white, after that the band reaches anal angle. Hindwing whitish.


Remarks: Hampson (1895) synonymised this species under Cidaria aurata Moore, Inoue (1982) treated this species as valid species. The species reported for the first time from India.

80. Genus Photoscotosia Warren


Distributional range: India: Himalaya, mountains of Turkestan, Tibet, but stragglers reach Japan and Indonesia (Java).

Remarks: Most of the Indian species restricted to Sikkim Himalaya only.

Key to the species

Forewing with antemedial double curved lines .............................................................. 1

Forewing with antemedial dark band instead of lines Basal area of forewing grey, marked by a white subbasal line, the post medial line dark brown, dentate below costa and started from costa with a dark grey line ....................... ................................. multilinea Warren

1. Red-brown specimen. Hindwing with a large oval bright orange apical patch extending upto M$_3$ ................................... miniosata (Walker)

Black brown. Hindwing not with oval orange patch, rather with fuscous patch on the anal half of the outer margin ......................... 2

2. On forewing a pale subbasal line straight and oblique, antemedial line angled on median nervure, a pale brown patch starting from costa, at median area, turns towards post medial pale line, a brown patch at apex ....... ................................. metachriseis Hampson

On forewing subbasal line curved and black, antemedial line black, curved and dentate on median nervure, postmedial line below costa, and at M$_3$ it approaches the antemedial line .................................. atromarginata Warren
173. *Photoscotosia multilinea* Warren


**Length of Forewing**: ♀ 24 mm; ♂ 26 mm.

**Diagnosis**: Refer Key.


**Remarks**: Hindwing of female with a crenulated post medial line extended from outer border to Rs. Hampson (1895) treated this species under *undulosa* Alpheraki as synonym. Inoue (1982) treated *multilinea* Warren as good species.

174. *Photoscotosia atromarginata* Warren


**Material examined**: One ♀, Yatang, Sikkim, Old collection.

**Length of Forewing**: 17 mm.

**Diagnosis**: Refer Key.


**Remarks**: The specimen is bigger (37 mm) in wing expanse in comparison with the specimens (32 mm) from E. Nepal reported by Inoue (1982).

175. *Photoscotosia metachriseis* Hampson


**Material examined**: One ♀, five mile camp Nathula Road, ♀ N. of Lachen, N. Sikkim, 27.vii.1989, alt. ca 3500 m. S. S. Saha coll.

**Length of Forewing**: 23-26 mm.

**Diagnosis**: Refer Key.


**Remarks**: Specimens from E. Nepal are smaller in wing expanse than specimens from Sikkim.

176. *Photoscotosia miniosata* (Walker)


**Length of Forewing**: 24 mm.

**Distribution**: India : Sikkim (Tadong), Meghalaya (Cherrapunji), West Bengal and Himachal Pradesh (Kulu). Elsewhere : Bangladesh (Sylhet), Taiwan, West China and Philippines.

177. *Photoscotosia fulguritis* Warren


178. *Photoscototia venipicta* Warren


**Distribution**: India : Sikkim.

179. *Photoscototia aurantiaria* (Moore)

*183. Cidaria lativittaria* (Moore)


**Distribution**: India: Sikkim and West Bengal (Darjiling).

*184. Cidaria albapex* Hampson


**Distribution**: India: Sikkim.

**Remarks**: After Hampson (1895) no record of this species is available.

*185. Cidaria scortea* Swinhoe


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Kurseong).

*186. Cidaria intertexta* Warren


**Distribution**: India: Sikkim.

*187. Cidaria aurata* Moore


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala).


*Distribution*: India : Sikkim.


*Distribution*: India : Sikkim.


*Distribution*: India : Sikkim.


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*Distribution*: India : Sikkim.


*Distribution*: India : Sikkim.


*Distribution*: India : Sikkim.

**Length of Forewing:** 9-10 mm.

**Diagnosis:** Black marks present on the thorax, abdomen and at the base of wing at costa. The edges of antemedial band waved, medial area having cell-speck and two waved lines, submarginal line waved and fade. In hindwing traces of cell-speck and postmedial band present.

**Distribution:** India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). Elsewhere: W. China and Taiwan.

**Remarks:** Prout (1914) described the species under the genus *Apithecia* Prout. The specimens are damaged and too much rubbed up.

* 197. *Cidaria obfuscata* (Warren)


**Distribution:** India: Sikkim, Meghalaya (Khasi Hills) and Nagaland.

**Remarks:** Swinhoe (1900) kept this species under the genus *Ochyria* Hübner. Inoue (1972) synonymised the genus *Ochyria* under the genus *Xanthorhoe* Hübner. Larva feeds on *Impatiens* sp. (mihi) Sivastopulo (1948).

83. Genus *Larentia* Treitschke


**Diagnosis:** Refer key.

**Distributional range:** World wide.

**Key to the species**

Fuscous brown; palpi reaching beyond frons, white subbasal line of forewing indistinct, medial area with a dark broad patch lines on it. Underside of hindwing with a post medial line angled at M₃. .............. *siderifera* Moore

- Leaden grey; palpi not reaching beyond frons. In forewing a black basal patch, medial black patch oblique and white edged near costa.

Underside of hindwing having a waved post medial line and a cell speck ................. .................................. *olivacea* Warren

* 198. *Larentia argentina* (Moore)


**Distribution:** India: Sikkim.

**Remarks:** Inoue (1982, 1992) reported this species from E. Nepal and Taiwan under the genus *Lamropteryx* Stephens.

* 199 *Larentia punctatissima* Warren


**Distribution:** India: Sikkim.

**Remarks:** Hamson (1895) studied the species last after that no worker dealt with this species.

* 200 *Larentia stellata* (Warren)


**Distribution:** India: Sikkim. Elsewhere: Tibet.

**Remarks:** Prout (1914) dealt with the species under the genus *Cidaria* Treitschke.

* 201 *Larentia hypolopha* Hampson


**Distribution:** India: Sikkim.

**Remarks:** After the discovery of this and the next species by Hampson (1895) no worker dealt with these species.

* 202 *Larentia abraxidia* Hampson

*203. **Larentia lacteiguttata** (Warren)


**Distribution**: India: Sikkim.

*204. **Larentia bicolor** (Warren)


**Distribution**: India: Sikkim.

*205. **Larentia apicistrigata** (Warren)


**Distribution**: India: Sikkim.

Remarks: This and the two former species were studied by Hampson (1895) after that no worker dealt with these three species.

*206. **Larentia variabilis** (Warren)


**Distribution**: India: Sikkim.

Remarks: Prout (1914) treated this species under the genus *Cidaria*. Treitschke.

*207. **Larentia minuta** (Butler)


Remarks: Now this species is *Cidaria minuta*.

*208. **Larentia fasciata** (Warren)


**Distribution**: India: Sikkim.

*209. **Larentia interrupta** (Warren)


**Distribution**: India: Sikkim.

*210. **Larentia niveopicta** (Warren)


**Distribution**: India: Sikkim.

Remarks: Inoue (1982) reported this species under the genus *Electrophaes* (?) and reported from Nepal.

*211. **Larentia albiseriata** (Warren)


**Distribution**: India: Sikkim.

Remarks: After Hampson (1895) it is not yet reported from any where.

*212. **Larentia comis** Butler


**Distribution**: India : Sikkim. **Elsewhere**: Japan.

**Remarks**: Now this is kept under *Cidaria comis* Prout (1914).

* 213. *Larantia siderifera* (Moore)


**Material examined**: One ♀, 19.vii. 1989, Thangu, N. Sikkim, alt. c. 3750 m. coll. S. S. Saha.

**Length of Forewing**: 15 mm.

**Diagnosis**: Refer key.

**Distribution**: India : Sikkim and Meghalaya (Khasi Hills).


214. *Larentia olivacea* (Warren)


**Material examined**: One ♀, vii.1989, Lachen, N. Sikkim, alt. ca 3500 m. coll. S.S. Saha.

**Length of Forewing**: 23 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim.

**Remarks**: Inoue (1982) reported the species from E. Nepal under the genus *Gagitodes* Warren. The specimen studied in this paper is much bigger than that of the specimen described by Hampson (1895).

* 84. *Genus Gnamptopteryx* Hampson


**Distributional Range**: India (Sikkim), Sri Lanka and Taiwan.

215. *Gnamptopteryx cymatia* (Hampson)


**Distribution**: India : Sikkim. **Elsewhere**: Taiwan.

* 85. *Genus Ecliptopera* Warren


**Distributional range**: There are several Holarctic species, but most of the species are reported from E. Asia.

216. *Ecliptopera rectilinea* Warren


**Distribution**: India : Sikkim and Meghalaya (Khasi Hills). **Elsewhere**: Peninsular Malaysia and Indonesia (Bali, Borneo).

**Remarks**: Hampson (1895) synonymised this species under *Cidaria dissecta* Moore. Later on Inoue (1992) treated this as good species.

* 86. *Genus Dysstroma* Hübner


**Distributional range**: Throughout Holarctic but its greatest diversity is in the North-East Himalaya and Western China. A few species are reported from Taiwan and Indonesia (Borneo).
217. *Dysstroma dentiferum* (Warren)


218. *Dysstroma sikkimense* Heydemann


87. Genus *Venusia* Curtis


*Distributional range*: Holarctic, Himalaya and Taiwan.

* 219. *Venusia sikkimensis* (Elwes)


* 220. *Venusia lilacina* (Warren)


*Remarks*: Inoue (1982) reported the species from Nepal as *V. lilacina lilacina* (Warren).

221. *Venusia obliquisigna* (Moore)


*Length of Forewing*: 14 mm.

*Diagnosis*: Forewing having subbasal line, a double waved antemedial line, an oblique black line costa to lower angle of cell, four waved postmedial lines angled below M₃, three waved submarginal lines bent after M₄ to the margin, Hindwing whiter, with waved postmedial line and three submarginal lines.


88. Genus *Hydrelia* Hübner


*Distributional range*: Himalaya, Meghalaya (Khasi Hills), Nagaland, Taiwan, Philippines and Indonesia.

*Remarks*: Out of 14 Indian species eleven species of this genus recorded from Sikkim.

**Key to the species**

Both wings with rounded outer margin [Wings yellow, both wings having black cell speck and five orange lines at marginal and submarginal area] .......................... *flavilinea* Warren

Forewing with rounded outer margin, outer margin of hindwing strongly crenulate, ...... 1

1 Forewing pale yellow having pale black basal patch, one curved, medial brown shade, posteriorly it is slender, a discal dot on this shade, one submarginal line formed of brown spots ...... .............................................. *pictaria* (Moore)

Wings silvery white. Forewing with sinuous subbasal dark line, adjacent to discal dot there is one excurred line, two sinuous postmedial
lines submarginal line formed of black dots and veins. Hindwing having black discal dot and fuscous bands ......................................... recurvilineata (Moore)

*222. Hydrelia rufigrisea (Warren)


* 223. Hydrelia marginepunctata Warren


224. *Hydrelia flavilinea* Warren


**Material examined**: One ♂, 1894, Yatang, Sikkim, coll. G. C. Dudgean.

**Length of Forewing**: The specimen is badly damaged, therefore, measurement cannot be taken.

**Diagnosis**: Refer key.

**Distribution**: India : Sikkim.

*225. Hydrelia rhodoptera* Hampson


**Remarks**: Inoue (1982) reported two types of specimens, one pinkish and one ochreous brown from Gunsa (E. Nepal).

* 226. *Hydrelia plumbeolineata* Hampson


**Distribution**: India : Sikkim.

**Remarks**: Hampson (1895) described the species from Sikkim, after that no report regarding this species is available.

* 227. *Hydrelia rufinota* Hampson


* 228. *Hydrelia cingulata* Hampson


* 229. *Hydrelia crocearia* Hampson


**Distribution**: India : Sikkim (Yatang).

**Remarks**: Inoue (1982) reported the species from Nepal as Agnibesa crocearia.

* 230. *Hydrelia sanguiflua* Hampson

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231. *Hydrelia pictaria* (Moore)


**Length of forewing**: 1 ♂, 15 mm (due to damaged condition measurement and sex of two examples could not be determined).

**Diagnosis**: As per key.

**Distribution**: India: Sikkim.

**Remarks**: Cotes and Swinhoe (1888) kept the species under the genus *Agnibesa* Moore. Hampson (1895) dealt this species under *Hydrelia* but Inoue (1982) reported *Agnibesa pictaria pictaria* (Moore) from Nepal.

232. *Hydrelia recurvilineata* (Moore)


**Material examined**: One ♂ vii. 1890, Gnatang, Sikkim (Old coll).

**Length of Forewing**: 15 mm.

**Diagnosis**: Reddish brown specimens. Forewing having plenty of dark waved lines which are more prominent on veins; antemedial, postmedial and submarginal lines are indistinct. Hindwing whiter, two antemedial, two postmedial and two submarginal lines, the first one is less prominent, all the lines darker on veins.

**Distribution**: India: Sikkim, West Bengal (Darjiling), Cotes and Swinhoe (1888).

**Remarks**: Compared to Hampson’s (1895) specimen, the wing expanse of this specimen is larger.

89. Genus *Asthena* Hübner


Diagnosis: As per key.

**Distributional range**: Palaearctic Region, North America, Himalayan Region and Taiwan.

*233. *Asthena plurilinearia* (Moore)


**Distribution**: India: Sikkim, Meghalaya, West Bengal (Darjiling), North West Himalaya. Elsewhere: Japan and U. S. S. R.

234. *Asthena albosignata* (Moore)


**Material examined**: One ♀, 1.iv. 1889, Sikkim, coll. J.G. Pilcher.

**Length of Forewing**: 16 mm.

**Diagnosis**: Reddish brown specimens. Forewing having plenty of dark waved lines which are more prominent on veins; antemedial, postmedial and submarginal lines are indistinct. Hindwing whiter, two antemedial, two postmedial and two submarginal lines, the first one is less prominent, all the lines darker on veins.

**Distribution**: India: Sikkim, West Bengal (Darjiling), Cotes and Swinhoe (1888).

**Remarks**: Compared to Hampson’s (1895) specimen, the wing expanse of this specimen is larger.

90. Genus *Polynesia* Swinhoe


**Distributional range**: North East India, Kerala, Andamans, Sri Lanka, Peninsular Malaysia, Indonesia and New Guinea.

235. *Polynesia sunandeva* (Walker)

Material examined: Two ♀ x.1895 and xi.1896, Sikkim, alt. ca 550 m. coll. G. C. Dudgeon.

Length of Forewing: 13 14 mm.

Dagnosis: Bright yellow wings marked with red fasciae. The large red patches are grey centred. Hindwing falcated between M₁ and M₃, Rs and M₁ pointed.


Remarks: Hampson (1895) mentioned Travancore one of the localities of the species, but thereafter it is not reported from there.

*236. Polynesia truncapex Swinhoe


Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Peninsular Malaysia and Indonesia (Bali and Borneo).

*91. Genus Xanthorhoe Hübner


Distributional range: Almost cosmopolitan (Holloway, 1997).

*237. Xanthorhoe albigirata (Koller)


*92. Genus Horisme Hübner


Distributional range: N. E. India, Sri Lanka, Myanmar, Taiwan, Japan and Indonesia.
242. *Chloroclystis spissidentata* Warren


*Distribution*: India : Sikkim.

243. *Chloroclystis lucinda* (Butler)


244. *Chloroclystis modesta* Warren


*Remarks*: The last three species under the genus are reported by Hampson (1895) thereafter no record are available.

*94. Genus *Eupithecia* Curtis


*Distributional range*: Almost throughout the world.

*Remarks*: In India the genus is distributed in mountain and submountain region only.

245. *Eupithecia costipicta* Warren


*Distribution*: India : Sikkim.

246. *Eupithecia rufipicta* Hampson


*Distribution*: India : Sikkim.

247. *Eupithecia irambata* Warren


*Distribution*: India : Sikkim.

248. *Eupethecia rubridorsata* Hampson


*Distribution*: India : Sikkim.

*Remarks*: Hampson (1895) described this endemic species, later on no record of this species is available.

*95. Genus *Trichopterigia* Hampson


249. *Trichopterigia sanguinipunctata* (Warren)


*Distribution*: India : Sikkim and Meghalaya (Khasi Hills). *Elsewhere*: China, Taiwan, Myanmar, Philippines (Luzon) and Indonesia (Borneo).

*96. Genus *Trichopteryx* Hübner


*Distributional range*: Himalaya, Khasi Hills,
Taiwan, Palaearctic and Nearctic Region
Hampson (1895).

250. *Trichopteryx sikkima* (Moore)


*Distribution*: India : Sikkim (Rungchu Valley).

251. *Trichopteryx viretata* Hübner


*Distribution*: India : Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala). *Elsewhere*: Europe.

*Remarks*: Prout (1912-15) dealt this species under the genus *Acasis* Duponchel and cites its distribution as Central Europe, Russia, N. W. India, Taiwan (Formosa) and he also added according to Staudinger in Eastern Siberia and Japan.

*97. Genus Microloba* Hampson


*Distribution*: Eastern Asia.

252. *Microloba bella* (Butler)

1914. *Microloba bella* : Prout, Macrolep. world, 4 : 189, fig. 6d.


Subfamily ENNOMINAE

Key to the genera

Hindwing tailed at M₃ .................................. 1
- Hindwing not tailed at M₃ .............................. 4

1. R₂ absent in forewing .... *Ourapteryx* Leach
   R₂ present in forewing ................................ 2

2. Rs and M₁ of hindwing stalked, tail at M₂ short
   ........................................... *Srinopteryx* Butler
   Rs and M₁ of hindwing arise from cell ...... 3

3. R₁ and R₂ of forewing stalked and anastomoses with Sc ........................ *Thinopteryx* Butler
   R₁ anastomoses with R₂ and R₃ arises from Sc, R₂-R₃ stalked ................*Xeropteryx* Butler

4. Body smoothly covered with scale ............. 5
   Body roughly covered with scale mixed with hair ........................................ 43

5. Palpi upturned and covered with smooth scales, hindwing Sc + R₁ anastomoses with the cell .................. *Aplochlorea* Warren
   Palpi porrect ........................................ 6

6. Palpi not reaching beyond the frons .......... 7
   Palpi reaching well beyond the frons .......... 12

7. R₁ and R₂ of forewing stalked.................. 8
   R₁ and R₂ of forewing not stalked ............. 9

8. Rs of hindwing from angle of cell ............
   ........................................... *Myrteta* Walker
   Rs of hindwing before angle of cell ...........
   ........................................... *Scardamia* Guenée

9. Forewing R₂, R₃ stalked ...................... 10
   Forewing R₃, R₅ stalked, R₂ absent ........ 11

10. Antennae is not unipectinate; M₁ and M₂ of fore wing stalked ...... *Peratophyga* Warren
    Antennae of both sex/ex unipictinate, M₁ and M₂ of forewing not stalked ...............
    ........................................... *Plutodes* Guenée

11. Wing covered with scale and long hair ..... ...
    ........................................... *stegania* Guenée
    Wings hyaline ............................. *Zamarada* Moore

12. Palpi covered with much longer hair ....... 13
    Second joint of palpi clothed with hair and up turned, 3rd joint naked and porrect ........ 33
13. Forewing apex very much falcate .......... 14
   Apex of forewing not highly falcate .... 16
14. M₂ of forewing from the middle of cell ... 15
   M₂ of forewing from above middle of cell and obolescent in female .................
   .................................................. Hyposidra Guenée
15. Hind wing outer margin not produced at R₃, Fore wing R₁ and R₂ stalked and anastomosing
   with Sc ........................................ Oxymacaria Waren
   Hind wing outer margin produced to a point
   at R₃. Fore wing R₂ absent, R₁ free ........
   .................................................. Krananda Moore
16. Outer margin of hind wing not angled at M₃ ...
   Outer margin of hindwing angled at M₃ ... 17
17. Inner margin of fore wing and costa of hind wing evently curved .................. 18
   Inner margin of forewing and costa of hindwing excised beyond middle ............
   .................................................. Corymica Walker
18. In Forewing outer margin suberect, apex not produced .................................. 19
   Apex of forewing produced with very oblique outer margin ......................... 20
19. Forewing of normal breadth ................
20. Forewing long and narrow .................. 21
20. Outer margin of forewing evenly curved, R₁ coincident with Sc ........ Abraxas Leach
   Outer margin of forewing excised below apex ........................................ Pseudopanthera Hübner
   Abdomen very long and narrow ............ 22
22. Antennae shorter, not dilated at extremity ............................................ Obeidia Walker
   Antennae long and dilated at extremity ................................................ Vithora Moore
23. R₂ present in forewing .................... 24
   R₂ absent in forewing .... Laxiaria Walker
24. R₁ and R₂ of forewing stalked and R₁ connected Sc by bar .................. Hypochrosis Guenée
   R₁ of forewing not connected Sc by bar ........
25. Cu₁₉ of both wings from angle of cell, R₃ of forewing anastomoses with Sc ...........
   Cu₁₉ of both wings from before angle of cell ...........................................
26. R₃ - R₃ from angle of cell ................
   ................................................. Euremene Duponchel
   R₃ - R₃ from before angle of cell ................................................. Prionia Hubner
27. Large strongly built moths, M₂ of fore wing from middle of cell ........... Dalima Moore
   - M₂ of forewing above middle of cell ........ 28
28. R₂ - R₃ of fore wing stalked ..............
   ................................................. Loxasphilates Warren
   - R₁ and R₂ of fore wing stalked ............. Anonychia Warren
29. Cu₁₉ of wings from angle of cell .......... 30
   Cu₁₉ of wings from before angle of cell ....
   .................................................. Tanaoctenia Warren
30. R₂ of fore wing absent ........ Macaria Curtis
   - R₂ of fore wing present ..................... 31
31. R₁ and R₂ of fore wing free ..............
   .................................................. Orsonoba Walker
   R₂ - R₃ of fore wing stalked ............... 32
32. R₁ of fore wing free, hind tibiae not dilated ........................................ Spiopera Warren
   R₁ anastomoses with Sc, hind tibiae of male dilated with a tuft of hair ...........
   .................................................. Callerinns Warren
33. Eyes not hairy .................................
34. Eyes hairy .................................... 42
34. R₁ and R₂ of forewing stalked and connected with Sc and R₃ ....................... 35
35. Antennae of male bipectinate ................
   .................................................. Heterostegane Hampson
36. Antennae of male with short branch which ends as bristle, retinaculum a tuft of hair ....
   .................................................. Synegia Guenée
- Antennae of male moderate, branches near to apex, retinaculum of male a plate like or bar shaped structure. \textit{Parasynegia} Warren

37. $R_1 - R_2$ of fore wing stalked .................. 38
- $R_1$ and $R_2$ of fore wing from cell ............ 40

38. Outer margin of both wings rounded ....... 39
- Both wings angled at $M_3$ ...... \textit{Psyra} Walker

39. Frons having sharp tuft. Second joint of palpi not reaching vertex. \textit{Hyperpyura} Guenée
- Frons having no tuft, 2nd joint of palpi reaches vertex .............. \textit{Petalia} Herrich-Schaeffer

40. Scaling smooth in thorax ....................... 41
- Long wooly hair covers throax ..................... \textit{Odontopera} Stephens

41. Outer margin of forewing suberect and hindwing angled ...... \textit{Mimochroa} Warren
- Outer margin of both wings irregular ..............

42. $R_1$ and $R_2$ of forewing stalked .......... 43
- $R_1$ and $R_2$ of forewing free ...................... \textit{Garaeus} Moore

43. Frontal side of palpi fringed with hair, palpi upturned ......................... 44
- Palpi porrect ...................................... 45

44. $R_1$ of forewing given free, apex prodeced. $M_3$ of hindwing produce. \textit{Amblychia} Guenée
- $R_1$ of forewing given off from Sc, costa arched towards apex. $M_3$ of hindwing not produced. \textit{Chorodna} Walker

45. Palpi short. Cell of hindwing long, extending two thirds of its length .............. 46
- Palpi long. Cell of hindwing of normal length .......... 47

46. Frons covered with dense hair. Proboscis weak, male hind tibial 1st pair of spur nearer to apex. \textit{Biston} Leach
- Frons less hairy. Proboscis strong. Hind tibial 1st pair of spur medial ........ \textit{Buzur} Walker

47. Outer margin of hindwing rounded ......... 48
- Outer margin of hind wing irregular, angled at Rs and $M_3$ .......... \textit{Erebomorpha} Walker

48. $Sc$ and $R_1$ of fore wing separate .......... 49
- $R_1$ of fore wing arises from Sc .................

49. Outer margin of wings crenulated .......... 50
- Outer margin of wings non crenulate ............. \textit{Medasina} Moore

50. Fore wing of male with fovea .................... 51
- Forewing without fovea .......................... 52

51. Antennae bipectinate ............................. 52
- Antennae simple .................................. 54

52. Antennae of male bipectinate to all segments ................................ \textit{Cleora} Curtis
- Antennae of male bipectinate to three fourth length ............... 53

53. Hind tibia of male dilated with a fold containing a ridge of hair ............... \textit{Alcis} Curtis
- Hind tibia of male not dilated and without ridge of hair ........ \textit{Boarmia} Treitschke

54. Antennae of male robustly ciliate .............. \textit{Rutellerona} Swinhoe
- Antennae of male fasciculate ........................ 55

55. Hind tibia dilated ........ \textit{Paradarisa} Warren
- Hind tibia not dilated ................................ 56

56. Male with no tuft of hair from hind coxae ........ \textit{Ectropis} Hübner
- Male with tufts of hair from hind coxae ........ \textit{Psilalcis} Warren

57. Antennae of both sexes bipectinate. $R_1$ and $R_2$ of fore wing stalked .............. \textit{Phthonandria} Warren
- Antennae flattened and thickened. Fore wing with $R_2$ stalked with $R_3$ - $R_5$ and anastomasing with $R_5$ stalked with $R_1$ - $R_3$ and anastomasing with $R_1$ ................................ \textit{Micrabraxill} Butler

98. Genus \textit{Abraxas} Leach

**Diagnosis:** Refer key.

**Distributional range:** Palaearctic and Oriental regions, extended up to North Australia.

**Key to the species**

Head to abdomen orange yellow ............... 1

Head to abdomen pale yellow, black spots on abdomen dorsally and two pairs of black spots laterally. Forewing with diffused orange antemedial band, dark medial and post medial bands ......................... *irrorata* Moore

1. Forewing with fulvous patch at base ....... 2

   Forewing with basal orange patch, wings white with fuscous irroration, veins black ........... *nigrivena* Warren

2. Basal fulvous patch of forewings bigger, another patch with silvery marks on inner margin beyond middle, an end cell grey patch with dark marking extending up to costa, series of curved postmedial spots with dark streaks at veins .................. *sylvata* (Scopuli)

   Basal fulvous patch smaller, other markings blue grey, no dark mark at end of cell, postmedial spots in straight line, no dark streaks at veins ............... *martaria* Guenée

253. *Abraxas sylvata* (Scopuli)


**Material examined:** One ♀, 5.x.1888; one ♂, vii.1893; one ♂, viii.1897, alt. ca 550 m.; Sikkim, G. C. Dudgeon coll. three ♂, 5.x.1988, alt. 2010 m, Rabangla, S. Sikkim and one ♂, 24.x.1988, Tumin, alt. 1800 m, E. Sikkim, coll. V. C. Agrawal. 24.x.1988, Tumin, alt. 1800 m, E. Sikkim, coll. V. C. Agrawal.

**Length of Forewing:** ♂ 18-25 mm, ♀ 27 mm.

**Diagnosis:** Refer key.

**Distribution:** India: Sikkim (S. Sikkim), Assam, N. W. Himalaya and Nilgiris. **Elsewhere** : Central Europe to Asia.

**Remarks:** Entire forewing of the specimens, collected during 1988, covered with leaden grey. Other characters agree well with the description made by Hampson (1895).

254. *Abraxas irrorata* Moore


**Material examined:** Two ♀, Sikkim (Yatang), *Old Collection*.

**Length of Forewing:** 22-25 mm.

**Diagnosis:** Refer key.

**Distribution:** India: Sikkim (Yatang), West Bengal (Darjiling) and Uttar Pradesh (Mumaun). **Elsewhere** : Nepal.

*255. Abraxas fulvosparsa* Hampson


**Distribution:** India: Sikkim.

**Remarks:** After the discovery of the species no record of the species is available.

*256. Abraxas spontaneata* Walker


**Distribution:** India: Sikkim and Meghalaya (Khasi Hills).

**Remarks:** Inoue (1982) recorded the species from Nepal as *Heterabraxas spontaneata*.

*257. Abraxas fasciata* Swinhoe


**Distribution:** India: Sikkim and Meghalaya (Khasi Hills).
Remarks: Further no record of this species is available except Hampson (1895) who had recorded the species from the area mentioned in distribution.

258. Abraxas martaria Guenée


Material examined: One ♂, iv.1889, one ♂, 7.vii.1891, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 18 - 23 mm.

Diagnosis: Refer Key.

Distribution: India: Sikkim, Assam (Sibsagar), Meghalaya (Khari Hills), Bihar (Buxar) and Himachal Pradesh (Kulu). Elsewhere: Bangladesh (Sylhet), Bhutan and Nepal.


*259. Abraxas metamorpha Warren


Distribution: India: Sikkim.

*260. Abraxas alpestris Warren


Distribution: India: Sikkim.

*261. Abraxas diaphana Warren


Distribution: India: Sikkim, Meghalaya

Distribution: India: Sikkim.

Remarks: The last three species, including this, Hampson (1895) recorded from Sikkim after that no worker reported these species.

262. Abraxas nigrivena Warren


Material examined: One ♂, vi.1884, Sikkim, J. G. Pilcher coll.

Length of Forewing: 12 mm.

Diagnosis: Refer Key.

Distribution: India: Sikkim, Meghalaya.

Elsewhere: Nepal.

99. Genus Peratophyga Warren


Distributional range: From Himalaya, Khari Hills upto Indonesia.

Diagnosis: Refer Key.

Remarks: This genus can easily be recognised by the position of M2 and a kidney shaped fovea.

263. Peratophyga aerata Moore


Length of Forewing: 12 mm.

Diagnosis: Ochreous. Basal patch of forewing fuscous, submarginal broad band concave outwardsly and convex inwardly, looks like a second bracket, its outer area yellowish. Hindwing to some extent similar with variation of size of bands.

Distribution: India: Sikkim, Meghalaya

Remarks: Further no record of this species is available except Hampson (1895) who had recorded the species from the area mentioned in distribution.
(Khasi Hills), West Bengal (Darjiling) and Himachal Pradesh (Kasauli, Kulu and Simla). Elsewhere: Japan.

Remarks: First of all this species was reported as *Ephyra grata* Butler (swinhoe, 1900) which is later on synonymised under *aerata* (Moore) (Hampson 1895).

*264. *Peratophyga xanthyla* (Hampson)


Distribution: India: Sikkim. Elsewhere: Peninsular Malaysia and Indonesia (Borneo).

100. Genus *Heterostegane* Hampson


Diagnosis: Refer key.

Distributional range: Old world tropics extends into Palaearctic region.

265. *Heterostegane subtessellata* (Walker)


Material examined: One ♂ one ♀ 20.viii.1890, alt. ca 550 m, ♀ vi.1896, Sikkim, G. C. Dudgeon coll.

Diagnosis: Yellow coloured specimen. Forewing antemedial line curved at M₂ and M₃, postmedial line concave and the submarginal line angled outwardsly at M₁ and terminate at outer angle in a dark shed. Hind tibia of male is to some extent dilated.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Dharmsala), Karnataka (Canara) and Nilgiris. Elsewhere: Nepal, Myanmar, Malaya, Taiwan and Sundaland.

Remarks: Larva is the defoliator of *Acacia* (Leguminosae).

101. Genus *Cassyma* Guenée


Distributional range: Restricted to Oriental tropics and is not represented east of Sundaland, Holloway (1993).

266. *Cassyma heteroneurata* Guenée


Distribution: India: Sikkim. Elsewhere: Indonesia (Java and Borneo).

Remarks: Swinhoe (1900) catalogued this species. After that no record of this species is available.

102. Genus *Zamarada* Moore


Diagnosis: Refer key.

Distributional range: This genus chiefly in African tropics, but a few species occur in Oriental tropics.

267. *Zamarada scriptifasciata* (Walker)


Material examined: One (sex indet), vi.1897, alt. ca 550 m, one ♂, ix.1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Diagnosis: Wings yellowish hyaline, broad greyish marginal band on both wings deep notch between M₃ and culb, a grey small end cell spot at forewing.


103. Genus *Petalia* Herrich-Schäffer

**Diagnosis**: Refer key.

**Distributional range**: Mostly Indo-Australian, but a few species are found in the E. Palearctic, E. Africa and S. America.

**Key to the species**

- Male with a fovea, at the base of Sc + R₁ of hindwing. Both wings with antemedial and post medial rufous bands. Underside of wings brownish, outer area fuscous, no cell spot on any wings .......... **riobearia** (Walker)
- Male without any fovea. Black cell spot on underside of both wings present ............... 1

1. Forewing with antemedial line, both wings with straight medial line. Underside whitish, outer area fuscous .................................................. **medardaria** Herrich-Schaeffer
- Forewing with antemedial brown band and both wings with medial brown bands, two less prominent postmedial bands. Underside brownish, the marginal area darker .......... ........................................... **fasciata** (Moore)

268. **Petalia medardaria** Herrich-Schaeffer

1854. **Petalia medardaria** Herrich-Schaeffer, Samml. ausser. Schmett., p. 84, fig. 534.

1993. **Petalia medardaria** : Holloway, Moths Borneo, 11 : 102, pl. 5, figs. 188, 192.

**Material examined**: Two ♂, one ♀; one ♂, 16.viii.1888, alt. ca 600 m; one ♂, v.1897, alt.ca 550 m; one ♀ 22.viii.1890; Sikkim, G. C. Dudgeon coll.

**Diagnosis**: As per key.

**Distribution**: Indo-Australian Region.

**Remarks**: Larvae of this species group are defoliator of Zizyphus spp., *Hovenia dulcis* and *Gounia leptostachia* (Rhamnaceae).

*269. **Petelia capitata** (Walker)*


1976. **Petelia capitata** : Holloway, moths Borneo, Mount Kinabalu, p. 74, fig. 527.


**Remarks**: After Hampson (1895) no walker dealt with this species.

270. **Petalia fasciata** (Moore)

1867. **Bargosa fasciata** Moore, Proc. zool. soc. Lond., 1867 : 634, pl. 32, fig. 8.


**Material examined**: One ♂, 22.viii.1890, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 24 mm.

**Diagnosis**: Refer Key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and Bengal (Swinhoe, 1900). Elsewhere : Japan (from *rivulora* Butler).

**Remarks**: The specimen is larger in size compare to Hampson’s (1895) specimen.

271. **Petalia riobearia** (Walker)


**Material examined**: Three ♂, ix-x.1888, G. C. Dudgeon coll.

**Length of Forewing**: 21 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills), and Nilgiri Hills. Elsewhere : Nepal.

**Remarks**: Hampson (1895) synonymised this species under *vaxillaria* Guenee, later on Swinhoe (1900) treated this as a good species.
104. Genus *Myrteta* Walker


*Diagnosis*: Refer key.

*Distributional range*: Mostly Indian species, a few species from Sri Lanka, Indonesia (Borneo) to New Guinea, Taiwan and Japan.

*273. Myrteta planaria* Walker


*Distribution*: India: Sikkim, Meghalaya (Khasi Hills), and West Bengal (Darilling) (Cotes and Swinhoe 1888).

*274. Myrteta sericea* Butler


*Material examined*: One♂, 2♀, 15.vii.1888 and one♀, v.1886, alt. 2500 m., Sikkim, G.C. Dudgeon coll.

*Diagnosis*: White. A double fulvous line starts from the base of inner margin meet together at cell to from a single line, double waved line from below open to middle of inner margin, another similar submarginal line becomes double and run towards inner margin, single submarginal and marginal line. Hind wing with single antemedial, danistemedial, single marginal and marginal line.


*275. Myrteta subvitrea* Hampson


*Distribution*: India: Sikkim.

*276. Myrteta subpunctata* Warren


*Distribution*: India: Sikkim.

*Remarks*: After Hampson (1895) no worker dealt with this and the former species.

*277. Myrteta simpliciata* (Moore)


*Distribution*: India: Sikkim, Meghalaya (Khasi Hills).

*Remarks*: No worker after Hampson (1895) studied this species.

*105. Genus Tasta* Walker


*Distribution*: North East India to Borneo.

*278. Tasta micaceata* Walker


*106. Genus Bapta*Stephes


*Distributional range*: Indo-Australian, Palaearctic and American.

*279. Bapta platyleucata* (Walker)


For other detail refer Mondal and Ghosh (1997).

**Remarks**: Inoue (1987) recorded the species from Nepal as *Lomographa platyleucata*.

280. **Bapla mytylata** (Guenee)


**Distribution**: India: Sikkim; Meghalaya (Khasi Hills); N. W. Himalaya and Punjab (Thundian).

**Remarks**: Prout (1915) reported that the species *foedata* Warren (mytylata Leech) nec Guenee.

107. Genus **Stegania** Guenee


**Diagnosis**: Refer key.

**Distributional range**: Throughout India, Sri Lanka, Myanmar, Indonesia (Borneo) and Europe

Hampson (1895)

**Key to the species**

Antennae of male ciliated ...................... 1

- Antennae of male serrated. Forewing antemedial line curved, medial and post medial lines to some extent straight hindwing medial and post medial lines slightly crenulate, lines of both wings orange yellow ....................

- Forewing of male with fovea .................. 2

2. Forewing with less prominent antemedial line, a straight medial line and a lunulate post medial line angled outwardly at median area. Lines of hindwing irregular ......................

- Forewing with antemedial and submarginal line, no medial line. Hindwing with prominent antemedial line, post medial line less prominent ....... *

281. **Stegania marginata** Warren


**Material examined**: One ♀, x.1888; one ♂, vii.1896 and one ♂, viii.1897, alt. ca 550 m.; Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 12 - 13 mm.

**Diagnosis**: Refer key.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland.

*282. **Stegania strigata** (Warren)


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland.

**Remarks**: Inoue (1987) reported this species as *Monocerotes strigata* (Warren) from Nepal.

283. **Stegania urbica** (Swinhoe)


**Material examined**: One ♀ 28.v.1890 and one ♂, 14.viii.1890, Sikkim, G. C. Dudgeon coll.
284. *Stegania rectifascia* Hampson


*Material examined:* One ♂ and one ♀, vi.1896, alt. ca 550 m. Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: ♂ ♀ 9 mm.

*Diagnosis*: Refer key.


285. *Stegania latifasciata* Moore


*Distribution*: India: Sikkim, Meghalaya (Khasi Hills); and W. Bengal (Darjiling) Cotes and Sunhoe (1888).

286. *Stegania trilineata* (Moore)


*Material examined*: One ♂ vii.1895, Gnatang and one ♂, viii.1895, alt. ca 2200 m; Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 13 14 mm.

*Diagnosis*: Refer key.

*Distribution*: India: Sikkim and W. Bengal (Darjiling).

108. Genus *Synegia* Guenée


*Diagnosis*: As per key.

*Distributional range*: Indian subcontinent to Japan and extending east up to New Caledonia.

**Key to the species**

Shape of Retinaculum like flattened spoon ........................................... 1

Retinaculum bar shaped. Costal area of forewing purplish grey, below this area a ferruginous line from apex to base of the wing, one oblique antemedial line, one postmedial band and the submarginal band which forms a quadrangular blotch at inner margin. In hindwing area between ante and post medial lines and apical area rufous. End cell speck on both wings, undersides pale and patches on the lines ....................................................... *camptogrammara* (Guenée)

1. Shaft of antennae white. Wings yellow irroration with crimson, outer margin of hindwing slightly excised towards anal angle. Forewing having ante and post medial lines, a speck at end of cell. Hindwing having sub marginal line angled to the margin below M₁ ............................................. *erythra* Hampson

Shaft of antennae dark colour. Wings yellow, irroration with orange, the oblique band of the forewing meets a quadrative patch between R₅ and culb. Hind wing subbasal line black, submargin lines from a black patch at middle ............................................. *lidderdalii* (Butler)

287. *Synegia erythra* Hampson


*Material examined*: One ♀, i.1897, alt. ca 550 m., Sikkim, G. C. Dudgeon coll.

*Diagnosis*: As per key.

GHOSH: Insecta: Lepidoptera: Heterocera: Geometridae

288. Synegia lidderdalii (Butler)


Material examined: One ♂, viii. 1889, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 16 mm.

Distribution: India: Sikkim.

Remarks: Now this species is known as Borbachaa pardaria Swinhoe (1900).

109. Genus Parasynegia Warren


Diagnosis: Refer key.

Distributional range: Himalaya, Assam and Meghalaya (Khasi Hills) and Indonesia.

Key to the species

Yellow, irrorated with orange, Forewing with medial band formed by two lunulate lines, one illdefined submarginal band formed by series of black specks. Hindwing having one subbasal band, two lunulate medial lines, a sub marginal band. Both wings having dark speckes at end of cell, a very small white dot at the centre of the speck ........... diffusaria (Moore)

Yellow, irrorated with ferruginous. Forewing with highly curved antemedial line, a slightly crenulate postmedial line, an oblique line from apex anastomoses with post medial line between M₁ and Cu₉ reaches inner margin, a dark ringed white spot at end of cell. Hindwing with five lines, of which post medial one lunulate and submarginal one forms a fork near apex, ringed end cell spot smaller ........ pluristriaria (Walker)

292. Parasynegia pluristriaria (Walker)


Material examined: One ♂, 7.x.1890 and two ♀, v. 1896, alt. ca 550 m.; Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 23 mm, ♀ 22 mm.

Diagnosis: As per key.

Distribution: India : Sikkim, Meghalaya (Khasi Hills), Assam (Sibsagar), West Bengal
(Darjiling) and Himachal Pradesh (Dharmsala). Elsewhere: Bhutan.

293. *Parasyngia diffusaria* (Moore)


*Material examined*: One ♀, ii.1897, alt. ca 550 m., Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 22 mm.

*Diagnosis*: Refer key.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling), Elsewhere: Bhutan.

*Remarks*: Both the species are placed here with *Parasyngia* after Swinhoe (1900), in which the specimens examined fit well.

110. Genus *Hyperythra* Guenée


*Diagnosis*: Refer key.

*Distributional range*: Indo-Australian.

*Remarks*: The genus has similarity with *Erasria* Hubner (American) and *Petrodava* Walker (African). Out of six species known so far under this genus, two occur in Sikkim. Here both the species are dealt with.

**Key to the species**

Yellow with pink suffusion and fucous striaion. Forewing antemedial line angled below costa, indistinct medial and post medial bands pinkish. Hindwing with antemedial line and postmedial band, one or two black marks below costa. Underside apical patch whitish .............................. ............................... *lutea* (Stoll)

Olive green, no pink suffusion on upper and undersides. Medial and postmedial reddish bands of both wings indistinct, underside apical grey patch prominent, the postmedial bands of both wing prominent .......................................................... *phoenix* Swinhoe

294. *Hyperythra lutea* (Stoll)


*Material examined*: One ♀, 7.xii.1888, one ♀, l.ix.1889, alt. ca 550 m., one ♀, i.1897, one ♀, iii 1897, Sikkim, G. C. Dudgeon coll.

*Diagnosis*: As per key.

*Distribution*: Indian Subregion including Sikkim. Elsewhere: S. E. Asia and Sundaland.

*Remarks*: Larvae feed on *Goania* (Rhamnaceae).

295. *Hyperythra phoenix* Swinhoe


*Material examined*: One ♀, v.1892, Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 21 mm.

*Diagnosis*: Refer key.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland. Elsewhere: Peninsular Malaysia.

*Remarks*: The host plant *Ziziphus* (Rhamnaceae).

111. Genus *Krananda* Moore


*Diagnosis*: As per key.

*Distributional range*: Oriental tropics and subtropics, extends towards east upto New Guinea (Holloway, 1993).
296. *Krananda semihyalina* Moore


**Material examined**: One ♀, vi.1892, one ♂, vi.1896 and one example without date of collection, Sikkim, G.C. Dudgeon coll.

**Length of Forewing**: ♂ 20-23 mm, ♀ 29 mm.

**Diagnosis**: Central area of wings diaphanous, scaleless, both wings having inner marginal markings, wings margin cremulated and the tail of the hindwing strongly produced. Beyond hyaline area of underside of wings with diffused rufous and fuscous.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills), Himachal Pradesh (Dalhousie) and Bengal, Swinhoe (1900).

112. Genus *Gonodontis* Hübner


**Diagnosis**: As per key.

**Distribution**: Indian subcontinent to Australia.

297. *Gonodontis clelia* (Cramer)


**Material examined**: One ♂, ix.1897, alt. ca 550 m., Sikkim, G. C. Dudgeon coll.

**Diagnosis**: Pale reddish with brown irration. Forewing ante and postmedial lines angled below costa, an indistinct band from cell to inner margin, a brown speck on costa near apex. Hindwing with medial and slightly angled post medial lines, outer margin darker and angled at M₂.

**Distribution**: India : Sikkim, Maharashtra (Bombay), S.India and Andamans. Elsewhere : Sri Lanka, Singapore and Indonesia (Borneo).

**Remarks**: The species is placed here with *Gonodontis* after Swinhoe (1900), in which specimen examined fits well. The larva feed on *Excaecaria* (Euphorbiaceae) recorded from Andamans, Holloway (1993).

113. Genus *Luxiaria* Walker


**Diagnosis**: As per key.

**Distributional range**: Mainly Indo-Australian but reaches upto Japan.

**Key to the species**

Hindwing cell short, Cula from before angle of cell. [Crenulate outer margin of hindwing, not having angle at M₃, both wings with sinuous medial line, post medial and submarginal waved lines conjoined to from a brown band. Under side of forewing apex white] .................. .................. contigera (Walker)

Outermargin of hindwing angled at M₃ : Pale yellow, Forewing with postmedial series of specks very oblique and continued on hindwing as antemedial line, hindwing having series of medial specks. Underside with postmedial and submarginal bands ............. exclusa Walker

Outermargin of hindwing rounded and not angle at M₃ : [Orange yellow. Forewing with ante and medial spots and a big postmedial patch. Hindwing having broad submarginal dark band. Under side having marginal band on forewing and submarginal band on hind wing] .................. phyllosaria (Walker)

298. *Luxiaria contigaria* (Walker)


**Material examined**: One ♂, 29.vi.1888, one ♂, 20.viii.1890, one example 22.viii.1890 and one ♀, x.1896, alt. ca 550 m.; Sikkim, G. C. Dudgeon coll.
Length of Forewing: ♂ ♀ 20 mm.

Diagnosis: Refer key.

For other detail refer Mondal and ghosh (1997).

299. *Luxiaria exclusa* (Walker)


Material examined: One ♀ x.1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 21 mm.

Diagnosis: As per key.


*300. *Luxiaria obliquata* Moore


Distribution: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). Elsewhere: Taiwan.

301. *Luxiaria phyllosaria* (Walker)


Material examined: One ♂, vi.1896, alt. ca 550 m, sikkim, G. C. Dudgeon coll.

Length of Forewing: 19 mm.

Diagnosis: Refer key.

Distribution: India: Sikkim and Meghalaya (Khasi Hills). Elsewhere: Sri Lanka, Indonesia (Sumatra, Borneo and Sulawesi) and Philippines.

*302. *Luxiaria acutaria* (Snellen)


Distribution: India: Sikkim. Elsewhere: Indonesia (Sumatra, Java and Borneo).

*303. *Luxiaria mitorhaphes* Prout


Distribution: India: Sikkim and Assam. Elsewhere: Nepal, Japan, Taiwan, Myanmar and Indonesia (Borneo and Java).

*114. Genus *Tephrina* Duponchel


Distribution: Widely distributed, some species have wide range in the old world.

304. *Tephrina (?) purpurascens* (Moore)


Distribution: India: Sikkim and West Bengal (Darjiling).

Remarks: After Hampson (1895) no worker studied this species.

115. Genus *Oxymacaria* Warren


Diagnosis: As per key.

Distributional range: India and Borneo.

305. *Oxymacaria palliata* (Hampson)


Material examined: One example (badly damaged), vi. 1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 17 mm.

Diagnosis: White with olive-brown iroration, Sinuous ante and medial lines, a submarginal band sharply bent at M1 towards outer margin. On underside all the lines and band prominent.

Distribution: India: Sikkim and Nilgiris.

*116. Genus Zeheba Moore


Distributional range: India, Sri Lanka and Indonesia.

306. Zeheba lucidata (Walker)


Distribution: India: Sikkim, Meghalaya (Khasi Hills) and Nilgiris. Elsewhere: Sri Lanka, Indonesia (Sumatra, Java and Borneo) and Australia (Cape York).

Remarks: Hollow (1993) cited Borneo as geographical range. He also narrated lucidata as a complex of three species viz. aureta Moore and marginata Walker.

117. Genus Macaria Curtis


Diagnosis: As per key.

Distributional range: Almost cosmopolitan. But some authors have split off the genus, Prout (1915).

Key to the species

- Hind tibia of male dilated .................... 1
  Hind tibia not dilated ...................... 8
  1. Outer margin of forewing acutally angled at M3 Antemedial medial and postmedial lines of forewing sharply bent near costa. Hind wing having antemedial and double postmedial lines. End-cell speck on both wings. Underside having dark area beyond post medial line of both wings .................. effusata Guenée Outer margin of forewing slightly angled at M3 .................................................

2. Underside of the wing orange .............. 3
   Underside of the wing not so ................ 5

3. Underside of base of wing orange. Forewing having waved antemedial line, a white band starting from below costa reaches inner margin. Hindwing medial white band having an end cell speck, and a dark line parallel to it ...... ........................................... fasciata (Fabricious) Underside of wings wholly orange .............

4. In forewing outer part of medial band with orange suffusion. The band of hindwing orange, beyond medial band a black patch at the centre of the wing .................. xanthonora Walker

Band of wings not being differentiated rather suffered with purple grey. Underside orange, beyond postmedial line having purplish fuscous blotch ............... elvirata Guenée

5. Hindwing having double postmedial line ....
   Hindwing not having double line, hindwing with medial band and having numerous black patches beyond it, a white patch nearer to outer margin below M3 ........... nora (Walker)

6. Margin of hind wing strongly crenulate. Postmedial line of forewing straight and dark marks beyond it. Underside of hindwing rufous and having a postmedial band ..................
   ........................................... odataria Swinhoe
   Margin of hind wing not so .................. 7

7. Greyish with fuscous iroration. Forewing with ante- and medial lines, postmedial line ochreous. Hindwing having antemedial line and end cell spot, clear patches towards apex beyond double postmedial black line. Both wings having marginal line ..................
   .......................................... pulviata (Fabricius ?)
   Rufous. Forewing having ante- and medial
lines, a quadrangular spot between Cula and culb nearer to base, the double postmedial line strongly curved near costa, the area between this and margin purplish and one apical speck hindwing having no cell spot, a dark line beyond the double postmedial line ........................................ azataria Walker

8. Outer margin of forewing slightly angled. Whitish with brown suffusion. Forewing with oblique antemedial, medial and postmedial lines angled below costa, and a spot below M3. Hindwing having antemedial and postmedial lines and a marginal crenulate black line and spot at Culb. Black spot at end of cell of both wings ......................... pervolgata (Walker)

9. Whitish with fuscous suffusion. Forewing having antemedial and medial spots on costa, a double line below medial nervure, a triangular patch nearer to apex, an oblique band from M1 to inner margin. Hindwing with antemedial and oblique post medial lines angled at apex. Underside of both wings having dark submarginal bands .................................. acutaria Walker

Grey with dark brown iroration. Forewing with subbasal speck, sinuous antemedial, oblique medial and postmedial lines angled below costa, a dark oblique band just beyond postmedial line. Hindwing with antemedial, waved postmedial line and rufous band beyond. Both wings having dark specks at end of cell. Underside of both wings having sinuous medial line and rufous post medial band ................. emersaria Walker

307. Macaria fasciata (Fabricius)


Material examined: Three ♂ iii-vi.1896, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 19 mm.
Diagnosis: As per key.

Distribution: India: Sikkim, West Bengal (Darjiling), Bihar (Buxar and Ranchi), Himachal Pradesh (Solan and Kasauli), M. P. (Mhow), Maharashtra (Mumbai) and Nilgiri Hills. Elsewhere: Sri Lanka.

308. Macaria norata Walker


Material examined: One ♂ and one ♀, iii and v.1896, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ ♀ 19 mm.
Diagnosis: Refer key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling) and Bihar (Buxar). Elsewhere: Indonesia (Sulawesi).

309. Macaria xanthonora Walker


Material examined: One ♀, iv.1896, one ♀ v.1896 alt. ca 550 m; 2 ♂, v.1896 and viii.1897; Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 16 mm, ♀ 19 mm.
Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills) and Nilgiris. Elsewhere: Bhutan and Myanmar.

310. Macaria elvirata Guenée


Material examined: One ♂, one ♀, v and vii.1896, Sikkim, G. C. Dudgeon coll. (only wings of the specimens).
**Length of Forewing**: $\delta \varphi$ 16 mm.

**Diagnosis**: As per key.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling) *metagonaria* Walker, Maharashtra (Mumbai) and Nilgiris.

311. *Macaria odataria* (Swinhoe)


**Material examined**: One $\delta$, 10/16.viii.1888, alt. ca 550 m, Sikkim, G. C. Dudgeon Coll.

**Length of Forewing**: 16 mm.

**Diagnosis**: Refer key.

**Distribution**: India: Sikkim, Meghalaya (Shillong) and West Bengal (Darjiling). Elsewhere: Myanmar (Tenasserim).

*312. Macaria ozararia* (Walker)


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Travancore. Elsewhere: Sri Lanka, Indonesia (Borneo, Sumatra and Java).

313. *Macaria pulviata* (Fabricius)


**Material examined**: Three $\delta$, one $\varphi$, iii.1896, alt. ca 550 m; G. C. Dudgeon Coll.

**Length of Forewing**: $\delta \varphi$ 15 mm.

For other detail Mondal and Ghosh (1997) may be consulted.

314. *Macaria ozataria* Swinhoe


**Material examined**: One $\delta$, 1890. Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 14 mm.

**Diagnosis**: Refer key.

**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

315. *Macaria pervolgata* Walker


**Material examined**: One $\varphi$ vi.1896, alt. ca 550 m, G. C. Dudgeon coll.

**Length of Forewing**: 14 mm.

**Diagnosis**: Refer key.

**Distribution**: India: Sikkim, Bengal, Punjab and Maharashtra (Pune).

316. *Macaria effusata* Guenèe


**Material examined**: One $\delta$, 3.x.1890, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 17 mm.

**Diagnosis**: As per key.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala and Simla).

317. *Macaria acutaria* Walker


Material examined: Two ♀ xi.1896 and xii.1897, one ♂, xii.1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 15 mm, ♀ 17 mm.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), Nagaland and U. P. (Varanasi).

318. Macaria emersaria Walker


Material examined: One ♂, vi-1888, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 17 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Assam (Sibsagar), Bihar (Ranchi) and Nilgiri Hills. Elsewhere: Sri Lanka, and Myanmar.

319. Macaria perfusaria Walker


Material examined: One ♀, vi-1886, one ♀, xii.1897, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 12-14 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), Nagaland, Himachal Pradesh (Dharmsala) and Nilgiris. Elsewhere: Sri Lanka, Myanmar, Malacca and Indonesia (Borneo) and Philippines.

119. Genus Obeidia Walker


Diagnosis: As per key.

Distributional range: North-East India, Malay, China and Japan.

Remarks: Mostly Chinese species only two species are reported from N. E. India.

322. Obeidia tigrata (Guenee)


Material examined: One ♂, 30.vi.1888, one ♂, 1895, one ♀, iii.1895, Sikkim; one ♀, 15.vii.1989, alt. 3750 m. Thangu and one ♀, 25.vii.1989, Jeema, N. Sikkim, coll S. Chatterjee.

Length of Forewing: ♂ 33-34 mm, ♀ 30-32 mm.

Diagnosis: Ground colour yellow spotted with black. Basal and outer area of both wings having small spots on basal and outer area, spot of end of
cell of both wings bigger, the spot at postmedial series on both wings.

**Distribution**: India: Sikkim, Meghalaya (Khasi hills), Nagaland and West Bengal (Darjiling). Elsewhere: China, Malay and Taiwan.

*323. Obeidia millepunctata* Warren


**Distribution**: Hampson (1895) is the last worker who dealt with this species.

120. Genus *Vithora* Moore


**Diagnosis**: As per key.

**Distributional range**: N. E. India, China and Japan.

*324. Vithora indrasana* Moore


**Material examined**: One ♂, 17.ix.1889, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 30 mm.

**Diagnosis**: Body yellow with black marking. Forewing black, its yellowish base, a white patch at cell, two quadrate patches, one below the cell another nearer to antemedial area, three white patches at postmedial area. Hindwing with whitish postmedial incomplete dark band, a black cell spot and a dark irregular marginal band.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and ‘Bengal’ (Cotes and Swinhoe 1888).

121. Genus *Percnia* Gueneé


**Dagnosis**: Refer key.

**Distributional range**: North India to Japan.

**Key to the species**

Head and thorax with black spots, dorsal side of abdomen with pair black spots. Forewing with paired black spots basally, dots of forewing arranged in five rows. In hindwing dots are arranged in four rows ..................

.............................................. *belluaria* Gueneé

No dots on head, thorax and abdomen. Forewing with lines instead of dots, antemedial line lunulate, medial line straight, in between crenulated postmedial and submarginal line a fuscous band. In hindwing dot absent antemedial line absent, other lines or band similar to forewing and having a small cell spot .......................... *maculata* (Moore)

*325. Percnia ductaria* (Walker)


**Distribution**: India: Sikkim.

**Remarks**: Now this is *Hetrabraxas ductaria* after Swinhoe (1900).

*326. Percina coryneta* Swinhoe


**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and Nagaland. Elsewhere: Myanmar.

**Remarks**: Hampson (1985) reported the species from India. Inoue (1982) reported the species from Nepal under the genus *Matabraxas* Butler.

*327. Percnia tincta* Hampson


**Distribution**: India: Sikkim.
Remarks: Hampson (1895) described the species from Sikim, after that no record of this species is available.

*328. Percnia felinaria Guenée


329. Percnia belluaria Guenée


Length of Forewing: 31-34 mm.

Dagnosis: As per key.


Remarks: Size of the spots varies directly with the size of wings. Inoue (1982) reported Percnia belluaria belluaria from Nepal.

330. Percnia maculata (Moore)


Material examined: One ♀, viii.1897, alt. c 550 m, Sikim, G. C. Dudgeon coll.

Length of Forewing: 28 mm.

Distribution: India: Sikim, Meghalaya (Khasi Hills) and West Bengal. Elsewhere: Nepal.

122. Genus Arichanna Moore


State Fauna Series 9, Fauna of Sikim

Dagnosis: Refer key.

Distributional range: This species mostly found in India, but also reported from S. China, Japan and Taiwan, a few species from Europe and Borneo.

Key to the species

Hind tibiae of male dilated and with tuft of hair ........................................... 1
Hind tibiae not dilated .................................................... 3

1. Head, thorax and abdomen black. Hindwing orange. Olive-yellow forewing with eight series of black spots. Hindwing with large marginal and submarginal spots, medial spots less prominent ............... transectata (Walker)

- Head, thorax and abdomen not black. Hindwing whitish .................................. 2

2. Head and thorax green and fuscous. Forewing olive green with Sc free and traces of four bands. Hindwing with postmedial and submarginal lines and a cell spot ........... tenebraria Moore

- Head and thorax yellow, spotted with black. Forewing greenish-yellow with Sc and R, stalked and traces of seven maculated bands. Hindwing with numerous submarginal and marginal spots and one end cell spot following another spot beyond this ....................... lapsariata (Walker)

3. Antennae of male fasciculate .................. 4

- Antennae of male serrated and fasciculate yellow-brown. Forewing with indistinct double series of patches, in medial area and beyond postmedial patches having white scales. Hindwing with postmedial line, marginal band and less distinct cell spot ................. plagifera (Walker)

4. Forewing with antemedial line or band ...... 5

- Forewing without any antemedial line or band. Veins of forewing reddish-brown, postmedial line whitish near the margin and continued with a double black line, submarginal series of white specks less distinct .................. rubrivena Warren
5. Forewing black with white and ochreous irroration, antemedial white line faded, medial white band bifurcated at median area to costa, postmedial white band also bifurcated near apex. Hindwing white with a dark spot at end of cell and postmedial and submarginal band ........................................... ramosa (Walker)

- Forewing fuscous brown with black striation, double maculated antemedial band, double postmedial patches, a patch on costa nearer to apex and large patch at cell and beyond it. Hindwing pale with a cell spot and a postmedial line ............... biquadrata Warren

*331. Arichanna maculata Moore


Distribution : India : Sikkim and Assam. Elsewhere : Tibet and Indonesia (Sumatra).

332. Arichanna transectata (Walker)


Material examined : One ♂, 1894, Yatang, Sikkim, G. C. Dudgeon coll. and one ♀, 25.vii.1989, Thangu, alt. c 3750 m. N. Sikkim, S. Chatterjee coll.

Length of Forewing : ♂ 30-35 mm and ♀ 40 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim and Meghalaya (Khasi Hills).

Remarks : Inoue reported this species from Nepal as Arichanna (Paricterodes) lapsariata consocia (Butler). The species consocia (Butler) was synonymised by Hampson (1895).

333. Arichanna lapsariata Walker


Length of Forewing : ♂ 30-35 mm and ♀ 40 mm.

Diagnosis : Refer key.

Distribution : India : Sikkim and Assam. Elsewhere : Tibet and Indonesia (Sumatra).

334. Arichanna rubrivena Warren


Material examined : One ♂, viii.1895, Gnatang, Sikkim, G. C. Dudgeon coll. and one ♀, Yatang (Old Collection). (Both the specimens are damaged).

Length of Forewing : ♂ 20 mm ♀ 22 mm.

Diagnosis : As per key.

Distribution : India : Sikkim.

Remarks : Inoue (1987) reported the species from Nepal as Arichanna (Phyllabraxas) rubrivena Warren.

*335. Arichanna violacea (Warren)


Distribution : India : Sikkim.

Remarks : Inoue (1987) reported the species from Nepal as Arichanna (Phyllabraxas) violacea Warren.
from Nepal as *Arichanna (Phyllabraxas) violacea* (Warren).

*336. Arichanna transfasciata* Warren


**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and Nagaland.

**Remarks**: After Hampson (1895) no record of the species available.

*337. Arichanna marginata* Warren


**Distribution**: India : Sikkim, Meghalaya (Khasi Hills), Nagaland and Himachal Pradesh (Dharmsala). **Elsewhere**: Bhutan and Taiwan.

**338. Arichanna ramosa** (Walker)


**Material examined**: One example, 1894, Yatang, Sikkim, G. C. Dudgeon coll (specimen damaged, sex in det).

**Length of Forewing**: 22 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim. **Elsewhere**: Chang-Yang, Pu-tsu-fang and Tibet (Prout 1915).

**339. Arichanna biquadrata** Warren


**Material examined**: One ♂, two ♀ vii.1895, Gnating alt. c 3200 m, seven ♂, vii.1895, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: ♂ 18-20 m ♀ 18 mm.

**Dagnosis**: Refer key.

**Distribution**: India : Sikkim.

**Remarks**: Inoue (1987) reported the species from Nepal as *Arichanna (Phyllabraxas) biguadrata* Warren.

*340. Arichanna albovittata* Moore


**Distribution**: India : Sikkim (Hampson, 1895) and West Bengal (Darjiling) (Cotes and Swinhoe 1888).

**Remarks**: After Hampson (1895) no report of this species is available.

**341. Arichanna plagifera** Walker


**Material examined**: One ♂, 30.v.1887, one ♀, vii.1895, alt. c 3200 m., Sikkim, G. C. Dudgeon coll and one ♀ 1.viii.1989, N. Sikkim (Old Coll.).

**Length of Forewing**: ♂ ♀ 22 mm.

**Dagnosis**: As per key.

**Distribution**: India : Sikkim and N. India (Swinhoe 1900).

**Remarks**: Inoue (1987) reported the species from Nepal.

**342. Arichanna tenebraria** (Moore)


**Material examined**: One ♂ and two ♀, 27.vii.1989, 5 kms N. W. of Lachen, alt. c 3500 m, N. Sikkim, coll. S. S. Saha.

**Length of Forewing**: ♂ 33 and ♀ 34 mm.
**Diagnosis**: As per key.

**Distribution**: India: Sikkim and Meghalaya (Khasi Hills) (Hampson, 1895).

**Remarks**: Inoue (1987) reported the species from Nepal as *Arichanna (Paricterodes) tenebraria* (Moore).

*343. Arichanna ? subaenescens* Warren


*344. Arichanna negans* Prout


**Distribution**: India: Sikkim and Assam. Elsewhere: Tibet and Indonesia (Sumatra).

123. Genus *Paradarisa* Warren


**Diagnosis**: Refer key.

**Distributional range**: The genus comprised of large number of Oriental species.

**Remarks**: Some of the species of the genus are polyphagous, Sato (1984) and Holloway (1992) have reported ferns and gymosperms as well as numerous angiosperm families as host plants.

*346. Alcis nigridorsaria* (Guenée)


**Material examined**: One ♂, 10.vi.1890, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 20 mm.

**Diagnosis**: Red-brown with greenish tinge. Collar to abdomen with brown lines. Fore wing R₁ given off from Sc, double antemedial line prominent, medial line forms of some specks. Hind wing base dark brown, antemedial line from cell to inner margin, an end cell speck. Both wings having crenulate marginal line.

**Distribution**: India: Sikkim and Western Himalaya. Elsewhere: Nepal.
*347. *Alcis tenera* Warren


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125. Genus *Cleora* Curtis


**Diagnosis**: As per key.

**Distributional range**: It is well represented in Old World tropics, sparsely represented into temperate latitudes and N. America. It is also well represented in Pacific Islands.

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348. *Cleora fraterna* (Moore)


**Material examined**: One ♂, viii.1888; one ♀, s. ix.1888, alt. c. 1750 m, Sikkim, one ♂, 1891, ♀, and ♀, viii. ix. 1896 alt. c. 550 m, one ♂, x. 1897, alt. c. 550 m, G. C. Dudgeon coll. and one ♂, 26. ix. 1988, Tumin, E. Sikkim, alt. 1800 m, coll. V. C. Agarwal (At light).

**Length of Forewing**: ♂ 21-23 mm, ♀ 20-24 mm.

**Diagnosis**: A rufous band on second abdominal segment. Ground colour of wing yellowish, a rufous band prior to antemedial line, a fuscous band beyond postmedial line nearer to costa, a white centred cell spot, one rufous spot touching it. Under side of both wings having rufous cell spots, on fore wing it is triangular.

**Distribution**: India: Sikkim, Assam, Meghalaya, West Bengal, Maharashtra and Andaman Island. Elsewhere: Bangladesh, Sri Lanka and Australia.

**Remarks**: Hampson (1895) confused *B. acaciaria* Boisduval with a few species as treated in the synonym list. Prout (1915) observed this composite group of species from Indo-Australian and Africa. *C. fraterna* is considered here as a good species after Inoue (1982), who resonably separated this from other members of *acaciaria* group.

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*349. *Cleora inoffensa* (Swinhoe)


**Distribution**: India: Sikkim and Assam. Elsewhere: Sundaland, Philippines, Indonesia (Sulawesi) and Solomons.

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*126. Genus *Diplurodes* Warren


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*350. *Diplurodes parvularia* (Leech)


**Distribution**: India: Sikkim. Elsewhere: Japan and Taiwan.

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127. Genus *Ectropis* Hübner


**Diagnosis**: As per key.

**Distributional range**: Northern temperate latitudes but also moderate diversity in the Indo-Australian tropics Holloway (1993). The taxa are mostly montane Holloway (1993).

**Key to the species**

Bright pink. In forewing traces of antemedial and submarginal lines, post medial line indistinct and bent outwards beyond cell..................
........................................... *rubrifusa* (Warren)
- Olive green. In fore wing double antemedial black band, a medial diffused band and a submarginal band becomes a patch near apex .............................................. duplex (Moore)

351. Ectropis rubrifusa (Warren)


Material examined : One ♂, 1891, Gnatang, alt. c. 3800 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 18 mm.


128. Boarmia Treitchke


Diagnosis : As per key.

Distributional range : Cosmopolitan.

Remarks : Prout (1915) has pointed out that this is a very large genus or group of genera, very difficult to subdivide satisfactorily although showing considerable variation in structure, chiefly in the secondary sexual characters of the male.

Key to the species
- Male having fovea at the base of fore wing .......................................................... 1
  Male without fovea at the base of fore wing .......................................................... 15

1. Antennae of male fasciculate .......... 2
  - Antennae of male bipectinate .......... 7

2. R₁ and R₂ of fore wing not stalked .......... 3
  - R₁ and R₂ of fore wing stalked .......... 5

3. Sc anastomoses with R₁. Grey, with fuscous iroration; Fore wing having sinusus antemedial line, a spec on cell. hind wing postmedial and submarginal lines indistinct. No cell speck .............................................. diversicolor Warren
  Sc not anastomoses with R₁ .................. 4

4. Grey, suffused with green. Fore wing postmedial line with a sinuas beyond cell and a rufous patch below the sinuas. Hind wing sub marginal line having dark marks .......... cnifera Moore
  Pale grey, suffused with fuscous. both wings with prominent antemedial lines. Hind wing submarginal line crenulated with pale outer edge .............................................. idaeoides Moore

5. Fore wing having double antemedial and postmedial lines .............................................. 6
  - No clear lines on fore wing. Antemedial, medial and postmedial series of speck on fore wing. Hind wing with antemedial and post medial lines. Both wings with brown patch at the middle post medi ally. Underside of both wings with cell spots ................. boarmiaria Gueneé

6. Grey brown with fuscous iroration. Lines of fore wing prominent .............................................. crepuscularia Hübner
  - Brown. Lines of fore wing less prominent .......... bhurmitra Walker

7. Hind tibia of male dilated ................. 8
  - Hind tibia of male not dilated ............... 13

8. Male having no hair on inner margin of hind wing .......................................................... 9
  Male having a fold on inner margin of hind wing with fringes of long hair. Antemedial line of fore wing irregular, one small cell spot. Postmedial line of both wings oblique .......... .............................................. trancissa Walker

9. Antemedial line of fore wing and postmedial line of both wings double. Underside white large cell spots, margin black .............................................. propulsaria Walker
  The lines are not double ....................... 10

10. First segment of abdomen with band ...... 11
  No band on first segment of abdomen ........ 12

11. Red brown, Abdomen with dark band on first segment. Fore wing with stigma at end of
cell ............... variegata (Moore)
Rufous with black irroration. First segment of abdomen with white band. Fore wing with black cell spot at end of cell. Underside with black cell spots .......... semiclarata (Walker)

12. Antennae of male with long branches. R\textsubscript{1} and R\textsubscript{2} not stalked .......... cineracea (Moore)
Branches of antennae of male smaller. R\textsubscript{1} and R\textsubscript{2} stalked .......... sublavaria Guenée

13. Breadth of fore wing of male normal ...... 14
Forewing of male long and narrow R\textsubscript{1} - R\textsubscript{3} stalked. Large basal rufous patch at forewing. Both wings with dark specks at end of cell .......... nigriceps Warren

14. Pale rufous. Ante- and Post-medial lines of forewing angled beyond cell and between the two lines covered with black suffusion. No cell spots .......... fuliginea Hampson
Grey. All the lines of forewing present, no black suffusion between lines. Both wings with cell spots .......... nilgirica Hampson

15. Antennae of male bipectinate with decumbent branches .................................................... 16
Antennae of male serrate and fasciculate. Red brown. Wing with olive green tinge. Forewing with a balck lunule at end of cell. Hind wing with end cell spot .......... virescens Butler

16. R\textsubscript{1} of fore wing from the cell .......... ......... 17
R\textsubscript{1} and R\textsubscript{2} of fore wing stalked. Rufous. In forewing an indistinct broad fascia from base to outer margin below apex, an indistinct annulus at the end of cell. Underside with prominent cell spots .......... separata Walker

17. Forewing produced. Underside with broad dark submarginal band. No rough hair .......... subplagiata (Walker)
- Forewing less produced. Underside of hind wing of male clothed with rough hair and scale below the middle of cell .......... delineata (Walker)

353. Boarmia diversicolor (Warren)


Material examined : One ♂, 1895, Yatang, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 18 mm.

Distribution : India : Sikkim, West Bengal (Darjiling) and Punjab.

*354. Boarmia conspurcata (Walker)


Distribution : India : Sikkim, West Bengal (Darjiling).

Remarks : Prout (1915) stated its occurrence from Darjiling, after that no record of this species is available.

*355. Boarmia cervina Hampson


Distribution : India : Sikkim.

Remarks : Hampson (1895) described this species from Sikkim after that it is not reported so far.

356. Boarmia conifera (Moore)


Material examined : One ♂, 1891, Gnatang, Sikkim, alt. c 3800 m, G. C. Dudgeon coll.

Length of Forewing : 18 mm.

Diagnosis : As per key.

Distribution : India : Sikkim and West Bengal (Darjiling) Cotes and Swinhoe (1887).

357. Boarmia idaoides (Moore)


*Material examined:* One example, 6.v.1889, coll. J. G. Pilcher, one example, 15.x.1890, Sikkim, G. C. Dudgeon coll. (all collection badly damaged).

*Diagnosis:* As per key.

*Distribution:* India : Sikkim, Meghalaya (Khasi Hills), Naga and Karen Hills and West Bengal (Darjiling).

358. *Boarmia marmorata* (Moore)


*Distribution:* India : Sikkim and 'Bengal' Cotes and Swinhoe (1887).

*Remarks:* The species was reported from Sikkim by Hampson (1895) after that it is not reported so far.

359. *Boarmia crepuscularia* Hübner


*Material examined:* Teo, VII. 1896 and VIII. 1897. Sikkim, alt. Ca 550 m. G. C. Dudgeon coll.

*Length of Forewing:* 18 mm.

*Diagnosis:* As per key.

*Distribution:* India : Sikkim, Meghalaya (Khasi Hills) and Western Himalaya (Hampson, 1895). *Elsewhere:* Europe, China and Japan (Hampson, 1895).

360. *Boarmia bhurmitra* walker


*Material examined:* Two ♂ and one ♀, 15.x.1889, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* 18 mm.

361. *Boarmia boarmiaria* (Guenène)


*Material examined:* Six ♂, ix.1889, one ♀, vi.1896, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* ♂ 23-24 mm and ♀ 24 mm.

*Diagnosis:* As per key.

*Distribution:* India : Sikkim, Assam, Nagaland and West Bengal (Darjiling). *Elsewhere:* Sri Lanka and Taiwan.

*Remarks:* Holloway (1976) reported the species as *Racotis boarmiaria* from Borneo.

362. *Boarmia bisinuata* Hampson


363. *Boarmia propulsaria* Walker


*Material examined:* One ♂, 20.viii.1890, G. C. Dudgeon coll.
**Boarmia variegata** (Moore)


**Material examined:** One \( \sigma \), 30.iv.1891, Sikkim G.C. Dudgeon coll.

**Length of Forewing:** 16 mm.

**Diagnosis:** As per key.

**Distribution:** India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling).

*365. Boarmia melanosticta* Hampson


**Distribution:** Sikkim, alt. c 3800 m.

**Remarks:** Hampson (1895) described this species from Sikkim after that it is not reported so far.

*366. Boarmia nigralbata* (Warren)


**Distribution:** India : Sikkim.

**Remarks:** Inoue (1982) reported the species from Nepal as *Alcis nigralbata*.

*367. Boarmia Semiclarata* Walker


**Material examined:** One \( \sigma \), 16.ii.1897, alt. c. 550 m Sikkim, G.C. Dudgeon coll.

**Length of Forewing:** 16 mm.

**Diagnosis:** As per key.

**Distribution:** India : Sikkim, Meghalaya (Khasi Hills) and N.W. Himalaya.

*368. Boarmia atrostipata* Walker


**Distribution:** India : Sikkim, West Bengal (Darjiling) and Himachal Pradesh (Shimla and Solan).

*369. Boarmia trispinaria* Walker


**Distribution:** India : Sikkim, Meghalaya (Khasi Hills) and Kalu. Elsewhere : Bangladesh (Sylhet) and Myanmar (Mergui).

*370. Boarmia cineracea* (Moore)


**Material examined:** One \( \sigma \), 10.viii.1889, Sikkim, G.C. Dudgeon coll.

**Length of Forewing:** 30 mm.

**Diagnosis:** As per key.

**Distribution:** India : Sikkim, Assam (Holloway 1976), Meghalaya (Khasi Hills) Hampson (1895) and West Bengal (Darjiling) Cotes and Swinhoe (1988). Elsewhere : Indonesia (Sumatra).
**Remarks**: Occurrence of the species from Assam may be because earlier Khasi Hills was in Assam state.

371. Boarmia sublavaaria Guenée


**Material examined**: Two ♂, 1888 and vi. 1897, alt. c. 550 m, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: 21-23 mm.

**Dagnosis**: As per key.

**Distribution**: Throughout India. Elsewhere: Sri Lanka, Myanmar and Indonesia (Borneo) (Hampson 1895).

372. Boarmia transcissa Walker


**Material examined**: 3 ♂, 3 ♀ (vii. 1896, vi. 1897 and x. 1897) and ♀ (vii. 1896, ii. 1897 and viii. 1897) alt. c. 550 m, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: ♂ 19-21 mm and ♀ 22 mm.

**Dagnosis**: As per key.

**Distribution**: India: Sikkim, Assam (Sibsagar), Himachal Pradesh (Dhurmsala) and Nilgiris. Elsewhere: Sri Lanka, Myanmar and Indonesia (Java).

373. Boarmia fuliginea Hampson


**Material examined**: Two ♂ (Specimens badly damaged), xii. 1896 and ix. 1897, alt. c. 550 m., Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: 14 mm.

**Distribution**: India: Sikkim and Nilgiris.

374. Boarmia nilgirica Hampson


**Material examined**: One ♂, Yatang, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: 20 mm.

**Dagnosis**: As per key.

**Distribution**: India: Sikkim, Nilgiri plateau and Travancore.

375. Boarmia nigrescens (Warren)


**Material examined**: Two ♂, two ♀; ♂, viii. 1895 and ii. 1897, ♀, l. 1896 and xii. 1897; alt. c 550 m, Sikkim, G.C. Dudgeon coll.

**Length of Forewing**: ♂ 17 mm and ♀ 23 mm.

**Dagnosis**: As per key.

**Distribution**: India: Sikkim and Assam (Margharita) and Meghalaya (Khasi Hills).

376. Boarmia subplagiata (Walker)


**Material examined**: One ♂ (vi. 1896), one ♀ (viii. 1896) alt. c 550 m, Sikkim, G.C. Dudgeon coll.

**Length of Forewing**: 23 mm.

**Dagnosis**: As per Key.

**Distribution**: India: Sikkim and Himalaya (Cotes and Swinhoe 1888). Elsewhere: Japan (Hampson 1895).

**Remarks**: Inoue (1982) reported the species as Menophra subplagiata from Nepal. Swinhoe (1900) and Prout (1915), have reported this species under the genus Hemerophila.
377. *Boarmia delineata* (Walker)


*Material examined:* One ♂, vii.1897, alt. c. 550 m; eight ♀ one, 12. ix. 1891, alt. c. 550 m; iv and xi. 1895 (2), xi-xii. 1896 (2); ii, iii and xii. 1897 (3), Sikkim. G. C. Dudgeon coll.

*Length of Forewing:* ♂ 18 mm, ♀ 18-21 mm.

*Diagnosis:* As per key.

*Distribution:* India : Sikkim, Meghalaya (Khasi Hills) and Nilgiris. *Elsewhere:* Sri Lanka and Indonesia (Borneo).

378. *Boarmia separata* Walker


*Material examined:* Four ♂ one ♀, (vii. 1896 and iv-viii. 1897), ♀, vii. 1897, alt. c. 550 m; Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* ♂ 22-23 mm, ♀ 27 mm.

*Diagnosis:* As per key.

*Distribution:* India : Sikkim, Meghalaya (Khasi Hills). *Elsewhere:* Sri Lanka and Indonesia (Java and Borneo) (Hampson 1895).

*379. Boarmia dentilinea* Warren


*380. Boarmia albibasis* Hampson


*Distribution:* India : Sikkim.

*Remarks:* After Hampson (1895) description of this species, is not reported by any other worker so far.

381. *Boarmia albibipta* (Warren)


*Distribution:* India : Sikkim.

*382. Boarmia sericea* (Warren)


*Distribution:* India : Sikkim.

383. *Boarmia virescens* (Butler)


*Material examined:* One ♂, 1895, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* 37 mm.

*Diagnosis:* As per key.

*Distribution:* India : Sikkim.

*384. Boarmia euryzona* (Hampson)


*Distribution:* India : Sikkim and Meghalaya (Khasi hills).

*385. Boarmia incolorata* (Warren)

**GHOSH** : *Insecta : Lepidoptera : Heterocera : Geometridae*

*Distribution*: India: Sikkim, alt. ca 3800 m.

*386. Boarmia lignicolor* Warren


*Distribution*: India: Sikkim.

*387. Boarmia thricophora* Hampson


*Distribution*: India: Sikkim.

*129. Genus Hirasa* Moore


*Distributional range*: India to Japan.

*388. Hirasa scripturaria* (Walker)


*Distribution*: India: Sikkim, Nagaland, Meghalaya (Khasi Hills) and Himachal Pradesh (Kulu). *Elsewhere*: Bhutan, Myanmar and Indonesia (Java).

*130. Genus Phthonandria* Warren


*Diagnosis*: As per key.

*Distributional range*: Himalaya, W.China, Japan and Korea.

*389. Phthonandria atrilineata* (Butler)


*Material examined*: One ♀, vii.1897, alt. c 550 m, Sikkim, G.C.Dudgeon coll.

*Length of Forewing*: 27 mm.

*Diagnosis*: Reddish grey specimen with black frons and Palpi. Medial and post medial black lines of fore wing dentate. Underside pale and with cell spot.


*Remarks*: Hampson (1895) treated it under the genus *Boarmia*, Swinhoe (1900) placed it with *Phthonandria*; the latter has been reasonably followed here.

*131. Genus Ruttelleronia* Swinhoe


*Diagnosis*: As per key.

*Distribution*: Indo-Australian tropics with a range of low land to montane species (Holloway, 1993).

*390. Ruttelleronia cessaria* (Walker)


*Material examined*: One ♀, ix.1897, alt. c 550 m, Sikkim, G.C.Dudgeon coll.

*Length of Forewing*: 26 mm.


*Distribution*: India: Sikkim, Meghalaya (Khasi hills), Kanara and Nilgiris. *Elsewhere*: Sri Lanka, Malaya, Indonesia (Borneo) and New Guinea.
Remarks: The species was described under the genus *Boarmia* Walker (1860), subsequently Hampson (1895) placed it with the same genus. Recently Burlow (1982) and Holloway (1993) treated with the genus *Ruttelerona*, in which the specimen examined fits well.

*132. Genus *Menophra* Moore


*Distributional range*: N.E. India, W. China and Malaysia.

391. *Menophra subterminalis* (Prout)


133. Genus *Amblychia* Guenné


*Diagnosis*: As per key.

*Distributional range*: Oriental tropics, a single species known from New Caledonia (Holloway, 1993).

392. *Amblychia angeronaria* Guenné


*Material examined*: One ♂, viii. 1889, Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 44 mm.

*Diagnosis*: Pale brown, mottled with ochreous. the ante medial line with whitish lunule at inner edge the medial fasciae of fore wing narrow. Hind wing with straight medial, lunulate postmedial and submarginal lines. Underside paler, postmedial dark band of fore wing straight.

*134. Genus *Chorodna* Walker


*Diagnosis*: As per key.

*Distributional range*: Diversity on the Asian mainland and extended up to Sundaland.

**Key to the species**

- Outer margin of hind wing produced at veins .......................................................... 1

- Outer margin of hind wing evenly curved. In fore wing a line from middle of costa angled at each angle of cell, then oblique extending near base of inner margin .........................

............... *erubesia* Walker

1. Fore wing fuscous, a black patch above upper angle of cell. Outer margin of hind wing more produced at veins ............ *adumbrata* Moore

- Pale fuscous, irrorated with black, a ring spot at upper angle of cell of both wings. Outer margin of hind wing at veins less produced ........................................ *metaphaeria* (Walker)

*393. Chorodna pallidularia* Moore


*Distribution*: India: Sikkim, Assam (Sibsagar) and West Bengal (Darjiling). Elsewhere: Bhutan, China, N. Thailand, Peninsular Malaysia and Indonesia (Sumatra and Borneo).


Length of Forewing: 40-43 mm.

Dagnosis: As per key.

Distribution: India: Sikkim and West Bengal (Darjiling).

Remarks: According to Hampson (1895) this species is from Sikkim, after that this species is reported in this paper from Sikkim.

395. Chorodna metaphaeria (Walker)


Material examined: One ♂, 15.viii.1889, Sikkim, G.C.Dudgeon coll.

Length of Forewing: 37 mm.

Dagnosis: As per key.

Distribution: India: Sikkim and West Bengal (Darjiling).

396. Chorodna erebusaria Walker


Material examined: One ♂, 26.ix.1988, Tumin, S.Sikkim, alt. 1800 m. coll. V.C.Agawal and party.

Distribution: India: Sikkim, Meghalaya (Shillong) and West Bengal (Darjiling). Elsewhere: Myanmar.

Remarks: Swinhoe (1900) wrote Assam as locality as because earlier Shillong was in Assam.

397. Srinopteryx rufivinctata (Walker)


Material examined: One ♂, 23.iv.1889, Sikkim, G.C.Dudgeon coll.

Length of Forewing: 23 mm.

Dagnosis: As per key.


398. Srinopteryx undulifera Warren


Material examined: One ♀, Tumin, S.Sikkim, alt. ca 1475 m. 01.x.1988, coll. V.C.Agawal.

Length of Forewing: 23 mm.

Dagnosis: As per key.

Distribution: India: Sikkim.

Remarks: This species is endemic to Sikkim. Hampson (1895) reported this species from Sikkim, after that this species is reported in this paper.
136. Genus *Ourapteryx* Leach

1814. *Ourapteryx* Leach, zool. misc., p. 79.

*Diagnosis:* As per key.

*Distributional range:* Palearctic and Oriental regions.

**Key to the species**

In hind wing prominent submarginal band meets bigger medial one. Marginal line of each side of tail black, a black spot in the small rectangular lobe at the beginning of the hindwing tail .................... *podaliriata* Guenée

In hind wing no submarginal band, medial band smaller ................................................. 1

1. Costa of fore wing striated ......................... 2

Costa of fore wing not striated. Palpi and frons pale. Wings striated with fuscous ...................... ............................... *ebuleata* Guenée

2. Bright yellow. Bands of wings thicker, cilia of both wings orange except on M₁ and M₃ of hind wing ....................... *primularis* Butler

Almost white. Lines on the wings thinner. Ante-and post medial lines of forewing approaching each other towards inner margin. Cilia of hind wing red ......................................... ............................... *picticaudata* Walker

399. *Ourapteryx ebuleata* Guenée


*Material examined:* One ♂, 1894, Yatang, two examples, v.1897, alt. c 3500 m, Lachen, N.Sikkim, coll. S.S. Saha

*Length of Forewing:* ♂ 26-30 mm, ♀ 33 mm.

*Diagnosis:* As per key.

*Distribution:* India: Sikkim and Meghalaya (Khasi Hills), Nagaland and Himachal Pradesh (Shimla). *Elsewhere:* Malaya, and Indonesia (Sumatra and Borneo).

*400. Ourapteryx picticaudata* Walker


*Material examined:* One ♂, 25.vii.1888, alt. 1700 m. one ♂, 1894, Yatang, two examples, v.1897, alt. c 550 m, Sikkim, G.C. Dudgeon coll., three ♂, 27.vii.1989, alt. ca 3500 m, Lachen, N.Sikkim, coll. S.S. Saha

*Length of Forewing:* ♂ 26-30 mm, ♀ 33 mm.

*Diagnosis:* As per key.

*Distribution:* India: Sikkim and Meghalaya (Khasi Hills), West Bengal (Darjiling) and N.W. Himalaya. *Elsewhere:* Nepal.

*401. Ourapteryx clara* Butler


*Remarks:* Hampson (1895) put this species in synonymy list of *picticaudata* Walker later on this species treated reasonably as a good species from Sikkim by Holloway (1976). Another allied species *claretta* described by Hollow (1982) from Malaysia.

*402. Ourapteryx podaliriata* Guenée


*Material examined:* One ♂, 1893, Sikkim, G.C. Dudgeon coll.
Insecta: Lepidoptera: Heterocera: Geometridae

**Length of Forewing**: 28 mm.

**Distribution**: India: Sikkim and Kashmir.

**Elsewhere**: Bangladesh (Sylhet), Myanamar to Indonesia (Sulawesi).

**Remarks**: Locality 'Assam' reported by Holloway (1976) probably wrong as because earlier Sylhet was in undivided Assam.

### 403. *Ourapteryx primularis* Butler


**Material examined**: One ♂, 17.ix.1888, Sikkim, G.C.Dudgeon coll.

**Length of Forewing**: 37 mm.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling).

**Elsewhere**: Nepal.

### 404. *Ourapteryx sciticaudaria* Walker


**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

### 405. *Ourapteryx margaritata* Moore


**Distribution**: India: Sikkim and 'Bengal' (Cotes & Swinhoe, 1888).

**Remarks**: The larva feed on Vine, Virginia Creeper (Sevastopulo, 1947).

### 406. *Thinopteryx citrina* Warren


**Distribution**: India: Sikkim and Meghalaya (Khasi Hills).

**Elsewhere**: Omei-Shan.

### 407. *Thinopteryx crocoptera* (Kollar)


**Length of Forewing**: ♂ 32-35 mm. ♀ 31-37 mm.

**Diagnosis**: Pale orange. Fore wing costa white, ante and post medial line oblique. In hind wing submarginal line double, angled at M3.

**Distribution**: India: Sikkim, Assam (Cachar and Sibsagar), West Bengal (Darjiling), Bihar (Buxar) and Himachal Pradesh (Kulu and Solan).

**Elsewhere**: Sri Lanka, Bangladesh (sylhet), Myanmar, China, Japan and Malaya to Sundaland.

**Remarks**: The larva feed on Vine, Virginia Creeper (Sevastopulo, 1947).

### 408. *Xeropteryx columbicola* (Walker)


**Diagnosis**: As per key.

**Distribution range**: India: Myanmar and Indochina to Sundaland.

### 137. Genus *Xeropteryx* Butler


**Diagnosis**: As per key.

**Distributional range**: Sri Lanka, India to China, Japan, Taiwan, Malay and Sunda lands.
Material examined: One ♂, iv. 1896, alt. ca 550 m. Sikkim, G. C. Dudgeon coll.

Length of Forewing: 30 mm.


Diagnosis: As per key.

Distributional range: Palaearctic, Indo Australian and Nearctic regions.


Key to the species

Ante-and post medial lines of both wing prominent and continuous ....................... 1
Ante-and postmedial lines not prominent, outer margin of fore wing falcated, some fulvous spots on margin .................. *falcata* (Warren)

1. In both wings ante-and post medial lines broader, in fore wing a fulvous band prior to ante-medial line and outwardly a fulvous patch from M₂ to tornus, post-medial line rounded between M₁ and M₃. In hind wing sharply angled near M₂ ........................

.............................................. *regalis* (Moore)

In both wings ante-and post medial lines thinner, no fulvous patch or band, the lines sharply angled near M₂ ........................

.............................................. *contectaria* (Walker)

409. *Biston falcata* (Warren)


Length of Forewing: ♂ 30 mm and ♀ 34 mm.

Diagnosis: As per key.

Distribution: India: Sikkim; Elsewhere: Nepal.

410. *Biston regalis* (Moore)


Material examined: One ♀, 21. ix. 1888, alt. Ca 1700 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 46 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, W. Bengal (Darjiling Cotes and Swinhoe, 1888), N. W. Himalaya and Meghalaya (Khasi Hills) Hampson, 1895; Elsewhere: Japan (Hampson, 1895) and Taiwan.

*411. Biston sinuata* Hampson


Distribution: India: Sikkim.

412. *Biston contectaria* (Walker)


Material examined: One ♀, 16. iv. 1888, one ♂, vi. 1897, alt. Ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 25 mm, ♀ 40 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Shillong), West Bengal (Darjiling) and Himachal
Pradesh (Solun); Elsewhere: Bangladesh (Sylhet) and Nepal.

Remarks: Hampson (1895) kept this species under the synonymy list of the species *bengaliaria* Guenée. *B. contectaria* is considered here as a good species after Inoue (1982) who resonably treated this as a good species.

*140. Genus *Elphos* Guenée


Distributional range: Indo-Australian, a single species reported from Japan.

413. *Elphos hymenaria* Guenée


Distribution: India: Sikkim, Assam (Sibsagar) Meghalaya (N. Khasi Hills) and U. P. (Mussoorie); Elsewhere: Bangladesh (Sylhet), Myanmar, Singapore and Indonesia (Sumatra and Borneo).

414. *Elphos pardicelata* Walker


Distribution: India: Sikkim, Meghalaya (Khasi Hills) and N. W. Himalaya; Elsewhere: Bangladesh (Sylhet) and Nepal.

*141. Genus *Xandrames* Moore


Distributional range: Himalaya to Japan, Taiwan and Malaya to Indonesia (Borneo).

415. *Xandrames albofasciata* Moore


Distribution: India: Sikkim and H. P. (Solun); Elsewhere: Nepal.

*142. Genus *Gnophos* Treitschke


Distributional range: Palearctic region, N. India, Taiwan, Africa and America.

416. *Gnophos muscosaria* Walker


Distribution: India: Sikkim and N. W. Himalaya.


417. *Gnophos colaria* Guenée


Distribution: India: Sikkim and throughout Himalaya; Elsewhere: W. China.

418. *Gnophos licheneus* Oberthür


*143. Genus *Ophthalomodes* Guenée


Distributional range: Oriental region.

Remarks: Holloway (1993) treated *Ophthalomides* as a synonym of *Ophthalmites* Fletcher, 1979, as replaced name.
419. *Ophthalomides herbidaria* Guenée


**Distribution**: India : Sikkim and W. Himalaya; *Elsewhere*: Bangladesh (Sylhet), Sri Lanka and Taiwan.

420. *Ophthalomides cordularia* Swinhoe


**Distribution**: India : Sikkim and Meghalaya (Khasi Hills).

144. Genus *Buzura* Walker


**Diagnosis**: As per key.

**Distributional range**: Indo-Australian and India to S. Russia, Japan, Korea.

421. *Buzura suppressaria* (Guenée)


**Material examined**: One ♂, 15. viii. 1890, three ♀, 22. viii. 1890; x. 1896 and iv. 1897, alt C 550 m, Sikkim G. C. Dudgeon coll.

**Length of Fore wing**: ♂ 30 mm and ♀ 35-42 mm.

**Diagnosis**: White irrorated with brown and black. Three yellow irregular bands on fore wing and two on hind wing.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and H. P. (Dharmsala); *Elsewhere*: Bangladesh (Sylhet) and Myanmar and Indonesia (Borneo).

145. Genus *Erebomorpha* Walker


**Diagnosis**: As per key.

**Distributional range**: N. E. India to Japan, Taiwan and Korea.

**Key to the species**

Outer margin of hind wing produced at Rs and M₃ ........................................................ 1

Outer margin of hind wing not so, excurred between M₁ and C ula. Apex of fore wing with a grey-patch with a white spot in it, a submarginal band with some lunules arising from apical patch reaches inner margin ...

.................................................. *compositata* (Guenée)

1. A white band on metathorax. A white band from base of fore wing to apex where is striated, white medial and submarginal lines are from band to inner margin ................. ........................................... *fulgurita* Walker

A white band on first segment of abdomen. In fore wing a white medial band starting from costa reaches cula and turning upward reaches costa postmedially forming a curved band, one white curved band starting from apex meets the former curved band at cula. In hind wing a white band starting from base runs parallel to costa and turns downward postmedially to reach inner margin .............. ........................................... *fulguraria* Walker

422. *Erebomorpha fulgurita* Walker


**Material examined**: One ♂, 13. ix. 1888, one ♂, 4. iv. 1889, Two ♀ Sikkim G. C. Dudgeon coll One ♂, 01. x. 1888, Tumin, alt. C 1475 m. E. Sikkim, coll V. C. Agrawal and party; one ♀, 18. x. 1995 Demtam, coll. S. C. Mitra and party, Sikkim.
Length of Forewing: \( \sigma \) 37-45 mm and \( \varphi \) 45-53 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling) (zanthosoma Felder, 1874).

423. Ereboromorpha fulguraria Walker


Material examined: One \( \sigma \), vii. 1889, Sikkim (Old collection).

Length of Forewing: 45 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling); Elsewhere: Nepal and Taiwan.

Remarks: Inoue (1987) reported the species as E. fulguraria fulguraria Walker from Nepal.

424. Ereboromorpha compositata (Guenèe)


Material examined: One \( \sigma \), 8. iv. 1889, Sikkim G. C. Dudgeon coll.

Length of Forewing: 35 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling).

Remarks: Inoue (1992) reported compositata Moore, 1868 (not Guenèe, 1857) as synonym of moorei (Thierry-Mieg, 1899) under the genus Vindusara Moore, 1868 from Taiwan.

146. Genus Micrabraxas Butler


Diagnosis: As per key.

Distributional range: Himalaya.

Key to the species

R\(_1\) and R\(_2\) anastomosed.............................. punctigera Butler

R\(_1\) and R\(_2\) approximated.............................. melanodonta (Hampson)

425. Micrabraxas punctigera Butler


Material examined: One (damaged), vii. 1895, Gnatang, Sikkim, G. C. Dudgeon coll.

Diagnosis: As per key.

Distribution: India: Sikkim and Himachal Pradesh (Dharmsala); Elsewhere: Nepal.

426. Micrabraxas melanodonta (Hampson)


Length of Forewing: 18 mm.

Diagnosis: As per key.

Distribution: India: Sikkim; Elsewhere: Nepal.

147. Genus Psyra Walker


Diagnosis: As per key.

Distributional range: N. India to Japan.
Key to the species

Yellow-brow with fuscous iroration. In forewing rufous bands beyond ante- and postmedial lines. In hind wing with medial and post medial oblique lines having dark suffusion in between them ........................................... spurcataria (Walker)

Purple-grey. Ante-, post medial and submarginal lines are ill defined and with yellow edged black spots on them. The submarginal line with three triangular black spots. In hind wing no such lines ........................................... angulifera Walker

427. Psyra spurcataria (Walker)


Material examined : One ♂, 18. iii. 1889, one ♀, vii. 1889, Sikkim, G. C. Dudgeon coll.

Length of Forewing : ♂ 22 mm, ♀ 28 mm.

Diagnosis : As per key.

Distribution : India : Sikkim Meghalaya (Khasi Hills), West Bengal (Darjiling) and N. W. Himalayas; Elsewhere : Nepal and Taiwan.

428. Psyra angulifera (Walker)


Material examined : One ♂, 15. iii. 1884, one ♀, Yatang, Sikkim, G. C. Dudgeon coll., one ♀, vi. 1896, alt. C 2200 m, coll. J. G. pilcher.

Diagnosis : As per key.

Distribution : India : Sikkim Assam (Swinhoe, 1900), West Bengal (Darjiling) Cotes and Swinhoe, 1888 and Himachal Pradesh (Dharmasala).

148. Genus Medasina Moore


Diagnosis : As per key.

Distributional range : Mostly Indo-Burmese, some species reported from Indonesia and Philippines.

Key to the species

Hind tibiae dilated. Antennae of male with shorter branch ........................................... 1
Hind tibiae not dilated. Antennae of male with longer branches ................................... 8

1. Fore wing with spot on costa .................... 2
Costa of fore wing with facis or striae or without spot ........................................... 3

2. Red brown. Fore wing with black ante- and post medial lines, the costal spot above end cell speck. Hind wing margin produced at M₃ and Cₚₕ ............. basistrigaria Moore
White. Fore wing with antemedial black band narrowing inner margin, triangular medial spot on costa coinjoined discocellular spot. Margin on hindwing not produced at M₃ and Cₚₕ ..................................... contaminata Moore

3. Costa of fore wing without spot ............. 4
Costa of fore wing with striae or facis ... 6

4. Endcell spot on fore wing only. Double antemedial line, a patch between M₃ and Cₚₕ. Both wings with marginal series of black speks ............... muscidaria Walker
End cell spot on both wings .................. 5

5. Red-brown. Thorax and abdomen barred with black. Fore wing with sinuous crenulate post medial line, a submarginal line with white spot at middle ........................................... combustaria Walker
Brown. Thorax and abdomen not barred with black. Fore wing with irregular sinuous black post medial line excurred between R₃ and
**M.**, submarginal line without any spot .......... \(\text{strixaria} \text{ Guenée}\)

**6.** White, spotted with pale brown. Fore wing with ante-,, medial post medial and submarginal lines A black mark between \(M_2\) and cula. \(\text{albidaria} \text{ Walker}\)

- Brown irrorated with black. In fore wing no such clear lines ............................................ 7

**7. Fore wing with pale fascia from base to apex. Hind wing with submarginal line ......... \(\text{similis} \text{ Moore}\)

- In fore wing no fascia from base to apex, costal fascia more striated with fuscous. Hind wing without submarginal line .......... \(\text{enteruptaria} \text{ Moore}\)

**8. Ante-,, medial and postmedial bands of fore wing not prominent, a whitish sinuous submarginal line with black spots on it. Hind wing with a speck at end of cell .......... \(\text{scotosiaria} \text{ Warren}\)

- Fore wing with a broad black band from median nervure to inner margin with a line on it, submarginal line having no spot on it. Hind wing without cell speck .......... \(\text{nigrovittata} \text{ Moore}\)

\(430. \text{ Medasina strixaria} \text{ (Guenée)}\)

1887.\(\text{Hemerophila strixaria} \text{ Guenée, Hist. nat. Ins. Lep., 1 : 217.}\)

1900.\(\text{Medasina strixaria} : \text{Swinhoe, Cat. East. Austrl. Lep. Het., (2) : 300.}\)

**Material examined**: One \(♀\) vii. 1889, one \(♀\) x. 1896, alt \(C\) 550 m, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 43-53 mm.

**Diagnosis**: As per key.

**Distribution**: India: Sikkim Assam (Sibsagar), Meghalaya (Khasi Hills) and West Bengal (Darjiling); Elsewhere: Myanmar.

\(431. \text{ Medasina Muscidaria} \text{ (Walker)}\)


**Material examined**: One \(♂\) 1887, one \(♀\) v. 1894; one \(♀\) vi. 1897, alt \(C\) 2150 m, Sikkim, G. C. Dudgeon coll.; One \(♂\), 3. x. 1988, Rabangla, S. Sikkim, alt. 2010 m. coll. S. S. Saha.

**Length of Forewing**: \(♂\) 22-29 m, \(♀\) 30 mm.

**Distribution**: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling); Elsewhere: Nepal.

**Remarks**: In Rabangla specimen differs from description of fauna by a broad submarginal fuscous band in underside of Fore wing.

\(432. \text{ Medasina basistrigaria} \text{ (Moore)}\)


**Material examined**: One \(♂\), 7. v. 1888, Sikkim, G. C. Dudgeon coll.
**322**

*Length of Forewing*: 23 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling); Elsewhere: Nepal.

433. *Medasina contaminata* (Moore)


*Material examined*: One ♀, 1894, Yatang, Sikkim, G. C. Dudgeon coll.

*Length of Forewing*: 28 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim and West Bengal (Darjiling) (Cotes and Swinhoe, 1887).

*434. Medasina quadrinotata* Warren


*Distribution*: India: Sikkim.

*435. Medasina livida* (Warren)


*Distribution*: India: Sikkim.

*436. Medasina creataria* (Guenée)


*Distribution*: India: Sikkim, Assam (Sibsagar) and West Bengal (Darjiling); Elsewhere: Nepal and Taiwan.

437. *Medasina albidaria* (Walker)


*Material examined*: One ♂, 23. iii. 1997, Rhenok, E. Sikkim, name of the collector not mentioned.

*Length of Forewing*: 23 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim, Meghalaya (Shillong), West Bengal (Darjiling) and Himachal Pradesh (Dharmsala and Simla); Elsewhere: Nepal, Chang and Omeo-Shan.

*Remarks*: Inoue (1982) has reported this species as *M. albidaria albidaria* (Walker) from Nepal.

438. *Medasina combustaria* (Walker)


*Material examined*: One ♀, 30. ix. 1988, Tumin, E. Sikkim alt. 1470 m., coll. V. C. Agrawal. (Specimen collected at light).

*Length of Forewing*: 17 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim, West Bengal (Darjiling); Elsewhere: Nepal.

*Remarks*: The species is placed here under the genus *Medasina* by Inoue (1982, 87) in which the specimen examined fits well.

439. *Medasina interruptaria* (Moore)


Length of Forewing : 32 mm.

Diagnosis : As per key.

Distribution : India : Sikkim, and Bengal
Cotes and Swinhoe (1887); Elsewhere : Nepal.

440. Medasina scotosaria (Warren)


Length of Forewing : ♂ 20-27 mm ♀ 33 mm.

Diagnosis : As per key.


441. Medasina nigrovittata (Moore)


Material examined : One ♂, viii. 1895, Sikkim, G. C. Dudgeon Coll.

Length of Forewing : 20 mm.

Diagnosis : As per key.

Distribution : India : Sikkim, Meghalaya (Khasi Hills), Nagaland and “Bengal” (Cotes and Swinhoe, 1887).

*442. Medasina reticulata Hampson


Distribution : India : Sikkim.

149. Genus Loxaspilates Warren


Diagnosis : As per key.

Distributional range : North India to Tibet, China and Taiwan.

Key to species

Cloudy antemedian fascia present, post median line oblique, subnarginal fascia dense at R₃ and cubital region ............... unidiluta Inoue

No antemedial fascia, only three dash on forewing, postmedial line being sinuous, submarginal line less prominent, discontinued before costa ................. hastigera (Butler)

*443. Loxaspilates obliquaria (Moore)


Distribution : India : Sikkim and North Western Himalaya; Elsewhere : Afghanistan and West China.

444. Loxaspilates hastigera (Butler)


Material examined : One ♂, 1894, Yatang, Sikkim, G. C. Dudgeon Coll.

Length of Forewing : 19 mm.

Distribution : India : Sikkim and N. W. Himalayas; Elsewhere : Afghanistan and Nepal.

*445. Loxaspilates dispar Warren


**Distribution**: India : Sikkim.

446. *Loxaspilates unidiluta* Inoue


**Material examined**: One ♀, vii. 1989, Yumthang, N. Sikkim, alt. 3984 m. S. S. Saha Coll.

**Length of Forewing**: 20 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim; Elsewhere : Nepal.

**Remarks**: The species, with its limited distributional range within Nepal. This is recorded for the first time from India (Sikkim).

150. Genus *Scardamia* Guenée


**Diagnosis**: As per key.

**Distributional range**: Chiefly Indo-Australian and African, a few species occurs in E. Siberia, China, Japan and Korea.

447. *Scardamia metallaria* Guenée


**Material examined**: One ♂, vi. 1895, alt. Ca 950 m, One ♂, viii. 1895, alt. 650 m, Sikkim, Coll. J. G. Pilcher and One ♂, viii. 1889, Sikkim, G. C. Dudgeon Coll.

**Length of Forewing**: 13 mm.

**Diagnosis**: Scarlet yellow, suffused with ferruginous. Curved antemedial line reaches medially at innermargin, postmedial curved line and speck at end of cell on both wings. Underside pale, curved postmedial line prominent.

**Distribution**: India : Sikkim, Himachal Pradesh (Solan), Maharashtra (Pune and Bombay), Travancore; Elsewhere : Sri Lanka, Taiwan, Indonesia (Java) and Siberia.

151. Genus *Tanaoctenia* Warren


**Diagnosis**: As per key.

**Distributional range**: This and the next genus occur in Nearctic and palaearctic regions, Sikkim and Meghalaya.

448. *Tanaoctenia haliaria* (Walker)


**Material examined**: One ♀ Sikkim One ♀, 1894, Yatang, Sikkim, G. C. Dudgeon Coll.

**Length of Forewing**: 21-23.

**Diagnosis**: Bright green (light green in old ♀ specimens). Palpi, frons and antennae rufous, abdomen whitish (old specimen). Fore wing with white antemedial oblique line joined in ~argin, white, oblique slightly curved post medial line at inner margin meets with ante-medial line of hind wing, a speck at end of cell.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling). Elsewhere : Nepal and Taiwan.

**Remarks**: This species in placed herewith *Tanaoctenia* after Inoue (1982), in which the specimen examined fits well.

*152. Genus *Metrocampa* Latreille


**Remarks**: The genus differs from *Tanaoctenia* by the absence of white scales in shaft of antennae.
449. Metrocampa biseriata (Moore)


Distribution : India : Sikkim and West Bengal (Darjiling).

153. Genus Aplochlora Warren


Diagnosis : As per key.

Distributional range : Indo-Australian.

450. Aplochlora dentisignata (Moore)


Material examined : One 9 vi. 1897, alt. C 2200 m, Sikkim G. C. Dudgeon Coll.

Length of Forewing : 26 mm.

Diagnosis : As per key.

Distribution : India : Sikkim, West Bengal (Darjiling) and Himachal Pradesh (Dalhousie); Elsewhere : Nepal.

Remarks : This species in placed here with Aplochlora after Inoue (1982), in which the specimen examined fits well. Inoue (1982) reported this species as A. dentisignata dentisignata from Nepal.

*451. Aplochlora vivilaca (Walker)


Distribution : India : Sikkim and Maharashtra (Bombay and Khandala); Elsewhere : Sri Lanka and Taiwan.

*452. Aplochlora viridis Warren


Distribution : India : Sikkim; Elsewhere : Taiwan.

Remarks : Hampson (1895) treated it under the genus Caberodes Guenée, but Inoue (1992) placed it under Aplochlora; the latter has been reasonably followed here.

*145. Genus Caberodes Guenée


Distributional range : North East India and Bhutan.

*453. Caberodes cinerascens (Moore)


Distribution : India : Sikkim (Hampson, 1895) and West Bengal (Darjiling) (Cotes and Swinhoe, 1888).

454. Caberodes costalis (Moore)


Distribution : India : Sikkim, Meghalaya (Khasi Hills) (Hampson, 1895) and Bengal (Cotes and Swinhoe, 1888).

155. Genus Plutodes Guenée


Diagnosis : As per key.

Distribution : The diversity of the species is in the oriental tropics and extending weekly in the Australian tropics and to subtropical latitudes in eastern Asia (Holloway, 1993).
**Key to the species**

R₁ of fore wing free. Outer margin of both wings slightly angled at C_u1u ' Fore wing costa yellow with some silvery scales below, three downward triangular spars downwards, middle one biggest, outer angle with a yellow patch. A narrow yellow patch at the apex of hind wing ..........................**costatus** (Butler)

- R₁ stalked with R₂-R₃; outer margin of both wings rounded ..............................

1. Basal patch of fore wing small, outer patch oval, with silvery line forming double inner edges, a rofous waved line crossing the oval patch. Basal patch of hind wing bigger and covers the whole base, the outer patch smaller ..........................**discigera** Butler

- Basal patch of fore wing smaller, outer patch being rectangular with double silvery inner edge. Basal patch of hind wing narrow, running along inner arrea to meet outer band with same double silvery inner edge, a black small spot on it near anal angle ......................

.......................... **exquisita** Butler

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*455. Plutodes prasina* (Swinhoe)

1892. *Asthena prasina* Swinhoe. Trans. ent. Soc. Lond., 1892: 13, pl. 1, fig. 10.


*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).

*456. Plutodes delphinaria* (Swinhoe)


*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).

*457. Plutodes subcaudata* Butler


*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and West Bengal (Darjiling).

458. *Plutodes costatus* (Butler)


*Length of Forewing*: 23 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Shimla).

459. *Plutodes discigera* Butler


*Material examined*: One ♂, xii. 1897, alt. C 550 m, Sikkim, G. C. Dudgeon Coll.

*Length of Forewing*: 18 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).

460. *Plutodes exquisita* Butler


*Material examined*: One ♂, 29. viii. 1889, Sikkim, G. C. Dudgeon Coll.

*Length of Forewing*: 15 mm.

*Diagnosis*: As per key.

*Distribution*: India: Sikkim and Meghalaya (Khasi Hills).
460. *Plutodes exquisita* Butler


**Material examined:** One ♂, 29. viii. 1889, Sikkim. *G. C. Dudgeon* Coll.

**Length of Forewing:** 15 mm.

**Diagnosis:** As per key.

**Distribution:** India : Sikkim and Meghalaya (Khasi Hills).

156. Genus *Odontopera* Stephens


**Diagnosis:** As per key.

**Distributional range:** Himalayas and Taiwan.

**Remarks:** Hampson (1895) kept the genus in the synonymy list under *Crocallis* Treitschke, Swinhoe (1900) reasonably treated this as valid genus. Subsequently, Inoue (1982, 87 and 92) agreed with views of Swinhoe.

461. *Odontopera bilinearia* (Swinhoe)


**Material examined:** One ♀, iii. 1896, alt C 550 m. Sikkim, *G. C. Dudgeon* Coll.

**Length of Forewing:** 26 mm.

**Diagnosis:** Outer margin of fore wing angled, the antemedial line excised and prominent, post medial line oblique, a white centred spot at cell. Outer margin of hind wing rounded, post medial line prominent, cell spot smaller.

**Distribution:** India : Sikkim, Uttar Pradesh (Kasouli) and Madhya Pradesh (Indore); Elsewhere : Nepal and Taiwan.

**Remarks:** Hampson (1895) synonymised *O. bilinearia* Swinhoe along with other species, but later on. Swinhoe (1900) and Inoue (1992) treated it as a valid species.

*157. Genus *Crocallis* Treitschke


**Distributional range:** Europe, Japan and India (Himalayas and Khasi Hills).

462. *Crocallis cervinaria* (Moore)


**Distribution:** India : Sikkim, Meghalaya (Khasi Hills) and West Bengal.

**Remarks:** After Hampson (1895) this species is not yet reported so far.

158. Genus *Hyposidra* Guenée


**Diagnosis:** As per key.

**Distributional range:** Diversity in Indo-Australian tropics but a few taxa are reported from Africa.

**Remarks:** The species of the genus are famous for its sexual dimorphism, the female is much larger with crenulated wing margin.

**Key to the species**

Antennae pectinated. Outer margin of neither wings of male excised ............................ 1

Antennae of male ciliated. Outer margin of both wings excised between M₁ and M₃. Leaden grey. Both wings with incomplete ante medial line, large patch at end of cell with bracket-shaped hyaline marked on it ................................................... *megaspila* Moore
1. Outer margin of hind wing of female non crenulated but angled at M3 .......................... 2
Outer margin of hind wing of female produced at veins. Ochreous. Fore wing with a basal costal fascia joining a rufous streak which arises from apex, together looks like a fascia running parallel to costa, a dark speak at end of cell, a submarginal sinuous line with some white lunules on it nearer costa ............................... infixaria (Walker)

2. Fore wing with traces of antemedial line and crenulate postmedial line, no cell speck or spot .................................. talaca (Walker)
Fore wing with traces of waved antemedial line and a postmedial purplish-white line angled below costa, a discocellular dark striga angled below costa, a discocellular dark striga angled inwardly the stigma is more cleat at underside ........................................ 
.................................... violescens Hampson

463. Hyposidra talaca (Walker)


Material examined : One ♂, vii. 1890, one ♂, vii. 1896, and one ♂, vii. 1897, alt. C 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 18-21 mm.

Diagnosis : As per key.

Distribution : Indo-Australian tropics from N. E. India to Queensland and Solomons.

Remarks : It is polyphagous, the larva is often recorded as a defoliator and flower feeder on tree crops and can attain pest status (Holloway, 1993).

464. Hyposidra violescens Hampson


Material examined : One ♂, vii. 1896, alt. C 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 19 mm.

Diagnosis : As per key.

Distribution : N. E. Himalaya; Elsewhere : N. Vietnam, N. Thailand, Peninsular Malaysia, Indonesia (Sumatra and Borneo).

*465. Hyposidra aquilaria (Walker)


Distribution : India : Sikkim and Meghalaya (Shillong); Elsewhere : W., S. and E. China, Taiwan, peninsular Malaysia and Indonesia (Sumatra and Borneo).

Remarks : This is a rare species of low land forest (Holloway, 1993).

466. Hyposidra infixaria (Walker)


Material examined : One ♂, i. 1897, alt. Ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing : 18 mm.

Diagnosis : As per key.

Distribution : India : Sikkim and Meghalaya (Khasi Hills); Elsewhere : From Myanmar to Taiwan and Sundaland.

Remarks : Larva feeds on Guava (Myrtaceae), Desmos (Annonaceae), Buchanania (Anacardiaceae) and Punica (Punicaceae) (Holloway, 1993).

467. Hyposidra megaspila (Moore)


**Material examined**: One ♂, viii. 1895, alt. Ca 2200 m, Sikkim, coll J. G. pilcher.

**Length of Forewing**: 15 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and “Bengal” (Cotes and Swinhoe, 1888).

**Key to the species**

- Antennae of male bipectinate, branches long. Apex of both wings truncate ..................
  
  ......................truncataria (Moore)

- Antennae of male with short branches, ending in fasciculate cilia. Apex of wings not truncate ............ patularia (Walker)

468. Dalima truncataria (Moore)


**Distributional range**: Greatest specific diversity in N. E. India, the genus is Oriental.

159. Genus Dalima Moore


**Diagnosis**: As per key.

**Material examined**: One ♂, ix. 1889, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 36 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and West Bengal (Cotes and Swinhoe, 1888); Elsewhere : Nepal.

*470. Dalima lucens* Warren


**Distribution**: India : Sikkim and Bengal (Swinhoe, 1900); Elsewhere : Nepal.

471. Dalima patularia (Walker)


**Material examined**: One ♂, viii. 1889, one example damaged iii. 1897, alt. Ca 550 m, Sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 27 mm.

**Diagnosis**: As per key.

**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Solan); Elsewhere : N. Thailand, West China and Indonesia (Borneo, Sumatra and Sulawesi).

*472. Dalima latitans* (Warren)


**Distribution**: India : Sikkim N. W. Himalaya and Meghalay (Khasi Hills).

**Remark**: Hampson (1895) reported the species last. After that it is not cited any where.

160. Genus Eurymene Duponchel


**Diagnosis**: As per key.
Distributional range: Very small genus, but occur in palacerctic, N. America, W. Himalaya and N. E. India.

Remarks: Only two species occur in India.

*473. Eurymene inustaria Moore


Distribution: India: Sikkim and Meghalay (Khasi Hills).

Remark: Hampson (1895) reported the species last, after that none reported the species.

474. Eurymene reticulata (Warren)


Material examined: One ♂, 1894, Yatang, G. C. Dudgeon coll.

Length of Forewing: 18 mm.

Diagnosis: Antennae of male minutely serrate and fasciculate. Head and collar pinkish. Near to apex of fore wing a rufous patch, both wings striated with chestnut. In hind wing one end cell spot which is more prominent on underside.

Distribution: India: Sikkim and Himachal Pradesh (Dalhousie).

161. Genus Prionia Hübner


Diagnosis: As per key.

Remarks: Here the genus Prionia followed after Hampson 1895 and Swinhoe (1900), but Prout 1915 replaced this by Osicerda Walker. He stated “Guenée and Hampson wrongly called this genus Prionia”

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Key to the species

Fore wing with R₁ and R₂ closely arise from cell, two waved lines, one from medial and another from postmedial, patches near costa. No cell spot................. squalidaria Hubner

R₁ and R₂ of fore wing on long stalk, antemedial band curved, post medial band forms an acute angle near middle of outer margin, then recurved to c_{abh}, a speck at end of cell. Three fourths of costal side orange. Apex of fore wing yellowish grey and anal area of hind wing grey, bounded by a black band. Under side of each wing with a cell spot ....................... incitata (Walker)

475. Prionia squalidaria Hübner


Material examined: One ♂, one ♀, viii. 1888, alt., C 650 m. one example (damaged). 15. vii. 1889, one ♀, 13. ix. 1890, one ♀, vi. 1896, 1 ♂, x. 1896, alt. C 550 m., one ♀, vi 1897, one ♂, xii. 1897, alt. C 550 m, Sikkim, (old collection).

Length of Forewing: ♂ 12-13 mm, ♀ 14-15 mm.

Diagnosis: As per key.

Distribution: India: Sikkim West Bengal (Darjiling) and Barrackpore), Orissa (Ganjam), Nilgiri Hills and Maharashtra (Pune and Alibagh); Elsewhere: Sri Lanka, Myanmar and Indonesia (Java).

*476. Prionia lithosiaria (Walker)


Distribution: India: Sikkim Meghalaya (Khasi Hills), and Nagaland; Elsewhere: Indonesia (Sarawak and Borneo).
477. *Prionia incitata* (Walker)


*Material examined:* One ♂, ii. 1897, alt. Ca 550 m, and one ♀, vi. 1888, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* ♂ 16 mm, ♀ 19 mm.

*Diagnosis:* As per key.

*Distribution:* India: Sikkim, West Bengal (Darjiling), Maharashtra (Khandala), Nilgiri Hills and Andaman Islands.

162. Genus *Anonychia* Warren


*Diagnosis:* As per key.

*Distributional range:* North India to W. China.

**Key to the species**

- Band of the fore wing not prominent, inner-margin of the band is prominent and straight, in outer area, the postmedial line forms an acute angle, followed by a strong curve. Post medial line of the hind wing straight ............ ......................................................... *grisea* (Butler)

- The band of fore wing dark, broad and prominent, inner margin of the band is not straight, the angle of the post medial line less acute followed by an irregular curve. Hind wing having no post-medial line .......... ................................................................. *lativitta* (Moore)

478. *Anonychia grisea* (Butler)


*Material examined:* One ♂, 1. vi. 1888, one ♂, ix. 1897, alt. Ca 1500 m, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* 12-14 mm.

*Diagnosis:* As per key.

*Distribution:* India: Sikkim, West Bengal (Darjiling), Maharashtra (Khasi Hills) and N. W. Himalaya; Elsewhere: West China.

479. *Anonychia lativitta* (Moore)


*Material examined:* Two ♀, 1894 Yatang, three ♂ and one ♀, vii. 1895, Sikkim, G. C. Dudgeon coll.

*Length of Forewing:* ♂ 16-21 mm, ♀ 16-18 mm.

*Diagnosis:* As per key.

*Distribution:* India: Sikkim, West Bengal (Darjiling) and N. W. Himalaya; Elsewhere: Nepal.

*163. Genus *Heterolocha* Lederer


*Distributional range:* Oriental and Southern Palaearctic.

480. *Heterolocha falconaria* (Walker)


*Distribution:* India: Sikkim, West Bengal (Darjiling) Punjab and N. W. Himalaya; Elsewhere: Nepal and Sundaland.

164. Genus *Fascellina* Walker

Diagnosis: As per key.

Distributional range: Himalaya, Assam, Nilgiris, Andamans, E. China, Taiwan, Myanmar and Indonesia (Sumatra to Celebes).

Key to the species

Inner and outer margins of fore wing excised near outer angle. Costa of hind wing truncate and excised ................................................... 1

Inner and outer margin of fore wing not excised. Apex of hind wing truncate. A red fascia below S^c from base to end of cell of fore wing, the post medial line angled below costa, then oblique and double to inner margin .................................................. porphyreofusa Hampson

1. Antemedial grey line of fore wing angled below costa, a grey patch on costa, a hyaline speck at end of cell .............................................. hypochryseis Swinhoe

Antemedial line of fore wing dark and broken, angled below costa, no speck at the end of cell .............................................. plagiata (Walker)

481. Fascellina hypochryseis Swinhoe


Material examined: One ♀, x. 1896, alt. Ca 550 m, one ♀, x. 1897, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 20-21 mm.

Diagnosis: As per key.

Distribution: India: Sikkim and Meghalaya (Khasi Hills).

482. Fascellina plagiata (Walker)


Material examined: One ♂, 29. vi. 1889, one ♀, xii. 1896 and two ♀, xii. 1897, alt. C 550m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 15mm and ♀ 18mm.

Diagnosis: As per key.

Distribution: India: Sikkim Himachal Pradesh and Assam; Elsewhere: Nepal, S. China, Taiwan, peninsular Malaysia and Indonesia (Borneo).

*483. Fascellina vinosa (Warren)


Distribution: India: Sikkim.

Remarks: Hampson (1895) dealt this species; after that no report is available.

*484. Fascellina subsignata Warren


Distribution: India: Sikkim and Meghalaya (Khasi Hills); Elsewhere: Taiwan.

485. Fascellina porphyreofusa Hampson


Material examined: One ♀, 17. iv. 1889, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 20 mm.

Diagnosis: As per key.

Distribution: India: Sikkim.

*486. Fascellina inormata Warren

GHOSH: Insecta: Lepidoptera: Heterocera: Geometridae


**Distribution**: India: Sikkim.

165. Genus *Mimochroa* Warren


**Diagnosis**: As per key.

**Distributional range**: N. E. India.

**Remarks**: Hampson (1895) treated these two species dealt here under the genus *Pericallia* Stephens, but Swinhoe (1900) placed these with *Mimochroa* the latter has been reasonably followed here.

487. *Mimochroa lugens* (Butler)


**Material examined**: One ♂, 1889, sikkim, G. C. Dudgeon coll.

**Length of Forewing**: 20 mm.

**Diagnosis**: Waved antemedial line of fore wing with purple grey on its inner edge, a lunulate submarginal line. A speck at end of cell of both wings.

**Distribution**: India: Sikkim and West Bengal (Darjiling).

*488. Mimochroa gynopteridia* (Butler)


**Distribution**: Sikkim and Meghalaya (Khasi Hills).

166. Genus *Garaeus* Moore


**Diagnosis**: As per key.

**Distributional range**: Oriental.

**Remarks**: In India the genus predominantly Himalayan.

**Key to the species**

Outer margin of both wings not produced at veins ........................................................................................................ 1

Outer margin of both wings produced at veins ........................................................................................................ 2

1. In forewing oblique post medial series of black specks, angled below costa. In hind wing no medial line but ante medial dark line ........................................................................................................... discolor Warren

In fore wing a double postmedial line. In hind wing a double medial line .......................................................... 2

2. Olive brown suffused with purple. In fore wing no speck at end of cell, post medial line from costa away from apex ........................................................................................................... apicata (Moore)

Chestnut and irrinated with fuscous. In fore wing a dark speck at end of cell, a purple and chestnut line from apex to middle of inner margin of hind wing ........................................................................................................... argillaceus Butler

*489. Garaeus cruentatus* Butler


**Distribution**: India: Sikkim.

**Remarks**: This endemic species is not reported after 1895.

*490. Garaeus coloratus* (Warren)


Distribution: India: Sikkim.

491. *Garaeus muscorarius* Hampson


Distribution: India: Sikkim.

Remarks: Species numbering Sl. No. 489 to 491 were last reported by Hampson (1895) after that these are not reported by any scientist so far.

492. *Garaeus discolor* Warren


Material examined: One ♂, iii. 1896, alt. ca 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: 16 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghlaya (Khasi Hills) and Nagaland.

493. *Garaeus apicata* (Moore)


Material examined: One ♀, 15. v. 1887, Sikkim, G. C. Dudgeon Coll.

Length of Forewing: 21 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Murree and Dharmsala. Elsewhere: Nepal, Myanmar, Taiwan (Spp. violaria Prout) and Indonesia (Sumatra and Borneo).

Remarks: The larva feeds on Verbenaceae (Holloway, 1993).

494. *Garaeus argillaceus* Butler


Material examined: One ♂, iii. 1897, 4 ♀, x. 1896 and i. 1897, alt. C 550 m, Sikkim, G. C. Dudgeon coll.

Length of Forewing: ♂ 13 mm and ♀ 20-22 m.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills) and Himachal Pradesh (Dharmsala). Elsewhere: W. China.

495. *Garaeus absona* (Swinhoe)


Material examined: One ♂, v. 1897, alt. ca 550 m, G. C. Dudgeon Coll.

Length of Forewing: 17 mm.


167. Genus *Pseudopanthera* Hübner


Diagnosis: As per key.

Distributional range: Mainly palearctic, single species occurs in Himalayan region.

496. *Pseudopanthera himalayica* (Kollar)


**Length of Forewing:** ♂ 15-17 mm and ♀ 16-19 mm. For other details Mondal and Ghosh, 1997.

168. Genus *Spilopera* Warren


**Diagnosis:** As per key.

**Distributional range:** India to Japan.

*497. Spilopera fuscomarginata* (Warren)


**Distribution:** Sikkim.

**Remarks:** The species is not reported after its discovery Hampson (1895).

498. *Spilopera ferrifera* (Moore)


**Material examined:** One ♀ (badly damaged), 8.1.1891, Sikkim, G. C. Dudgeon Coll.

**Length of Forewing:** 15 mm.

**Diagnosis:** Subbasal and medial brown bands are not prominent on fore wing. In hind wing with indistinct antemedial band. Underside of fore wing with sinuous antemedial black band and a broad black postmedial band. In hind wing only with post medial black thinner band.

**Distribution:** India : Sikkim.

169. Genus *Callerinnys* Warren


**Diagnosis:** As per key.

**Distributional range:** India to Indonesia and a few species from China.

*499. Callerinnys combusta* (Warren)


**Distribution:** India : Sikkim. Elsewhere : Sri Lanka and Taiwan.

**Remarks:** The species is placed here with *Callerinnys* after Inoue (1992).

500. *Callerinnys obliquilinea* (Moore)


**Material examined:** One example (sex in det), xii. 1897, alt. Ca 550m., Sikkim, G. C. Dudgeon Coll.

**Length of Forewing:** 16 mm.

**Diagnosis:** As per key.

**Distribution:** India : Sikkim, Meghalaya (Khasi Hills), and west Bengal (Darjiling). Elsewhere : Bhutan, Nepal and Myanmar (Karen Hills).

170. Genus *Leptomiza* Warren


**Diagnosis:** As per key.

**Distribution:** Chiefly Indian, a few species from China.

**Key to the Species**

A sap green band bounded by two antemedial chocolate line from costa to inner margin of fore wing, one similar postmedial line with dentate green band beyond the line. Outer margin of both wings produced at M₁ and M₂.
In fore wing single antemedial line, a fuscous streak below Sc from base to apex, a post medial line starting post medialy runs upto outer angle. Outer margin of fore wing and hind wing produced at M₁, M₃ and R₅, M₁, M₃ respectively. *translineata* (Walker)

501. *Leptomiza decorata* (Moore)


Material examined: One ♀, 4. iv. 1889, Sikkim, G. C. Dudgeon Coll., one ♀, Tumin, alt. 1800 m, 26. ix. 1899, coll. V. C. Agrawal.

Length of Forewing: 23 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), and West Bengal (Darjiling).

Remarks: The specimen collected at light.

502. *Leptomiza translineata* (Walker)


Material examined: One ♂, ii. 1896, alt. C 550 m., Sikkim, G. C. Dudgeon Coll.

Length of Forewing: 21 mm.

Diagnosis: As per key.

Distribution: India: Sikkim, Meghalaya (Khasi Hills), and U. P. (Benaras).

Remarks: The specimen in much smaller in comparison to Hamson’s description.

*503. *Leptomiza amethystina* (Warren)


**Distribution**: India: Sikkim.

*504. *Leptomiza calcearia* (Walker)


**Distribution**: India: Sikkim, and Himachal Pradesh (Kulu and Solan). Elsewhere: Taiwan.

*171. Genus *Pseudomiza* Butler


**Distribution**: Mostly Indian extended its range towards China, Taiwan and Korea.

505. *Pseudomiza castanearia* (Moore)


**Distribution**: India: Sikkim, and West Bengal (Darjiling).

Remarks: Butler (1889) made this species type of the genus. Hampson (1895) treated it under the genus *Heteromiza* Warren, but Swinhoe (1900) placed it with *Pseudomiza*, the latter has been resonably followed here.

172. Genus *Hypochrosis* Guenée


**Diagnosis**: As per key.

**Distribution range**: Cheifly Indo-Australian genus.

Remarks: Some species are being attracted to saline secretions from the human eye, and also capable of sucking human blood wounds and by piercing soft tissue (Burlow, 1982).

**Key to the species**

Outer margin of fore wing evenly curved or oblique .................................................. 1
- Outer margin of fore wing excurred at middle. Grey, the head, thorax and abdomen spotted with black. Fore wing with black spots at base, a band of black spots beyond middle. Hind wing with double submarginal line. Apical area of underside of fore wing bright yellow ....................................

pyrrhularia (Gueneé)

1. Bright yellow, apex of fore wing not sharply pointed, outer margin curved........................ pachiaria (Walker)

- Pale red, apex of fore wing sharply pointed, outer margin oblique........ hyadaria Gueneé

506. Hypochrosis pachiaria (Walker)


Material examined: One ♂, ix. 1889, Sikkim, G. C. Dudgeon Coll.

Length of Forewing: 24 mm.

Diagnosis: As per key.

Distribution: India : Sikkim, Meghalaya (Khasi Hills), West Bengal (Darjiling), Himachal Pradesh (Kulu), Nilgiris, Shevaroys and Andaman (Port Blair). Elsewhere : Myanmar.

Remarks: Hampson (1895) included this species in Fauna of British India, but after that this in not reported by any worker.

507. Hypochrosis iris (Butler)


Distribution: India : Sikkim, Meghalaya (Khasi Hills), and Khyeng Hills (Hampson 1895).

Remarks: Hampson (1895) included this species in Fauna of British India, but after that this in not reported by any worker.

508. Hypochrosis hyadaria Gueneé


Length of Forewing: 19 mm.

Diagnosis: As per key.

Distribution: India : Sikkim, Meghalaya and West Bengal (Darjiling). Elsewhere : Sri Lanka and a few forms from Myanmar, Thailand and Indonesia.

Remarks: H. hyadaria belongs to a complex of species which are similar in wing pattern, but by the character of genitalia they are differentiated as different ssp. from different countries (Holloway, 1993).

*509. Hypochrosis festivaria (Fabricius)

1794. Phalaena festivaris Fabricius. Ent. Syot., 3(2) : 84.


510. Hypochrosis pyrrhularia (Gueneé)


Material examined: One ♂, vi. 1897, alt. C, 550 m. G. C. Dudgeon Coll.

Length of Forewing: 18 mm.

Diagnosis: As per key.


*511. Hypochrosis rufescens (Butler)


173. Genus Corymica Walker


Diagnosis: As per key.

Distribution range: Chiefly Oriental, one species extending to New Guinea and Queensland (Holloway, 1993).

Remarks: Very small genus and mostly Indian, out of six Indian species three species already reported from Sikkim.

512. Corymica arnearia Walker


Material examined: One ♀, 6. x. 1988, Rabangla, S. Sikkim, V. C. Agrawal Coll.

Length of Forewing: 16 mm.

Diagnosis: Bright yellow, irrorated with rufous, collar rufous. Fore wing with a medial rufous line starting from a spot at costa and touching a white centred spot at inner margin, a rufous patch apically at outer margin. In hind wing white centred spot at costa medially, rufous post medial specks. Apical patch of underside more prominent.


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

*513. Corymica specularia (Moore)


Distribution: India: Sikkim, Assam, Himachal Pradesh (Dharmasala) and Nilgiris. Elsewhere: Sri Lanka, W. China, Japan and Indonesia (Sumatra).

514. Milionia pulchrinervis Felder

1868. Milionia pulchrinervis Felder, Reise Nov. Lep., pl. 104, fig. 6.


Distribution: India: Sikkim, Elsewhere: Bangladesh (Sylhet).

515. Milionia zonea Moore


Distribution: India: Sikkim, and Assam (Cachar and Sibsagar). Elsewhere: Myanmar and Indonesia (Borneo).

*175. Genus Eilicrinia Hübner


Distributional range: Palearctic, N. India and Taiwan.

Remarks: This is a small genus, only two species are reported from India of which one species is recorded from Sikkim.

516. Eilicrinia flava Moore


Distribution: India: Sikkim, Meghalaya (Khasi Hills), Nagaland (Hampson, 1895) and West Bengal (Darjiling) Swinhoe (1900) Elsewhere: Cheking, China and Taiwan.

*176. Genus Eurytaphria Warren

**Distributional range**: India to Indonesia.

**Remarks**: Only three species represented from India and all these species are reported from Sikkim. All these species were reported by Hampson (1895) after that these were not reported by any one.

517. *Eurytaphria undilineata* Warren


**Distribution**: India : Sikkim, and Travancore. **Elsewhere**: Myanmar (Toungoo).

518. *Eurytaphria bisinuata* Hampson


**Distribution**: India.

519. *Eurytaphria pachyceras* Hampson


**Distribution**: India : Sikkim, Elsewhere : Bhutan.

*177. Genus *Peetula* Moore


**Distribution**: N. W. Himalaya and Sikkim. **Remarks**: This Indian genus is with only two species.

520. *Peetula exanthemata* Moore


**Distribution**: India : Sikkim, and west Bengal (Cotes and Swinhoe, 1888).

*178. Genus *Xenographia* Warren


**Distribution**: Sikkim, Meghalaya and Nagaland. **Remarks**: Out of three species of the genus one species is reported from Sikkim.

521. *Xenographia lignataria* Warren


1895. *Xenographia lignataria* : Hampson, Fauna Brit, India, Moths, 3 : 189, fig. 104.

**Distribution**: India : Sikkim.

*179. Genus *Hypulia* Swinhoe


**Distributional range**: Sikkim, Meghalaya and Sundaland. **Remarks**: Very small genus, only a single species from India and four species from Sundaland.

522. *Hypulia dirempta* (Walker)


**Distribution**: India : Sikkim, and Meghalaya (Khasi Hills) **Elsewhere**: Myanmar and Singapore.

*180. Genus *Rhynchobapta* Hampson


**Distributional range**: N. E. India to Japan and one species from Indonesia (Borneo, Sumatra and Sulawesi).

523. *Rhynchobapta cervinaria* (Moore)


**Distribution**: India : Sikkim, Meghalaya (Khasi Hills) Hampson, 1895, West Bengal (Darjiling) Cotes and Swinhoe. **Elsewhere**: West China.
The following species have been incorporated after the writing of the manuscript.

181. Genus *Psi/alcis* Warren


**Diagnosis**: Fovea present at the base of fore wing of male. Antennae fasciculate. Hind tibia not dilated. Tufts of long hair from coxae of hind legs.

**Distributional range**: India to Indonesia.

524. *Psi/alcis inceptaria* (Walker)


**Material examined**: One ♂ and one ♀, i. 1897 and two ♀ v. 1897, Sikkim, G. C. Dudgeon Coll.

**Length of Forewing**: ♂ 21 mm, ♀ 18 mm.

**Diagnosis**: Brown, with fuscous irroration, Fore wing with indistinct waved, antemedial, curved medial and a post medial line bent outwards at M₁, a black spot at end of cell. Both wings with crenulate black marginal line.

**Distribution**: India : Sikkim, and Nilgiris. Elsewhere: Sri Lanka, Myanmar and Indonesia (Flores).

**Remarks**: Larva feeds on dry and green grass (Singh, 1953).

182. Genus *Opisthograditis* Hübner


**Diagnosis**: Antenna of male simple. Fore wing of male with fovea at base, Cula from angle of cell, R₂ and R₃ stalked, R₂ absent, discocellular bend. Hind tibia not dilated. C₈ of hind wing before angle of Cell.

**Distributional range**: Palearctic and Northern Indo-Australian.

525. *Opisthograditis rumiformis* (Hampson)


**Material examined**: Two ♂ Lachen, alt. 3500 m. 27. vii. 1989, One ♀, N. W. of Lachen, N. Sikkim, 2. viii. 1989, Old collection.

**Length of Forewing**: ♂ 21 mm, ♀ 18 mm.

**Diagnosis**: Basal area of fore wing choocolat brown, beyond post medial area choocolat brown except apical region, the cell spot slightly cresent shape which is choocolat brown. Hind wing with choocolat brown crenulated sub-marginal line, beyond which brownish, choocolat brown cell spot smaller, underside of hind wing beyond postmedial line with deep choocolat brown. In fore wing which is lighter.

**Distribution**: India : Sikkim; Elsewhere: Nepal and Tibet.

**Remarks**: The species reported for the first time from India (Sikkim).

**SUMMARY**

The paper deals with systematic account of 525 species of Geometridae belonging to 182 genera and five subfamilies from the state of Sikkim of these three species are reported for the first time from India. Most of the species are wide spread throughout the world but 83 species are restricted to Indian limit only. Out of these 83 species 43 species, 70 species and 73 species are restricted to Sikkim, North East India and North India respectively.

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INSECTA: TRICHOPTERA

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INTRODUCTION

There are 7000 species (approximately) of order Trichoptera known in the world. Out of these, about 1000 species of caddiflies occur in India, Sikkim alone has a good number of 179 species constituting 17.9% of the known trichopterans from India.


The material studied belonged to collections received from Dr. F. Schmid, Canada, as well as that available in the National Zoological Collection of Zoological Survey of India. Altogether 179 species of caddiflies have been treated from Sikkim representing 45 genera and 21 families. It is interesting to observe that 98 species are endemic to the state of Sikkim and only one i.e. Stenopsyche splendida Martynov is a first record from Sikkim. The representatives of 45 species available in the collection of Z. S. I. have been examined and the other 134 species have been reviewed from literature.

SYSTEMATIC ACCOUNT

Family RHYACOPHILIDAE

Genus Rhyacophila Pictet

1. Rhyacophila alticola Kimmins


2. Rhyacophila anatina Morton


Wing espanse : 16 mm.

Distribution : India : Sikkim and Meghalaya.

3. Rhyacophila angden Schmid


Distribution : India : Sikkim.

4. Rhyacophila auriostigma Schmid


Wing expanse: 12-17 mm.

Distribution: India: Sikkim and West Bengal.

5. Rhyacophila bidens Kimmins


Wing expanse: 20-25 mm.


6. Rhyacophila chakungpa Schmid


Distribution: India: Sikkim.

7. Rhyacophila changpo Schmid


Wing expanse: 24 mm.

Distribution: India: Sikkim.

8. Rhyacophila chayulpa chayulpa Schmid


Wing expanse: 22-24 mm.

Distribution: India: Sikkim.

9. Rhyacophila chematangpa Schmid


Distribution: India: Sikkim.

10. Rhyacophila chugalungpa Schmid


Distribution: India: Sikkim and West Bengal.

11. Rhyacophila chulukpa Schmid


Distribution: India: Sikkim.

12. Rhyacophila curvata Morton


Distribution: India: Sikkim, Manipur and Meghalaya.
13. **Rhyacophila dakshi** Schmid


**Distribution**: India : Sikkim and West Bengal. **Elsewhere**: Nepal.

14. **Rhyacophila dongkyapa** Schmid


**Wing expanse**: 15-22 mm.

**Distribution**: India : Sikkim, Arunachal Pradesh and Manipur.

15. **Rhyacophila dongre** Schmid


**Distribution**: India : Sikkim.

16. **Rhyacophila drokpa nyanpa** Schmid


**Distribution**: India : Sikkim.

17. **Rhyacophila drotangpa** Schmid


**Distribution**: India : Sikkim.

18. **Rhyacophila fletcheri** (Kimmins)


**Wing expanse**: 20-24 mm.

**Distribution**: India : Sikkim and Arunachal Pradesh.

19. **Rhyacophila gelukpa** Schmid


**Wing expanse**: 25-40 mm.

**Distribution**: India : Sikkim and Arunachal Pradesh.

20. **Rhyacophila gyelbu** Schmid


**Distribution**: India : Sikkim and Manipur.
21. Rhyacophila hingstoni Martynov


*Wing expanse*: 30-35 mm.


22. Rhyacophila hobsoni Martynov


23. Rhyacophila kando Schmid


*Distribution*: India: Sikkim, Arunachal Pradesh and Uttar Pradesh.

24. Rhyacophila khasiorum Schmid


*Wing expanse*: 12-15 mm.

*Distribution*: India: Sikkim, Arunachal Pradesh, Manipur, Meghalaya and Uttar Pradesh.

25. Rhyacophila khiyampa Schmid


*Wing expanse*: 32 mm.

*Distribution*: India: Sikkim.

26. Rhyacophila kubra Schmid


*Distribution*: India: Sikkim.

27. Rhyacophila kyadongpa Schmid


*Distribution*: India: Sikkim.

28. Rhyacophila laptsapa Schmid


MAJUMDAR (CHAUDHURY) : *Insecta: Trichoptera*

_Wing expanse _: 18 mm.

_Distribution _: India : Sikkim.

29. *Rhyacophila lepcha* Schmid


_Wing expanse _: 17-25 mm.

_Distribution _: India : Sikkim.

30. *Rhyacophila nabochepa* Schmid


_Wing expanse _: 15 mm.

_Distribution _: India : Sikkim, Arunachal Pradesh and West Bengal.

31. *Rhyacophila ngorpa* Schmid


_Wing expanse _: 25-34 mm.

_Distribution _: India : Sikkim and West Bengal.

32. *Rhyacophila nyamangpa* Schmid


_Distribution _: India : Sikkim.

33. *Rhyacophila obscura* Martynov


_Distribution _: India : Sikkim, Himachal Pradesh and Uttar Pradesh.

34. *Rhyacophila poba* Schmid


_Wing expanse _: 18 mm.

_Distribution _: India : Sikkim.

35. *Rhyacophila rongpa* Schmid


Wing expanse: 20-27 mm.

Distribution: India: Sikkim, Arunachal Pradesh and Manipur.

36. **Rhyacophila sanglungpa** Schmid


Distribution: India: Sikkim, Arunachal Pradesh and Manipur.

37. **Rhyacophila scissa** Morton


Wing expanse: 20-27 mm.

Distribution: India: Sikkim, Arunachal Pradesh, Meghalaya and Uttar Pradesh.

38. **Rhyacophila scissoides** Kimmins


Wing expanse: 15-18 mm.


39. **Rhyacophila sherpa** Schmid


Distribution: India: Sikkim.

40. **Rhyacophila shingripa** Schmid


Distribution: India: Sikkim.

41. **Rhyacophila stenostyla** Martynov


Wing expanse: 25-30 mm.


42. **Rhyacophila tarkiya** Schmid


MAJUMDAR (CHAUDHURY) : Insecta : Trichoptera

Distribution : India : Sikkim.

43. **Rhyacophila tashepa** Schmid


Distribution : India : Sikkim.

44. **Rhyacophila tashidingpa** Schmid


Distribution : India : Sikkim, Arunachal Pradesh and West Bengal.

45. **Rhyacophila tengylingpa** Schmid


Wing expanse : 15 mm.

Distribution : India : Sikkim.

46. **Rhyacophila tshringpa** Schmid


Wing expanse : 18-26 mm.

Distribution : India : Sikkim.

47. **Rhyacophila tshogpa** Schmid


Wing expanse : 17-25 mm.

Distribution : India : Sikkim.

48. **Rhyacophila tshongkhapa** Schmid


Wing expanse : 25-32 mm.

Distribution : India : Sikkim.

49. **Rhyacophila yarlungpa** Schmid


Wing expanse : 15 mm.

Distribution : India : Sikkim.

50. **Rhyacophila yigrongpa** Schmid


Wing expanse : 16 mm.

Distribution : India : Sikkim.
51. **Rhyacophila yishepa** Schmid


*Wing expanse*: 16 mm.

*Distribution*: India : Sikkim.

52. **Rhyacophila yulha** Schmid


*Wing expanse*: 16 mm.

*Distribution*: India : Sikkim.

53. **Rhyacophila zhungpa** Schmid


*Wing expanse*: 18-25 mm.

*Distribution*: India : Sikkim, Arunachal Pradesh and Uttar Pradesh.


Genus **Himalopsyche** Banks

54. **Himalopsyche amitava** Schmid & Botsoneanu


*Distribution*: India : Sikkim.

55. **Himalopsyche angnorbui** Schmid


*Wing expanse*: 44-50 mm.

*Distribution*: India : Sikkim and Uttar Pradesh.

56. **Himalopsyche biansata** Kimmins


57. **Himalopsyche digitata** (Martynov)


*Wing expanse*: 30 mm.

*Distribution*: India : Sikkim, Arunachal Pradesh, Uttar Pradesh and West Bengal.

58. **Himalopsyche dolmasampa** Schmid


Distribution: India: Sikkim and Uttar Pradesh.

59. *Himalopsyche gyamo* Schmid


Wing expanse: 45-55 mm.

Distribution: India: Sikkim and Uttar Pradesh.

60. *Himalopsyche horai* (Martynov)


Distribution: India: Sikkim, Uttar Pradesh, Himachal Pradesh and Uttar Pradesh.

61. *Himalopsyche lanceolata* (Morton)


Wing expanse: 30-46 mm.

Distribution: India: Sikkim, Manipur and Meghalaya.

62. *Himalopsyche lepcha* Schmid


Wing expanse: 22 mm.

Distribution: India: Sikkim, Uttar Pradesh and West Bengal.

63. *Himalopsyche malenanda* Schmid


Wing expanse: 35-40 mm.

Distribution: India: Sikkim, Arunachal Pradesh and Uttar Pradesh.

64. *Himalopsyche phedogensis* Kimmins


Distribution: India: Sikkim.

65. *Himalopsyche tibetana* (Martynov)


Wing expanse: 40-45 mm.

Distribution: India: Sikkim and Uttar Pradesh.

66. Himalopsyche yongma Schmid


Wing expanse: 38 mm.

Distribution: India: Sikkim.

Family HYDROPTILIDAE

Genus Apsilochorema Ulmer

67. Apsilochorema annandalei Martynov


68. Apsilochorema tigmatejanam Schmid


Distribution: India: Sikkim and Uttar Pradesh.

69. Apsilochorema vaneyam Schmid


Distribution: India: Sikkim, Assam and Arunachal Pradesh.

Family HYDROPTILIDAE

Genus Stactobia Mclachlan

70. Stactobia calin Schmid


Distribution: India: Sikkim, Arunachal Pradesh, Uttar Pradesh and West Bengal.

71. Stactobia ori Schmid


Distribution: India: Sikkim.

72. Stactobia snori Schmid


Distribution: India: Sikkim, Arunachal Pradesh and West Bengal.

73. Stactobia snufi Schmid


Distribution: India: Sikkim.

74. Stactobia thrain Schmid


**MAJUMDAR (CHAUDHURY) : Insecta : Trichoptera**

**Distribution**: India : Sikkim.

**75. Stactobia throli** Schmid


**Distribution**: India : Sikkim.

Family GLOSSOSOMATIDAE

**Genus Glossosoma** Curtis

**76. Glossosoma caudatum fissum** Martynov


**Distribution**: India : Sikkim, Arunachal Pradesh, Himachal Pradesh, Manipur, Uttar Pradesh and West Bengal.

**77. Glossosoma dentatum akhandam** Schmid


**Distribution**: India : Sikkim, Arunachal Pradesh, Manipur, and Meghalaya.

**78. Glossosoma dirghakantakam** Schmid


**Distribution**: India : Sikkim and Arunachal Pradesh.

79. *Glossosoma kamarasikam* Schmid


**Distribution**: India : Sikkim and Arunachal Pradesh.

80. *Glossosoma kchinam* Schmid


**Distribution**: India : Sikkim.

81. *Glossosoma nigroroseum* Schmid


**Distribution**: India : Sikkim, Arunachal Pradesh, Manipur, Meghalaya and Uttar Pradesh.

82. *Glossosoma varjakantakam* Schmid


**Distribution**: India : Sikkim, Arunachal Pradesh, Manipur, Meghalaya and Uttar Pradesh.

Family STENOPSYCHIDAE

**Genus Stenopsyche** Mc Lachlan

83. *Stenopsyche dirghajihvi* Schmid


**Distribution**: India : Sikkim and Arunachal Pradesh.
84. *Stenopsyche griseipennis* McLachlan


*Wing expanse*: 25 mm.

*Distribution*: India: Sikkim, Assam, Arunachal Pradesh, Manipur, Meghalaya, Uttar Pradesh and West Bengal.

85. *Stenopsyche haimavatika* Schmid


*Distribution*: India: Sikkim, Arunachal Pradesh, Meghalaya, and Uttar Pradesh.

86. *Stenopsyche himalayana* Martynov


*Distribution*: India: Sikkim, Assam, Jammu & Kashmir, Meghalaya, and Uttar Pradesh.

87. *Stenopsyche similis* Ulmer


*Distribution*: India: Sikkim, Arunachal Pradesh, Punjab, Uttar Pradesh and West Bengal.

88. *Stenopsyche splendida* Martynov


*Wing expanse*: 40-45 mm.

*Distribution*: India: Sikkim, Arunachal Pradesh, Maharashtra and West Bengal.

*Remarks*: This species is first recorded from Sikkim.

Family PHILOPOTAMIDAE

Genus *Gunungiella* Ulmer

89. *Gunungiella dvitiya* Schmid


*Distribution*: India: Sikkim, Arunachal Pradesh, Maharashtra and Uttar Pradesh.

90. *Gunungiella prathama* Schmid


*Distribution*: India: Sikkim, Arunachal Pradesh, and Uttar Pradesh.

Genus *Wormaldia* McLachlan

91. *Wormaldia melanion* Schmid


*Distribution*: India: Sikkim.

Family XIPHOCENTRONIDAE

Genus *Proxiphocentron* Schmid

92. *Proxiphocentron prathamajam* Schmid


Distribution: India: Sikkim.

Genus Condocentron Schmid
93. Condocentron tchaturbhuja Schmid


Distribution: India: Sikkim and Arunachal Pradesh.

Genus Drepanocentron Schmid
94. Drepanocentron abhimanyu Schmid


Distribution: India: Sikkim.

95. Drepanocentron dacharatha Schmid


Distribution: India: Sikkim.

96. Drepanocentron vichitravirya Schmid


Distribution: India: Sikkim and Arunachal Pradesh.

Genus Abaria Mosely
97. Abaria margaritifera Schmid


Distribution: India: Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Tamil Nadu, Uttar Pradesh and West Bengal.

98. Abaria richika Schmid


Distribution: India: Sikkim.

99. Abaria uchinara Schmid


Distribution: India: Sikkim.

Family PSYCHOMYIIDAE

Genus Tinodes Leach

100. Tinodes achtachastra Schmid


Distribution: India: Sikkim

101. Tinodes alpachastra Schmid


Distribution: India: Sikkim

102. Tinodes atichastra Schmid


Distribution: India: Sikkim.

Genus Psychomyia Latreille

103. Psychomyia asvagosha Schmid


Distribution: India: Sikkim, Uttar Pradesh and West Bengal.

Higler (1992) did not reported this species from India.

104. Psychomyia dugpa Schmid


Distribution: India: Uttar Pradesh.

Higler (1992) did not reported this species from India.

105. Psychomyia scottae Schmid


Distribution: India: Sikkim.

106. Psychomyia wangii Schmid


Distribution: India: Sikkim and West Bengal.

Family POLYCENTROPIDAE

Genus Plectrocnemia Stephens

107. Plectrocnemia banksi Fischer


Distribution: India: Sikkim.

108. Plectrocnemia navasi Ulmer


Distribution: India: Sikkim.

Family HYDROPSYCHIDAE

Genus Hydropsyche Pictet

110. Hydropsyche asiatica Ulmer


Distribution: India: Sikkim and West Bengal.

111. Hydropsyche luctuosus (Ulmer)


Distribution: India: Sikkim.

Genus Macrostemum Kolenati

112. Macrostemum fastosum (Walker)


**MAJUMDAR (CHAUDHURY): Insecta: Trichoptera**

**Distribution**: India: Sikkim, Assam and West Bengal. Elsewhere: Hong Kong.

**Genus Parapsyche** Betten


**Distribution**: India: Sikkim.

**Genus Arctopsyche** Mclachlan


**Distribution**: India: Sikkim, Arunachal Pradesh and Uttar Pradesh.


**Distribution**: India: Sikkim.


**Distribution**: India: Sikkim.


**Distribution**: India: Sikkim and Arunachal Pradesh.


**Distribution**: India: Sikkim, Arunachal Pradesh, Manipur, Punjab, Uttar Pradesh and West Bengal. Elsewhere: Tibet.

**Family PHRYGANOPSYCHIDAE**

**Genus Phryganopsyche** Wiggins


**Distribution**: India: Sikkim, Arunachal Pradesh and Manipur.

**Family PHRYGANEIDAE**

**Genus Eubasilissa** Martynov


**Distribution**: India: Sikkim, Arunachal Pradesh, Assam Uttar Pradesh, W. & E. Himalaya and West Bengal.


**Distribution**: India: Sikkim.

**Genus Neurocyta** Navas


*Distribution*: India: Sikkim and West Bengal.

Family LEPIDOSTOMATIDAE

Genus *Adinarthrella* Mosely

123. *Adinarthrella kimsa* Mosely


*Distribution*: India: Sikkim.

Genus *Adinarthrum* Mosely

124. *Adinarthrum kurseum* Mosely


*Distribution*: India: Sikkim and Assam.

Genus *Agoerodes* Mosely

125. *Agoerodes sika* Mosely


*Distribution*: India: Sikkim.

Genus *Paraphlegopteryx* Ulmer

126. *Paraphlegopteryx prestes* Weaver


*Distribution*: India: Sikkim.

*Remarks*: Saini et al. (2001) did not refer this species from Sikkim.

127. *Paraphlegopteryx pippini* Weaver


*Distribution*: India: Sikkim.

*Remarks*: Saini et al., (2001) did not refer this species from Sikkim.

128. *Paraphlegopteryx ulmeri* Weaver


*Remarks*: Saini et al., (2001) did not refer this species from Sikkim.

129. *Paraphlegopteryx normalis* Mosely


130. *Paraphlegopteryx schmidtii* Weaver


*Remarks*: Saini et al., (2001) did not refer this species from Sikkim.

131. *Brachycentrus kozlovi* Martynov


MAJUMDAR (CHAUDHURY): Insecta: Trichoptera

**Distribution**: India: Sikkim, Kashmir, Uttar Pradesh and Ladakh.

**Remarks**: Higler (1992) did not report the occurrence of this species in India.

Genus **Micrasema** McLachlan

132. **Micrasema abghavyani** Schmid


**Distribution**: India: Sikkim.

133. **Micrasema adhiram** Schmid


**Distribution**: India: Sikkim.

134. **Micrasema jihmam** Schmid


**Distribution**: India: Sikkim.

Family **UENOIDAE**

Genus **Uenoa** Iwata

135. **Uenoa hiberna** Kimmins


**Distribution**: India: Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Uttar Pradesh and West Bengal.

Family **LIMNEPHILIDAE**

Genus **Apatania** Kolenati

136. **Apatania devisarasplai** Schmid


**Distribution**: India: Sikkim and Uttar Pradesh.

**Remarks**: This species was originally described by Schmid (1968) from Sikkim. Higler (1992) also reported its occurrence in Sikkim but Saini et. al., (2001) reported its occurrence in Uttar Pradesh only.

137. **Apatania dirgabahu** Schmid


**Distribution**: India: Sikkim.

Genus **Aplatyphlax** Kimmins

138. **Aplatyphlax eupalinos** Schmid


**Distribution**: India: Sikkim.

Genus **Astratodina** Mosely

139. **Astratodina antenor** Schmid


**Distribution**: India: Sikkim.

Genus **Asynarchus** McLachlan

140. **Asynarchus tibetanus** Schmid


**Distribution**: India: Sikkim.
Genus *Limnophilus* Leach

141. *Limnophilus fuscovittatus* Schmid


*Distribution*: India : Sikkim.

Genus *Moropsycha* Banks

142. *Moropsycha krichnaruna* Schmid


*Distribution*: India : Sikkim and Arunachal Pradesh.

143. *Moropsycha trikonakarni* Schmid


*Distribution*: India : Sikkim.

Genus *Notania* Kimmins

144. *Notania adhanya* Schmid


*Distribution*: India : Sikkim.

145. *Notania itarichtha* Schmid


*Distribution*: India : Sikkim.

Genus *Pseudostenophylax* Martynov

146. *Pseudostenophylax fimbriotalarida* Schmid


*Distribution*: India : Sikkim.

147. *Pseudostenophylax glycerion* Schmid


*Distribution*: India : Sikkim.

148. *Pseudostenophylax griseolus* Martynov


*Distribution*: India : Sikkim.

149. *Pseudostenophylax himalayanus* Martynov


*Distribution*: India : Sikkim.

150. *Pseudostenophylax pauper* Schmid


*Distribution*: India : Sikkim.

151. *Pseudostenophylax secretus* Martynov


*Distribution*: India : Sikkim and Punjab.
MAJUMDAR (CHAUDHURY) : Insecta : Trichoptera

152. **Pseudostenophylax tenuifalcatus**

Schmid


**Distribution** : India : Sikkim.

Family GOERIDAE

Genus *Goera* Stephens

153. **Goera kausalya**

Schmid


**Distribution** : India : Sikkim.

154. **Goera mandna**

Mosely


**Distribution** : India : Sikkim, Arunachal Pradesh and Assam.

155. **Goera roghu**

Schmid


**Distribution** : India : Sikkim.

Family LEPTOCERIDAE

Genus *Adicella* McLachlan

156. **Adicella dirce**

Schmid


**Distribution** : India : Sikkim.

157. **Adicella eloa**

Schmid


**Distribution** : India : Sikkim.

158. **Adicella enone**

Schmid


**Distribution** : India : Sikkim.

159. **Adicella euphrosyne**

Schmid


**Distribution** : India : Sikkim.

160. **Adicella evohe**

Schmid


**Distribution** : India : Sikkim.

161. **Adicella myrtho**

Schmid


**Distribution** : India : Sikkim.

162. **Adicella nyse**

Schmid


**Distribution** : India : Sikkim.
Genus *Poecilopsyche* Schmid

163. *Poecilopsyche bimasena* Schmid


*Distribution*: India: Sikkim.

164. *Poecilopsyche pandava* Schmid


*Distribution*: India: Sikkim.

165. *Poecilopsyche suyadhana* Schmid


*Distribution*: India: Sikkim.

Genus *Setodes* Rambur

166. *Setodes aparimeya* Schmid


*Distribution*: India: Sikkim, Arunachal Pradesh.

167. *Setodes dhanavriddha* Schmid


*Distribution*: India: Arunachal Pradesh and Uttar Pradesh.

168. *Setodes tchaturadanta* Schmid


*Distribution*: India: Sikkim.

169. *Setodes yatharupa* Schmid


*Distribution*: India: Sikkim.

Genus *Trichosetodes* Ulmer

170. *Trichosetodes atidhanin* Schmid


*Distribution*: India: Sikkim, Uttar Pradesh and West Bengal.

Family LIMNOCENTROPODIDAE

Genus *Limnocentropus* Ulmer

171. *Limnocentropus fletcheri* Mosely


*Distribution*: India: Sikkim.

172. *Limnocentropus himalayanus* Martynov


*Distribution*: India: Sikkim.

173. *Limnocentropus insolitus* Ulmer

MAJUMDAR (CHAUDHURY): Insecta: Trichoptera


*Distribution*: India: Sikkim and West Bengal.

174. Limnocentropus mergatus Kimmins


*Distribution*: India: Sikkim.

Family ODONTOCERIDAE
Genus Psilotreta Banks

175. Psilotreta assamensis Parker & Wiggins


*Distribution*: India: Sikkim and Arunachal Pradesh.

176. Psilotreta schmidtii Parker & Wiggins


*Distribution*: India: Sikkim.

Family HELICOPSYCHIDAE
Genus Cochliophylax Schmid

177. Cochliophylax astynome Schmid


*Distribution*: India: Sikkim.

178. Cochliophylax hippothae Schmid


*Distribution*: India: Sikkim.

ACKNOWLEDGEMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata for providing laboratory facilities. Thanks are also due to Dr. F. Schmid, Biosystematic Research Centre, Ontario, Canada for providing collection of Trichoptera literature and also for his valuable suggestions. Thanks are also due to Dr. A. K. Hazra, Scientist-E and Sri I. J. Gupta, Officer-in-Charge, Lepidoptera Section for going through the manuscript and help in many ways.

LIST OF SPECIES FROM SIKKIM

Family RHYACOPHILIDAE
Genus Rhyacophila Pictet

1. Rhyacophila alticola Kimmins
2. Rhyacophila anatina Morton
3. Rhyacophila angden Schmid
4. Rhyacophila auriostigma Schmid
5. Rhyacophila bidens Kimmins
6. Rhyacophila chakungpa Schmid
7. Rhyacophila changpo Schmid
8. Rhyacophila chayulpa chayulpa Schmid
9. Rhyacophila chematangpa Schmid
10. Rhyacophila chugalungpa Schmid
11. Rhyacophila chulukpa Schmid
12. Rhyacophila curvata Morton
13. Rhyacophila dakshi Schmid
14. Rhyacophila dongkyapa Schmid
15. Rhyacophila dongra Schmid
16. Rhyacophila drotangpa Schmid
17. Rhyacophila fletcheri (Kimmins)
18. Rhyacophila gelukapa Schmid
19. Rhyacophila gyelbu Schmid
20. Rhyacophila hobsoni Martynov
21. Rhyacophila hingstoni Martynov
<table>
<thead>
<tr>
<th></th>
<th>Scientific Name</th>
</tr>
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<tbody>
<tr>
<td>23.</td>
<td>Rhyacophila kando Schmid</td>
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<tr>
<td>24.</td>
<td>Rhyacophila khasiorum Schmid</td>
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<tr>
<td>25.</td>
<td>Rhyacophila khyampna Schmid</td>
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<td>26.</td>
<td>Rhyacophila kubra Schmid</td>
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<td>27.</td>
<td>Rhyacophila kyadongpa Schmid</td>
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<td>28.</td>
<td>Rhyacophila laptsapa Schmid</td>
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<td>29.</td>
<td>Rhyacophila lepcha Schmid</td>
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<td>30.</td>
<td>Rhyacophila nabochepa Schmid</td>
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<td>31.</td>
<td>Rhyacophila ngorpa Schmid</td>
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<td>32.</td>
<td>Rhyacophila nyamangpa Schmid</td>
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<td>33.</td>
<td>Rhyacophila obscura Martynov</td>
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<td>34.</td>
<td>Rhyacophila poba Schmid</td>
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<td>35.</td>
<td>Rhyacophila rongpa Schmid</td>
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<td>36.</td>
<td>Rhyacophila sanglungpa Schmid</td>
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<td>37.</td>
<td>Rhyacophila scissa Morton</td>
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<td>38.</td>
<td>Rhyacophila scissoides Kimmins</td>
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<td>39.</td>
<td>Rhyacophila sherpa Schmid</td>
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<td>40.</td>
<td>Rhyacophila shingripa Schmid</td>
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<td>41.</td>
<td>Rhyacophila stenostyla Martynov</td>
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<td>42.</td>
<td>Rhyacophila tarkiya Schmid</td>
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<td>43.</td>
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<td>Rhyacophila tengyelingpa Schmid</td>
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<td>46.</td>
<td>Rhyacophila tshringpa Schmid</td>
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<td>Rhyacophila tshogpa Schmid</td>
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<td>48.</td>
<td>Rhyacophila tshongkhapa Schmid</td>
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<td>51.</td>
<td>Rhyacophila yishepa Schmid</td>
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<td>52.</td>
<td>Rhyacophila yulha Schmid</td>
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<td>53.</td>
<td>Rhyacophila zhungpa Schmid</td>
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<td>54.</td>
<td>Rhyacophila amitava Schmid &amp; Botsoneanu</td>
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<td>55.</td>
<td>Rhyacophila angorbunt Schmid</td>
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<td>56.</td>
<td>Rhyacophyse biansata Kimmins</td>
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<td>57.</td>
<td>Rhyacophyse digitata (Martynov)</td>
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<td>58.</td>
<td>Rhyacophyse dolmasampa Schmid</td>
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<td>59.</td>
<td>Rhyacophyse gyamo Schmid</td>
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<td>60.</td>
<td>Rhyacophyse horai (Martynov)</td>
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<td>61.</td>
<td>Rhyacophyse lanceolata (Morton)</td>
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<td>62.</td>
<td>Rhyacophyse lepcha Schmid</td>
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<td>63.</td>
<td>Rhyacophyse malenanda Schmid</td>
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<td>64.</td>
<td>Himalopsyche phedogesis Kimmins</td>
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<td>65.</td>
<td>Himalopsyche tibetana (Martynov)</td>
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<td>66.</td>
<td>Himalopsyche yongma Schmid</td>
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<td>67.</td>
<td>Apsilochorema annandalei Martynov</td>
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<td>68.</td>
<td>Apsilochorema tigatejanam Schmid</td>
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<td>69.</td>
<td>Apsilochorema vaneyam Schmid</td>
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<td>70.</td>
<td>Hydroptilidae</td>
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<td>Stactobia colin Schmid</td>
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<td>72.</td>
<td>Stactobia orii Schmid</td>
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<td>73.</td>
<td>Stactobia snori Schmid</td>
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<td>74.</td>
<td>Stactobia snuffi Schmid</td>
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<td>75.</td>
<td>Stactobia thrain Schmid</td>
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<td>76.</td>
<td>Stactobia throli Schmid</td>
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<td>77.</td>
<td>Glossosoma caudatum fissum Martynov</td>
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<td>78.</td>
<td>Glossosoma dentatum akhandam Schmid</td>
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<td>79.</td>
<td>Glossosoma dirghakantakam Schmid</td>
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<td>80.</td>
<td>Glossosoma kamarasikam Schmid</td>
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<td>81.</td>
<td>Glossosoma kchinam Schmid</td>
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<td>82.</td>
<td>Glossosoma nigroseum Schmid</td>
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<td>83.</td>
<td>Glossosoma varjakantakan Schmid</td>
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<td>84.</td>
<td>Stenopsyche dirghajivi Schmid</td>
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<td>85.</td>
<td>Stenopsyche griseipennis Mclachlan</td>
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<td>86.</td>
<td>Stenopsyche haimavatika Schmid</td>
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<td>87.</td>
<td>Stenopsyche himalayana Schmid</td>
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<td>88.</td>
<td>Stenopsyche similis Ulmer</td>
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<td>89.</td>
<td>Gunungiella dvitiya Schmid</td>
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<td>91.</td>
<td>Wormaldia melanion Schmid</td>
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Genus Proxiphocentron Schmid
92. Proxiphocentron prathamajam Schmid
Genus Cnodoxocentron Schmid
93. Cnodoxocentron tchaturbhujia Schmid
Genus Drepanocentron Schmid
94. Drepanocentron abhimanyu Schmid
95. Drepanocentron dacharatha Schmid
96. Drepanocentron vichitravirya Schmid
Genus Abaria Mosely
97. Abaria margaritifera Schmid
98. Abaria richika Schmid
99. Abaria uchinara Schmid
Family PSYCHOMYIIDAE
Genus Tinodes Leach
100. Tinodes achtachastra Schmid
101. Tinodes alpachastra Schmid
102. Tinodes atichastra Schmid
Genus Psychomyia Latrille
103. Psychomyia asvagosha Schmid
104. Psychomyia dugpa Schmid
*105. Psychomyia karkii Malicky.
106. Psychomyia scotae Schmid
107. Psychomyia wangii Schmid
Family POLYCENTROPIDAE
Genus Plectrocnemia Stephens
108. Plectrocnemia aurea Ulmer
109. Plectrocnemia banksi Fischer
110. Plectrocnemia navasi Ulmer
Family HYDROPSYCHIDAE
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111. Hydropsyche asiatica Ulmer
112. Hydropsyche luctuosus (Ulmer)

Genus Macrostenum Kolenati
113. Macrostenum fastosum (Walker)
Genus Parapsyche Betten
114. Parapsyche mahati Schmid
Genus Arctopsyche Mclachlan
115. Arctopsyche compositus Martynov
116. Arctopsyche fissa Schmid
117. Arctopsyche inequispinosa Schmid
118. Arctopsyche integra Schmid
119. Arctopsyche lobata Martynov
Family PHRYGANOPSYCHIDAE
Genus Phryganopsyche Wiggins
120. Phryganopsyche lattipennis (Banks)
Family PHRYGAENIDAE
Genus Eubasilissa Marynov
121. Eubasilissa machlachlani (White)
122. Eubasilissa tibetana Martynov
Genus Neurocyta Navas
123. Neurocyta arenata Navas
Family LEPI DOSTOMATIDAE
Genus Adinarthrella Mosely
124. Adinarthrella kimsa Mosely
125. Adinarthrum kurseum Mosely
Genus Agoerodes Mosely
126. Agoerodes sika Mosely
Genus Paraphlegopteryx Ulmer
127. Paraphlegopteryx orestes Weaver
128. Paraphlegopteryx pippini Weaver
129. Paraphlegopteryx ulmeri Weaver
130. Paraphlegopteryx normalis Mosely
131. Paraphlegopteryx schmidtii Weaver
Family BRACHYCENTRIDAE
Genus Brachycentrus Curtis
132. Brachycentrus kozlovi Martynov

* Saini et al. (2001) listed this species from Sikkim original reference of this species has not been seen, therefore it has not been included in the text.
Genus *Micrasema* Mclachlan
133. *Micrasema abghavyani* Schmid
134. *Micrasema adhiram* Schmid
135. *Micrasema jihnam* Schmid

Family UENOIDAE
Genus *Uenoa* Iwata
136. *Uenoa hiberna* Kimmins

Family LIMNEPHILIDAE
Genus *Apatania* Kolenati
137. *Apatania devisaraspali* Schmid
138. *Apatania dirghabahu* Schmid

Genus *Aplatyphlax* Kimmins
139. *Aplatyphlax eupalinos* Schmid
Genus *Astratodina* Mosely
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Genus *Asynarchus* Mclachlan
141. *Asynarchus tibetanus* Schmid
Genus *Limnophilus* Leach
142. *Limnophilus fuscovittatus* Schmid

Genus *Moropsycha* Banks
143. *Moropsycha kricharuna* Schmid
144. *Moropsycha trikonakarni* Schmid
Genus *Notania* Kimmins
145. *Notania adhanya* Schmid
146. *Notania itarichta* Schmid
Genus *Pseudostenophylx* Martynov
147. *Pseudostenophylax fimbriatofalcatus* Schmid
148. *Pseudostenophylax glycerion* Schmid
149. *Pseudostenophylax griseolus* Martynov
150. *Pseudostenophylax himalayanus* Martynov
151. *Pseudostenophylax pauper* Schmid
152. *Pseudostenophylax secretus* Martynov
153. *Pseudostenophylax tenuifalcatus* Schmid

Family GOERIDAE
Genus *Goera* Stephens
154. *Goera kausalya* Schmid
155. *Goera mandna* Mosely
156. *Goera rachhu* Schmid

Family LEPTOCERIDAE
Genus *Adicella* Mclachlan
157. *Adicella dirce* Schmid
158. *Adicella eloa* Schmid
159. *Adicella enone* Schmid
160. *Adicella euprosyne* Schmid
161. *Adicella evoha* Schmid
162. *Adicella myrho* Schmid
163. *Adicella nyse* Schmid

Genus *Poecilopsyche* Schmid
164. *Poecilopsyche bimasena* Schmid
165. *Poecilopsyche pandava* Schmid
166. *Poecilopsyche suyodhana* Schmid

Genus *Setodes* Rambur
167. *Setodes aparimeya* Schmid
168. *Setodes dhanavriddha* Schmid
169. *Setodes tchaturdanta* Schmid
170. *Setodes yatharupa* Schmid

Genus *Trichosetodes* Ulmer
171. *Trichosetodes atidhanin* Schmid

Family LIMNOCENTROPIDAE
Genus *Limnocentropus* Ulmer
172. *Limnocentropus fletcheri* Mosely
173. *Limnocentropus himalayanus* Msrtynov
174. *Limnocentropus insolitus* Ulmer
175. *Limnocentropus mergatus* Kimmins

Family ODONTOCERIDAE
Genus *Psilotreta* Banks
176. *Psilotreta assamensis* Parker&Wiggins
177. *Psilotreta schmidt* Parker&Wiggins

Family HELICOPSYCHIDAE
Genus *Cochilophylax* Schmid
178. *Cochilophylax astynome* Schmid
179. *Cochilophylax hippothae* Schmid
REFERENCES


INTRODUCTION

The family Vespidae belongs to superfamily Vespoidea which includes true wasps. The superfamily Vespoidea is one of the seven recently recognised superfamilies of aculeate Hymenoptera. There are about 700 species known under Vespidae from the world.

The complex social organisation and nest architecture make these wasps fascinating insects. Whereas their painful sting may, sometimes, prove fatal yet their venom has its utilization in immunisation. Despite their interesting features and economic importance, they are chiefly predators of insect larvae and some of the species serve as effective predators for the control of some insect pests of agricultural crops.


An attempt has been made here to provide a consolidated information on the Vespidae fauna of the state of Sikkim in India.

The family Vespidae is characterised by the following characters: Antennae 13-segmented in male and 12-segmented in female; eyes emarginate; pronotum extending back to tegula, and mesopleurum without any oblique suture; wings longitudinally folded in repose (except in Masarinae and Stenogastrinae), fore wing with first discoidal cell elongate and longer than submedian cell, hind wing with an anal cell and enclosed cells; trochanters not divided and trochantellus absent, middle tibiae with one or two apical spurs, tarsal claws toothed, bifid or simple; thorax and gaster joined together by a long and slender or short petiole; gaster with spiracles on 1-7 segments and a sting without sheaths; male genitalia with characteristic spiniform parameres.

SYSTEMATICS

There are about 700 species of Vespidae known from the world and are classified under five subfamilies. In India, the family is represented by about 135 species/subspecies, 11 genera/subgenera under three subfamilies.

In Sikkim, the Vespidae is represented by three subfamilies, viz., Stenogastrinae, Vespinae and Polistinae. The present work records 32 species/subspecies under 9 genera and 7 subgenera from this state.

The keys to the subfamilies, tribes, genera, subgenera, species and subspecies are provided for the identification of various taxa of this region. Illustrations of taxonomic terms used in the present work are included for ready reference.
Fig. 1. Structure of head of Vespidae: A, front view; B, posterior view; C, side view – (a) lateral margin of clypeus that lies along eye margin; D, dorsal view; E, mandible (after Das and Gupta, 1989).
Fig. 2. Structure of thorax, wings, gaster, legs and male genital organs of Vespidae. A. Thorax, side view. B. Propodeum, dorsal view; C, D. Fore and hind wings; E. Leg; F. Fifth tarsal segment; G. Gaster, side view; H. First gastral sternite, ventral view; I. Male genitalia; J. Male subgenital plate (after Das and Gupta, 1989).
Fig. 3. Structure of head, thorax, fifth tarsal segment and gaster of Stenogastrinae: A, head, front view; B, head, dorsal view; C, head, posterior view; D, gaster; E, fifth tarsal segment (after Das and Gupta, 1989).
TAXONOMIC TERMINOLOGY

The morphological terms used in the present work are mainly based on the works of Richards (1956, 1973), Sehgal (1963), van der Vecht (1941, 1975) and Das and Gupta (1989). The morphological terms used in the text are illustrated in figures 1, 2 and 3.

SYSTEMATIC ACCOUNT

Family VESPIDAE

1. Subfamily STENOGASTRINAE

1. Genus Eustenogaster van der Vecht, 1969
   1. scitula (Bingham), 1897
   2. hauxwellii (Bingham), 1894

2. Genus Parischnogaster Schulthess, 1914
   3. mellyi (Saussure), 1852

2. Subfamily POLISTINAE

1. Tribe Polistini

3. Genus Polistes Latreille, 1802
   1. Subgenus Polistes (Gyrostoma) Kirby and Spence, 1838
   4. gigas (Kirby and Spence), 1826
   2. Subgenus Polistes (Nygmopolistes) Richards, 1973
   5. tenebricosus sulcatus Smith, 1852
   3. Subgenus Polistes (Megapolistes) van der Vecht, 1968
   6. olivaceus (De Geer), 1773
   7. rothneyi sikkimensis van der Vecht, 1968
   4. Subgenus Polistes (Polistella) Ashmead, 1904
   8. adustus Bingham, 1897
   9. santoshae Das and Gupta, 1989
   4. strigosus atratus Das and Gupta, 1989
   10. sagittarius Saussure, 1853
   11. assamensis Bingham, 1897

2. Tribe Ropalidiini

4. Genus Ropalidia Guérin, 1838

5. Subgenus Ropalidia (Anthreneida)
   13. brevita Das and Gupta, 1989
   14. santoshae Das and Gupta, 1989
   15. rufocollaris rufocollaris (Cameron), 1900
   16. stigma stigma (Smith), 1858
   17. fasciata (Fabricius), 1804

6. Subgenus Ropalidia (Icarielii)
   Dalla Torre, 1904

18. scitula (Bingham), 1897

3. Tribe Polybiini

5. Genus Parapolybia Saussure, 1853

19. varia (Fabricius), 1787

3. Subfamily VESPINAE

6. Genus Vespa Linnaeus, 1758

7. Subgenus Vespa (Vespa) Linnaeus, 1758

20. analis nigrans Buysson, 1903

21. basalis Smith, 1852

22. bicolor Fabricius, 1787

23. mandarinia magnifica Smith, 1852

24. mocsaryana Buysson, 1905

25. tropica haematodes Bequaert, 1936

26. tropica ducalis Smith, 1852

27. velutina nigrithorax Buysson, 1905

28. vivax Smith, 1870

7. Genus Provespa Ashmead, 1903

29. anomala (Saussure), 1853

30. barthelemyi (Buysson), 1905

8. Genus Dolichovespula Rohwer, 1916

31. lama (Buysson), 1903

9. Genus Vespula Thomson, 1869

32. flaviceps flaviceps (Smith), 1872
SYSTEMATIC ACCOUNT

Family VESPIDAE

Key to the Subfamilies of VESPIDAE
(After Das and Gupta, 1989)

1. Wings not folded longitudinally when at rest. Tarsal claws with one tooth. Mandible elongate. Occipital carina either joining with or almost reaching near to hypostomal carina. Antennal sockets far apart, separated from the basal margin of clypeus by a long supraclypeal area. In male, clypeus and mandible produced like a beak. Nervulus distinct. Second cubital cell rectangular. Thorax short, globular; first gastral segment petiolate, longer than rest of the gaster.......................... STENOGASTRINAE

– Wings folded longitudinally when at rest. Tarsal claw simple, without tooth. Mandibles of normal shape. Occipital carina joining with or running towards the base of mandible. Antennal sockets not very far apart and separated from the basal margin of clypeus by short supraclypeal area. In male, clypeus and mandible normal, not beak shaped. Nervulus short. First cubital cell larger than second cubital cell. Thorax normal. First gastral segment petiolate or subpetiolate or sessile, not much longer than the rest of the gaster................................................................2

2. Hind wing usually with an anal lobe. Hind coxa without a dorsal carina. Mesepimeron not completely or not at all separated from the mesepisternum. Dorsal episternal groove and epicnemial carina always absent. Gaster sessile, 1st tergite anteriorly truncate with an anterior vertical face and a posterior horizontal face, the two making a right angle. Occipital carina absent dorsally, usually present laterally but may or may not reach base of mandible. Apical margin of clypeus broadly truncate or emarginate medially forming two lateral sharp or blunt lobes. Apical margin of postscutellum produced in the middle forming a long triangular lobe in the basal part of propodeum. Propodeum almost vertical and without rugosities, with a circular apical orifice. Mandibles large with an expanded apical margin. Male antenna straight apically, without a hook-like bend. Larger, stouter species with nest consisting of several combs on a horizontal plane and wrapped by a papery envelope VESPINAE

1. Subfamily STENOGASTRINAE

The Stenogastrinae, a primitive group of wasps, are occupying an intermediate position between solitary Eumenidae and social Polistinae and Vespinae of family Vespidae. The members of this subfamily show diversity in social behavior from solitary to primitively social to eusocial behavior. They build their nests in different forms with masticated vegetable fibres or soil particles or stones, leaves and bark of the trees. More than one female may be present in one nest. The adult wasps do not fold their wings when at rest. Bingham (1890) reported that the solitary nests are made by a single pair of the large size species,
while the several members amongst the smaller species made the celled social nests in tier which are cylindrical or bell-like or hexagonal in shape.

The subfamily Stenogastrinae is represented by seven genera: *Liostenogaster* van der Vecht, 1969; *Eustenogaster* van der Vecht, 1969; *Parischnogaster* Schulthess, 1914; *Anischnogaster* van der Vecht, 1969; *Metischnogaster* van der Vecht, 1969; *Holischnogaster* van der Vecht, 1969 and *Stenogaster* Guérin, 1838. Of these, first three genera occur in Indian subregion. Only two genera, viz., *Eustenogaster* and *Parischnogaster* have been reported from Sikkim (Das and Gupta, 1989).

**Diagnostic characters**: Body elongate; clypeus generally convex basally, but slightly depressed below middle and convex apically, apical margin of clypeus with a pointed tooth; in male, clypeus and mandible produced like a beak; supraclavicular area very long; occipital carina joining or reaching near hypostomal carina; in female antenna 12-segmented and in male 13-segmented; pronotal carina absent; pronotal fovea absent, apical margin of pronotum laterally with an oval area; scutellum without median groove, but median carina may or may not present mesepimeron totally separated from mesepisternum; propodeum with or without distinct median groove and striations; middle and hind tibia with one long and one short tibial spur; tarsal claw unidentate; fore wing with 4 cubital cells; first cubital cell shorter than second cubital cell; nervulus distinct; first gastral segment petiolate, much longer than the rest of the gaster.

**Key to the genera of Stenogastrinae**

1. Second segment of maxillary palpus more than 2x as long as third segment; hind wing with brownish narrow band on ventral margin at base; larger species .................................................. 
   **Eustenogaster** van der Vecht

   Second segment of maxillary palpus less than 2x as long as third segment; hind wing without brownish narrow band; usually smaller species .................................................. 2

2. Occipital carina meeting hypostomal carina; gastral petiole more than 1.5x as long as thorax; second gastral segment petiolate at base; mouth parts short, extended slightly beyond the tip of clypeus; antenna strongly swollen beyond seventh segment ..................................................
   **Parischnogaster** Schulthess

   Occipital carina not meeting hypostomal carina; gastral petiole about 1.5x as long as thorax; second gastral segment not petiolate at base; mouth parts long, extended far beyond the tip of clypeus; antenna gradually swollen apically ............................... *Liostenogaster* van der Vecht*

(*Not recorded from Sikkim).

1. Genus *Eustenogaster* van der Vecht


This genus is represented by four species, viz., *scitula* (Bingham), 1897; *hauxwellii* (Bingham), 1894; *eximia* (Bingham), 1890 and *fraterna* (Bingham), 1897 from Indian subregion. Of these, *E. scitula* and *E. hauxwellii* have been recorded from the state of Sikkim.

**Key to the species of Eustenogaster**

1. Gaster widest at both second and third segments; propodeum with an inverted 'T'-shaped yellow mark on each side; clypeus entirely yellow ................. *hauxwellii* (Bingham)

   Gaster widest at second segment only; propodeum usually entirely black; clypeus only longitudinally yellow in the middle ................
   .................................................................. *scitula* (Bingham)

1. *Eustenogaster scitula* (Bingham)


Remarks: This species is readily distinguished by having gaster widest at second segment and clypeus not continuous with inner eye margin. Propodeum entirely black (Das and Gupta, 1989).

2. Eustenogaster hauxwellii (Bingham)


Distribution: India: Sikkim, Elsewhere: Indonesia, Thailand, Malaysia and Myanmar.

2. Genus Parischnogaster Schulthess


This genus is represented only by a single species, P. mellyi (Saussure), 1852 in Indian subregion.

3. Parischnogaster mellyi (Saussure)


Diagnostic characters: Female: Body 10 mm long; Body narrow, covered with fine silvery pubescence. Head wider than thorax; clypeus slightly longer than wide, with a pointed tooth apically; supraclavale area, interantennal space, frons, vertex up to posterior ocelli, mesoscutum, scutellum, mesopleuron rugoso-reticulate; inner orbit, ocular sinus generally smooth; interocular distance on vertex as long as clypeus; postscutellum with a few punctures in the middle; propodeum with irregular narrow striations and distinct median groove; gaster petiole long, strongly swollen towards apex and slightly narrowed at apex; gaster widest at both second and third segment.

Head and thorax in general dark brown. Antenna, pronotum, mesopleuron, metapleuron (except the yellow marks), sides of propodeum, legs (except the yellow marks) and gaster reddish-brown. Yellow are: clypeus at apex, mandible, antennal scape, a band on pronotum, three spots on mesoscutum, two circular marks on scutellum, postscutellum at base, two marks on mesepisternum, a mark on dorsal metapleuron, two marks at the apex of propodeum, fore coxa in front, femora apically, a line below on fore and middle tibiae, a short line on gaster petiole on side at apex, another line on the side of second gastral tergite and elongate mark on either side of third to fifth tergites, second sternite on sides and third to sixth sternites largely.


Remarks: Das and Gupta (1989) give a detailed account of this species.

2. Subfamily POLISTINAE

These are commonly called Paper-wasps. The nests consist of a single comb which is not enclosed in a paper envelope. In most of the Temperate zone species the nests are annual, each being founded by one or more overwintering females. One of the females becomes dominant and is the only one to lay eggs.

The normal larval food consists of dismembered caterpillars. Some species of Polistes exert considerable predator pressure on economically important insects such as tobacco horn worm and cotton ballworm. In an attempt to utilize the wasps as a biological control agent, shelters are sometimes placed in cultivated fields to afford nesting sites to founding females (Krombein and Burks, 1979).

Diagnostic characters: Body usually elongate; apical margin of clypeus tapering into a sharp or blunt tooth. Occipital carina always present; apical margin of postscutellum truncate to weakly produced in the middle at the base of propodeum; mesepisternum not completely or not
at all separated from mesepisternum. Hind wing usually with an anal lobe; 1st gastral segment petiolate or subpetiolate.

**Key to the tribes of Polistinae**

1. First gastral segment always petiolate and usually strongly swollen apically; pronotal lobe apically in front of tegula without a carina; dorsal episternal groove always absent; subtegular area basally in front of pronotal lobe not margined with a carina; second gastral tergite and sternite usually fused. .................. Ropalidiini

- First gastral segment either petiolate or subpetiolate; pronotal lobe apically in front of tegula with a distinct carina; dorsal episternal groove either present or absent; subtegular area basally in front of pronotal lobe margined with distinct carina, second gastral tergite and sternite never fused. ................................. 2

2. First gastral segment subpetiolate; shorter than second segment; muscle slit of propodeum long and narrow; subdiscoideus joins postnervulus at or close to middle; mesepisternum with or without epicnemial carina; apical margin of postscutellum usually almost truncate. ............................... Polistini

- First gastral segment petiolate; not shorter than second segment; muscle slit of propodeum short and wide; subdiscoideus joins postnervulus below middle; mesepisternum without epicnemial carina; apical margin of postscutellum weakly produced in the middle just at the base of propodeum. ... Polybiini

1. Tribe Polistini

This tribe is represented by a single genus in Indian subregion.

3. Genus *Polistes* Latreille


This genus is subdivided into eleven subgenera (Richards, 1978). Of these, six, viz., *Polistes* (Polistes) Latreille, 1802; *P. (Gyrostoma)* Kirby and Spence, 1826; *P. (Nygmopolistes)* Richards, 1973; *P. (Megapolistes)* van der Vecht, 1968; *P. (Stenopolistes)* van der Vecht, 1972 and *P. (Polistella)* Ashmead, 1904 are represented in Indian subregion. In Sikkim, four subgenera have been reported. These can be recognised by the following key.

**Key to the subgenera of Polistes**

1. Pronotal fovea present; clypeus not extending far beyond the anterior tentorial pits; anal lobe of hind wing large and separated from the rest of the wing membrane by a smooth incision; mesepisternum usually with epicnemial carina (except in subgenus *Nygmopolistes*) and dorsal episternal groove (except in subgenus *Gyrostoma*) ................................. 2

- Pronotal foveae absent; clypeus extending far beyond the anterior tentorial pits; anal lobe of hind wing more or less reduced; mesepisternum without epicnemial carina and with incomplete dorsal episternal groove ................................. 5

2. First gastral sternite with well-developed margin at base. In males, clypeus touching the inner eye margin; terminal antennal segment coiled apically ................................. Subgenus *Polistes* Latreille*

- First gastral sternite with or without well-developed margin at base. In males, clypeus touching or not touching the inner eye margin; terminal antennal segment usually not coiled apically ................................. 3

3. Mesepisternum without dorsal episternal groove; parastigma of fore wing 1.4x as long as first intercubitus; interantennal space produced into a blunt tooth. In males, hind trochanter with one tooth; mandible with three teeth, proximal tooth separated from the distal teeth by a large gap; subgenital plate flat, without any tubercle and apophyses .............. Subgenus *Gyrostoma* Kirby and Spence

- Mesepisternum with well-developed dorsal episternal groove; parastigma shorter than first
intercubitus; interantennal space normal, not produced into a blunt tooth. In males, hind trochanter normal; subgenital plate with lateral tubercle and with or without apophyses ... 4

4. Mesepisternum without epicnemial carina. In males, subgenital plate not squarish, narrow at apex, without apophyses; digitus long and narrow .............................................................

 .......... Subgenus Nygmopolistes Richards

- Mesepisternum with distinct epicnemial carina. In males, subgenital plate squarish, with a pair of apophyses; digitus basally wide ................ 

 .......... Subgenus Megapolistes van der Vecht

5. Anal lobe of hind wing much reduced, apex almost rounded, separated from the rest of the wing membrane by a wide gap; interocellar distance as long as, or less than the diameter of posterior ocellus; first gastral sternite without a well-developed margin at base ................................

 .......... Subgenus Stenopolistes van der Vecht*

- Anal lobe of hind wing larger, apex nearly straight and separated from the rest of the wing membrane by a smaller gap; interocellar distance more than the diameter of posterior ocellus; first gastral sternite usually bounded by well developed margin at base ......................

 ............... Subgenus Polistella Ashmead

[* Polistes (Polistes) and Polistes (Stenopolistes) not recorded from Sikkim.]

1. Subgenus Polistes (Gyrostoma)

Kirby and Spence

1826. Cyclostoma Kirby and Spence. Introduction to Entomology, 3 (ed. 1) : 633. Name preocc. by Cyclostoma Lamarck, 1799. Type-species : Cyclostoma gigas Kirby and Spence, 1826.

1838. Gyrostoma Kirby and Spence. Introduction to Entomology, 3 (ed. 5) : 36, 631. New name.

This subgenus is known by its type-species from the Oriental region, which is also reported from the state of Sikkim.

4. Polistes (Gyrostoma) gigas

(Kirby and Spence)


1983. Polistes (Gyrostoma) gigas (Kirby and Spence) : Das and Gupta, Oriental Ins., 17 : 405, cat., syn., ref., dist. India, South China, Taiwan.

Diagnostic characters : Large sized wasps, 25 mm (female) to 35 mm (male); clypeus not extended beyond anterior tentorial pits; interantennal space produced into a distinct tubercle. In males, mandibles large with three teeth, proximal tooth widely separated from distal teeth. In females, head and thorax reddish-brown; gaster, middle and hind legs and antennae, blackish-brown and in males, body in general reddish-brown; gaster, thorax and legs partly blackish and antennae largely blackish-brown.

Distribution : India : Sikkim. Elsewhere : Taiwan and South China.

2. Subgenus Polistes (Nygmopolistes)

Richards


This is a small subgenus represented by a single species, viz., P. (N.) tenebricosus Lepeletier, 1886 in whole of Oriental region. Two subspecies, viz., tenebricosus tenebricosus Lepeletier, 1886 and tenebricosus sulcatus Smith, 1852 are known from Oriental region. Of these, only one subspecies tenebricosus sulcatus is reported from the state of Sikkim.

5. Polistes (Nygmopolistes) tenebricosus sulcatus Smith


Diagnostic characters : Female : Antennae
black, its first, second and third segments apically reddish. Head reddish, with a black mark on frons and vertex. Pronotum reddish with a black mark below. Gaster reddish, its basal half of first tergite, second tergite at base, first, second and third sternites (except for two reddish marks on both sides), black. Legs in general black, except apical half of fore femur, fore tibia, middle and hind tibiae apically, all tarsi, reddish. Wings wholly yellowish.

Material examined: India: Sikkim, 548 m, 1 male and 2 females, vii. 1897, coll. Dudgeon; 1 female, date of collection not given, coll. A. V. Knyvett.


Remarks: This subspecies superficially resembles P. (Polistella) sagittarius Saussure, 1853, but can be differentiated by the presence of pronotal fovea. This subspecies is mainly found in the hilly areas.

3. Subgenus Polistes (Megapolistes) van der Vecht


This is a moderate size subgenus and widely distributed in Oriental region. Three species, viz., olivaceus (De Geer), 1773; wattii Cameron, 1900 and rothneyi Cameron, 1900 are known from Indian region. Only olivaceus and rothneyi have been reported from the state of Sikkim.

Key to the species of Polistes (Megapolistes)

1. Transverse striation of propodeum strong; metapleuron ventrally with distinct punctures. In males, apophyses longer than wide with sparse pubescence .......... rothneyi Cameron
   - Transverse striation of propodeum week; metapleuron ventrally impunctate or with scattered fine punctures ......................

2. Occipital carina in female incomplete. In males, apophyses flattened and spatulate at apex, shiny and without pubescence ........................................ olivaceus (De Geer)
   - Occipital carina in female complete. In males, apophyses long and narrow with dense pubescence .................... wattii Cameron

(* Not reported from Sikkim)

6. Polistes (Megapolistes) olivaceus (De Geer)


Distribution: India: Sikkim, Assam, West Bengal, Himachal Pradesh, Arunachal Pradesh, Meghalaya, Tripura, Manipur, Jammu and Kashmir, Madhya Pradesh and Karnataka. Elsewhere: Japan, Iran, Tanzania (Zanzibar Is.), Seychelles, Madagascar, Mauritius; widely distributed in the Oriental Region and Oceanic islands and also found in Australia and New Zealand.

7. Polistes (Megapolistes) rothneyi sikkimensis van der Vecht


Remarks: This subspecies is easily distinguished by having propodeum black with four red or yellow marks; first gastral tergite black with broad yellowish apical band; mesepisternum with three reddish marks.

4. Subgenus Polistes (Polistella) Ashmead


Type-species: Polistes manilensis Saussure, 1853.

Das and Gupta (1989) reported twelve species, viz., ephippium Cameron, 1900; dawnae Dover and Rao, 1922; lepcha Cameron, 1900; adustus Bingham, 1897; santoshae Das and Gupta, 1989; similis Das and Gupta, 1989; stigma (Fabricius), 1793; latinis Das and Gupta, 1989; strigosus Bequaert, 1940; sagittarius Saussure, 1853; assamensis Bingham, 1897 and maculipennis Saussure, 1853 from Indian subregion. Subsequently, Jonathan et al. (2000b) transferred another species, Polistes hoplitus Saussure, 1853 as a new combination to this subgenus Polistes (Polistella) which was previously referred to subgenus Polistes (Nygmopolistes) by Das and Gupta (1989), because of the absence of pronotal fovea. Thus the subgenus Polistes (Polistella) contains a total of 13 species from Indian subregion. Of these, five species have been reported here from the state of Sikkim and these can be identified by the following key.

Key to the species/subspecies of Polistes (Polistella)

1. Gaster black with reddish-brown or red or yellow markings .............................................. 2
   - Gaster coloured other than black .............. 3
2. Second gastral sternite angular at base, propodeum with sharp lateral edges. (Legs not completely black) .................. adustus Bingham
   - Second gastral sternite rounded at base, propodeum with rounded lateral edges. (Propodeum with sharp striations; postscutellum with a carina at base) .......................... santoshae Das and Gupta
3. Apical margins of first to fifth gastral tergites with apical yellow bands; mesoscutum finely punctuate. .................. assamensis Bingham
   - Apical margins of gastral tergites without apical bands ................................................. 4
4. Pronotum ribbed; head narrower than thorax; second gastral tergite almost yellow; in males, subgenital plate with a broad central tubercle; thorax black with various yellow markings .... .......... strigosus atratus Das and Gupta
   - Pronotum not ribbed; head about as wide as thorax; second gastral tergite entirely reddish-brown; in males, subgenital plate with a small central tubercle .......... sagittarius Saussure

8. Polistes (Polistella) adustus Bingham


9. Polistes (Polistella) santoshae

Das and Gupta


Remarks: This subspecies is very close to adustus Bingham, 1897, differs by having head wider than high; clypeus as wide as long; temple wider than eye in profile; postscutellum with a carina at base; propodeum with round lateral...
edges, its surface shiny with sharp transverse striations.

10. *Polistes* (Polistella) *strigosus atratus*  
Das and Gupta  

**Material examined** : India : Sikkim, 1 male, 1 female, no further data, coll. A.V. Knyvett; Gangtok, 2 females, 24. iv. 1976, coll. A.R. Bhaumick and party.  

**Distribution** : India : Sikkim, Assam, Manipur, West Bengal, Tripura, Bihar, Delhi and Uttar Pradesh.  

**Remarks** : This subspecies can be distinguished from *Polistes* (Polistella) *strigosus strigosus* Bequaert, 1940 from China by having thorax black with various yellow markings.

11. *Polistes* (Polistella) *sagittarius* Saussure  

**Material examined** : India : Sikkim, 547 m, 1 female, vi. 1897, coll. Dudgeon; 2 females, no other data, coll. A.V. Knyvett; 1 female, data of collection not given, Reg. No. 4710/12; 1 female, no other data, Reg. No. 1105/1 H.  


12. *Polistes* (Polistella) *assamensis* Bingham  

**Distribution** : India : Sikkim and Assam.  

### 2. Tribe Ropalidiini

This tribe is represented by a single genus, *Ropalidia* Guérin, 1838 (= *Icaria* Saussure, 1853), which is widely distributed in the tropical parts of the old world.

### 4. Genus *Ropalidia* Guérin

This genus is subdivided into five subgenera, viz., *Ropalidia* (*Anthreneida*) White, 1847; *R. (Icarielia)* Dalla Torre, 1904; *R. (Paraicaria)* Gribodo, 1892; *R. (Polistratus)* Cameron, 1900 and *R. (Ropalidia)* Guérin, 1838. Of these, first three subgenera occur in Indian subregion. In the state of Sikkim only two subgenera, viz., *R. (Anthreneida)* and *R. (Icarielia)* have been reported (Das and Gupta, 1989).

#### Key to the subgenera of *Ropalidia*

1. Mesopleuron with a distinct epicnemial carina  
   **Subgenus** .......... *Anthreneida* White  
   Mesopleuron without an epicnemial carina  
   **Subgenus** .......... *Icarielia* Dalla Torre

5. **Subgenus Ropalidia (Anthreneida) White**

   **Type-Species** : *Vespa sumatracea* Weber, 1801 (= *Anthreneida coronata* White, 1841).  
   This is a large subgenus, widely distributed in the Oriental, Wallacea and Australian regions. Das and Gupta (1989) reported 22 species from Indian subregion. From the state of Sikkim, five species/subspecies have been recorded and these can be distinguished by the following key.

#### Key to the species/subspecies of *Ropalidia* (*Anthreneida*)

1. Propodeum at base with a pair of short longitudinal carinae. (Gastral petiole as long as hind femur) .......... *brevita* Das and Gupta
- Propodeum without such carinae................. 2
2. Second gastral tergite and sternite not fused .................................................. 3
- Second gastral tergite and sternite fused .... 4
3. Median groove of propodeum deep and almost complete; petiole 1.7x as long as wide; scutellum with strong dense reticulate punctures santoshae Das and Gupta
- Median groove of propodeum not so deep, obsolete at base; petiole more than 2x as long as wide, gradually swollen apically, its apical margin normal ............... fasciata (Fabricius)
4. Third antennal segment atleast 3x as long as wide at apex; sides of second gastral tergite marked with yellow at base; pronotum red.. ................ rufocollaris rufocollaris (Cameron)
- Third antennal segment less than 3x as long as wide at apex; side of second gastral tergite not marked or differently marked; pronotum not red, but black marked with yellow. .......... ............................................ stigma stigma (Smith)

13. Ropalidia (Anthreneida) brevita
Das and Gupta


Distribution : India : Sikkim, Assam, Tripura, Himachal Pradesh, Uttar Pradesh, Orissa, West Bengal, Delhi, Goa, Karnataka and Kerala.

Remarks : The female of this species is distinguished by having the gastral petiole as long as hind femur.

14. Ropalidia (Anthreneida) santoshae
Das and Gupta


Material examined : India : Sikkim : Kambar, 1000 m, 1 female, 15. viii. 1959, coll. F. Schmid (Gupta Collection).

Distribution : India : Sikkim, Meghalaya, Arunachal Pradesh and West Bengal.

Remarks : Das and Gupta (1989) gave a detailed account of this species.

15. Ropalidia (Anthreneida) rufocollaris rufocollaris (Cameron)


Remarks : This subspecies is mainly recognised from other members of Ropalidia (Anthreneida) in having a yellow mark at the base of second gastral tergite and propodeum black at sides. In males, aedeagus is longer and narrower than any other species.

16. Ropalidia (Anthreneida) stigma stigma (Smith)


Remarks: This species is distinguished by having body reddish with black and yellow markings. Das and Gupta (1989) gave a detailed account of this species.

17. Ropalidia (Anthreneida) fasciata (Fabricius)


Material examined: India: Sikkim, 550 m, 1 female, viii. 1897, coll. Dudgeon.


6. Subgenus Ropalidia (Icarielia) Dalla Torre


This is a small subgenus, represented in Indian subregion by four species, viz., scitula Bingham, 1897; flavopicta (Smith), 1857; montana Carl, 1930 and malaisei (van der Vecht), 1962. Only one species has been reported from Sikkim.

18. Ropalidia (Icarielia) scitula (Bingham)


Diagnostic characters: Female and Male: Propodeum very finely transversely striated; temple wider than eye in female, 0.5x as wide in male; third antennal segment more than 2x as long as wide at apex; second tergite obliquely cut off at apex. Legs dark brown.


3. Tribe Polybiini

This tribe is represented by three genera, viz., Parapolybia Saussure, 1853; Polybioides Buysson, 1913 and Belanogaster Saussure, 1854 in India. Only the genus Parapolybia has been reported from the state of Sikkim.

5. Genus Parapolybia Saussure


In India, the genus Parapolybia is represented by three species, viz., varia (Fabricius), 1787; indica (Saussure), 1853 and nodosa van der Vecht, 1966. Of these, only varia has been reported from the state of Sikkim.

19. Parapolybia varia (Fabricius)

1787. Vespa varia Fabricius, Mant. Insect., 1 : 293, des. Type: China (Copenhagen Museum).


Diagnostic characters: This is a highly variable species in its colour pattern. The species is characterised by having median groove of propodeum shallow; body with prominent yellow markings, second gastral tergite with a yellow mark at base; petiole shorter than head width; occipital carina incomplete; interocular distance at clypeus about as long as or shorter than at vertex level.

Material examined: India: Sikkim, 1 male, no data, Reg. No. 4729/12.


Remarks: Das and Gupta (1989) gave a detailed description of this species.
3. Subfamily VESPINAE

This is morphologically the most specialized subfamily of the social wasps. Component species are commonly called hornets (those nesting above ground) and yellow jackets (those nesting usually subterraneously). The nests consist of several to many combs of hexagonal cells composed of paper; cells constructed early in the year may be used for several larvae in succession. The combs are usually enclosed in a paper envelope. The nests are annual, new queens and males being produced late in the summer or early in the fall; the newly fertilized queens overwinter and begin new nests in the spring. There are relatively a few precise records of the nests used to feed vespine larvae; apparently dismembered and masticated adult Diptera and honeybees are commonly used; the wasps may also obtain bits of flesh from fresh and decaying carcasses. Adult vespines feed on liquid foods, primarily nectar or honey; some species are known to prey upon adult honey bees, which they kill and extract nectar from the crop.

Diagnostic characters: Apical margin of clypeus broadly truncate or concave medially and emarginate laterally, ending in two rounded lateral lobes; mandibles short and wide; maxillary palps 6-segmented; labial palps 4-segmented; antennae 12-segmented in female and worker and 13-segmented in male; mesepimeron separated from mesepistemum by a suture; hind margin of postscutellum produced in the middle forming a long, triangular lobe wedged in the upper part of the propodeum; gaster subsessile, first tergite with a distinct edge or rounded angle between the anterior vertical and the posterior horizontal face.

This subfamily is represented by four genera, viz., Vespa Linnaeus, 1758; Provespa Ashmead, 1903; Vespula Thomson, 1869 and Dolichovespula Rohwer, 1916 from Indian subregion. All these four genera have been reported from Sikkim. These can be distinguished by the following key.

Key to the genera of Vespinae
(After Das and Gupta, 1989)

1. Head small, with short vertex and narrow temples; ocelli very large, posterior ocelli much closer to the eyes than to each other, about as far from the occiput as from the eyes; carina on hind coxa incomplete, absent ventrally from posterior surface; fore wing with large stigma, basal vein joining subcosta close to stigma; first cubital cell very long, as long as the distance of its apex to the tip of the wing; first gastral segment cup-shaped, the tergite convex anteriorly. Coloration uniformly brown, clypeus sometimes brownish. Nocturnal in habits. Colonies founded by swarming .................

........................................................................ Provespa Ashmead

2. Clypeus with short hairs on its apical region; posterior ocelli at the level of the center of eyes; vertex wide; temple wider behind eyes; pronotal carina strong and bent forwards dorsally, with a pit near its lower 0.3; fore wing with a long prestigma, at least 3x as long as stigma; hind wing with hamuli originating before the tip of subcostella; male antenna with tyloids. Length more than 20 mm .................

........................................................................... Vespa Linnaeus

3. Malar space very short, shorter than the width
of pedicel; eye almost touching base of mandible; lower edge of mandible not straight but convex basally; occipital carina present laterally, reaching or not reaching base of mandible; pronotal carina weak or absent; male antenna with long scape, equal to or a little shorter than 3rd flagellar segment, the latter without tyloids; aedeagus longer than parameres; nest small or large, envelope of nest with blister-like patches on outside or with large, overlapping sheets ..............................................

\[Vespula\] Thomson

- Malar space long, longer than the maximum width of pedicel, as long as the basal width of mandible; lower edge of mandible straight, not convex basally; occipital carina almost entirely absent; pronotal carina present; male antenna with short scape; aedeagus as long as parameres; nest usually aerial, envelope of nest with additions of large sheets, not blister-like ..............................................\[Dolichovespula\] Rohwer

6. Genus \textit{Vespa} Linnaeus

This genus is divided into two subgenera: \textit{Vespa} (\textit{Vespa}) Linnaeus, 1758 and \textit{Vespa} (\textit{Nyctovespa}) van der Vecht, 1959. Only \textit{Vespa} (\textit{Vespa}) is represented in the state of Sikkim.

7. Subgenus \textit{Vespa} (\textit{Vespa}) Linnaeus


Type-species: \textit{Vespa crabro} Linnaeus, 1758.


Eighteen species/subspecies are recognised from India. Of these, nine species are known to occur in the state of Sikkim. These can be recognised by the following key.

**Key to the species/subspecies of \textit{Vespa} (\textit{Vespa})**

(Female and Worker: antenna 12-segmented, gaster 6-segmented)

(After van der Vecht, 1957, 1959)

1. Apical margin of clypeus with a broad and deep apical emargination, forming lateral lobes and with a median triangular tooth projecting only half the length of the lateral lobes. 6th gastral segment yellow. (Head wholly yellow or orange-yellow, at most vertex with a black spot around ocelli) ..............................................

\[analis\ nigrans\ Buysson\]

- Apical margin of clypeus emarginate or broadly truncate, but without a median tooth ........

2. Head strongly widened and produced behind the eyes; temple in profile view more than 2x as wide as eye. Clypeus coarsely punctate, strongly emarginate apically; temple and mesopleuron finely and sparsely punctate in lower half.

\[mandarinia\ magnifica\ Smith\]

- Head normal; temple almost 1.5x as wide as eye ..............................................

3. Clypeus coarsely punctate or lower vertical area of pronotum with distinct transverse striations; thorax black and head black to red, not marked with yellow; gaster brown with tergite 2 yellow ..............................................

\[tropica\ (Linnaeus)\]

- Clypeus subpolished, with scattered punctures; lower vertical area of pronotum without distinct transverse ridges; head, thorax and gaster black to brown, with reddish or yellow areas ..... 6

4. Apical margin of clypeus hairy and with a blunt triangular tooth on each side of the median emargination; body covered with stiff hairs; pronotum with strong transverse striations in its lower vertical area near the pronotal pit; tergite 2 yellow .................\[tropica\ (Linnaeus)\]

- Apical margin of clypeus less hairy, with short rounded lobes on each side of the median emargination; striations on pronotum fine to indistinct. (Vertex, temple, postscutellum and propodeum sparsely and finely punctate; scutellum and metapleurum almost impunctate) ..............................................\[mocsaryana\ Buysson\]

5. First gastral tergite black, rarely with a small yellowish spot or narrow border; head and antennae mostly dark red or reddish-brown;
wings darker .................................................. tropica haematodes Bequaert

First gastral tergite more extensively marked with orange-yellow; second tergite bicolored with a broad yellow band, rarely with a black line in between; wings uniformly yellowish-brown, darker at base ........................................ tropica ducalis Smith

6. Gaster largely black; apical half of clypeus impunctate, its apical emargination shallow and without lateral lobes, middle tibia with long hairs, hairs longer than the width of tibia; postscutellum brown. Body hairs yellowish-brown .................................................. basalis Smith

Gaster black or yellow; apical 0.33 of clypeus with more crowded punctures its apical margin clearly emarginate forming lateral lobes; middle tibiae with a few long hairs. Body hairs black ........................................ bicolor Fabricius

Gaster and thorax largely black; clypeus orange, temple reddish-brown; legs blackish with tarsi yellowish-brown; frons, vertex and mesoscutum with dense long hairs; gaster with short, less conspicuous hairs; hairs on second tergite shorter than the width of hind basitarsus; body extensively black, or the mesoscutum partly orange-yellow. ........................................ velutina nigrithorax Buysson

(Note: Vespa (Vespa) vivax Smith not included in the key)

(Male : antenna 13-segmented, gaster 7-segmented)

1. Head large and swollen (as in the worker).
   (Malar space comparatively longer, tyloids present on segments 4-13, apical margin of 6th and 7th tergites shallowly emarginate) ...
   ........................................ mandarinia magnifica Smith

2. Sides of clypeus not touching the eyes, separated from them by narrow extensions of inner orbits ........................................ 3

- Sides of clypeus touching the eyes ........................................ 6

3. Emargination of 6th gastral sternite broad and semi-elliptical, its sides curving gradually towards sides of hind margin; fourth antennal segment with only the basal tyloid; clypeus rather coarsely punctate ........................................ 4

- Emargination of 6th gastral sternite as wide as deep, with angular edges; fourth antennal segment with 2 tyloids; clypeus finely punctate ........................................ 5

4. First gastral tergite black, rarely with a small yellowish spot or narrow border; head and antennae mostly dark red or reddish-brown; wings darker ........................................ tropica haematodes Bequaert

First gastral tergite more extensively marked with orange-yellow; second tergite bicolored with a broad yellow band, rarely with a black line in between; wings uniformly yellowish-brown, darker at base ........................................ tropica ducalis Smith.

5. Body yellow, vertex and mesoscutum black; junction of postscutellum and propodeum with a Y-shaped black mark ........................................ bicolor Fabricius

Body more extensively black, thorax wholly black .......... velutina nigrithorax Buysson

6. Antenna long and slender, fourth segment 2x as long as wide, without tyloids; clypeus sparsely and shallowly punctate; middle and hind tibiae densely covered with long hairs.

- Antenna relatively short, fourth segment less than 2x as long as wide, with 2 distinct tyloids; clypeus more closely punctate; middle and hind tibiae with short and sparse hairs ........................................ 7

7. Apical margin of clypeus depressed, the depression often produced medially into a groove reaching middle of clypeus; incision of
6th sternite semi-elliptical, wider than deep..
........................................................................... analys Fabricius

(Head wholly yellow or orange-yellow, sometimes with a black spot near ocelli; first to fifth tergites narrowly yellow at apex.....
........................................................................... analys nigrans Buysson)

- Apical margin of clypeus hardly depressed, with short and blunt median carina; incision of 6th sternite almost as deep as wide; head thinner and body more slender..................................
........................................................................... mocsar yana Buysson
(Nota  Vespa (Vespa) vivax Smith could not be included in the key)

20. Vespa (Vespa) analys nigrans Buysson


Remarks : This species is readily recognised by having body colour predominantly yellow with head and thorax black dorsally and body dorsally covered with dense blackish hairs.

21. Vespa (Vespa) basalis Smith


22. Vespa (Vespa) bicolor Fabricius


Remarks : This species is readily recognised by having body colour predominantly yellow with head and thorax black dorsally and body dorsally covered with dense blackish hairs.

23. Vespa (Vespa) mandarinia magnifica Smith


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

Remarks: This is a distinct subspecies having the head orange-red, thorax black and gaster reddish-brown with narrow apical bands on 1st to 5th tergites, the tip of gaster yellowish-brown.

24. *Vespa (Vespa) mocsaryana* Buysson


Remarks: This species can be identified by the characters mentioned in the key. Das and Gupta (1989) gave a detailed description of this species.

25. *Vespa (Vespa) tropica haematodes* Bequaert


Remarks: This species can be distinguished by having body black, covered with long, thick black hairs; thorax and abdomen densely pruinose; head smooth, but not shiny; head, apex of femora, tibiae and tarsi, a broad band on hind margins of 1st and 3rd tergites, a narrow line on the hind margins of 2nd, 4th and 5th tergites, and whole of 6 tergite, yellow; a black ring-like mark on frons; scape and pedicel ventrally yellow; wings brownish hyaline (Das and Gupta, 1989).

26. *Vespa (Vespa) tropica ducalis* Smith


Remarks: Das and Gupta (1989) have expressed their doubts about the correct identity of this subspecies.

27. *Vespa (Vespa) velutina nigrithorax* Buysson


28. *Vespa (Vespa) vivax* Smith


Remarks: This species can be distinguished by having body black, covered with long, thick black hairs; thorax and abdomen densely pruinose; head smooth, but not shiny; head, apex of femora, tibiae and tarsi, a broad band on hind margins of 1st and 3rd tergites, a narrow line on the hind margins of 2nd, 4th and 5th tergites, and whole of 6 tergite, yellow; a black ring-like mark on frons; scape and pedicel ventrally yellow; wings brownish hyaline (Das and Gupta, 1989).
7. Genus *Provespa* Ashmead


The genus *Provespa* is represented by three species, viz., *anomala* (Saussure), 1853; *barthelemyi* (Buysson), 1905 and *nocturna* van der Vecht, 1936. Of these, *P. anomal* and *P. barthelemyi* are known from India including Sikkim (Das and Gupta, 1989).

**Key to the species of *Provespa***  
(After van der Vecht, 1936, 1957)

1. Body slender, thorax in dorsal view 1.5x as long as wide; mesocutum longer than wide; first gastral tergite slender, its width at apex 1.6x its length; clypeus brownish; length 14 mm (female), 11-13 mm (worker). Male flagellum without tyloids ................................ ........................................... *anomala* (Saussure)

   - Body stouter, thorax 1.25x as long as wide; mesoscutum as long or less longer than wide; clypeus pale yellow, darker along margins; length 14-15 mm (worker). Male flagellum with tyloids ..................... *barthelemyi* (Buysson)

29. *Provespa anomal* (Saussure)


Distribution: India: Sikkim, Meghalaya, Arunachal Pradesh and Uttar Pradesh.

Elsewhere: Myanmar, Malaysia, Indonesia.

30. *Provespa barthelemyi* (Buysson)


8. Genus *Dolichovespula* Rohwer


This genus is known from India by two species, viz., *asiatica* Archer, 1981 and *lama* (Buysson), 1903. Only the latter has been reported from the state of Sikkim.

31. *Dolichovespula lama* (Buysson)


Diagnostic characters: This species is mainly recognised by having a dorsal yellow stripe on pronotum; lateral yellow spots on scutellum and metasternum; gastral tergites and sternites 1–3 with yellow bands; clypeus without any punctures.

Distribution: India: Sikkim and Uttar Pradesh.

9. Genus *Vespula* Thomson


The members of this genus are commonly
called yellow jackets. They make their nests in the ground or in cavities. This genus is represented by eight species/subspecies, viz., flaviceps flaviceps (Smith), 1872; vulgaris (Linnaeus), 1758; structor (Smith), 1872; germanica (Fabricius), 1793; orbata orbata (Buysson), 1902; nursei Archer, 1981; austriaca (Panzer), 1799 and koreensis stizoides (Buysson), 1905 from India. Only flaviceps flaviceps (Smith) has been reported from the state of Sikkim.

32. Vespula flaviceps flaviceps (Smith)


Diagnostic characters : Female and Worker : Third mandibular tooth straight or nearly straight along its mesal margin; occipital carina distinct laterally, less developed in the worker; scape relatively short; interocellar distance more than 0.5x the width of an ocellus; cubital vein Iia as long as or longer than Iib; punctuation on thorax weak; propodeum smooth, without carinae; prebasal depression of first tergite weak.

Male : Occipital carina distinct only at sides; antennae without tyloids; terminal segments slender, not curved; last gastral tergite with a flat apical lobe; mandible without a triangular black spot at base.

Body markings highly variable in female and worker. Body pale yellow : frons above, temple, vertex, black; clypeus yellow, with a basal black line; antennae black, scape dark brown. Thorax black with following yellow : posterior margin of pronotum, wing base, scutellum anteriorly a pair of spot on propodeum, gaster with bands. Legs largely yellowish (Das Gupta, 1989).

Distribution : India : Sikkim, Assam, Manipur, Himachal Pradesh and Uttar Pradesh. Elsewhere : China, Korea, Myanmar, USSR.

SUMMARY

The family Vespidae contains potter wasps, paper wasps, hornets or yellow jackets. Most of these wasps are beneficial, since the insects they feed their larvae are mostly injurious or at least not useful species. By their predatory habits, they destroy a large number of insect pests and may be used as effective predators for the control of some of the pest species.

The present paper deals with the Vespidae fauna of Sikkim, India. Altogether 32 species/subspecies under 9 genera, 7 subgenera and 3 subfamilies are treated in the text. The keys are provided for the identification of various taxa. Illustrations of taxonomic terms used in the present work are included for ready reference.

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(Note : for detailed Bibliography, Das and Gupta, 1989 may be consulted).
INTRODUCTION

The family Scoliidae belongs to superfamily Scolioidae, which includes one of the most attractive groups of wasps. The superfamily Scolioidae is one of the seven recently recognised superfamilies of aculeate Hymenoptera. The superfamily has four families, viz., Scoliidae, Tiphiidae, Mutillidae and Sapygidae in India.

The members of this family Scoliidae are commonly known as hairy wasps, usually black in colour, marked with spots or bands of yellow, white or red. Their wings are usually dark with a metallic iridescence. The members of this family are world-wide in distribution and their larvae are ectoparasitic on the larvae of Scarabaeidae.

Our knowledge about these wasps is very limited. Bingham (1897) made an attempt to provide an account of family Scoliidae. Betrem (1928) did a pioneering monographic work on the Indo-Australian genera and species of this family. Addition of more taxa, change in the systematic position and classification in more natural groups were significant contributions made by several workers namely: Betrem and Bradley (1964); Bradley (1964-1974); Guiglia (1965); Krombein (1963-1978); Gupta and Jonathan (1991) and Jonathan and Gupta (1993).

The members of this family are readily distinguished from other wasps by having wing membrane beyond the cells closely striolate and meso- and metasternum form a flat plate overlying the bases of the middle and hind coxae.

The family is known by two subfamilies, viz., Proscoliinae and Scoliinae. The subfamily Proscoliinae is known by two species, one each from Armenia and Greece. The subfamily Scoliinae is represented by a large number of species and subspecies, and is distributed throughout the World.

The subfamily Scoliinae is subdivided into two tribes, viz., Campsomerini and Scoliini. In the state of Sikkim this subfamily is represented by 27 species/subspecies under nine genera.

MATERIAL AND METHODS


In the present study, the attempt has been made to provide keys to the tribes, genera, species and subspecies for the identification of various taxa recorded from Sikkim. Illustrations of taxonomic terms used in the present work, distributional tables and maps are given.

TAXONOMIC TERMINOLOGY

The morphological terms followed by Betrem (1928) and Krombein (1928) are used in the present work. The morphological terms used in
Fig. 1: Anterior view of head of a Scoliid

Fig. 2: Lateral view of Thorax of a Scoliid
Fig. 3: a) Dorsal view of thorax of a Scoliid; b) male genitalia, ventra aspect at left; dorsal aspect at right; c) aedeagus.
Fig. 4. a) Diagramatic view of fore wing: a) various veins, b) various cells.
the text are illustrated in figures 1-4.

SYSTEMATIC ACCOUNT

Family SCOLIIDAE
Subfamily SCOLIINAE

I. Tribe Campsomerini

1. Genus Phalerimeris Betrem
   1. Phalerimeris phalerata phalerata (Saussure)
   2. Genus Colpacampsomeris Betrem
   2. Colpacampsomeris indica indica (Saussure)
   3. Genus Sericocampsomeris Betrem
   3. Sericocampsomeris stygia stygia (Burmeister)
   4. Sericocampsomeris rubromaculata rubromaculata (Smith)

4. Genus Campsomeriella Betrem
   1. Subgenus Campsomeriella Betrem
   5. Campsomeriella (Ci), collaris collaris (Fabricius)
   2. Subgenus Annulimeris Betrem
   6. Campsomeriella (A.) annulata (Fabricius)
   5. Genus Megacampsomeris Betrem
   7. Megacampsomeris asiatica himalayana (Betrem)
   8. Megacampsomeris shillongensis (Betrem)
   9. Megacampsomeris prismatica (Smith)

II. Tribe Scoliini

6. Genus Liacos Guerin
   10. Liacos erythrosoma erythrosoma (Burmeister)
   7. Genus Carinoscolia Betrem
   11. Carinoscolia bhamoensis (Magretti)
   12. Carinoscolia opalina opalina (Smith)
   8. Genus Megascolia Betrem & Bradley
   3. Subgenus Regiscolia Betrem
   13. Megascolia (Regiscolia) fulvifrons (Saussure)
   9. Genus Scolia Fabricius
   4. Subgenus Discola Betrem & Bradyle
   14. Scolia (Discola) Sikkimensis Bingham
   15. Scolia (Discola) rugifrons Betrem
   16. Scolia (Discola) affinis Guerin
   17. Scolia (Discola) quadripustulata Fabricius
   18. Scolia (Discola) felderi Betrem
   19. Scolia (Discola) laeviceps Smith
   20. Scolia (Discola) cyanipennis Fabricius
   21. Scolia (Discola) venusta Smith
   22. Scolia (Discola) nobilis nobilis & Saussure
   23. Scolia (Discola) elizabethae Bingham
   24. Scolia (Discola) carmichaeli Betrem
   25. Scolia (Discola) binotata binotata Fabricius
   26. Scolia (Discola) wagneri Betrem
   27. Scolia (Discola) desidiosa Bingham

Subfamily SCOLIINAE

Key to the tribes of SCOLIINAE

1. Fore wing with two recurrent veins, second recurrent absent in Colpacampsomeris indica, second recurrent not coalescent with first, however, reaching the cubital vein; sexual diamorphism well developed, males more slender and usually with extensive yellow integumental markings, while females robust and usually black; volsella divided into apical and basal parts by a transverse suture...........

......................I. Tribe Campsomerini

– Fore wing with single recurrent vein, second recurrent vein, when present, coalescing with first recurrent vein before reaching cubital vein; sexual diamorphism not so marked, males comparatively more robust than in Campsomerini and extensively marked with yellow only in a few species, where the females
also maculated extensively; volsella not divided by a suture ..................................................... II. Tribe Scoliini.

I. Tribe Campsomerini

Key to genera of the tribe Campsomerini

Female

1. Fore wing with a single recurrent vein .......... 2. Coipacampsomeris Betrem
   - Fore wing with two recurrent veins .......... 2

   2. Upper plate of metapleurum entirely impunctate, transition between its dorsal and vertical areas either sharp and marked by a carina or the transition very gradual .......... 3
   - Upper plate of metapleurum usually punctate above, transition between its vertical and dorsal areas gradual to blunt, usually sharp anteriorly and gradual posteriorly ........................................ 4

   3. Lateral carina of propodeum abbreviated or extended up to spiracles; head behind ocelli impunctate; dorso-median area of propodeum triangularly protruded posteriorly; posterior surface of propodeum impunctate to finely and sparsely punctate; longer spur of hind tibia black, white or testaceous, usually blunt or acute but sometimes slightly spatulate at the apex. For wing yellowish hyaline to entirely fuscous, often basally hyaline and apically fuscous .......... 4. Campsomeriella Betrem
   - Lateral carina of propodeum extended beyond the spiracles; head behind the ocelli with scattered to close punctures; dorso-median area of propodeum not triangularly protruded posteriorly; posterior surface of propodeum closely punctate at least above; longer spur of hind tibia black or testaceous, usually blunt at the apex. Fore wing usually dark brown ...... 3. Sericocampsomeris Betrem.

   4. Front infront of anterior ocellus with a group of deep punctures, scapulae without shallow longitudinal grooves; lateral carina extended beyond the spiracles; carina along the outer margin of the dorsum of propodeum distinct but the high; longer spur of hind tibia straight, acute or somewhat blunt at the apex; first submarginal cell almost entirely setose; basal abdominal tergites usually with yellow or reddish-brown bands ..................................................... 1. Phalerimeris Betrem

   - Front infront of anterior ocellus usually without any group of deep punctures; scapulae with shallow longitudinal grooves; carina along the outer margin of dorsum of propodeum very strong and high and extended posteriorly up to the upper half of the postero-lateral area, with a deep groove along the inner side; dorso-median area, with a deep groove along the inner side; dorso-median area of propodeum sometimes with a median turbercle posteriorly; second submarginal cell protruded posteriorly; longer spur of hind tibia black or testaceous, usually blunt at the apex. Integument usually entirely black, sometimes basally hyaline to entirely fuscous, often basally hyaline and apically fuscous .......... 4. Campsomeriella Betrem

   - Lateral carina of propodeum extended beyond the spiracles; head behind the ocelli impunctate; dorso-median area of propodeum triangularly protruded posteriorly; posterior surface of propodeum impunctate to finely and sparsely punctate; longer spur of hind tibia black, white or testaceous, usually blunt or acute but sometimes slightly spatulate at the apex. For wing yellowish hyaline to entirely fuscous, often basally hyaline and apically fuscous .......... 4. Campsomeriella Betrem

   - Lateral carina of propodeum extended beyond the spiracles; head behind the ocelli with scattered to close punctures; dorso-median area of propodeum not triangularly protruded posteriorly; posterior surface of propodeum closely punctate at least above; longer spur of hind tibia black or testaceous, usually blunt at the apex. Fore wing usually dark brown ...... 3. Sericocampsomeris Betrem.

   4. Front infront of anterior ocellus with a group of deep punctures, scapulae without shallow longitudinal grooves; lateral carina extended beyond the spiracles; carina along the outer margin of the dorsum of propodeum distinct but the high; longer spur of hind tibia straight, acute or somewhat blunt at the apex; first submarginal cell almost entirely setose; basal abdominal tergites usually with yellow or reddish-brown bands ................................................ .....
distinct, apical sternite usually with dense erect setae, known as copulatory brushes. Male genitalia with parameres slender, angular in circumference and their apices thickened, basal part of volsellae without dense hair ............ 4. *Campsomeriella* Betrem

- Head not broader than high in frontal aspects; front without a large punctate area in front of anterior ocellus; declivity of the vertex not strongly sloping and temple not receding; apical sternite without dense erect setae. Male genitalia with parameres slender but not angular in circumference and their apices not thickened, basal part of volsellae with sparse to dense hairs ........................................ 3

3. Anterior ocellus usually large and placed in a broad shallow pit; integument entirely, or marked with bands or spots, yellow or reddish; vestiture predominantly black or white, or black mixed with white, sometimes apical abdominal segments with reddish setae; wings hyaline to fuscous. Male genitalia with parameres short and slender, basal part of volsellae with short hair. Body length 20-26 mm ...................... 3. *Sericocampsomeris* Betram

- Anterior ocellus small and usually placed in a small, shallow pit; integument usually marked with yellow or reddish-yellow spots and bands, rarely entirely black; apical abdominal segments always with black setae; wings hyaline with a subapical fuscous mark or sometimes entirely fuscous ........................................ 4

4. Basal part of volsellae with short, sparse hair distance between the bases of these hairs more than their thickness ........................................ 1. *Phalerimeris* Betrem

- Basal part of volsellae with long, dense hair, distance between the bases of these hair less than their own thickness ........................................ 5. *Magacompsomeris* Betrem

1. Genus *Phalerimeris* Betrem


- Basal part of volsellae without dense erect setae, known as copulatory brushes. Male genitalia with parameres slender, angular in circumference and their apices thickened, basal part of volsellae without dense hair ............ 4. *Campsomeriella* Betrem

- Head not broader than high in frontal aspects; front without a large punctate area in front of anterior ocellus; declivity of the vertex not strongly sloping and temple not receding; apical sternite without dense erect setae. Male genitalia with parameres slender but not angular in circumference and their apices not thickened, basal part of volsellae with sparse to dense hairs ........................................ 3

3. Anterior ocellus usually large and placed in a broad shallow pit; integument entirely, or marked with bands or spots, yellow or reddish; vestiture predominantly black or white, or black mixed with white, sometimes apical abdominal segments with reddish setae; wings hyaline to fuscous. Male genitalia with parameres short and slender, basal part of volsellae with short hair. Body length 20-26 mm ...................... 3. *Sericocampsomeris* Betram

- Anterior ocellus small and usually placed in a small, shallow pit; integument usually marked with yellow or reddish-yellow spots and bands, rarely entirely black; apical abdominal segments always with black setae; wings hyaline with a subapical fuscous mark or sometimes entirely fuscous ........................................ 4

4. Basal part of volsellae with short, sparse hair distance between the bases of these hairs more than their thickness ........................................ 1. *Phalerimeris* Betrem

- Basal part of volsellae with long, dense hair, distance between the bases of these hair less than their own thickness ........................................ 5. *Magacompsomeris* Betrem

1. Genus *Phalerimeris* Betrem


This genus is widely distributed in the Oriental Region and also occurs in New Guinea and adjacent Islands. The female of this genus can be easily distinguished from that of *Megacampomeris* in having a group of deep punctures in front of anterior ocellus.

Of the three species known from Indian subregion, viz., *P. madurensis* Betrem, *P. lantachneri* (Dalla-Torre) and *P. phalerata* Saussure, only *P. phalerata* subspecies *phalerata* Saussure has been recorded from Sikkim.

1. *Phalerimeris phalerata phalerata* Saussure


1897. *Ells iris* (Lapeletier) : Bingham, Fauna of British India Hym., 1 : 94. Male. Female (specimens from North India, Myanmar and Java only).


Diagostic characters: Female : Length 12-18 mm. Black. Antennae, tibiae and tarsi reddish; first three tergites with narrow apical orange bands, that on second narrowed towards sides. Erect vestiture reddish-golden, except black on the last abdominal segment and pygidium. Tomentum golden. Wings yellowish, apex of fore wing with large, well defined dark mark.

Male : Length 10-16 mm. Black. Abdomen with faint blue reflections. The yellow markings as follows : clypeus (except for a small to large median triangular area), a line along lower inner eye orbit, scrobes, a long mark on gena, pronotum broadly along its posterior margin, a minute postero-lateral mark on mesoscutum, a narrow anterior band on scutellum small, anterior spot on
metanotum, fore coxa, apical mark on fore femur below, middle femur with narrow stripes above and below, outer surface of fore and middle tibiae, posterior bands on first four tergites, band on first tergite usually convering apical half, band on third emarginate on sides, fourth band narrow and sometimes interrupted in the middle, rarely with postero-lateral spots on fifth tergite also; second, third and usually fourth sternites with narrow apical lateral spots, spots on second and third sternites sometimes united in the middle, those on fourth widely separated in the middle. Erect vestiture pale, except black on last three abdominal tergites. Wings slightly infumated; fore wing usually with a light subapical mark.


Distribution: India: Sikkim; Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Meghalaya, Tripura, Uttar Pradesh and West Bengal. Elsewhere: China, Myanmar, Taiwan and Sulawesi.

2. Genus *Colpacampsomeris* Betrem


Type-species: *Scolia indica* Saussure, 1855 [= *Colpacampsomeris indica indica* (Saussure, 1855)] (Original designation).

This genus is widely distributed in the Oriental Region and is hitherto known only by its genotype, viz., *Colpacampsomeris indica* (Saussure).

This genus is easily separated from other genera of the tribe Campsomerini by having a single recurrent vein in the fore wing in both the sexes and body size ranging from 26-35 mm.

This genus is represented by a single subspecies from the state of Sikkim.

2. *Colpacampsomeris indica indica* (Saussure)


Diagnostic characters: Female: 25-35 mm. Integument entirely black. Vestiture black except apices of second of fifth segments with bright red or golden red setae; pygidium also similarly clothed with red-golden setae, wings dark brown with strong blue reflections.


Material examined: India: Sikkim, 1 Male, no further data (Z.S.I., Calcutta).


3. Genus *Sericocampsomeris* Betrem


Type-species: *Scolia stygia* Illiger (= *Scolia quadriguttulata* Burmeister).

This is a moderate sized genus, widely distri-
buted in the Oriental Region, and is also known from southern China and Sulawesi. It is known by four species in India, viz., *S. rubromaculata* (Smith), *S. bella* (Bingham), *S. stygia* (Illiger) and *S. flavomaculata* Gupta and Jonathan. Only *S. stygia* stygia (Illiger) and *S. rubromaculata* (Smith) are known from Sikkim. These species/subspecies can be distinguished by the following key:

**Key to the species/subspecies of *Sericocampsomeris***

1. Females .......................................................... 2
   - Males .................................................................. 3
2. Integument of abdomen basically black, third and fourth tergites with paired yellow spots. 
   ................................................................. *stygia stygia* (Illiger)
   - Integument of abdomen basically reddish-brown 
   ................................................................. *rubromaculata rubromaculata* (Smith)
3. Clypeus almost entirely yellow, scutellum and metanotum with yellow marks ................. 
   ........................... *stygia stygia* (Illiger)
   - Clypeus, scutellum and metanotum black .... 
   .......... *rubromaculata rubromaculata* (Smith)
3. *Sericocampsomeris stygia stygia* (Illiger)


**Material examined** : India : Sikkim, 1 Male, no further data (Z.S.I., Calcutta).


**Remarks** : This species is readily recognised by having four spots on the abdomen.

4. *Sericocampsomeris rubromaculata rubromaculata* (Smith)


**Material examined** : India : Sikkim, 1 Female, no further data (Z.S.I., Calcutta).

**Distribution** : India : Sikkim and Arunachal Pradesh.

4. Genus *Campsomeriella* Betrem


This genus is widely distributed in the African, southern Palearctic and Indo-Australian Regions, except Australia. This genus is divided into four subgenera, viz., *Campsomeriella* Betrem, *Annulimeris* Betrem, *Rodriguimeris* Betrem and *Madonimeris* Metrem. Of these, *Campsomeriella* and *Annulimeris* are widely distributed in Indian subregion.

One subspecies and one species are known under these two subgenera. These can be distinguished by the following key.

**Key to the subgenera and species/subspecies of *Campsomeriella***

**Female**

1. Basal portion of the lateral carina of propodeum not extending up to spiracles; impunctate areas behind the callosities usually large; spurs of middle and third tibiae black or testaceous ...

................................................. subgenus *Campsomeriella*
Betrem. Wings dark brown, abdominal vestiture black ....... *collaris collaris* (Fabricius)

- Basal portion of the lateral carina of propodeum extending somewhat beyond the spiracles; impunctate areas behind the callosities small to very small; spurs of middle and hind tibiae white ............................................................... .

........................................ subgenus *Annulimeris*

Betrem ...... Integument black, abdominal vestiture white. Abdominal segments with apical white fringe ...... *annulata* (Fabricius)

Male

1. Apical sternites with capulatory brushes ...... subgenus *Campsomeriella* Betrem ...... Pronotum, scutellum and metanotum with yellow marks; apical yellow bands on the basal tergites comparatively broad ......................... 

.................. .... *collaries collaris* (Fabricius)

- Apical sternites without copulatory brushes......subgenus *Annulimeris* Betrem ...... First to fifth abdominal tergites with broad to narrow basal bands *annulata* (Fabricius)

5. *Campsomeriella* (*Campsomeriella*)

*collaris collaris* (Fabricius)


Distribution : India : Sikkim; Arunachal Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnata, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh.


Remarks : This is one of the most abundant and widely distributed Indian scoliid, breeding throughout the year in all the ecosystems and areas of low to very heavy rainfall. This species can be easily recognised by having the integument of the female black, the wings dark fuscous with strong blue reflections and the occiput and pronotum with conspicuous erect white setae. Males have more extensive yellow marks on abdomen.

6. *Campsomeriella* (*Annulimeris*) *annulata* (Fabricius)


Distribution : India : Sikkim; Arunachal Pradesh, Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Meghalaya, Tripura, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, China, Indonesia, Korea, Malaysia, Myanmar, Nepal and Taiwan.

Remarks : This is the only species under the subgenus *Annulimeris* Betrem. This species is widely distributed in North India and also
distributed from Bangladesh to Japan.

5. Genus *Megacampsomeris* Betrem


Type-species : *Tipha grossa* Fabricius, 1804

This is a moderately large genus, represented by 7 species and 2 subspecies from India.

The following species and subspecies are known from the state of Sikkim : *Megacampsomeris shillongensis* (Betrem), *M. prismatica* (Smith) and *M. asiatica himalayana* (Betrem).

These can be distinguished by the following key :

**Key to the species/subspecies of **

**Female**

1. Basal abdominal tergites with white apical fringes. Fore wing light brown; subspecies known from north India .................................

   1. *asiatica himalayana* (Betrem)
   
   - Basal abdominal tergites with fringes other than white. ........................................... 2

2. Basal tergites with yellow or reddish-yellow apical bands, fore wing without any well defined dark apical spot, vestiture on abdomen golden, except on fifth, and following segments black *shillongensis* (Betrem)

   - Basal tergites without such bands; vestiture on the abdomen predominantly golden. Mesoscutum with a large impunctate area in the middle ................. *prismatica* (Smith)

**Male**

1. Clypeus entirely yellow, except for a minute spot in the middle, sometimes black; genae with large yellow marks; all the femora almost entirely yellow on outside .................................................. *shillongensis* (Betrem)

   - Clypeus with a black area in the middle, never entirely yellow; genae without any yellow mark; femora never marked yellow on outerside .2

2. Vestiture on legs entirely white; apical fringes of first to fourth tergites also white. (Wings yellowish hyaline) ........................................... ............... *asiatica himalayana* (Saussure)

   - Vestiture on legs never white; apical fringes of abdominal tergites not white. (Second and third femora without any yellow maculations) ..... ........................................... *prismatica* (Smith)

7. *Megacampsomeris asiatica himalayana* (Betrem)


**Material examined** : India : Sikkim, no further data, A. V. Knyvett (Z.S.I., Calcutta).

**Distribution** : India : Sikkim; Himachal Pradesh, Karnataka, Meghalaya and Uttar Pradesh.

**Elsewhere** : Bhutan and Nepal.

**Remarks** : This subspecies is widely distributed in the himalayan region of India, Bhutan and Nepal.

8. *Megacampsomeris shillongensis* (Betrem)


**Material examined** : India : Sikkim : Deorali, 1500m, 2 Males, 23.ix.1978, A.N.T. Joseph; Phungta, 1300m, 1 Male, 16.ix.1978, A.N.T.

Distribution: India: Sikkim; Manipur, Meghalaya and West Bengal.

Elsewhere: Myanmar and Nepal.

9. *Megacampsomeris prismatica* (Smith)


1928. *Campsomeris (Megacampsomeris) prismatica* Betrem. Treubia. 9 (Suppl.): 152-153. Male, Female; Java, Sumatra, Borneo, Sulawesi, Malakka, North India, Taiwan and Japan.


Material examined: India: Sikkim: Gangtok, Nam Nam, 1470m, 1 Male, 30.v.1976, G. Singh.

Distribution: India: Sikkim; Arunachal Pradesh, Himachal Pradesh, Kashmir, Manipur, Meghalaya, Orissa, Uttar Pradesh and West Bengal.

Elsewhere: China, Honshu, Indonesia, Japan, Korea, Malaysia, Myanmar, Nepal, the Philippines and Taiwan.

Remarks: This is a widely distributed species and easily recognised by having vestiture on abdomen predominantly golden, fore wing without any well defined apical spot and mesoscutum with a large impunctate area in the middle.

II. Tribe Scoliini

Key to the genera of tribe Scoliini

1. Fore wing with two recurrent veins (the second recurrent coalescent with first recurrent before reaching cubital vein), and with three discoidal cells ............................................. *Liacos* Guerin

   = Fore wing with only first recurrent vein (the second recurrent vein absent), and with two discoidal cells ......................................................... 2

2. Front with a transverse ridge; the frontal carina present between frontal spatium and anterior ocellus. Basal portion volsella very long, with long dense hairs ............ *Carinoscolia* Betrem

   = Front without such a transverse carina.......... 3

3. Large sized species, 19-50 mm. Fore wing with three submarginal cells, except in *M. fulvifons* Saussure with two submarginal cells; first tergite with a strong tubercle anteriorly..........

   .................................................. *Megascolia* Betrem

   = Small to moderate sized species, 5-25 mm. Fore wing always with two submarginal cells; first tergite with a small to moderate sized tubercle anteriorly, tubercle often absent ......

   .................................................. *Scolia* Fabricius

6. Genus *Liacos* Guerin


Type-species: *Scolia (Liacos) dimidiat~* Guerin, 1838 [=*Liacos analis analis* (Fabricius, 1804)]. Original designation.

This genus is widely distributed in Indo-Australian Region and also occurs in tropical Africa. This genus is represented by a single species, *L. erythrosoma* (Burmeister) from Indian subregion.

*Liacos erythrosoma* is a polytypic species widely distributed in Oriental Region. Three subspecies have been recorded from India, viz., *erythrosoma erythrosoma* (Burmeister), *erythrosoma fulvopicta* Cameron and *erythrosoma aurantica* Micha. Of these, *erythrosoma erythrosoma* has been recorded from Sikkim.

10. *Liacos erythrosoma erythrosoma* (Burmeister)


Type-species: Scolia opalina Smith. 1858. Original designation.

This is a moderate sized genus, widely distributed in the Indo-Australian Region and also recorded from eastern Palaearctic Region. This genus is known in India by two species, viz., C. opalina (Smith) and C. bhamoensis (Margretti). Both the species have been recorded from Sikkim also.

These species can be identified by the following key:

**Key to species of Carinoscolia**

1. Integument and vestiture entirely black ........


11. Carinoscolia bhamoensis (Magretti)

1928. Scolia (Carinoscolia) bhamoensis (Magretti) : Betrem, Treubia, 9 (suppl.): 184-185. Female, Male. India : Sikkim, Meghalaya.

Material examined: India : Sikkim, 1 Female, no further data (Z.S.I., Calcutta).


Remarks: The distribution of this species is restricted to hilly areas of Myanmar and N-E India. It can easily be distinguished from C. opalina Smith by having head and pronotum largely reddish-yellow.

7. Genus Carinoscolia Betrem


**Diagnostic characters**: Female

Length 21-23 mm. Integument black. The following red: usually a pair of large rounded spots on first tergite entirely, second tergite except for a pair of lateral spots and a median spot, sometimes second tergite entirely and third to sixth tergites wholly, usually at sides or whole of second sternum and whole of third to sixth sternite. Vestiture black, red to bright red on red integument of abdomen. Wings dark brown with golden reflections.

Material examined: India : Sikkim, Ranjeet Valley, Manjitar 270m, 1 Female, 27.v.1976, S. Biswas (Z.S.I., Calcutta).

Distribution: India : Sikkim; Arunachal Pradesh, Manipur, Tamil Nadu and West Bengal.

Elsewhere: Indonesia, Malaysia, Myanmar, Hainan, Malacca and Nepal.

Remarks: This is a widely distributed species in Oriental Region. It can be differentiated from all other subspecies by having golden reflections on the wings and comparatively extensive reddish integument and vestiture of the abdomen.

7. Genus Carinoscolia Betrem

12. Carinoscolia opalina (Smith)

This polytypic species is known by three subspecies, viz., *opalina opalina* (Smith) from Kalimantan, Sumatra, Malaya, Myanmar and Sikkim in India; *opalina brevicornis* (Saussure) from Java and *opalina propodealis* (Rohwer) from the Philippines.

Only one subspecies *Carinoscolia opalina opalina* is known from Sikkim.

12a. Carinoscolia opalina opalina (Smith)


**Distribution**: India : Sikkim.

**Elsewhere**: Kalimantan and Myanmar.

**Remarks**: Bingham (1897) identified 1 female from Sikkim. This subspecies is readily distinguished by its entirely black integument and vestiture; and purplish-golden reflections of the wings.

8. Genus *Megascolia* Betrem


Type-species: *Scolia procer* Illiger, 1802. [= *Megascolia procer procer* Illiger, 1802]. Original designation.

This genus is widely distributed in the Oriental Region and is also known from southern Palaearctic and Mediterranean regions. The genus is subdivided into two subgenera, viz., *Megascolia* Betrem and *Regiscolia* Betrem & Bradley.

These two subgenera can be distinguished by the following key:

**Key to the subgenera of Megascolia**

**Female**

1. Clypeus very broad, its anterior rim comparatively narrow, median portion narrow and not widely truncate or subtruncate; disc of clypeus strongly raised and punctate, neither smooth nor rugulose; scapula usually with a strong tubercle in front of tegula, sometimes this tubercle may be small or indistinct ..............

- Clypeus relatively small and narrow; its anterior rim broad and in the middle broadly truncate or subtruncate; disc of clypeus flat, usually rugulose, scapula without any tubercle in front of tegula.............................................


- **Megascolia** Betrem

- **Regiscolia** Bradley & Betrem

**Male**

1. Apical portion of volsella without a blade-like appendage, apex of the cuspis volsellaris with long coarse conspicuous setae; plates of aedeagus with needle-like teeth ...............

- Apical portion of the volsella with a blade-like appendage; apex of the cuspis volsellaris often with small setae; apical-third of the plate of aedeagus often with five, small tooth ........


- **Megascolia** Betrem

- **Regiscolia** Bradley & Betrem

Only subgenus *Regiscolia* Bradley and Betrem is reported from Sikkim, India.

3. Subgenus *Regiscolia* Bradley & Betrem


Type-species: *Scolia flavifrons* Fabricius, 1775 [= *Megascolia (Regiscolia) flavifrons flavifrons* (Fabricius), 1775], subsequent designation.

This subgenus is widely distributed in the Oriental Region and is also known from Mediterranean and southern Palaearctic Regions.
This subgenus is known by three species, viz.,
M (R.) rubida (Gribodo), M. (R.) azurea (Christ)
and M. (R.) fulvifrons (Saussure). M. (R.)
fulvifrons is the only species known from the
state of Sikkim, India.

13. Megascolia (Regiscolia) fulvifrons
(Saussure)

Distribution : India : Sikkim; Assam and West
Bengal.
Elsewhere : Bangladesh, Myanmar and
Singapore.

9. Genus Scolia Fabricius

This genus is represented by two subgenera,
viz., Scolia Betrem (1928) and Discolia Saussure
(1863) in the Indian subregion. In the state of
Sikkim this genus is represented by 14 species
and subspecies, under subgenus Discolia Saussure.

Subgenus Discolia Saussure

1863. Scolia subgenus Discolia Saussure, Soc. ent. France,
Type-species : Scolia nobilitata Fabricius. Designated by
Betrem and Bradley, 1964.

This genus is widely distributed in most
gеographical regions of the world. About 40
species/subspecies are known under this subgenus
from India. Of these, 14 are recorded from the
state of Sikkim. These can be identified by the
following key:

Key to the species of the genus Scolia
(Discolia)

Female

1. Abdominal integument entirely black .......... 2
   - Abdominal integument not entirely black; more
     or less maculated with yellow to reddish ... 7

2. Integument of antennae, head and thorax
   entirely black ........................................... 3.
   - Integument of antenne and head/or antennal
     flagellum more or less reddish, rest of
     integument black ..................................... 4.

3. Vestiture entirely black, second abdominal
tergite finely and densely punctate posteriorly,
and with some interspersed large punctures
.............................. cyanipennis Fabricius
   - Vestiture white mixed with black, pre-
     dominantly white on head and lateral thorax;
     second abdominal tergite not finely and densely
     punctate posteriorly ............................

Material examined : India : Sikkim, 11 Males,
without dates, A.V. Knyvett (Z.S.I., Calcutta).
4. Antennal flagellum orange-red, rest of the entirely black metanotum and dorso-median area of propodeum almost entirely smooth, except for a few scattered punctures. ........................................... _affinis_ Guerin

- Antenna and head, more or less reddish ...5.

5. Clypeus entirely black; mesoscutum with only a V-shaped impunctate area posteriorly in the middle........................... _rugifrons_ Betrem

- Clypeus not entirely black, half to almost entirely reddish; mesoscutum with a quadrate impunctate area posteriorly in the middle ......

............................................ 6

6. Clypeus reddish at its posterior half only; frontal fissure prominent and extending up to anterior ocellus; vestiture yellowish-white and black _carmichaeli_ Betrem.

- Clypeus almost entirely reddish except along the anterior margin, black; frontal fissure weak not extending up to anterior ocellus; vestiture predominantly black except for reddish setae on the head ..................... _felderi_ Betrem

7. Head and thorax black, abdomen with reddish spots or bands........................................... 8

- Head, abdomen and/or thorax with yellow or reddish spots or bands ..................................... 10

8. Apical margin of clypeus truncate in the middle; most of the metapleurum covered with coarse, contiguous to subcontiguous punctures; second and third abdominal sternites mostly .............. ............................. _quadripustulata_ Fabricius

- Apical margin of the clypeus broadly and gently rounded in the middle; metapleurum not covered with coarse, contiguous to subcontiguous punctures, broadly impunctate in the middle; abdominal sternites black ............. 9

9. Front impunctate, erect hair on the occiput entirely white; elsewhere predominantly black; third and fourth tergites with a pair of well-separated, rounded red spots. Body length 14-21 mm.............. _binotata binotata_ Fabricius

- Front with sparse punctures; erect hair almost entirely white except apical fringes of abdominal tergites mixed with black; only third tergite with a pair of ovoid well separated red spots. Body length 11-12 mm ............................................... _wagneri_ Betrem.

10. Thorax black, except sometimes with a reddish spot on mesopleurum above......................... 11

- Thorax maculated with yellow, particularly the propodeum ............................................. 13

11. Head with a large rectangular yellow mark on the front, elsewhere black....... _venusta_ Smith

- Head with front and vertex almost entirely yellowish to reddish ............................. 12

12. Abdomen with a broad yellow to red band on third tergite and sometimes with not a well defined narrow band on fourth tergite also; propodeum with coarse, deep punctures...... ............................. _elizabethae_ Bingham

- Abdomen with paired yellow spots on third and fourth tergites; propodeum with small, shallow, sparse to scattered punctures........ ............................. _nobilis nobilis_ Saussure.

13. Scutellum and metanotum black; vestiture reddish brown except on fourth to sixth abdominal tergites black ..................................................... _sikkimensis_ Bingham.

- Scutellum and metanotum almost entirely yellow; vestiture white except posterior margin of abdominal tergites and fifth and sixth sternites black .............. _desidiosa_ Bingham.

Male

1. Abdomen entirely black ......................... 2

- Abdomen with red or yellow maculations ............................................................. 10

2. Head and antennae, entirely black ............. 3

- Head and/or antennae, more or less yellow to red ..................................................... 7

3. Anterior ocellus in a deep pit, vertex almost impunctate; mesopleurum impunctate below above towards the base of coxae, elsewhere sparsely punctate ............. _laeviceps_ Smith
- Anterior ocellus not in a deep pit, vertex not entirely impunctate, mesopleurum, usually with sparse to close punctures below .................. 4

4. Antennal flagellum long, not clavate towards apex, segments toward tip longer than broad; metapleurum mostly with subcontiguous punctures except for a narrow impunctate stripe below on upper plate ................... \textit{quadripustulata} Fabricius.

- Antennal flagellum short, clavate towards apex, segments towards tip as broad as long; metapleurum usually broadly impunctate in the middle, lower plate not subcontiguously punctate ............................................................................. 15

5. Vestiture entirely black ........................................ \textit{cyanipennis} Fabricius.

- Vestiture not entirely black, more or less, mixed with white ........................................ 6

6. Fore wing membrane beyond cells devoid of setae, posterior half of fore wing and hind wing lighter in shade ......................................................... \textit{binotata binotata} Fabricius

- Fore with membrane beyond cells covered with fine setae; posterior half of the fore wing and hind wing not light ................ \textit{wagneri} Betrem

7. Only antennal flagellum orange red, at least beneath, rest of the integument black; dorso-median area of propodeum with shallow, sparse punctures .................................. \textit{affinis} Guerin

- Head and antennae, more or less, reddish; dorso-median area of propodeum with deep, close punctures .................................................. 8

8. Head and antennae almost entirely reddish-yellow, except apical margin of the clypeus, black; vestiture black except on head, largely yellowish-white .................. \textit{felderi} Betrem

- Head and antennae not almost entirely reddish, antennae or vertex entirely black; vestiture on thorax, and abdomen not entirely black ..... 9

9. Scapus and five to six apical segments of antennae black; vertex entirely reddish-yellow .................................. \textit{carmichaeli} Betrem

- Antennal flagellum entirely orange to red; vertex entirely black ........................................ \textit{elizabethae} Bingham

10. Antennae, head and thorax entirely black ........................................ 11

- Antennae and head, more or less, maculated with yellow thorax black or maculated with yellow ........................................ 13

11. Antennal flagellum not clavate towards apex; most of metapleurum covered with contiguous to subcontiguous punctures; larger sizes species; body 17-20 mm ........................................ \textit{quadripustulata} Fabricius

- Antennal flagellum clavate towards apex; upper plate of the metapleurum impunctate at its lower half of more ................... 12

12. Abdomen with first five tergites having white erect vestiture excepting apical fringes; third tergite with paired small red spots; fore wing membrane beyond cells extensively clothed with microtrichiae ........ \textit{wagneri} Betrem

- Abdomen with paler vestiture usually on first tergite and on areas having red spots; fore wing membrane beyond cells devoid of microtrichiae, except for a small triangular area adjacent to marginal cell ......................... \textit{binotata binotata} Fabricius

13. Propodeum entirely black, yellow maculation on thorax restricted to scapulae, or scapulae entirely black ........................................ 14

- Propodeum extensively maculated with yellow ............................................................................. 16

14. Scapulae entirely black; clypeus and front almost entirely yellow; third tergite with a pair of elongated yellow marks ................ \textit{elizabethae} Bingham

- Scapulae yellow; clypeus black; front black or with only a transverse yellow mark; third abdominal tergite entirely yellow or with a yellow band, latter interrupted in the middle 15

15. Second to fourth tergites almost entirely yellow; front with a transverse yellow mark ........ \textit{venusta} Smith.
- Third tergite only with a yellow interrupted band; front black.......................................................... nobilis nobilis Saussure

16. Fore wing with a subapical fuscous mark; all the femora largely yellow; yellow bands on second and third tergites not broadly emarginate in the middle .................................................. sikkimensis Bingham

- Fore with without any subapical mark; third femur black, only first and second femora with yellow marks; yellow bands on second and third tergites broadly emarginate in the middle ........................................ desidiosa Bingham

14. Scolia (Discolia) sikkimensis Bingham


Distribution : Sikkim, Meghalaya and West Bengal. Elsewhere : Bhutan and Nepal.

Remarks : This species is mainly distributed in N-E Himalayan region. This species is easily recognised by having reddish-brown legs, wings with golden effulgence and vestiture is general reddish-brown, except black on fourth to sixth tergites.

15. Scolia (Discolia) rugifrons Betrem


Distribution : India : Sikkim; Meghalaya.

Remarks : Betrem (1928) reported 1 female from Ranjeet Valley in Sikkim. This species is recognised by having abdomen variously marked; frontal spatium and vertex, red; clypeus entirely black. Median tubercle on first tergite is not developed.

16. Scolia (Discolia) affinis Guerin


Distribution : Sikkim; Assam, Bihar, Delhi, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Tamil Nadu, Tripura, Pondicherry, Uttar Pradesh and West Bengal. Elsewhere : Myanmar and Nepal.

Remarks : This is one of the most common and widely distributed scoliid. The female can be easily distinguished by having organe-red antennal flagellum and integument and vestiture entirely black.

17. Scolia (Discolia) quadripustulate Fabricius


1928. Scolia (Scolia) kumaoensis Betrem, Treubia, 9 (suppl.) : 309. India (Z.S.I., Calcutta).


Material examined : India : Sikkim : Melli, 2

**Distribution**: India: Sikkim; Karnataka, Meghalaya, Tamil Nadu, Uttar Pradesh and West Bengal.

**Elsewhere**: Sri Lanka.

**Remarks**: This is a uncommon but widely distributed species. The female is easily distinguished from other mostly black species of *Scolia*, by having red spots on the black abdomen.

18. *Scolia (Discolia) feldrei* Betrem


**Material examined**: India: Sikkim: Melli, 235m, 1 Female, 4.vi.1976, S. Biswas (Z.S.I., Calcutta).

**Distribution**: India: Sikkim; Assam, Karnataka, Kerala, Meghalaya, Nagaland and West Bengal. **Elsewhere**: Myanmar.

**Remarks**: The female of this species is easily recognised by having head and antennae, red, and vestiture black. Head predominantly with reddish-brown hair and wings brown with purplish effulgence.

19. *Scolia (Discolia) laeviceps* Smith


1928. *Scolia (Scolia) laeviceps* Smith: Betrem, *Treubia*, 9 (suppl.): 265-266. Female, Male; India: Sikkim; Myanmar.


**Material examined**: India: Sikkim, Ranipur, 1 Female, 23.v.1994, B. C. Das and party (Z.S.I., Calcutta).

**Distribution**: India: Sikkim; Himachal Pradesh, Jammu & Kashmir, South India and West Bengal. **Elsewhere**: Sri Lanka.

**Remarks**: The female of this species is easily identified, for it is the only species of *Scolia* with integument of antennae, head and thorax, and vestiture entirely, black.

21. *Scolia (Discolia) venusta* Smith


**22. Scolia (Discolia) nobilis nobilis** Saussure


Type female (sex not stated). "Les Indes Orientales" (Copenhagen Museum).


**Material examined**: India: Sikkim, 1 Female, vii.1912, no further data (Z.S.I., Calcutta).

**Distribution**: India: Sikkim; West Bengal.

**Remarks**: This typical and uncommon subspecies is known from hilly areas of Darjiling and Sikkim. This species is mainly recognised by having frontal spatium above, front, ocular sinus, vertex except the ocellar triangle, paired spots on third and fourth tergites, yellow. Scapus and first two antennal segments, frontal laminae, tegulae and legs reddish-brown. Wings yellowish hyaline with purplish reflections.

**23. Scolia (Discolia) elizabethae** Bingham


**Material examined**: India: Sikkim, 1 Female, vii.1912, no further data (Z.S.I., Calcutta).

**Distribution**: India: Sikkim; West Bengal.

**Remarks**: The female of this species is easily recognised by having body integument black and abdomen with weak blue reflections. Antennal flagellum, posterior half of frontal spatium front and vertex wholly, a band on third tergite, sometimes a narrow band on fourth tergite also, red or reddish-yellow. Vestiture predominantly black, sometimes with white hair on occiput, sides of thorax, legs and sternites. Wings dark brown with purplish reflections.

**24. Scolia (Discolia) carmichaeli** Betrem


**Material examined**: India: Sikkim, 1 Male, no further data, F.A. Moller (Copenhagen Museum).

**Distribution**: India: Sikkim, Arunachal Pradesh and West Bengal.

**Remarks**: This is an uncommon species and its distribution is restricted to North-East India. It is one of the Indian species of the genus *Scolia* in which head is almost entirely red in both sexes. It can be differentiated from all other such species in having predominantly white vestiture in both the sexes.

**25. Scolia (Discolia) binotata binotata** Fabricius


**Material examined**: India: Sikkim, 2 Females, 10 Males, vii.1897, G. C. Dudgeon (Z.S.I., Calcutta).

**Distribution**: India: Sikkim; Arunachal Pradesh, Manipur, Uttar Pradesh and West Bengal. Elsewhere: Sri Lanka.

**26. Scolia (Discolia) wagneri** Betrem


**Material examined**: India: Sikkim, Melli, 3
Females, 8 Males, 4-8.vi.1976, G. Singh; Manjit, Ranjeet, 1 Male, 27.v.1976, G. Singh (Z.S.I., Calcutta).

**Distribution**: India: Sikkim.

**Remarks**: This species is close to *binotata binotata* Fabricius, but can be distinguished by having erect vestiture almost entirely white and third tergite with a pair of oval well separated, red spots.

27. *Scolia (Discolia) desidiosa* (Bingham)


**Distribution**: India: Sikkim; Assam, Arunachal Pradesh, Uttar Pradesh and West Bengal. Elsewhere: Myanmar.

**Remarks**: Bingham (1896) reported 1 female from Runjeet Valley in Sikkim and 1 female and 1 Male from Sikkim and Myanmar (Bingham, 1897). This species is close to *sikkimensis* Bingham, but can be distinguished by having scutellum and metanotum almost entirely yellow; vestiture largely white, except posterior margins of tergites and fifth and sixth sternites, black.

**SUMMARY**

The scoliids are ectoparasitoids of coleopteran larvae, mainly *Scarbaeidae*, which are pests of forest and agriculture. Many of these may be economically exploited for the biological control of insect pests.

This paper deals with the Scoliidae fauna from the state of Sikkim. Altogether 27 species/subspecies under 9 genera and two tribes are treated in the text. The keys for the identification of tribes, genera, species and subspecies are provided. Distributional table and illustrations of morphological characters are included for ready reference.

**ACKNOWLEDGEMENTS**

We are grateful to Dr. J.R.B. Alfred, Director, Zoological Survey of India for providing necessary facilities to carry-out this research work. We are thankful to Dr. Arun Kumar, Scientist ‘E’ Officer-in-charge, Northern Regional Station, Z.S.I., Dehra Dun and Shri Rati Ram, P.P.O. for helping us in various ways.

**REFERENCES**


## Table Showing Distribution of Species/Subspecies of Subfamily Scoliinae
(Family : Scoliidae) in Sikkim

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<tr>
<td>I. Tribe Capsomerini</td>
</tr>
</tbody>
</table>

### 1. Genus *Phalerimeris* Betrem

1. *Phalarimeris phalerata phalerata* (Saussure)
   - **India**: Sikkim; Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Meghalaya, Tripura, Uttar Pradesh, West Bengal.
   - **Elsewhere**: China, Myanmar, Nepal, Taiwan, Sulawesi.

### 2. Genus *Colpacampsomeris* Betrem

2. *Colpacampsomeris indica indica* (Saussure)
   - **India**: Sikkim; Arunachal Pradesh, Himachal Pradesh, Meghalya, Uttar Pradesh, S. India, West Bengal.
   - **Elsewhere**: Mayanmar, Indonesia.

### 3. Genus *Sericocampsomeris* Betrem

3. *Sericocampsomeris stygia tygia* (Burmeister)
   - **India**: Sikkim; Arunachal Pradesh.

4. *Sericocampsomeris rubromaculata rubromaulata* (Smith)
   - **India**: Sikkim; Arunachal Pradesh, Andhra Pradesh, Assam, Bihar, Delhi, gua, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Tripur, Uttar Pradesh.
   - **Elsewhere**: Benglsdesh, Myanmar, Nepal, Srilanka.

### 4. Genus *Campsomeriella* Betrem

1. Subgenus *Campsomeriella* Betrem

5. *Campsomeriella (C.) collaris collaris* (Fabricius)
   - **India**: India : Sikkim, Arunachal Pradesh, Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Meghalya.
   - **Elsewhere**: Bangladesh, China, Indonesia, Korea, Malaysia Mayanmar, Nepal, Taiwan

2. Subgenus *Annulimeris* Betrem

6. *Campsomeriella (A.) annulata* (Fabricius)
   - **India**: Sikkim, Himachal Pradesh, Karnataka, Meghallaya, Uttar Pradesh.
   - **Elsewhere**: Bhutan, Nepal.
5. **Genus *Magacampsomeris* Betrem**

Elsewhere: Myanmar, Nepal |
Elsewhere: China, Honshu, Indonesia, Japan, Lorea, Malaysia, Myanmar, Nepal, Philippines, Taiwan. |

**II. Tribe *Scoliini***

6. **Genus *Liacos* Guerin**

Elsewhere: Myanmar, Nepal |

**7. Genus *Carinoscolia* Betrem**

| **11. *Carinoscolia bhamoensis* (Magretti)** | India: Sikkim  
Elsewhere: Kalimautan, Myanmar |
| **12. *Carinoscolia opalina opalina* (Smith)** | India: Sikkim, Assam, West Bengal.  
Elsewhere: Bangladesh, Myanmar, Singapore. |

**8. Genus *Megascolia* Betrem & Bradley**

3. **Subgenus *Regiscolia* Betrem**

Elsewhere: Bhutan, Nepal |

9. **Genus *Scolia* Fabricius**

4. **Subgenus *Discolia* Betrem & Bradle**

| **14. *Scolia (Discolia) sikkimensis* Bingham** | India: Sikkim, Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Tamil Nadu, Tripura, Pandicherry, Uttar Pradesh, West Bengal.  
Elsewhere: Myanmar, Nepal |
| **15. *Scolia (Discolia) rugifrons* Betrem.** | India: Sikkim, Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Tamil Nadu, Tripura, Pandicherry, Uttar Pradesh, West Bengal.  
Elsewhere: Myanmar, Nepal |
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<tr>
<th>No.</th>
<th>Species</th>
<th>Distribution</th>
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<td><strong>India</strong>: Sikkim, Karnataka, Meghalaya, Tamil Nadu, Uttar Pradesh, West Bengal. <strong>Elsewhere</strong>: Sri Lanka</td>
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<td>17.</td>
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<td><strong>India</strong>: Sikkim, Himachal Pradesh, Kashmir, S. India, West Bengal. <strong>Elsewhere</strong>: Sri Lanka</td>
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<td>20.</td>
<td><em>Scolia (Discolia) cyanipennis</em> Fabricius</td>
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<td>21.</td>
<td><em>Scolia (Discolia) venusta</em> Smith</td>
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<td>24.</td>
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<td>25.</td>
<td><em>Scolia (Discolia) binotata binotata</em> Fabricius</td>
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<td>27.</td>
<td><em>Scolia (Discolia) desidiosa</em> Bingham</td>
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INTRODUCTION

The family Sphecidae belongs to superfamily Sphecoidea which includes blue mud-dauber, black and yellow mud-dauber, digger or sand wasps. These sphecid wasps made their presence on earth when the primitive men established their home in forest. These wasps followed men from their forested habitats to mud houses to build mud nests in their houses. These sphecid wasps are mainly beneficial to man and cause no harm to him (Bohart and Menke, 1976).

The member of this family Sphecidae show complexities in their behaviour, and are always being subject of biological studies. Some species are ground nesters, and known as digger wasps; some species nest in pre-existing cavities used by beetle larvae, old insect galls; some construct their own mud cells. The majority of the members of this family are predatory on a great variety of terrestrial insects; but some are cleptoparasitic, that is, their larvae develop on the provision in the nest of other wasps. Because of their predatory and cleptoparasitic habits, it may be possible to exploit them for the control of insect pests.

Our knowledge of Indian Sphecidae is very limited. The only reference manual available in Indian Sphecidae is by Bingham (1897). Besides this, there are several small to large publications on Indian and Oriental Sphecidae by Brothers (1975); Cameron (1899-1905); Carpenter (1945, 1953); Hingston (1925); Krombein (1981-1991); Nurse (1914); Tsuneki (1956-1973); Turner (1911-1929); van der Vecht (1949-1973); Roy and Kundu (1985) and Jonathan et al. (2000).

Bohart and Menke (1976) published a generic reclassification of the world species of Sphecidae. The classification proposed by them has been followed here. However, Krombein (1979) has restored the subfamilies recognised by Bohart and Menke, to family rank.

The family Sphecidae characterised by the following characters: Pronotum essentially fixed with the mesothorax; its posterior margin in dorsal view nearly straight and usually separated from the scutum by a constriction that contributes to the formation of a raised collar; pronotal lobe well-separated from the tegula, so that the mesoscutum and mesopleuron are in contact with each other, but in some cases the pronotal lobe is very close to tegula or in narrow contact. Hind leg with a cleaning pecten or brush in a basal depression on the inner side of the basitarsus; this apparatus is opposed by the pectinate inner tibial spur. The setae simple and unbranched. Inner eye margin not notched or emarginate, except for Trypoxylonini and Philanthini. Circi on tenth tergum on male absent in most higher sphecids, but are present in Dolichurini, some Sphecini, most Sceliphronini and Astatinae. The thorax with episternal sulcus on the mesopleuron.

SYSTEMATICS

The family Sphecidae is represented by nine subfamilies. This is a moderately large family,
having more than 1,500 species known from the world, of these 450 species are known to occur in India, which is only a fraction of those awaited discovery.

In the state of Sikkim, this family is represented by seven subfamilies. 60 species/subspecies under 25 genera have been recorded from the state of Sikkim. Of these, one species marked with double asterisks (**) and 12 species marked with single asterisk (*) in the systematic account, have been recorded here for the first time from India and Sikkim respectively.

MATERIAL AND METHOD
An attempt has been made here to provide a consolidated account of the fauna of Sphecidae of the state of Sikkim, India based on a collection present at Zoological Survey of India. The material was received through various surveys of the state made by scientists of the Z.S.I. The keys to the subfamilies, tribes, genera, subgenera, species and subspecies are provided for the identification of various taxa. Taxonomic terms used in the present work have been explained with the help of illustrations.

TAXONOMIC TERMINOLOGY
The terms of morphological characters used in the text are mainly based on the works of Bingham (1897), Bohart and Menke (1976) and Krombein (1981-1991). The morphological terms are illustrated in figures 1-4.

SYSTEMATIC ACCOUNT
FAMILY SPHECIDAE
1. Subfamily AMPULICINAE
1. Tribe Dolichurini
1. Genus Dolichurus Latreille
1. taprobanae Smith, 1869
2. bipunctatus Bingham, 1896

2. Tribe Ampulicini
2. Genus Ampulex Jurine
3. latifrons Kohl, 1893
4. sikkimensis (Kriechbaum), 1874

5. crudeis Bingham, 1897
6. ruficaxis Cameron, 1902
7. compressa (Fabricius), 1793

2. Subfamily SPHECINAE
3. Tribe Sceliphronini
3. Genus Chalybion Dahlbom
1. Subgenus Chalybion Dahlbom
8. bengalense Dahlbom, 1845
9. malignum (Kohl), 1906

4. Genus Sceliphron Klug
2. Subgenus Sceliphron Klug
10. intrudens (Smith), 1859
11. madraspanum (Fabricius), 1793

3. Subgenus Prosceliphron van der Vecht
12. rectum Kohl, 1918

5. Genus Chlorion Latreille, 1802-1803
13. lobatum (Fabricius), 1775

4. Tribe Sphecini
5. Genus Sphex Linnaeus
4. Subgenus Sphex Linnaeus
*14. argentatus Fabricius, 1793
*15. sericeus fabricii Dahlbom, 1843
16. subtruncatus Dahlbom, 1843

6. Genus Isodontia Patton
17. aurifrons (Smith), 1859
18. edax (Bingham), 1897

7. Genus Prionyx van der Linden
*19. viduatus (Christ), 1791

4. Tribe Ammophilini
8. Genus Ammophila W. Kirby
20. atripes Smith, 1852
21. punctata Smith, 1856
*22. basalis Smith, 1856
*23. laevigata Smith, 1856

3. Subfamily LARRINAE
6. Tribe Larrini
9. Genus Larra Fabricius
**24. polita rufipes (Smith), 1857
10. Genus *Liris* Fabricius

5. Subgenus *Liris* Fabricius

25. *anthracina* Kohl, 1892
26. *dulcis* (Smith), 1860
27. *haemorrhoidalis* (Fabricius), 1804
28. *morio* Kohl, 1892
29. *sagax* Kohl, 1892
30. *subtessellata* (Smith), 1856
31. *jaculator* (Smith), 1856
32. *aurulenta* (Smith), 1856

11. Genus *Dicranorhina* Shuckard

33. *ruficornis* (Cameron), 1889
34. *varicornis* (Cameron), 1904

12. Genus *Tachytes* Panzer

35. *modestus* Smith, 1856

13. Genus *Tachysphex* Kohl

36. *bengalensis* Cameron, 1889

8. Tribe Miscophini

14. Genus *Lyroda* Say

37. *formosa* (Smith), 1859
38. *nigra* (Cameron), 1904
39. *venusta* Bingham, 1897

15. Genus *Trypoxylon* Latreille

6. Subgenus *Trypoxylon* Latreille

40. *gracilescens* Smith, 1860
41. *intrudens* Smith, 1870
42. *rejector* Smith, 1870
43. *bicolor* Smith, 1856

4. Subfamily CRABRONINAE

9. Tribe Crabronini

16. Genus *Crabro* Fabricius

44. *funestus* Kohl, 1915

17. Genus *Hingstoniola* Turner and Waterston

45. *duplicata* (Turner and Waterston), 1926

18. Genus *Dasyproctus* Lepeletier and Brulle

46. *agilis* (Smith), 1858
47. *oppidanus* Leclercq, 1972

19. Genus *Ectemnius* Dahlbom

48. *asiaticus* Leclercq, 1950
49. *fulvopilosellus* (Cameron), 1902
50. *violaceipennis* (Cameron), 1907

20. Genus *Lestica* Billberg

51. *alacer* (Bingham), 1896

5. Subfamily NYSSONINAE

10. Tribe Nyssonini

21. Genus *Brachystegus* A. Costa

52. *violaceipennis* (Cameron), 1904

11. Tribe Gorytini

22. Genus *Ammatomus* A. Costa

53. *alipes* (Bingham), 1897

23. Genus *Hoplisoides* Gribodo

54. *pictus* (Smith), 1856

12. Tribe Stizinini

24. Genus *Bembecinus* A. Costa

55. *prismaticus* (Smith), 1858

6. Subfamily PHILANTHINAE

13. Tribe Cercerini

25. Genus *Cerceris* Latreille

56. *basimaculata* Cameron, 1907
57. *instabilis* Smith, 1856
58. *pulchra* Cameron, 1890
59. *tristis* Cameron, 1890
60. *vigilans* Smith, 1856

SYSTEMATIC ACCOUNT

Key to the Indian Subfamilies of family SPHECIDAE (After Bohart and Menke, 1976)

1. Gaster with cylindrical petiole composed of sternum only, except in *Amphophila* with two sections; jugal lobe of hind wing large, with an anal vein.................................. SPHECINAE
1. Subfamily AMPULICINAE

The member of this subfamily are commonly known as “Cockroach Wasps” They prey upon cockroaches, one of the most primitive insect order. They occur principally in the tropic of old and new World.

Diagnostic characters: Inner orbits entire; ocelli normal; antennae inserted low on face, sockets contiguous with fronto-clypeal suture,
male with 13 and female with 12 segments. Clypeus strongly nasiform; mandible without a notch on externo-ventral margin. Pronotal lobe close to or touching tegula. Notauli long and deep. Propodeum moderately long with U-shaped to nearly triangular enclosure. Middle tibia with two spurs. Claws with a single tooth or bifid. Fore wing with two or three submarginal cells and two recurrent veins, first recurrent received by submarginal I or II, second recurrent received by II or III. Gaster sessile or with a short petiole. Male genitalia: Volsella with movable digitus and cuspis; aedeagus with teeth on ventral edge; cerci present or absent.

In India this subfamily is represented by two tribes. These can be distinguished by the following key:

**Key to the tribes of Ampulicinae**

1. Antennal sockets with an over hanging frontal lobe; metasternum Y-shaped. Gastral petiole inserted between and on same level as hind coxae ......................... Ampulicini

- Antennal sockets not covered or both over laid by a single median plateform-like lobe; metasternum not Y-shaped. Gastral petiole inserted above and somewhat after hind coxae ......................... Dolichurini

1. Tribe Dolichurini

This tribe is represented by a single genus, viz., *Dolichurus* Latreille, 1809 from India, including Sikkim. *Dolichurus* is the most generalised member of the tribe, having large number of species.

1. Genus *Dolichurus* Latreille


This is a small genus of mostly small and inconspicuous species, represented in India by five species, viz., *bipunctatus* Bingham, 1896; *clavipes* Cameron, 1897; *gilberti* Turner, 1912; *taprobanae* Smith, 1869 and *reticulatus* Cameron, 1899. Only two species have been reported from the state of Sikkim. These can be distinguished by the following key:

**Key to the species of Dolichurus**

1. Head and thorax entirely black; lateral angles of pronotum slightly produced, but not tuberculate ................. *taprobanae* Smith

- Head and thorax black, apex of tubercle above base of antennae and lateral tubercles on pronotum whitish-yellow...........................

.............................. *bipunctatus* Bingham

1. *Dolichurus taprobanae* Smith


**Remarks**: This species is readily distinguished by having head and thorax entirely black; pronotum not produced laterally.

2. *Dolichurus bipunctatus* Bingham


**Remarks**: This species is recognised by
having head and thorax black except tubercle above the base of antennae and pronotal tubercles, whitish-yellow.

2. Tribe Amplicini

This tribe represents majority of the species in the subfamily. All these species are under genus Ampulex Jurine, 1807.

2. Genus Ampulex Jurine


This is a moderately large genus comprising most of the species of the subfamily Ampulicinae. In India, this genus is represented by 22 species/subspecies, viz., aborensis Nurse, 1914; aenea Spinola, 1841; approximata Turner, 1912; assamensis Cameron, 1903; carinifrons Cameron, 1903; constanceae (Cameron), 1891; crudelis Bingham, 1897; compressa (Fabricius), 1793; formosa Kohl, 1893; himalayensis Cameron, 1903; hospes cognata Kohl, 1893; interstitialis Cameron, 1903; khasiana Cameron, 1903; latifrons Kohl, 1893; longicollis Cameron, 1902; montana Cameron, 1903; nigricans Cameron, 1899; pilosa Cameron, 1900; rothneyi Cameron, 1902; ruficoxis Cameron, 1902; sikkimensis (Kriechbaumer), 1874 and sodalicia Kohl, 1893. In Sikkim, this genus is represented by four species. These species can be distinguished by the following key:

Key to the species of Ampulex

1. Wings fuscous or smoky. (latifrons may be traced through either half of the couplet)

   2. Wings fusco-violaceous ........................................5

2. Median longitudinal carina on clypeus bifurcated near apical third; metallic blue or green, hind femora red; tarsi black ..........3

3. Pronotum not raised into a tubercle, above almost flat; claws bifid ........................................... latifrons Kohl

4. Fore wing with two submarginal cells; head, thorax and abdomen almost entirely smooth. Body metallic blue ........... crudelis Bingham

5. Hind coxa red ................ ruficoxis Cameron

   Hind coxa black ............... latifrons Kohl

3. Ampulex latifrons Kohl


Distribution: India: Sikkim, Meghalaya.

Remarks: This species is distinguished from its closely related species, viz., khasiana Cameron in having hind femora entirely red; pronotum not raised, cubical and almost-flat.

4. Ampulex sikkimensis (Kriechbaumer)

5. **Ampulex crudelis** Bingham


**Material examined**: India: Sikkim, 600 m, 1 ex., x. 1897, coll. Dudgeon (Ind. Mus. Colln.).

**Distribution**: India: Sikkim, Meghalaya.

**Remarks**: This species is easily distinguished by having fusco-violaceous wings; hind coxae and femora red, while legs in general dark blue.

6. **Ampulex ruficoxis** Cameron


**Material examined**: India: Sikkim, 600 m, 1 ex., x. 1897, coll. Dudgeon (Ind. Mus. Colln.).

**Distribution**: India: Sikkim, Meghalaya.

**Remarks**: This species is easily distinguished by having fusco-violaceous wings; hind coxae and femora red, while legs in general dark blue.

7. **Ampulex compressa** (Fabricius)


**Material examined**: India: Sikkim, 600 m, 1 ex., x. 1897, coll. Dudgeon (Ind. Mus. Colln.).

**Distribution**: India: Sikkim, Meghalaya, Assam, Arunachal Pradesh, Orissa, Bihar, Maharashtra, West Bengal, Andaman and Nicobar Islands and throughout India.

**Elsewhere**: Australia, Ethiopia, Myanmar, Sri Lanka, Chagos Archipelago, East Indies, Hawaii, Mauritius, New Caledonia, Seychelles and St. Helena.

**Remarks**: This species is close to *crudelis* Bingham in having seven longitudinal carinae on propodeum, but readily distinguished by having middle and hind femora red; fore wing with three cubital cells and the characters given in the key.

2. **Subfamily SPHECINAE**

The members of this subfamily are commonly called as “Sand wasps” They are commonly found in fields, forests and also in human habitats.

**Diagnostic characters**: Inner orbit entire, converging, diverging, or parallel; ocelli normal. Antennae in male 13 and in female 12-segmented. Mandible without notch or annulations. Pronotal lobe broadly separated from tegula. Middle tibia usually with two apical spurs; middle coxal cavities and coxae usually approximate, middle coxae without dorso-lateral carinae; precoxal lobe present; hind femur simple apically; claws with one to five teeth, or simple; aroleum usually large. Propodeum usually long with or without U-shaped enclosure. Fore wing with three submarginal cells, except *Ammophila* in Gaster with cylindrical petiole composed of sternum only unless it has two sections. Jugal lobe of hind wing large containing an anal vein.

This subfamily is subdivided into three tribes. A key to the tribes is given below (Bohart and Menke, 1976: 82).

**Key to the tribes of Sphecinae**

1. Tarsi with plentulae and /or claws of some legs with one basal tooth on inner margin...
   ................................................................. **Sceliphronini**

   – Tarsi without plentulae; claw simple or with one or more basal teeth on inner margin...
   ........................................................................... 2

2. Claw with two or more teeth; second recurrent vein usually received by submarginal cell III, but if not then claw...
with at least three teeth or apico-ventral setae of hind 5th tarsomere very broad, separated at base by not more than 1.5x of setal widths; tarsi without plentulae. Sphecini

- Claw usually simple or with one tooth, if with two teeth then apico-ventral setae of hind 5th tarsomere narrow, separated by three or more times of setal widths; second recurrent vein usually received by submarginal cell II; tarsi sometimes with plentuale. Ammophilini

3. Tribe Sceliphronini

This tribe is represented by three genera in India. They are also found in the state of Sikkim. A key to distinguish these genera is given below.

**Key to the genera of Sceliphronini**

1. Propodeal dorsum at most with a median longitudinal groove. (Mandibles simple or with a subapical tooth on inner margin; third anal vein of hind wing broadly separated from wing margin; body usually metallic blue or black and yellow) .. *Chalybion* Dahlbom
   - Propodeum with a U-shaped dorsal enclosure, defined posteriorly by a semicircular sulcus or furrow. .. 2
2. Both recurrent veins received by second submarginal cell; spiracular groove absent; body usually with yellow areas; female without fore tarsal rake. .. *Sceliphron* Klug
   - Second recurrent vein received by third submarginal cell or interstitial between II and III; spiracular groove present; body often with metallic blue or green. Antennal sockets contiguous with fronto-clypeal suture in female, separated by less than the diameter of socket in male .. *Chlorion* Latreille

3. Genus *Chalybion* Dahlbom

1. Subgenus *Chalybion (Chalybion)* S. str.


**Material examined** : India : Sikkim, 600 m, 5 exs., vii. 1897, coll. Dudgeon; 3 exs., no data given, coll. A. V. Knyvett.

**Distribution** : India : Sikkim, Andaman and Nicobar Is., Bihar, Goa, Himahal Pradesh, Jammu and Kashmir, Meghalaya, Orissa, Karnataka, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

**Remarks** : This species can be recognised by having body shiny, deep blue with glistening silvery pubescence. Apical segment of antennae, tarsi black. Mesoscutum punctate, petiole abdomen smooth and polished.

9. Chalybion (Chalybion) malnignum (Kohl)


4. Genus *Sceliphron* Klug

This genus is found in all of the temperate and tropical continental areas of the world and many islands. The species of this genus are moderately small to large (12-32 mm) in size; usually black in colour and legs conspicuously marked with yellow in most species. The yellow markings, very long petiole and propodeal enclosure readily distinguish the species of this genus from other genera.

The genus has been divided into two subgenera, viz., *Prosceliphron* van der Vecht, 1968 and *Sceliphron* s. str. These two can be distinguished by the presence of cerci and the short hyposternal carina in *Prosceliphron* (Bohart and Menke, 1976).

Key to the subgenera of *Sceliphron*

1. Eighth tergite without cerci in male, hypostomal carina long, ending near the base of mandible ...................... *Sceliphron* s. str.
   - Eighth tergite of male with cerci; hypostomal carina evanescent, extending about half way to the base of mandible ...................... *Prosceliphron* van der Vecht

2. Subgenus *Sceliphron* (Sceliphron) s. str.


In India, this subgenus is represented by five species/subspecies, viz., *intrudens* (Smith), 1859; *javanum nalandicum* Strand, 1915; *javanum petiolare* Kohl, 1918; *madraspatanum* (Fabricius), 1793 and *madraspatanum andamanicum* Kohl, 1918. Only two species have been recognised from Sikkim, and these can be distinguished by the following key:

Key to the species of *Sceliphron* (Sceliphron)

1. Hind leg with femur at its extreme apex and apical half of tibia, black. Body 27-30 mm ............................................. *intrudens* (Smith)
   - Hind leg with femur and tibia at its apical two-thirds, black. Body 16-18 mm .......... 
     ........................................... *madraspatanum* (Fabricius)

10. *Sceliphron* (Sceliphron) *intrudens* (Smith)


*Remarks*: This is one of the common and widely distributed species in India and adjoining countries. This species is readily distinguished by having yellow bands on legs.

11. *Sceliphron* (Sceliphron) *madraspatanum* (Fabricius)


3. Subgenus *Sceliphron* (Prosceliphron) van der Vecht


This subgenus is represented by 5 species/subspecies, viz., *coromandalicum* (Lepeletier), 1845; *curvatum* Smith, 1817; *deforme tibiale* Cameron, 1899; *formosum* Smith, 1856 and *rectum* Kohl, 1918. Only one species has been reported from Sikkim. 

12. *Sceliphron (Prosceliphron) rectum* Kohl


Distribution: India: Sikkim.

5. Genus *Chlorion* Latreille


In India, this genus is represented by two species viz., *lobatum* (Fabricius), 1775 and *splendidum* Fabricius, 1804. Of these, only *lobatum* has been reported from the state of Sikkim.

13. *Chlorion lobatum* (Fabricius)


Diagnostic characters: Female: Body length 24-32 mm, smooth and shiny; head and thorax with a very few shallow punctures; clypeus transverse, convex in the middle, its anterior margin curved and emarginate; the median segment long and cylindrical; abdomen petiolate, the petiole short; legs long and slender, the tibiae and tarsi spinose; wings hyaline; body blue-green in colour, but the antennae, the tibiae below and the tarsi dark black. Clypeus with silvery pile.

Male: Body length 15-26 mm, slightly smaller in size, but more or less similar with female; clypeus triangular; tagulae purple-blue.


4. Tribe Sphecini

This tribe is represented by three genera, viz., *Sphex* Linnaeus, 1758; *Isodontia* Patton, 1881 and *Prionyx* van der Linden, 1827 from India and also from Sikkim.

Key to genera of tribe Sphecini

1. Length of basal veinlet of submarginal cell II greater than anterior veinlet; spiracular groove absent. (Hind tarsal claw with two to five teeth on inner margin) ....................

.. Prionyx van der Linden

- Length of basal veinlet of submarginal cell II equal to or (more often) shorter than anterior veinlet; spiracular groove present or absent........................................ 2

2. Female mandible long, broadest at middle, usually strongly arcuate; propodeal side with complete spiracular groove; length of petiole along dorsum less than combined length of hind tarsomeres II-IV ...... *Sphex* Linnaeus

- Female mandible short, broadest at or near apex; propodeal side without spiracular groove or groove indicated near hind coxa; length of petiole along dorsum more than combined length of hind tarsomeres II-IV ........................................ *Isodontia* Patton

6. Genus *Sphex* Linnaeus

This genus has been divided into two subgenera, *Sphex* s. str. and *Fernaldina* Bohart and Menke, 1963. *Sphex* (*Fernaldina*) has been reported from Holarctic region. Indian species/subspecies fall under subgenus *Sphex* (*Sphex*).

4. Subgenus *Sphex* (*Sphex*) s. str.


Five species/subspecies, viz., argentatus Fabricius, 1793; diabolicus Smith, 1858; sericeus fabricii Dahlbom, 1843; subtruncatus Dahlbom, 1843 and predator melanopoda Strand, 1915 are referable to this subgenus from India. Sikkim is represented by three species. These can be distinguished by the following key:

**Key to the species/subspecies of Sphex (Sphex)**

1. Postscutellum not longitudinally notched; wings fulvo-hyaline. (Pubescence on head and median segment black; legs black; fore and middle femora and tibiae, red.) .......... subtruncatus Dahlbom
   - Postscutellum longitudinally notched; wings clear hyaline. ................................................. 2

2. Face at sides and clypeus with dense silvery pubescence. Pubescence on thorax and petiole thin soft and hoary white. Body largely black .......... argentatus Fabricius
   - Head and thorax covered with dense ferrugenuous-red pubescence. Body largely red with black areas. .................. sericeus fabricii Dahlbom

14. Sphex (Sphex) argentatus Fabricius


**Material examined** : India : Sikkim, 600 m, 5 exs., vii. 1897, coll. Dudgeon (Ind. Mus. Colln.); 1 ex., no data given, coll. A. V. Knyvett.

**Distribution** : India : Sikkim, Assam, Bihar, Orissa, Kerala, Uttar Pradesh, Meghalaya and throughout India (Bingham 1897 : 250).

**Elsewhere** : African middle east, Australian and Eastern Palaeartic regions, China, Japan, Malaysia, Sri Lanka, Myanmar, Pakistan, Bangladesh.

**Remarks** : This species is readily distinguished by having postscutellum bituberculate, body largely black with silvery white hairs. This is the first record of this species from the state of Sikkim.

15. Sphex (Sphex) sericeus fabricii Dahlbom


**Material examined** : India : Sikkim, 600 m, 9 exs., vii-ix. 1897, coll. Dudgeon; 1 ex., no data given, coll. A. V. Knyvett.

**Distribution** : India : Sikkim, Meghalaya, West Bengal, Orissa, Karnataka. **Elsewhere** : Sri Lanka, Pakistan, Myanmar, China, Australia, Malaysia.

**Remarks** : This is the first record of this subspecies from the state of Sikkim.

16. Sphex (Sphex) subtruncatus Dahlbom


**Material examined** : India : Sikkim, 600 m, 1 ex., vi. 1897, coll. Dudgeon (Ind. Mus. Colln.); 1 ex., no data given, coll. A. V. Knyvett; 1 ex., vi. 1912, coll. Nil.

**Distribution** : India : Sikkim, West Bengal, Meghalaya, Tripura, Uttar Pradesh, Kerala and Western Ghats. **Elsewhere** : Indonesia, China, Africa, Myanmar, Sri Lanka.
6. Genus *Isodontia* Patton


In India, this genus is represented by five species, viz., *apicata* (Bingham), 1897; *aurifrons* (Smith), 1859; *diodon* (Kohl), 1890; *edax* (Bingham), 1897 and *ochroptera* (Kohl), 1890. Only two species have been reported from the state of Sikkim. These can be distinguished by the following key:

**Key to the species of *Isodontia***

1. Wings fulvo-hyaline; pubescence on front and thorax golden ................. *aurifrons* (Smith)

- Wings fusco-hyaline with purple effulgence; pubescence largely greyish or silvery .......... *edax* (Bingham)

17. *Isodontia aurifrons* (Smith)


18. *Isodontia edax* (Bingham)


*Material examined*: India : Sikkim, 1 ex., vii. 1897, coll Dudgeon (Ind. Mus. Colln.).

*Distribution*: India : Sikkim, Rajasthan and widely distributed in India. *Elsewhere*: Africa, China, Pakistan, East Mediterranean, Soudi Arabia, Egypt, Gambia, Sierra Leone, Guinea, Socotra Is., Taiwan, Ryukyus.

*Remarks*: This is the first time of the species from the state of Sikkim.

5. Tribe Ammophilini

This tribe is represented by three genera, viz., *Ammophila* Kirby, 1798; *Parapsammophila* Taschenberg, 1869 and *Podolonia* Fernald, 1927. Only *Ammophila* has been reported from Sikkim.

8. Genus *Ammophila* Kirby


In India, this genus is represented by eight species/subspecies, viz., *atripes* Smith, 1852; *basalis* Smith, 1856; *laevigata* Smith, 1856; *punctata* Smith, 1856; *tyrannica* Cameron, 1890; *brevipennis* Bingham, 1897; *philomela* Nurse, 1903 and *smithii* Smith, 1856. Only four species have been reported from the state of Sikkim. These can be distinguished by the following key:

**Key to the species of Ammophila**

1. Pronotum, mesonotum and propodeum striate; propodeum dorsally along the middle line sometimes reticulate ........................................ 2
   - Pronotum and mesonotum punctate, propodeum striate at sides, punctate along the middle line .............................................. 3

2. Propodeum dorsally and laterally transversely striate. Abdomen largely bluish-black. Body large, female 18-30 mm; male 23-27 mm. .................................................. *atripes* Smith
   - Propodeum dorsally reticulate and striate along the sides. Abdomen largely red. Body short, female 20-22 mm, male 16-18 mm. ............................................. *basalis* Smith

3. Legs red in female, except coxae, trochanters and femora above, tibiae at apex and tarsi of hind legs, black. Length 20 mm. .................. ........................................ *laevigata* Smith
   - Legs black. Length 17-18 mm. .................... .................................. *punctata* Smith

20. **Ammophila atripes** Smith


**Remarks**: This is a distinct species by having pronotum and mesoscutum largely striated; legs in general red in female and black in male.

21. **Ammophila punctata** Smith


**Remarks**: This species is readily distinguished by having pronotum and mesoscutum punctate, abdomen largely black, with apex of first and following two segments, red.

22. **Ammophila basalis** Smith


**Material examined**: India: Sikkim, 3 exs., no data, coll. L. de Nieceville.

**Distribution**: India: Sikkim, Assam, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Karnataka, Tamil Nadu, Punjab, Uttar Pradesh and West Bengal. Elsewhere : Pakistan.

**Remarks**: This is the first record of this species from the state of Sikkim.

23. *Ammophila laevigata* Smith


**Material examined**: India: Sikkim, 300 m, 1 ex., 600 m, 2 exs., vii.-viii. 1897, coll. Dudgeon.


**Remarks**: This is the first record of this species from Sikkim.

3. Subfamily LARRINAE

The members of this subfamily are often dark in colour ranging from 2-30 mm. in length. Most species are fossorial and commonly termed as "digger wasps" They prey upon the adults of spiders, Orthoptera, Hemiptera, Diptera, Coleop-tera, Hymenoptera and also larvae of Lepidoptera.

**Diagnostic characters**: Inner orbits usually converging above, parallel, rarely converging below; posterior ocelli usually normal. Antennae inserted low on face except near middle in some genera, sockets contiguous with fronto-clypeal suture or separated. Female with 12 and male with 13-segmented antennae. Clypeus transverse except about as high as broad in some genera. Palpal formula 6-4, except 5-3 in some *Tachytes*. Pronotal lobe separated from tegula. Mesopleuron usually with an episternal sulcus. Metapleuron consisting only of upper area, definitive pleuron tapering ventrad. Middle tibia with one apical spur; middle coxae usually separated, each with a dorso-lateral carina or crest like elevation; claws simple except toothed in some females of Larrini. Propodeum short to long, dorsal enclosure present or absent. Fore wing usually with 3 submarginal cells but sometimes none. Hind wing with jugal lobe varying from as long as anal area to very small or absent. Gaster usually sessile, but sometimes pedunculate or petiolate; tergum I and occasionally II with lateral carina; male with 7 visible terga; pygidial plate present or absent. Volsella in male simple without digitus, rarely absent; cerci absent.

This subfamily is represented by four tribes, viz., Larrini, Palarini, Miscophini and Trypoxylonini in India. Only three tribes are represented in the state of Sikkim. These tribes can be distinguished by the following key (Bohart and Menke, 1976).

**Key to the tribes of Larrinae**

1. Hind ocelli reduced to flat, opaque scars of various shapes; jugal lobe of hind wing large, nearly as long as anal area...........Larrini
   – Hind ocelli with a convex or somewhat flattened, complete transparent lens; jugal lobe of hind wing small or absent, never more than one-half the length of anal area......2
2. Inner orbits emarginate.......Trypoxylonini
   – Inner orbits straight, bowed or sinuate but not emarginate........................................3
3. Clypeus divided into three parts by two
vertical suture-like lines; antennal sockets separated from fronto-clypeal suture by one-third or more of a socket diameter; hind ocelli usually flattened and elliptical. **Palarini***

- Clypeus not divided into three parts; antennal sockets essentially contiguous with fronto-clypeal suture; hind ocelli round and convex; (hind femoral apex simple, femur thickest near middle, gradually tapering towards apex; inner orbits parallel or converging above) ............................................. **Miscophini**

(* Not recorded from Sikkim)

6. Tribe **Larrini**

This tribe is represented by nine genera, viz., **Larra** Fabricius, 1793; **Liris** Fabricius, 1804; **Paraliris** Kohl, 1884; **Dicranorhina** Shuckard, 1840; **Tachytes** Panzer, 1806; **Parapiagetia** Kohl, 1896; **Tachysphex** Kohl, 1883; **Holotachysphex** Beaumont, 1940 and **Prospopigastra** A. Costa, 1867 in India. Only five genera have been reported from Sikkim. A key to the genera is given below:

**Key to the genera of tribe Larrini**

1. Gaster pedunculate, first segment longer than broad in dorsal view; ocelli on a nearly flat surface .................. **Dicranorhina** Shuckard

- Gaster not pedunculate, first segment about as broad as long in dorsal view; middle ocellus usually in a depression and area between ocelli often raised .................. 2

2. Frons below median ocellus with a transverse swelling extending between the eyes and joining a linear swelling along inner orbit to form a M or inverted U-shaped swelling ...

- Frons variable and without swelling as above ........................................ 3

3. Female: last tarsomere evenly arcuate in lateral view, sides diverging most of way to apex, ventral surface without hairmat; claws without an inner tooth; pronotal collar flat or slightly arcuate in front view; pygidial plate glabrous and shiny, no transverse row of setae apically. Male: propodeum densely punctate; apical half of outer surface of fore tibia usually with one or more erect bristles ........................................... **Larra** Fabricius

- Female: last tarsomere angled in lateral view, sides parallel on apical half; ventral surface usually with dense hair; claw prehensile, sometimes with an inner tooth; pronotal collar wedged-shaped in front view; pygidial plate extensively setose and usually with a transverse row of apical setae. Male: Propodeum dull and impunctate or if shiny, then at most with sparse minute punctures; outer surface of fore tibia without bristles ........................................... **Liris** Fabricius

4. Ocellar scars very long, distance between middle ocellus and of tail less than the length of scar; pygideal plate covered with dense setae which obscure integument ............... ........................................... **Tachytes** Panzer

- Ocellar scars oval or oblong; distance between middle ocellus and lower end of scar equal to or greater than length of scar; pygidial plate bare in female, absent in male. Gastral tergum II without a lateral carina, male fore femur with a baso-lateral notch or depression ........................................... **Tachysphex** Kohl

9. Genus **Larra** Fabricius


1840. **Monomatium** Shuckard, In Swainson and Shuckard, *Cabinet Cyclopedia of Lardner*, 129 : 181. Type-species: **Larraxena princeps** Smith, 1851. Designated by Pate, 1935. First included species.


Type-species: *Sphex anathema* Rossi, 1790.  
Original designated.


In India, this genus is represented by seven species, viz., *apicepennis* Cameron, 1904; *bicolorata* Cameron, 1900; *fuscinerva* Cameron, 1900; *polita rufipes* (Smith), 1859; *pygidialis* Cameron, 1904 and *simillima* (Smith), 1856. Only one subspecies has been reported from the state of Sikkim, which is detailed below:

24. *Larra polita rufipes* (Smith)


Diagnostic characters: Body largely black, except head and clypeus in front, posterior margin of pronotum, first to fifth abdominal segments with apical bands, bright silvery; legs except the coxae and trochanters, red.

Body minutely punctate, pruinose; clypeus broader than long; propodeum finely trans-striate, at sides smooth; tarsal claws long and stouter.

Material examined: India : Sikkim, 600 m, 1 ex., viii. 1897, coll. Dudgeon.

Distribution: India : Sikkim. Elsewhere : Indonesia (Java) and Kalimantan.

Remarks: This is the first record of this subspecies from India, including Sikkim.

25. *Liris* (Liris) *anthracina* Kohl


26. *Liris* (Liris) *ducalis* (Smith)


**Material examined** : India : Sikkim, 600 m, 6 exs., vii. 1897 and 1000 m, 3 exs., vii. 1897, coll. Dudgeon.


27. *Liris (Liris) haemorrhoidalis* (Fabricius)


28. *Liris (Liris) morio* Kohl


**Distribution** : India : ? Sikkim.

29. *Liris (Liris) sagax* Kohl


**Distribution** : India : ? Sikkim.

30. *Liris (Liris) subtessellata* (Smith)


**Material examined** : India : Sikkim, 600 m, 10 exs., vii-ix. 1897, coll. Dudgeon; 1 ex., no data given, coll. A. V. Knvett; Manul, 1491 m, 1 ex., 5 viii. 1959, coll. A.G.K. Menon.

**Distribution** : India : Sikkim; West Bengal, Assam, Karnataka, Orissa, Tamil Nadu. *Elsewhere* : Mediterranean region, Oriental region, Ryukyus, S-W Asia.

**Remarks** : This species is recorded here for the first time from Sikkim.

31. *Liris (Liris) jaculator* (Smith)


**Material examined** : India : Sikkim, 1 ex., v. 1912, no further data; 600 m, 3 exs., viii-xi. 1897, coll. Dudgeon.


**Remarks** : This is the first record from the state of Sikkim.

32. *Liris (Liris) aurulenta* (Smith)


**Material examined** : India : Sikkim, 600 m, 6 exs., vii-viii. 1897, coll. Dudgeon.

**Distribution** : India : Sikkim, Assam, Bihar, Karnataka, Rajasthan, Tamil Nadu, West Bengal. *Elsewhere* : Myanmar, Sri Lanka, China, Japan, Indonesia, South and West Africa.

**Remarks** : This is the first record of this species from Sikkim.

11. Genus *Dicranorhina* Shuckard


This is a small genus of old world tropics. Three species viz., *fasciatiipennis* (Cameron),
1889; *ruficornis* (Cameron), 1889 and *varicornis* (Cameron), 1904 are referable to this genus from India. Of these, only two species are reported to occur in the state of Sikkim. Due to lack of details, a key to species could not be provided.

33. *Dicranorhina ruficornis* (Cameron)


34. *Dicranorhina varicornis* (Cameron)


*Distribution*: India : Sikkim.

12. Genus *Tachytes* Panzer


This is moderately a large genus, having about 24 species/subspecies in Indian region. They are black or black and red in colour, densely covered with golden or silvery pubescence. They nest in ground and store orthopteran larvae in their nests. The following species are referable to this genus from India : *assamensis* Cameron, 1904; *argyreus* (Smith), 1856; *astatus* Nurse, 1909; *brevipennis* Cameron, 1900; *celsissimus* Turner, 1917; *dichrous hospes* Bingham, 1898; *fervidus* Smith, 1856; *flagellatus* Nurse, 1903; *fulvopilosus* Cameron, 1904; *indicus* Dalla-Torre, 1897; *modestus* Smith, 1856; *monetarius* Smith, 1856; *nitidulus* (Fabricius), 1793; *pygmacus* Kohl, 1888; *repandus* (Fabricius), 1787; *rufipalpis* Cameron, 1904; *saundersii* Bingham, 1897; *sinensis* Smith, 1856; *tabrobane* Cameron, 1900; *tarsalis* (Dalla-Torre), 1897; *vestitus* (Smith), 1873; *vicinus* Cameron, 1889; *vischnu* Cameron, 1889 and *xenoferus* Rohwer, 1911. Only one species of this genus is known from Sikkim.

35. *Tachytes modestus* Smith


*Diagnostic characters*: Female and Male :

- Body in general densely pubescent; pile on abdomen silvery and head and thorax pale golden; stiff hairs on pygidium silvery, apical half of femora, tibiae and tarsi testaceous red.
- Wings yellowish hyaline. Body length 11-15 mm.


13. Genus *Tachysphex* Kohl


This is a moderately a large genus, represented in India by 20 species/subspecies, viz., *albocinctus* (Lucas), 1848; *albocinctus peculator* Nurse, 1909; *auriceps* Cameron, 1889; *bengalensis* Cameron, 1889; *bituberculatus* Cameron, 1905; *conclusus* Nurse, 1903;
**JONATHAN & KUNDU : Insecta : Hymenoptera : Sphecidae**

erythrophorus Dalla-Torre, 1897; erythrops (Spinola), 1838; fulvicornis Turner, 1918; gujaraticus Nurse, 1909; instructus Nurse, 1909; minutus Nurse, 1909; novarae (Saussure), 1867; plicosus (A. Costa), 1867; pompilijormis (Panzer), 1804; puncticeps Cameron, 1903; schmiedeknechti Kohl, 1883; selectus Nurse, 1909 and tinctipennis Cameron, 1904. Only one species has been reported from the state of Sikkim.

36. Tachysphex bengalensis Cameron


Diagnostic characters: Female : Body 8-10 mm long. Head and thorax closely punctate, abdomen smooth; front, clypeus and cheeks densely pilose; a λ-shaped groove behind the ocelli; first to fifth abdominal segments with broad apical silky pile. Body black, pubescence white. Wings clear hyaline.


7. Tribe Miscophini

This tribe is represented by four genera, viz., Lyroda Say, 1837; Paranysson Guérin-Meneville, 1844; Nitela Latreille, 1809 and Miscophus Turina, 1807, in India. Only one genus has been reported from the state of Sikkim.

14. Genus Lyroda Say


This genus is represented by five species in India, viz., argenteofacialis (Cameron), 1889; formosa (Smith), 1859; nigra (Cameron), 1904; salai Giner Mari, 1945 and venusta Bingham, 1897. Three species have been reported from the state of Sikkim. These can be distinguished by the following key:

**Key to the species of Lyroda**

1. Median segment finely rugose; basal two abdominal segments, red ................................. formosa (Smith)

- Median segment somewhat coarsely reticulate; abdomen entirely black......................... venusta Bingham (nigra could not be included in the key.)

37. Lyroda formosa (Smith)


Remarks : This species is readily distinguished by having dense velvety pruinose on body and basal two abdominal segments, red.

38. Lyroda nigra (Cameron)


Distribution : India : Sikkim.

39. Lyroda venusta Bingham


Material Examined: India: Sikkim, 600 m, 1.ix.1897, coll. Dudgeon (Ind. Mus. Colln.).


Remarks: This species is recorded here for the first time from the state of Sikkim.

8. Tribe Trypoxylonini

This tribe is represented by two genera, viz., Pison Jurine, 1808 and Trypoxylon Latreille, 1796. Of these, only Trypoxylon subgenus Trypoxylon has been reported from the state of Sikkim. However, a key to both the Indian genera is given below for ready reference.

**Key to the genera of tribe Trypoxylonini**

1. Fore wing with one submarginal cell; antennal sockets not contiguous with fronto-clypeal suture ...................... Trypoxylon Latreille
   - Fore wing with two or three submarginal cells; antennal sockets contiguous with fronto-clypeal suture .......... Pison Jurine*
   (* not reported from Sikkim)

15. Genus Trypoxylon Latreille

6. Subgenus Trypoxylon (Trypoxylon) s. str.


This is a moderately large subgenus, represented in India by 22 species, viz., accumulatus Smith, 1875; bicolor Smith, 1856; buddha Cameron, 1889; canaliculatus Cameron, 1889; fletcheri Turner, 1918; fulvocollare Cameron, 1904; geniculatus Cameron, 1902; gracilescens Smith, 1860; indicum Menke, 1976; intrudens, Smith, 1870, khasiae Cameron, 1904; mandibulatum Richards, 1933; montanum Schulz, 1906; nodosicorne Turner, 1917; orientale Cameron, 1904; pileatum Smith, 1856; pygnaeum Cameron, 1900; rejector Smith, 1870; responsum Nurse, 1903; testaceicorne Cameron, 1907; tinctipenne Cameron, 1889 and trochanteratum Cameron, 1902. In Sikkim this subgenus is represented by three species and these can be distinguished by the following key:

**Key to the species of Trypoxylon (Trypoxylon)**

1. Median segment with a medial longitudinal furrow, and two lateral convergent furrows enclosing a triangular space at base; triangular space weakly transversely striate ........................................ intrudens Smith
   - Median segment with only medial furrow, but no lateral furrow and triangular space ................................................... 2

2. Legs wholly black; fourth and following abdominal segments also black ......................................................................... rejector Smith
   - Legs black with reddish-brown markings .................................................. 3

3. Abdomen red, petiole only black .................................................. gracilescens Smith
   - Abdomen black; second and third abdominal segments, red ................................ bicolor Smith

40. Trypoxylon (Trypoxylon) gracilescens Smith


Remarks: This species is readily distinguished by having second to last abdominal segments red and legs black with reddish-brown markings.

41. Trypoxylon (Trypoxylon) intrudens Smith


**Remarks**: This species is readily distinguished by having two lateral convergent furrows, in addition to a median furrow on median segment, forming a weakly transversely striated triangular area.

42. *Trypoxylon (Trypoxylon) rejector* Smith


**Remarks**: This species is recognised by having legs black with reddish-brown markings and abdomen (except first segment) wholly red.

43. *Trypoxylon (Trypoxylon) bicolor* Smith


4. Subfamily CRABRONINAE

This subfamily includes a great variety of forms. They are commonly known as silver-moth or mustache-wasps, due to the presence of a transverse silvery clypeus which together with the vertical pale stripes on the scapes, forms an inverted pi-mark \( \pi \). They prey most orders of insects, but dipterans are favourite.

**Diagnostic characters**: Eyes moderately separated, converging below, ocelli normal. Antennal sockets close to fronto-clypeal suture; male with 11-13 and female with 12-segmented antenna. Mandible with externo-ventral notch. Pronotal lobe and tegula separated. Notauli short and indistinct. Middle tibia with one spur, sometimes none in male, rarely none in female; middle coxae slightly to broadly separated, without dorso-lateral carina; hind femoral apex sometimes thickened and truncate; claws simple; fore tarsus with or without a rake. Propodeum short, dorsal enclosure sometimes present; no propodeal sternite. Fore wing with one submarginal cell or this may be fused with first discoidal cell, third discoidal cell absent. Jugal lobe of hind wing small, shorter to longer than submedian cell, media diverging beyond cu-a; second anal vein and subcosta absent. Gaster sessile or pedunculate, tergite I with lateral carina; male with 7 visible tergites; pygidial plate always present in female and in some males. Volsella simple and cerci absent.

In India, this subfamily is represented by 13 genera under two tribes viz., Oxybelini and Crabronini. The following genera are referable to this subfamily: *Oxybelus* Latreille, 1796; *Encopognathus* Kohl, 1896; *Entomognathus*, Dahlbom, 1844; *Lindenius* Lepeletier and Brulle, 1834; *Rhopalum* Stephens, 1829; *Isorhopalum* Leclercq, 1963; *Crossocerus* Lepeletier and Brulle, 1834; *Crabro* Fabricius, 1775; *Vechtia* Pate, 1944; *Hingstoniola* Turner and Waterston, 1926; *Dasyproctus* Lepeletier and Brulle, 1834; *Ectemnius* Dahlbom, 1845 and *Lestica* Billberg, 1820.

**Key to the tribes of Crabroninae**

1. Submarginal and discoidal cells fused .......... **Oxybelini**

Submarginal and discoidal cells separate, not fused .......... **Crabronini**

The state of Sikkim is represented by tribe Crabronini only.

9. Tribe Crabronini

This tribe is represented by 12 genera in India, as already listed above. Only five genera, viz., *Crabro* Fabricius, *Hingstoniola* Turner and Waterston, *Ectemnius* Dahlbom, *Dasyproctus* Lepeletier and Brulle and *Lestica*
Billberg have been reported from the state of Sikkim. These genera can be distinguished by the following key:

**Key to the genera of tribe Crabronini**

1. Scapal basin with lateral carinae, which may be continuous dorsally
   - **Hingstoniola** Turner and Waterston
   - Scapal basin carinate laterally 2

2. Gaster with a slender peduncle, which is nodose toward the apex. Body Mostly dull
   - **Dasyproctus** Lepeletier and Brulle
   - Gaster sessile or pedunculate, but not nodose toward the apex 3

3. Female pygidial plate always flat; absent in male; verticulus absent but sometimes replaced by an angle or sharp tooth; (mandible usually bidentate apically)
   - **Crabro** Fabricius
   - Female pygidial plate more commonly gutter like 4

4. Orbital foveae absent or shallow; male antennae with 12 or rarely with 13 segments
   - **Ectemnius** Dahlbom
   - Orbital foveae distinct; male antennae always with 12 segments

**16. Genus Crabro Fabricius**


This is a small genus known by four species viz., *comberi* Leclercq, 1950; *flavoniger* Dutt, 1921; *funestus* Kohl, 1915 and *gulmargensis* Nurse, 1903. This genus is mainly known from India and Tibet. Only one species is known from Sikkim, which is detailed below:

**44. Crabro funestus** Kohl


**Distribution**: India : Sikkim, Hills of North India. Elsewhere : Tibet.

17. Genus *Hingstoniola* Turner and Waterston


This is a small genus represented by a single species viz., *duplicata* (Turner and Waterston), 1926 from Sikkim, in India, which is detailed below:

**45. Hingstoniola duplicata** (Turner and Waterston)


**Distribution**: India : Sikkim.

18. Genus *Dasyproctus* Lepeletier and Brulle


This is a small genus, known by four species, viz., *agilis* (Smith), 1858; *buddha* (Cameron), 1889; *oppidanus* Leclercq, 1972 and *pulveris* (Nurse), 1902 from India. Two species have been reported from Sikkim, which are detailed below. A key to species could not be provided.

**46. Dasyproctus agilis** (Smith)


47. Dasyproctus oppidanus Leclercq


Distribution: India: Sikkim.

19. Genus Ectemnius Dahlbom


This is a widely distributed genus. About 160 species in the world and 16 species have been described from India. Most of the species of Crabro from India belong to this genus (Bingham, 1897 : 321).

The following species are referable to this genus from India: agycus (Cameron), 1904; ammanitus Leclercq, 1958; asiaticus Leclercq, 1950; bogoressis Leclercq, 1958; chrysites (Kohl), 1892; corvidus Laclercq, 1961; fulvopilosellus (Cameron), 1902; fusceipennis (Lepeletier and Brulle), 1834; insignis (Smith), 1856; lyias (Cameron), 1905; melanotarsis (Cameron), 1902; menyllus (Cameron), 1905; palitans (Bingham), 1896; sodalis (Bingham), 1897; trichiosomus (Cameron), 1904 and violaceipennis (Cameron), 1907. Only three species have been reported so far from the state of Sikkim. A key to species could not be provided.

48. Ectemnius asiaticus Leclercq


Distribution: India: Sikkim.

49. Ectemnius fulvopilosellus (Cameron)


Distribution: India: Sikkim.

Remarks: This species is readily distinguished by having golden yellow pubescence on the body.

50. Ectemnius violaceipennis (Cameron)


Distribution: India: Sikkim.

20. Genus Lestica Billberg


This is a small genus of Oriental region. In India, this genus is represented by two species viz., alacer (Bingham), 1896 and quadriceps (Bingham), 1897. Only one species is known from the state of Sikkim, which is detailed below:

51. Lestica alacer (Bingham)


5. Subfamily NYSSONINAE

The members of this subfamily is commonly known as “sand wasps” Most species nest in the ground and prefer sandy habitats. They prey
up-on variety of other insects, from grasshoppers
to flies. This is fairly a large subfamily, there are
more than 1400 known species (Bohart and
Menke, 1976) under this family.

Diagnostic characters: Eyes parallel or
converging below, rarely converging above.
Mandible not notched nor toothed. Scutellum
without complete notauli. Middle tibia with two
apical spurs; claws simple. Propodeal sternite
absent. Fore wing with two or three submarginal
cells of which II usually receives at least one
recurrent vein; three discoidal cells present.
Jugal lobe in hind wing usually small, rarely
absent, at most half as long as anal area. Gaster
usually sessile, when pedunculate, made up of
both tergite and sternite. Male genitalia usually
with volsella differentiated into cuspis and
digitus.

In India, this subfamily is represented by 14
genera under five tribes, viz., Alyssonini,
Nyssonini, Gorytini, Stizini and Bembicini. The
following genera are referable to this subfamily :
Alysson Panzen, 1806; Nursea Cameron, 1902;
Nysson Latreille, 1802-1803; Synnevrus A. Costa, 1859;
Brachystegus A. Costa, 1859; Dienoplus W. Fox, 1893;
Gorytus Latreille, 1804; Lestiphorus Lepeletier, 1832;
Ammatomus A. Costa, 1859; Hoplisoidea Gribodo, 1884;
Stizus Latreille, 1802-1803; Stizoides Guérin-
Meneville, 1844; Bembecinus A Costa, 1859 and
Bembix Fabricius, 1775. The State of Sikkim is represented by 3 tribes, these can be
distinguished by the following key (Bohart and

Key to the tribes of Nyssoninae

1. Sternum I with two ridges diverging
posteriorly. (Median groove of scutum
strong; body sculpture rather coarse;
pronotal collar ridge like) .......... Nyssonini
   - Sternum I with a single ridge basally...... 2
2. Prestigmal length of submarginal cell I more
than twice the height of cell, omaulus absent,
propodeal enclosure extending far onto
vertical slope, scutellum with lamelliform
edge overlapping metanotum........... Stizini
   - Without above combination of characters...
......................................................... Gorytini

10. Tribe Nyssonini

This tribe is represented by 4 genera, viz.,
Nursea Cameron, 1902; Nysson Latreille, 1802-
1803; Synnevrus A. Costa, 1859 and
Brachystegus A. Costa, 1859. Of these only
one genus, viz., Brachystegus has been recorded
from the state of Sikkim.

21. Genus Brachystegus A. Costa

   Specidea. : 24. Type-species : Nysson dufourii
   Lepeletier, 1845 (= Nysson scalaris Illiger, 1807).
1976. Brachystegus A. Costa : Bohart and Menke,
   University Calif. Press, : 51, 470.

This is a small genus, known to have 2
species viz., decoratus Turner, 1914 and
violaceipennis (Cameron), 1904 from India.
Only one species is reported from the State of
Sikkim, which is discussed below :

52. Brachystegus violaceipennis (Cameron)

1976. Brachystegus violaceipennis (Cameron) : Bohart
   and Menke, University Calif. Press, : 473.

Distribution : India : Sikkim.

11. Tribe Gorytini

This tribe is represented by 5 genera, viz.,
Dienoplus W. Fox, 1893; Gorytes Latreille, 1804;
Lestiphorus Lepeletier, 1832; Ammatomus A. Costa, 1859 and
Hoplisoidea Gribodo, 1884 in India. Of these, only two genera
have been recorded from Sikkim. A key to these
genera is as follows :
Key to the genera of tribe Gorytini

1. Mesopleuron with no trace of sternaulus; inner eye margins strongly converging below .......................... Ammatomus A. Costa
   – Mesopleuron with distinct sternaulus; inner eye margins often nearly parallel and widely separated............... Hoplisoides Gribodo

22. Genus Ammatomus A. Costa


This genus is known to have two species, viz., alipes (Bingham), 1897 and lenis (Nurse), 1903. Of these, only alipes has been reported from Sikkim, which is discussed below:

53. Ammatomus alipes (Bingham)


Diagnostic characters: Female and Male:
Body length 9-13 mm, obscurely covered with fine hairs. Clypeus triangular, its anterior margin transverse; frons with a vertical impressed groove; propodeum with a triangular area at the base, smooth and shiny. Abdomen with a stout petiole.

Black. The following yellow: clypeus, scape, a line on the pronotum posteriorly, a line on mesoscutum on the antero-lateral margin, post-scutellum, fore and middle femora, tibiae and tarsi, and also hind tibiae and tarsi, apical margins of basal four segments of abdomen. Middle femora and hind tibiae black above, transverse band on basal segment emarginate in the middle, and bands on the remaining segments very wide laterally. Clypeus covered with dense silvery pile. Wings hyaline, nerves testaceous.


23. Genus Hoplisoides Gribodo


This genus is represented by six species, viz., bandraensis (Giner Mari), 1954; confusus (Dutt), 1922; homonymus (Schulz), 1906; orientalis (Handlirsch), 1888; pictus (Smith), 1856 and remotus (Turner), 1921 in India. Only one species has been reported from the state of Sikkim, which is detailed below:

54. Hoplisoides pictus (Smith)


Diagnostic characters: Female: 7-9 mm long. Head, thorax and abdomen smooth, with a few shallow scattered punctures. Head as wide as thorax; face and front weakly convex; clypeus transverse; triangular area at the base of median segment longitudinally striate. Black, except thorax and abdomen reddish. The following are yellow: base of mandible, upper two-thirds of clypeus, inner orbits, a spot on scape, a line on pronotum, tubercles, stripe on scutellum, an interrupted band on the posterior margin of basal abdominal segment. Legs and antennae reddish-yellow. Wings hyaline with a fuscous apical mark on fore wing.

Distribution: India: Sikkim, Tamil Nadu and West Bengal.

12. Tribe Stizini

This tribe is represented by three genera viz., Stizus Latreille, 1802-1804. Stizoides Guérin-Meneville, 1844 and Bembecinus A. Costa, 1859 in India. Only one genus is reported from the state of Sikkim, which is detailed below:
24. Genus *Bembecinus* A. Costa


This genus is represented by four species viz., *lateralis* (Bingham), 1897; *prismaticus* (Smith), 1858; *proximus* (Handlirsch), 1892 and *veniperdus* (Lohrmann), 1942 in India. Only one species is known from the state of Sikkim, which is discussed below:

55. *Bembecinus prismaticus* (Smith)


**Diagnostic characters**: Female and Male

Head, thorax and abdomen shiny, closely punctate, punctures bearing short hairs; median segment deeply excavated. Body black with a bright tint of purple and blue in certain reflection. The following are yellow: clypeus, a triangular above it, inner orbit of eyes, posterior margin of pronotum, tubercles, outer margin of tagula, two spots on scutellum, a transverse line on postscutellum and elongate spot on either side of median segment, apical margins of 2nd to 4th segments, 5th segment with a spot on each side. Legs variegated with yellow; wings iridescent, hyaline.


6. Subfamily PHILANTHINAE

This subfamily is considered to be one of the largest subfamilies of Sphecidae. There are about 1100 described species in the world fauna under this subfamily. Almost all the species are ground nesting, and the provisions are Hymenoptera or Coleoptera (Bohart and Menke, 1976).

**Diagnostic characters**: Eyes rather widely separated, inner orbit emarginate or entire, converging above. Antennal sockets separated from fronto-clypeal suture; male with 13 and female with 12-segmented antennae. Mandible without exptra-ventral notch. Mesoscutum with notauli usually distinct; omaulus, sternaulus and acitabular carina absent. Middle tibia with one spur; claws simple. Propodeum short to moderately long dorsal enclosure present, without propodeal sernite. Fore wing with 3 submarginal cells, II and III each usually receiving one recurrent vein; jugal lobe small to large; media in highwing diverging before, at or after cu-a; second anal vein and subcosta absent. Gaster sessile, pedunculate, or occasionally petiolae, petiole clearly composed of tergite and sternite; male with 7 exposed terga; pygidial plate usually present. Volsella simple or with digitus and cuspis; cerci usually absent.

In India this subfamily is represented by 2 tribes, viz., Philanthini and Cercerini. The tribe Philanthini contains only one genus *Philanthus* Fabricius from India. 11 species have been reported under genus *Philanthus*, but none belongs to the state of Sikkim. The tribe Cercerini is represented by 2 genera, viz., *Cerceris* Latreille, 1802-1803 and *Eucerceris* Cresson, 1865 in world fauna. The genus *Cerceris* contains a huge number of species in relation to other genera, and is the only genus known to occur in Sikkim. There are about 46 species (Bohart and Menke, 1976 : 576-589) under the genus *Cerceris* from India.

13. Tribe Cercerini

25. Genus *Cerceris* Latreille


The following species are referable to this genus from Sikkim, viz., *basimaculata* Cameron, 1907; *instabilis* Smith, 1856; *pulchra* Cameron, 1890; *tristis* Cameron, 1890 and *vigilans* Smith, 1856. These can be distinguished by the following key:

**Key to the species of Cerceris**

1. Enclosed triangular or cardate space at the base of median segment striate; (median segment posteriorly red, marked with yellow; enclosed space black). Female. ..................

................................. *instabilis* Smith

  Enclosed triangular or cardate space at the base of median segment punctate. 2

2. Abdomen with basal segment black .......... 3

  Abdomen with basal segment red ............ 2

3. Clypeus arched anteriorly .................

................................. *vigilans* Smith

  Clypeus emarginate anteriorly ............ 4

4. Apical margin of clypeus with two teeth. (Male) ................. *instabilis* Smith

  Apical margin of clypeus not dentate ..... 4

................................. *pulchra* Cameron

(Note: *C. basimaculata* Cameron, 1907 could not be included in the key)

56. *Cerceris basimaculata* Cameron


**Distribution**: India; Sikkim.

57. *Cerceris instabilis* Smith


**Material examined**: India: Sikkim, 2 exs., ix-x. 1897, coll. Dudgeon.

**Distribution**: India: Sikkim, Goa, Karnataka, Maharashtra, Meghalaya, Tripura, Tamil Nadu, West Bengal. Elsewhere: Myanmar, Sri Lanka.

**Remarks**: This species is readily distinguished by having propodeum posteriorly red and marked with yellow; enclosed area black and longitudinally striate.

This is new record of this species from Sikkim.

58. *Cerceris pulchra* Cameron


**Distribution**: India: Sikkim, Maharashtra and West Bengal.

59. *Cerceris tristis* Cameron


Material examined: India: Sikkim, 600 m, 2 exs., ii. 1897, coll. Dudgeon.

Distribution: India: Sikkim and West Bengal.

Remarks: This is the first record of this species from the state of Sikkim.

60. Cerceris vigilans Smith


Material examined: India: Sikkim, 600 m, 6 exs., vii-viii. 1897, coll. Dudgeon.

Distribution: India: Sikkim, Maharashtra, Orissa, Tamil Nadu and West Bengal. Elsewhere: Myanmar.

Remarks: This species is recorded here for the first time from Sikkim.

SUMMARY

The majority of the members of this family are predatory on a great variety of terrestrial insects; but some are cleptoparasitic. It may be possible to exploit some of them for the control of insect pests.

The present paper deals with the fauna of the state Sikkim, India. In Sikkim, the family Sphecidae is represented by 60 species/subspecies under 25 genera and 6 subfamilies. Of these, one species marked with double asterisk (**) and 12 species marked with single asterisk (*) in the systematic account, have been recorded here for the first time from India and Sikkim respectively.

The keys to the subfamilies, tribes, genera, subgenera, species and subspecies are provided for the identification of various taxa. Taxonomic terms used in the present work have been explained with the help of illustrations.

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INSECTA: HYMENOPTERA: ICHNEUMONIDAE

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INTRODUCTION

The family Ichneumonidae of the Order Hymenoptera is one of the largest of all animal groups. They are parasitic in cocoons, usually of Lepidoptera, but also of Symphyta, Braconidae, Ichneumonidae, Neuroptera, Diptera and spiders.

Nearly 60,000 species and subspecies are known from the world and are classified under 26 subfamilies. In India, about 1200 species and subspecies under 23 subfamilies represented the family.

The present paper records 204 species and subspecies under 103 genera and 16 subfamilies from the state of Sikkim. Jonathan (1999, 2000), has already provided information on subfamilies, genera, subgenera, species and subspecies in his publications on the fauna of the states of West Bengal, Meghalaya and Tripura. Therefore, diagnostic characters of various taxa, their detailed synonymy, keys, illustrations of morphological characters of taxonomic importance have not been repeated in this paper.

A list of various taxa known from the state of Sikkim, along with their junior synonym(s) and

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<th>Family</th>
<th>ICHNEUMONIDAE</th>
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<td>Taxa</td>
<td>Distribution</td>
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<tr>
<td>1. Subfamily PIMPLINAE</td>
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<tr>
<td>1. Genus <em>Leptopimpla</em> Townes in Townes et al., 1961</td>
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<tr>
<td><em>L. longiventris</em> (Cameron) = <em>Ephialtis longiventris</em> Cameron, 1908</td>
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<td>India: Sikkim; West Bengal.</td>
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<td>Elsewhere: Myanmar, Malaysia, Indonesia, Nepal, Taiwan &amp; Vietnam.</td>
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<tr>
<td>2. Genus <em>Dolichomitus</em> Smith, 1877</td>
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<tr>
<td><em>D. malanomerus tinctipennis</em> (Cameron) = <em>Ephialtis tinctipennis</em> Cameron, 1899</td>
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<tr>
<td>India: Sikkim; Meghalaya, Karnataka, Tamil Nadu, Uttar Pradesh.</td>
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<td>Elsewhere: Srilanka, Taiwan.</td>
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<td>3. Genus <em>Flavopimpla</em> Betrem, 1932</td>
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<td><em>F. nigromaculata nigromaculata</em>(Cameron) = <em>Ephialtis nigromaculatus</em> Cameron, 1899</td>
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<tr>
<td>India: Sikkim, Meghalaya</td>
<td></td>
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<tr>
<td>Elsewhere: Taiwan.</td>
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4. Genus *Afrephialtis* Benoit, 1953

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>4. <em>A. latisulcatus latisulcatus</em> (Cameron)</td>
<td>India: Sikkim; Assam. Elsewhere: Taiwan.</td>
</tr>
<tr>
<td><em>Pimpla latisulcatus</em> Cameron, 1908</td>
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<td><em>Ephialtis latiannulatus</em> Cameron, 1907</td>
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5. Genus *Iseropus* Foerster, 1956

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<tbody>
<tr>
<td><em>Pimpla himalayensis</em> Cameron, 1899</td>
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<td>6. Genus <em>Scambus</em> Hartig, 1838</td>
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7. Genus *Acropimpla* Townes, 1960

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<tr>
<td><em>Charitopimpla flavoscutis</em> Cameron, 1907</td>
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<td><em>Charitopimpla leucostoma</em> Cameron, 1907</td>
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<td>10. <em>A. nigroscutis</em> (Cameron)</td>
<td>India: Sikkim</td>
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<td><em>Charitopimpla nigroscutis</em> Cameron, 1907</td>
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<tr>
<td><em>Charitopimpla uchidai</em> Cushman, 1933</td>
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8. Genus *Sericopimpla* Kriechbaumer, 1895

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<tr>
<td><em>Exeristes albicincta</em> Morley, 1913</td>
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<td><em>Pimpla sagae</em> Vollenhoven, 1879</td>
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9. Genus *Camptotypus* Kriechbaumer, 1899

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<tr>
<td><em>Pimpla arianus arianus</em> Cameron, 1899</td>
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<td><em>Erythropimpla testaceus</em> Cameron, 1907</td>
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10. Genus *Itoplectis* Foerster, 1869

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<tr>
<td><em>Pimpla himalayensis</em> Cameron, 1909</td>
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11. Genus *Coccygomimus* Saussure, 1892

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<td><em>C. cameroni</em> (Dalla-Torre)</td>
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<td>= <em>Ephialtes formosana</em> Cushman, 1922</td>
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<td>= <em>Pimpla cyanea</em> Morley, 1913</td>
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<td>= <em>P. cynator</em> Morley, 1914</td>
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12. Genus *Lissopimpla* Kreichbaumer, 1889

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13. Genus *Xanthopimpla* Saussure, 1892

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<td><em>X. eleganas apicipennis</em> (Cameron)</td>
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<td><em>X. lepcha</em> (Cameron)</td>
<td>India: Sikkim, Meghalaya, Uttar Pradesh, Bihar, Assam, Orissa, Tamil Nadu. Elsewhere: China, Indonesia, Taiwan, Myanmar, Singapore, Hong Kong, Malaysia, Papua, New Guinea, Bismark Archipelago, Selomian Islands.</td>
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<td>= <em>X. commixta</em> Krieger, 1914</td>
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<td>= <em>X. giochiensis</em> Uchida, 1928</td>
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<td><em>X. pedator</em> (Fabricius)</td>
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<td>= <em>X. punctatrix</em> Schulz, 1906</td>
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<td><em>X. polyptila</em> Cameron, 1907</td>
<td>India: Sikkim, Uttar Pradesh, Tamil Nadu. Elsewhere: Malaysia, Indonesia.</td>
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<td>= <em>X. lissenota</em> Cameron, 1907</td>
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<td><em>X. punctata</em> (Fabricius)</td>
<td>India: Sikkim, Tamil Nadu, Bihar, Karnataka, West Bengal, Madhya Pradesh, South Andaman Islands, Assam, Uttar Pradesh. Elsewhere: China, Malaysia, Indonesia, Moluccas, Mauritius, Srilanka, Japan, Taiwan, Philippines, Ryukyus.</td>
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<td>= <em>X. ruficornis</em> Krieger, 1899</td>
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<td>= <em>Neopimpla punctata</em> Kuroiwa, 1908</td>
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<td>= <em>X. kriegeri</em> Szepligati, 1908</td>
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<td>= <em>Neopimploides syleptae</em> Viereck, 1912</td>
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<td>= <em>X. tibialis</em> Morley, 1903</td>
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<td>= <em>X. punctata szepligetii</em> Krieger, 1914</td>
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<td>= <em>X. macrura</em> Krieger, 1914</td>
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<td>38</td>
<td><em>X. stemmatator</em> (Thunberg)</td>
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<td>42.</td>
<td><em>T. zebra iridipennis</em></td>
<td>Cameron, 1907</td>
<td>India: Sikkim, Bihar, Uttar Pradesh, West Bengal, Himachal Pradesh, Assam.</td>
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<td>44.</td>
<td><em>N. zebroides indicus</em> (Gupta)</td>
<td>India: Sikkim, West Bengal.</td>
<td>Elsewhere: Taiwan.</td>
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<td>45.</td>
<td><em>A. orientalis himalayensis</em> (Gupta)</td>
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</table>
| 48. | *E. longipes* (Cameron)  
= *Bathymeris longipes* Cameron, 1906  
= *Xorides indicus* Szepligeti, 1914 | India: Sikkim, West Bengal.  
*Elsewhere*: Myanmar, Thailand. | |
| 49. | *A. nigricollis nigricollis* (Cameron)  
= *Eugalta nigricollis* Cameron, 1899  
= *Pseudoeugalta aspasia* Turner, 1919 | India: Sikkim, Assam, Meghalaya  
*Elsewhere*: Bangladesh, Myanmar, Laos. | |
| 50. | *A. punctulatus punctulatus* (Cameron)  
= *Eugalta punctulata* Cameron, 1899  
= *Baliena leptopus* Cameron, 1900 | India: Sikkim, Meghalaya.  
*Elsewhere*: Bangladesh, Myanmar. | |
| 51. | *A. spinosus* (Cameron)  
= *Eugalta spinosus* Cameron, 1899 | India: Sikkim, West Bengal, Meghalaya.  
*Elsewhere*: Myanmar. | |
| 52. | *T. maculicornis* (Cameron)  
= *Epiphryssa maculicornis* Cameron, 1899  
= *E. transversa* Cushman, 1933 | India: Sikkim, Meghalaya.  
| 55. | *S. flavobalteatum* (Cameron)  
= *Epiphryssa flavobalteatum* Cameron, 1899  
= *E. longibasis* Cushman, 1933 | India: Sikkim, Assam, Meghalaya.  
*Elsewhere*: China, Taiwan. | |
|   | 2. Subfamily TRYPHONINAE | | |
| 57. | *N. (Apatagium) tristrigata* (Enderlin)  
= *Apatagium tristrigatum* Enderlin, 1912 | India: Sikkim, Assam, West Bengal.  
*Elsewhere*: Indonesia. | |
| 58. | *N. (Bessobates) virgata* (Fourcroy)  
*Elsewhere*: China, USSR, Tibet, Japan, Korea. | |
| 60. | *N. (Prosthodocis) japonica* (Uchida)  
= *Parabatus cristatus* var. *japonicus* Uchida,  
= *P. ferrugineus* Cameron, 1899 | India: Sikkim, West Bengal.  
*Elsewhere*: Taiwan, Japan. | |
| 61. | *N. (Toxochiloides) latro latro* (Holmgren)  
= *PanISCUS latro* Holmgren, 1868  
= *P. ferrugineus* Cameron, 1899 | India: Sikkim, West Bengal, Meghalaya, Karnataka, Bihar, Assam, Maharashtra, Orissa, Andaman Is., Himachal Pradesh, Uttar Pradesh, Tamil Nadu, Kerala. | |
<table>
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<th>Insecta</th>
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<td><strong>1. Subfamily CHLOMUROIDEAE</strong></td>
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<tr>
<td>= <em>P. samoanus</em> Kohl, 1908</td>
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<td>= <em>P. javanus</em> Szepligeti, 1908</td>
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<td>= <em>P. ocellaris</em> Morley, 1913</td>
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<td>= <em>N. (Netalia) multicolor</em> Nikam &amp; Rao, 1972</td>
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<td>= <em>N. (Netalia) cameroni</em> Nikam, 1973</td>
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<td>64. <em>N. (N.) kashmirensis</em> (Cameron) = <em>Paniscus montanus</em> Cameron, 1906 = <em>P. kashmirensis</em> Cameron, 1906</td>
<td>India: Sikkim, Jammu &amp; Kashmir, Himachal Pradesh, Delhi, Uttar Pradesh, Bihar, West Bengal, Arunachal Pradesh, Karnataka.</td>
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<td>66. <em>N. (N.) orientalis</em> (Cameron) = <em>Paniscus orientalis</em> Cameron, 1905</td>
<td>India: Sikkim, Maharashtra, Karnataka, Kerala, Tamil Nadu, Bihar, Uttar Pradesh, Orissa, Meghalaya, West Bengal. Elsewhere: China, Japan, Myanmar, Sri Lanka, Taiwan, Ryukyus.</td>
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3. Subfamily XORIDINAE

23. Genus *Xorides* Latreille, 1809


4. Subfamily BANCHINAE

24. Genus *Apophua* Morley, 1913

70. *A. tricarinata* Cameron, 1908 = *Glypta tricarinata* Cameron, 1908 = *A. metopiiformis* Morley, 1913 | India: Sikkim. |
<table>
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<tr>
<th>25.</th>
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<td>Genus <em>Lissonota</em> Gravenhorst, 1829</td>
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<td>Genus <em>Stictolissonota</em> Cameron, 1907</td>
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<td>Genus <em>Leptobatopsis</em> Ashmead, 1900</td>
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<td><em>L. lepida</em> (Cameron)</td>
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<td><em>L. spilopus</em> (Cameron)</td>
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<td><em>L. v-maculata</em> (Cameron)</td>
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<td>= <em>L. binghami</em> Cameron, 1907</td>
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<td>= <em>Leptobatopsis grandicolor</em> Rao, 1953</td>
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<td>Genus <em>Banchopsis</em> Rudow, 1886</td>
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<td>Genus <em>Exetastes</em> Gravenhorst, 1829</td>
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<td>= <em>Campoplex longipes</em> Smith, 1878</td>
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<td>= <em>Icyona rufipes</em> Cameron, 1903</td>
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<td>= <em>Tegona rufipes</em> Morley, 1913</td>
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<td>31.</td>
<td>Genus <em>Campoplex</em> Gravenhorst, 1829</td>
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<td><em>C. formosana bharata</em> Maheshwary &amp; Gupta, 1977</td>
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<td>Genus <em>Delopia</em> Cameron, 1903</td>
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<td><em>D. prytanes</em> (Cameron) = <em>Campoplex prytanes</em> Cameron, 1903</td>
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<td><strong>89.</strong></td>
<td><em>D. simlaensis</em> (Cameron) = <em>Campoplex simlaensis</em> Cameron, 1905</td>
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<td><strong>91.</strong></td>
<td><em>D. virgulata</em> (Gupta &amp; Gupta) = <em>Dusona virgulata</em> Gupta &amp; Gupta, 1978</td>
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<td><strong>34.</strong></td>
<td>Genus <em>Campoletes</em> Holmgren, 1869</td>
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<td><strong>92.</strong></td>
<td><em>C. chlorideae</em> Uchida, 1957</td>
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<td><strong>35.</strong></td>
<td>Genus <em>Xanthocampoplex</em> Morley, 1913</td>
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<td><strong>93.</strong></td>
<td><em>X. nigromaculatus</em> (Cameron) = <em>Zachresta nigromaculata</em> Cameron, 1907 = <em>Xanthocampoplex orientalis</em> Morley, 1913</td>
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<td><strong>94.</strong></td>
<td><em>X. similis</em> Gupta &amp; Gupta, 1971</td>
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<td>Subfamily: CREMASTINAE</td>
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<td>95.</td>
<td><em>P. marginicollis</em> (Cameron)</td>
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<td><em>O. caudatus</em> (Cushman)</td>
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<td>99.</td>
<td><em>S. longicornis</em> (Uchida)</td>
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<td>100.</td>
<td><em>L. radiatus</em> (Uchida)</td>
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<td>101.</td>
<td><em>D. reticulatus</em> (Cameron)</td>
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<td>102.</td>
<td><em>E. abdominalis</em> (Szepligeti)</td>
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<td>105.</td>
<td><em>E. dasychirae</em> Cameron, 1905</td>
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| 106. | *E. flavocephalus* (Kirby) | = *Ophion flavocephalus* Kirby, 1900  
= *Henicocephalus lunulatus* Szepligeti, 1906  
= *H. albicaput* Morley, 1912  
*Elsewhere*: Australia, Bismark Archipelago, China, Christmas Is., Indonesia, Malaysia, Ryukyus, Singapore, Taiwan. |
*Elsewhere*: Myanmar, Laos. |
| 108. | *E. kanshirensis* (Uchida) | = *Henicospilus kanshiensis* Uchida, 1928  
= *Enicospilus sauteri* Cushman, 1937  
= *E. cushmani* Chiu, 1954 | India: Sikkim, Tamil Nadu.  
*Elsewhere*: China, Indonesia, Myanmar, Taiwan. |
| 109. | *E. laqueatus* (Enderlein) | = *Henicospilus laqueatus* Enderlein, 1921  
= *Enicospilus leetoni* Chiu, 1954 | India: Sikkim, Bihar, Delhi, Himachal Pradesh, Kerala, Karnataka, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.  
*Elsewhere*: Maldives, Nepal, Philippines, Taiwan. |
| 110. | *E. nigropectus* Cameron, 1905 | = *Henocospilus hariolus* Morley, 1912  
= *Amesospilus nigrostemmaticus* Enderlein, 1912  
= *Henicospilus fuscomaculatus* Uchida, 1928 | India: Sikkim; Andhra Pradesh, Karnataka, Himachal Pradesh, Tamil Nadu, Uttar Pradesh.  
*Elsewhere*: Japan, Indonesia, Malaysia, New Britain, Papua New Guinea, Philippines, Ryukyus, Sri Lanka, Taiwan, Thailand. |
| 111. | *E. pseudoconspersae* (Sonan) | = *Henicospilus pseudoconspersae* Sonan, 1927  
*Elsewhere*: China, Nepal, Philippines, Ryukus. |
*Elsewhere*: Brunei, China, Japan, Korea, Laos, Vietnam, Sri Lanka. |
| 113. | *E. vestigator* (Smith) | = *Ophion vestigator* Smith, 1858  
= *Henicospilus xanthusi* Szepligeti, 1906  
= *Enicospilus receptor* Chiu, 1954  
= *E. glabrifacies* Chiu, 1954  
*Elsewhere*: Brunei, Indonesia, Malaysia, Micronesia, Taiwan, Sri Lanka, Vietnam. |
| 114. | *E. yonezawanus* (Uchida) | = *Henicospilus yonezawanus* Uchida, 1928  
= *Enicospilus microstriatellus* Uchida, 1956 | India: Sikkim; Karnataka, Himachal Pradesh, Uttar Pradesh.  
*Elsewhere*: Japan, Myanmar, China, Indonesia, Malaysia, Papua New Guinea, Philippines, Ryukyus, Taiwan. |
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<th>8. Subfamily MESOCHORINAE</th>
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<td>42. Genus <em>Mesochorus</em> Gravenhorst, 1829</td>
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<td>115. <em>M. pilicornis</em> Cameron, 1907</td>
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<th>9. Subfamily METOPINAE</th>
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<td>43. Genus <em>Metopius</em> Panzer, 1806</td>
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<tr>
<td>116. <em>M. (Ceratopius) areolatus</em> (Cameron)</td>
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  = *Cultarius areolatus* Cameron, 1907 | India: Sikkim. |

| 117. *M. (Ceratopius) dissectorius lar* Morley |


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<th>44. Genus <em>Seticornula</em> Cameron, 1907</th>
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<td>118. <em>S. albopilosa</em> (Cameron)</td>
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  = *Megatrema albopilosa* Cameron, 1907 | Elsewhere: Myanmar, Sri Lanka |

  = *Seticornula albicalcar* Morley, 1912 |

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<th>45. Genus <em>Macromalon</em> Townes, 1959</th>
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<td>119. <em>M. orientale</em> Kerrich, 1968</td>
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  | India: Sikkim; Meghalaya, West Bengal. |

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<th>10. Subfamily GRAVENHORSTINAE</th>
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<td>46. Genus <em>Heteropelma</em> Wesmael, 1849</td>
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<td>120. <em>H. fulvitarse</em> Cameron, 1899</td>
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  = *H. reticulatum* Cameron, 1899 | India: Sikkim; Assam, Meghalaya, Himachal Pradesh. Elsewhere: China, Germany, Myanmar, Taiwan, Tibet. |

  = *Anomalon binghami* Cameron, 1907 |

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<th>11. Subfamily ACAENITINAE</th>
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<td>47. Genus <em>Ishigakia</em> Uchida, 1928</td>
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<td>121. <em>I. alecto</em> (Morley)</td>
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  = *Acaenitus alecto* Morley, 1913 | Elsewhere: China. |

  = *Sphimedia alecto* Cushman, 1933 |

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<th>48. Genus <em>Boloderma</em> Morley, 1913</th>
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<th>49. Genus <em>Yezoceryx</em> Uchida, 1928</th>
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<td>123. <em>Y. biumbratus</em> (Morley)</td>
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  = *Acaenitus biumbratus* Morley, 1913 | India: Sikkim. |

| 124. *Y. xanthorius* (Morley) |

  = *Acaenitus xanthorius* Morley, 1913 | India: Sikkim. |

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<td>50. Genus <em>Hyperacmus</em> Holmgren, 1856</td>
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<td>125. <em>H. quintanus</em> (Morley)</td>
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  = *Lampronota quintanus* Morley, 1913 | India: Sikkim. |
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<td>H. schaffneri</td>
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<td>Colganta fulvipennis</td>
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<td>M. tarsalis</td>
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<td>A. laevifrons</td>
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<td>X. flavispeculum</td>
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<td>H. ditissimus</td>
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<td>Echthrus maculiscutis</td>
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<td>58. Genus <em>Torbda</em> Cameron, 1902</td>
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<td>139. <em>T. geniculata</em> cameron, 1902</td>
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<td>140. <em>T. maculipennis</em> Cameron, 1902</td>
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<td>141. <em>T. nigromaculata</em> (Cameron)</td>
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<td><em>Miophatnus nigromaculatus</em> Cameron, 1907</td>
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<td>142. <em>E. striatifrons</em> Cameron, 1903</td>
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<td>61. Genus <em>Buysmania</em> Cheesman, 1941</td>
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<td>144. <em>B. oxymora annulitarsis</em> (Cameron)</td>
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<td><em>F. curvicarinata var rufescens</em> Morley, 1914</td>
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67. Genus *Goryphus* Holmgren, 1868

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<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>152. <em>G. salutator</em> (Cameron)</th>
<th>India: Sikkim, Meghalaya, West Bengal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= <em>Mesostenus salutator</em> Cameron, 1904</td>
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68. Genus *Skeatia* Cameron, 1901

<table>
<thead>
<tr>
<th>154. <em>S. cariniscuta</em> (Cameron)</th>
<th>India: Sikkim; Assam, Meghalaya.</th>
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</thead>
<tbody>
<tr>
<td>= <em>Mesostenoides cariniscuta</em> Cameron, 1907</td>
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69. Genus *Formostenus* Uchida, 1931

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70. Genus *Melcha* Cameron, 1902

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<thead>
<tr>
<th>156. <em>M. annulitarsis</em> (Cameron)</th>
<th>India: Sikkim.</th>
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</thead>
<tbody>
<tr>
<td>= <em>Buodias annulitarsis</em> Cameron, 1907</td>
<td></td>
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71 Genus *Euchalinus* Townes, 1961

<table>
<thead>
<tr>
<th>157. <em>E. pugnatus</em> Cameron, 1907</th>
<th>India: Sikkim.</th>
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72. Genus *Lepopron* Townes, 1970

<table>
<thead>
<tr>
<th>158. <em>L. rufo-ornatus</em> (Cameron)</th>
<th>India: Sikkim.</th>
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<tbody>
<tr>
<td>= <em>Buodias rufo-ornatus</em> Cameron, 1907</td>
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73. Genus *Nematopodias* Gravenhorst, 1829

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<thead>
<tr>
<th>159. <em>N. (Diapetus) nigromaculatus</em> (Cameron)</th>
<th>India: Sikkim.</th>
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<tbody>
<tr>
<td>= <em>Earrana nigromaculatus</em> Cameron, 1907</td>
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74. Genus *Aocrericus* Ratzburg, 1852

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<td>= <em>Osprynchotus peronatus</em> Cameron, 1902</td>
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16. Subfamily ICHNEUMONINAE

75. Genus *Eccoptoseage* Kriechbaumer, 1898

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<tr>
<td>= <em>Acanthojoppa schizoaspis</em> Cameron, 1902</td>
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<tr>
<td>= <em>A. flavo-orbitalis</em> Cameron, 1907</td>
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<td>= <em>Acanthojoppa indica</em> cameron, 1903</td>
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= A. *tinctipennis* Cameron, 1903  
= A. *apicilineata* Cameron, 1903  
= A. *curtispina* Cameron, 1903

163. *E. xanthopsis xanthopsis* (Cameron)  
= Acanthojoppa *xanthopsis* Cameron, 1903  
= A. *varicornis* Cameron, 1903  
= A. *tricolor* Cameron, 1907

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76. Genus *Chiaglas* Cameron, 1902

164. *C. longicornis* Cameron, 1903

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<th>164. C. longicornis Cameron, 1903</th>
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<td><em>Elsewhere:</em> Myanmar, Thailand.</td>
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165. *C. nigripes* Cameron, 1902  
= *C. varipes* Cameron, 1903  
= *C. longiventris* Cameron, 1903  
= Bolbomyschus *albpictus* Tosquinet, 1903

<table>
<thead>
<tr>
<th>165. C. nigripes Cameron, 1902</th>
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77. Genus *Achais* Cameron, 1903

166. *C. nobilitator* Heinrich, 1934

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<th>166. C. nobilitator Heinrich, 1934</th>
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78. Genus *Setanta* Cameron, 1901

167. *A. flavobalteatus* Cameron, 1903  
= Haliphera *maculipes* Cameron, 1903  
= H. *flavomaculata* Cameron, 1904  
= H. *latibalteata* Cameron, 1907

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79. Genus *Losgna* Cameron, 1903

169. *L. simulator* Townes et al., 1961  
= Joppomorpha *cariniscutis* Cameron, 1907

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<th>169. L. simulator Townes et al., 1961</th>
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80. Genus *Mesophadnus* Cameron, 1907

170. *M. spilopterus* Cameron, 1907

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81. Genus *Cratichneumon* Thomson, 1893

171. *C. flavomaculatus* (Cameron)  
= Leptothecus *flavomaculatus* Cameron, 1905

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82. Genus *Stirexephanes* Cameron, 1912

172. *S. signatus zonatus* (Cameron)  
= Darymna *zonata* Cameron, 1905

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<td>88. Aglaojoppa</td>
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<td>186. A. rufofemorata rufofemorata</td>
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<td>89. Amblyjoppa</td>
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<td>187. A. aelvanus (Cameron)</td>
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<td>188. A. forticornis forticornis (Cameron)</td>
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<td>90. Cnemojoppa</td>
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<td>189. Cnemojoppa rufipes (Cameron)</td>
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<td>91. Naenaria</td>
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<td>190. N. nigrocoerulea (Cameron)</td>
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<td>92. Cratojoppa</td>
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<td>191. C. maculata Cameron, 1907</td>
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<td>192. C. robusta Cameron, 1901</td>
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<td>93. Ileanta</td>
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<td>193. I. fulvipes Cameron, 1903</td>
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<td>94. Lachmetha</td>
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<td>194. L. spinitarsis Cameron, 1903</td>
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<td>95. Legnatia</td>
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<td>96. Listrodromus</td>
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<tr>
<td><strong>196. <em>L. crassipes</em> (Cameron)</strong></td>
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<tr>
<td><strong>197. <em>I. luteator</em> (Fabricius)</strong></td>
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<td><strong>201. <em>M. pectinata</em> Cameron, 1902</strong></td>
</tr>
<tr>
<td><strong>202. <em>C. coerulea coerulea</em> Cameron, 1901</strong></td>
</tr>
<tr>
<td><strong>203. <em>Xenojoppa crassispina</em> (Cameron)</strong></td>
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</table>
SUMMARY

The present paper deals Ichneumonidae fauna of the state of Sikkim, India. Altogether 204 species/subspecies under 103 genera, belonging to 16 subfamilies have recorded from this state.

ACKNOWLEDGEMENTS

I am grateful to Dr. J. R.B. Alfred, Director, Zoological Survey of India, for providing necessary facilities to carry out this work. I am also thankful to Shri Rati Ram, Publication Production Officer for helping one in various ways.

REFERENCES


INTRODUCTION

Ants do not need to be introduced because of its cosmopolitan distribution and abundance in our environment. Its social behaviour is highly developed and certain inborn instinct, keeps this creature in colonial form, exhibiting highest degree of distribution of labour, specialised caste oriented nature of work and cohesiveness amongst the said colony. Inspite of that, this tiny creature has remained totally neglected by the biologists.

Present work is in persuasion of our Annual Programme (1997-'98) to work out the ant fauna of Sikkim. Bingham (1903) recorded 69 species of ants from Sikkim in his “Fauna of British India, including Ceylon and Burma” Then Sikkim was a separate independent country under British Raj. Subsequently, Chapman and Capco (1951) also included another 15 species from Sikkim in their “Check List of Ants Asia” Since then no work has been done except Datta and Raychaudhuri (1983) on ants from this region.

Successive workers like Jerdon (1851, 54a, ’b), Rothneyi (1889), Forel (1900a, ’b, ’c), Mukherjee (1925, ’30), Karawajew (1926, ’28), Wheeler (1927, ’28), Negi et al. (1930), Menozzi (1935), Donisthorpe (1942, 43), Smith (1948), Wilson (1964), Taylor (1966, ’68), Bolton (1977), Baroni Urbani (1977a, ’b), Tiwari et al. (1977a, ’b, ’c, 1986a, ’b, 1994, 1996, 1999, 2000), Mathew (1980, 2000), Datta and Raychaudhuri (1983) and Imai et al. (1984) have made valuable contributions to the ant fauna of India, but no one has exclusively studied the ant fauna of Sikkim. There have been some records of ants from various parts of Sikkim in scattered form. This is the first attempt by the present authors to consolidate the ant fauna of Sikkim.

This taxonomic work of Ants of Sikkim is based on collection of ants made by the authors (1996) and other collections brought by the various survey parties of the department. Besides this, the specimens lying in the National Zoological Collection of this department, have also been incorporated. The entire material studied under this project, have been deposited in the collection of Zoological Survey of India, Calcutta.

Altogether 114 species, including previously reported species, under 39 genera and 7 subfamilies have been reported in this paper from the state of Sikkim, India. Out of these, 17 species marked with single asterisk (*) in the ‘List of the Taxa’ in Systematic Account, are new records from the state of Sikkim.

Key to the subfamilies, genera and species have been incorporated in this paper, but key to the species include only those species which were studied by the authors, other species so far recorded could not be incorporated in the key to the species, because of insufficient literatures.

TOPOGRAPHY

Sikkim is a small but beautiful state of India. It is situated in the Eastern Himalayas and is spread below the Mount Kanchendzanga (8534 m.), the third highest mountain in the world. It is comprised of 4 districts—(1) the North Sikkim, (2) the South Sikkim, (3) the West Sikkim and (4) the East Sikkim. It shares her borders with Tibet in the north, Bhutan in the east, Nepal in the west and state of West Bengal in the south.
Amidst the grandeur of mountain peaks, lush valleys, fast flowing rivers, terraced hills, Sikkim has got its unique topography. It occupies an area of 7,300 sq.km. and measures approximately 100 km. from north to south and 60 km. from east to west. The elevation ranges from 244 meters to over 8540 meters above the sea level.

Sikkim, a paradise of nature's lovers, has a fascinating blend of breath taking scenic view with hot spring and alpine environment. Yumthong is a place situated at an altitude of 4,000 m. (approx.). Shingba Sanctuary, enroute to Yumthong in north district, is famous for accommodating 24 species of Rhododendron plants and in the month of May-June, this sanctuary erupts into a riot of colours with Rhododendron ablaze, in fiery-red hues of pink, yellow, purple and white colours and attracts domestic and foreign tourists both. Besides this, the south and west districts are covered with teak and sal forests and terraced hill slopes are unique places of terraced cultivation. Its economy is based mainly on tourism, agriculture and forests.

MATERIAL AND METHOD

The specimens of ants were collected from the field by sweeping and picking up by hand with the help of brush and forceps. At the same time, bait in the form of sugar and jaggery were used to attract the ants. The specimens were preserved in 90% alcohol and brought to Headquarters for study. The specimens were set, pinned and labelled and kept in insects boxes for proper study. Smaller forms were preserved in alcohol and were studied directly in wet form. During study, mandibles and mouth parts were dissected for specific identification.

SYSTEMATIC ACCOUNT

Formicidae, to which ants belong, is one of the largest family of order Hymenoptera under class Insecta and is widely distributed throughout the world, because of its cosmopolitan nature. 9538 species of ants under 16 subfamilies, 59 tribes and 296 genera have been reported till date from the world (Hölldobler and Wilson, 1990). Of these, altogether 2479 species have been reported from the Classical Oriental regions, which includes Oriental and Indo-Australian regions. The splited species 770 are present in Oriental region and 1709 in Indo-Australian region (Bolton, 1995a).

Prior to this, Bingham (1903) reported 69 species under 30 genera from Sikkim. Subsequently Chapman and Capco (1951) recorded 15 species under 12 genera from this region. Datta and Raychaudhuri (1983) also reported 20 species under 16 genera and 4 subfamilies from the state of Sikkim, all aphid attending ants. Present work deals with 114 species, including those species reported by previous workers, under 39 genera spread over 7 subfamilies from the state of Sikkim.

Abbreviation: The abbreviations used in the text are M = Male, F = Female, W = Worker and S = Soldier.

LIST OF THE TAXA
INCORPORATED IN THE TEXT

Family FORMICIDAE
I. Subfamily DORYLINAE Forel
1. Genus Dorylus Fabricius
   A. Subgenus Typhlopone Westwood
   1. Dorylus (Typhlopone) labiatus Shuckard
   B. Subgenus Alaopone Emery
   2. Dorylus (Alaopone) orientalis Westwood
   2. Genus Aenictus Shuckard
   3. Aenictus ambiguus Shuckard
   4. Aenictus clavatus Forel
   5. Aenictus fergusoni Forel
   II. Subfamily PONERINAE Lepeletier
   3. Genus Anochetus Mayr
   6. Anochetus graeffei Mayr
<table>
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<tr>
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<th>Species</th>
<th>Author</th>
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<td><em>Odontomachus</em> Latreille</td>
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<td><strong>7.</strong></td>
<td><em>Odontomachus haematodus</em> (Linnaeus)</td>
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<td><em>Odontomachus monticola</em> Emery</td>
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<td><em>Harpegnathos venator</em> (Smith)</td>
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<td><em>Leptogenys</em> Roger</td>
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<td><strong>10.</strong></td>
<td><em>Leptogenys hodgsoni</em> Forel</td>
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<td><em>Leptogenys kitteli</em> (Mayr)</td>
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<td><em>Leptogenys moelleri</em> (Bingham)</td>
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<td><em>Leptogenys punctiventris</em> (Mayr)</td>
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<td><em>Diacamma</em> Mayr</td>
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<td><strong>15.</strong></td>
<td><em>Diacamma assamense</em> Forel</td>
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<td><em>Diacamma rugosum</em> (Le Guillou)</td>
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<td><strong>17.</strong></td>
<td><em>Diacamma rugosum sculptum</em> (Jerdon)</td>
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<td><strong>18.</strong></td>
<td><em>Diacamma rugosum sikkimensis</em> Forel</td>
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<td><em>Diacamma scalpratum</em> (Smith)</td>
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<td><em>Pachycondyla leeuwenhoeki</em> Forel</td>
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<td><em>Myoponera castanea</em> (Smith)</td>
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<td><strong>29.</strong></td>
<td><em>Amblyopone rothneyi</em> Forel</td>
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<td><strong>III.</strong></td>
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<td><em>Cerapachys</em> Smith</td>
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<td><em>Cerapachys sulcinodis</em> Emery</td>
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<td><em>Tetraponera birmana</em> (Forel)</td>
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<td><em>Tetraponera nigra</em> (Jerdon)</td>
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<td><strong>V.</strong></td>
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<td><em>Aphaenogaster</em> Mayr</td>
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<td><em>Aphaenogaster cristata</em> Forel</td>
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<td><em>Aphaenogaster rothneyi</em> Forel</td>
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<td><em>Aphaenogaster smythiesii</em> Forel</td>
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<td><strong>16.</strong></td>
<td><em>Pheidole</em> Westwood</td>
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<td><strong>36.</strong></td>
<td><em>Pheidole bhavanae</em> Bingham</td>
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<td><strong>37.</strong></td>
<td><em>Pheidole grayi</em> Forel</td>
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<td><strong>38.</strong></td>
<td><em>Pheidole indica himalayana</em> Forel</td>
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<td><strong>39.</strong></td>
<td><em>Pheidole jucunda</em> Forel</td>
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<td><strong>40.</strong></td>
<td><em>Pheidole jucunda fossulata</em> Forel</td>
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<td><strong>41.</strong></td>
<td><em>Pheidole malinsii</em> Forel</td>
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<td><strong>42.</strong></td>
<td><em>Pheidole pronotalis</em> Forel</td>
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<td><strong>43.</strong></td>
<td><em>Pheidole noda stella</em> Forel</td>
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<td><strong>44.</strong></td>
<td><em>Pheidole roberti</em> Forel</td>
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<td><strong>45.</strong></td>
<td><em>Pheidole smythiesii</em> Forel</td>
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<td><strong>17.</strong></td>
<td><em>Myrmica</em> Latreille</td>
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<td><strong>46.</strong></td>
<td><em>Myrmica rugosa</em> Mayr</td>
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<td><strong>47.</strong></td>
<td><em>Myrmica ritei</em> Emery</td>
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<td><strong>48.</strong></td>
<td><em>Myrmica smythiesii</em> Forel</td>
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<td><strong>49.</strong></td>
<td><em>Myrmica smythiesii rupestris</em> Forel</td>
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<td><strong>18.</strong></td>
<td><em>Pheidologeton</em> Mayr</td>
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<td><strong>50.</strong></td>
<td><em>Pheidologeton diversus</em> (Jerdon)</td>
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</tbody>
</table>
19. Genus **Crematogaster** Lund

51. *Crematogaster binghamii* Forel
52. *Crematogaster biroi* Mayr
53. *Crematogaster buddhae* Forel
54. *Crematogaster ebenina* (Forel)
55. *Crematogaster ebenina corax* Forel
56. *Crematogaster rogenhoferi flav* Forel
57. *Crematogaster ransonneti* Mayr
58. *Crematogaster rogenhoferi Mayr*
59. *Crematogaster rothenyi* Mayr
60. *Crematogaster walshi* Forel
61. *Crematogaster sagae Forel*
62. *Crematogaster politula* Forel
63. *Crematogaster sp.*

20. Genus **Lophomyrmex** Emery

64. *Lophomyrmex bedoti* Emery
65. *Lophomyrmex quadrispinosus* (Jerdon)
66. *Lophomyrmex burmanus* Emery

21. Genus **Rhoptromyrmex** Mayr

67. *Rhoptromyrmex wroughtoni* Forel

22. Genus **Tetramorium** Mayr

68. *Tetramorium bicarinatum* (Nylander)
69. *Tetramorium christiei* Forel
70. *Tetramorium pacificum* Mayr

23. Genus **Triglyphothrix** Forel

72. *Triglyphothrix striatidens* (Emery)

24. Genus **Solenopsis** Westwood

73. *Solenopsis geminata* (Fabricius)

25. Genus **Leptothorax** Mayr

74. *Leptothorax rothenyi* Forel

26. Genus **Cardiocondyla** Emery

75. *Cardiocondyla nuda* (Mayr)

VI. Subfamily **DOLICHODERINAE** Forel

27. Genus **Dolichoderus** Lund

76. *Dolichoderus affinis* Emery
77. *Dolichoderus affinis glabripes* Forel
78. *Dolichoderus thoracicus* (Smith)
79. *Dolichoderus feae* Emery
80. *Dolichoderus moggridgei* Forel
81. *Dolichoderus moggridgei bicolor* Santschi
82. *Dolichoderus sp.*

28. Genus **Technomyrmex** Mayr

*83. *Technomyrmex albipes* (Smith)
84. *Technomyrmex albipes brunneus* Forel

29. Genus **Bothriomyrmex** Emery

85. *Bothriomyrmex myops* Forel
86. *Bothriomyrmex walshi* Forel

30. Genus **Iridomyrmex** Mayr

87. *Iridomyrmex anceps sikimensis* Forel

VII. Subfamily **FORMICINAE** Lepeletier

31. Genus **Oecophylla** Smith

88. *Oecophylla smaragdina* (Fabricius)

32. Genus **Plagiolepis** Mayr

89. *Plagiolepis dichroa* Forel
90. *Plagiolepis moelleri* Bingham

33. Genus **Anoplolepis** Santschi

91. *Anoplolepis longipes* (Jerdon)

34. Genus **Formica** Linnaeus

92. *Formica fusca* Linnaeus
93. *Formica rufibarbis* Fabricius

35. Genus **Cataglyphis** Föerster

*94. *Cataglyphis setipes* (Forel)
36. Genus *Pseudolasius* Emery

95. *Pseudolasius familiaris* (Smith)

37. Genus *Polyrhachis* Smith

96. *Polyrhachis dives* Smith
97. *Polyrhachis illaudata* Walker
98. *Polyrhachis striata* Mayr
*99. Polyrhachis thompsoni* Bingham
100. *Polyrhachis* sp.

38. genus *Camponotus* Mayr

101. *Camponotus compressus* (Fabricius)
*102. Camponotus thoracicus* (Fabricius)
*103. Camponotus arrogans* (Smith)
104. *Camponotus dolendus* Forel
*105. Camponotus invidus* Forel
*106. Camponotus mitis* (Smith)
107. *Camponotus lamarki* Forel
108. *Camponotus camelinus* (Smith)
109. *Camponotus oblongus* (Smith)
110. *Camponotus sericeus penguensis* Emery
111. *Camponotus singularis* (Smith)
112. *Camponotus barbatus taylori* Forel
113. *Camponotus wasmanni* Emery

39. Genus *Paratrechina* Motschoulsky

114. *Paratrechina aseta* (Forel)

**Key to the Subfamilies of Formicidae**

1. Pedicel of abdomen with one node ..............2
   – Pedicel of abdomen with two nodes .......... 6
2. A more or less marked constriction between basal two segments of abdomen .......... 3
   – No constriction between basal two segments of abdomen ........................................4
3. Elongate, slender; scape usually short and stout, antennal fossa more or less encircled by a lateral carina on the cheek (rarely obsolete); posterior surface of head usually with distinct carina running ventrally from each dorso-lateral corner; dorsal surface of thorax with sutures indistinct or absent; pygidium margined laterally and posteriorly with a row of large or small (always distinct) spines ..............................................CERAPACHYINAE
   – Without these combinations of characters .... .................................................. PONERINAE
4. Opening at posterior end of gaster (acidopore) terminal, circular and usually surrounded by a fringe of hairs ...................... FORMICINAE
   – Opening at posterior end of gaster (acidopore) transverse, slit-like ............................................. 5
5. Eyes never present, blind .............................................. DORYLINAE
   – Eyes always present .................................................. DOLICHODERINAE
6. Elongate, often very slender; eyes very large and elongate; clypeus with a rounded upper margin, not prolonged between frontal carinae; frontal carinae usually narrow and not expanded laterally to cover the antennal insertions; antennae short ...................................................... PSEUDOMYRMECINAE
   – Without these combinations of characters; frontal carinae usually large, nearly always covering the antennal insertions ................................................. MYRMICINAE

I. Subfamily DORYLINAE Forel

**Key to the genera of Dorylinae**

(Workers)

1. Pedicel one-segmented; pro-mesonotal suture distinct, meso-metanotal suture obsolete ...... .............................................. Dorylus
   – Pedicel two-segmented; pro-mesonotal suture obsolete, meso-metanotal suture distinct ...... ............................................. Aenictus

(Males)

1. Of comparatively large size, length over 18 mm; node of pedical convex ...... Dorylus
- Smaller in size, length under 13 mm; node of pedicel concave, sometimes merely longitudinally grooved or bilobed, never convex

Aenictus

1. Genus Dorylus Fabricius

1793. Dorylus Fabricius, Ent. Syst., 2 : 365, M.
Type-species : Vespa helvola Linnaeus, 1764.

Key to the species of Dorylus (Workers)

1. Antennae of W-maj. 11-segmented and W-min. 10-segmented ........................................... labiatus
- Antennae of W-maj. and W-min. 9-segmented ................................................................. orientalis

A. Subgenus Typhlopone Westwood

1840. Typhlopone Westwood, Introd. Classif. Ins., 2 : 219, W.

1. Dorylus (Typhlopone) labiatus Shuckard


Distribution : India : Sikkim and whole continent of India, particularly from West Bengal, Uttar Pradesh, Manipur, Orissa, Himachal Pradesh, Maharashtra, Gujarat and Delhi.

B. Subgenus Alaopone Emery


2. Dorylus (Alaopone) orientalis Westwood


2. Genus Aenictus Shuckard

Type-species : A. ambiguus Shuckard, 1840.

Key to the species of Aenictus

1. Scape of antennae cylindrical; posterior border of hypopygium entire .................. ambiguus
- Scape of antennae more or less compressed, flat; posterior border of hypopygium broadly emarginate ....................................... clavatus

Note : Due to non-availability of detailed description of male of A. fergusoni, this species could not be included in the key.

3. Aenictus ambiguus Shuckard

1964. Aenictus ambiguus, Wilson, Pacific Insects, 6 (3) : 444.

Distribution : India : Sikkim, Gujarat, Maharashtra, Uttar Pradesh.

Remarks : Bingham (1903) reported the species and mentioned its localities as “Sikkim, Gujarat and Poona”

4. Aenictus clavatus Forel

Distribution: India: Sikkim, Gujarat, Karnataka, Maharashtra.

Remarks: Bingham (1903) recorded this species from Sikkim.

5. Aenictus fergusoni Forel


Remarks: Bingham (1903) recorded this species and mentioned “Sikkim” as one of its localities. Subsequently, Wilson (1964: 462) also reported this species along with some new synonyms.

II. Subfamily PONERINAE Lepeletier

Key to the genera of Ponerinae

1. Pedicel not free; a strong constriction, but no flexible joint between pedicel and abdomen .............................................. 2
   - Pedicel free; a flexible joint between it and abdomen .............................................. 3

2. Mandibles with distinct apical margin .............................................. Myopopone
   - Mandibles without any distinct apical margin .............................................. Amblyopone

3. Mandibles articulated close together in middle of front margin of head .............................. 4
   - Mandibles articulated wide apart at lateral angles of front margin of head ....................... 5

4. Antennal hollows confluent posteriorly .............................................. Odontomachus
   - Antennal hollows not confluent posteriorly .............................................. Anochetus

5. Mandibles long; curved upwards, one strong tooth at base of masticatory margin, then denticulate at apex ........................ Harpegnathos
   - Mandibles differently formed .............................................. 6

6. Claws pectinate .............................................. Leptogenys
   - Claws not pectinate .............................................. 7

7. Pronotum with teeth or spines .............................................. Odontoponera
   - Pronotum without teeth or spines .............................................. 8

8. Node of pedicel bispinous posteriorly .............................................. Diacamma
   - Node of pedicel not bispinous, sometimes denticulate posteriorly ................................... 9

9. Episternum of mesothorax separated from sternum by a suture ........................ Pachycondyla
   - Episternum of mesothorax not separated from sternum ........................................... Hypoponera

3. Genus Anochetus Mayr


Type-species: Odontomachus ghiliolli Spinola, 1851.

6. Anochetus graeffei Mayr


Diagnostic characters: W. TL 3.5 mm. Ferruginous; abdomen darker, mandibles and legs lighter in colour. Head somewhat irregularly rectangular, convex in front; closely and regularly punctured; mandibles with three apical teeth, more finely punctured, pre-apical inner margin minutely serrate. Thorax densely punctured, obliquely truncated posteriorly; apical face of metanotum margined at the sides. Node of pedicel ovate, rounded above, smooth; abdomen stout, basal segment densely punctate in front.

Distribution: India: Sikkim, West Bengal, Southern and Western India. Elsewhere: Indo-China, Samoa.
Remarks: Bingham (1903) reported *Anochetus punctiventris* Mayr, 1878 from Sikkim which was later on synonymised with *A. graeffei* Mayr, 1870 by Wilson (1959).

4. Genus *Odontomachus* Latreille


Type-species: *Formica haematoda* Linnaeus, 1758.

Key to the species of *Odontomachus*

1. The whole head very finely and delicately striate and having a beautiful silky gloss.....
   
   ...................................................
   
   *haematodus*

   - The upper part of the head smooth or punctate, not striate, no silky gloss ............ *monticola*

7. *Odontomachus haematodus* (Linnaeus)


**Distribution**: India: Sikkim, Assam, Meghalaya, Andaman and Nicobar Is., West Bengal. Elsewhere: Myanmar, China, Siam.

Remarks: Bingham (1903) recorded this species and mentioned its distribution as Sikkim along with other localities.

8. *Odontomachus monticola* Emery


**Distribution**: India: Sikkim, Assam, Meghalaya, Andaman and Nicobar Is., West Bengal. Elsewhere: Myanmar, China, Siam.

Remarks: Bingham (1903 : 48, 49) reported *O. punctulatus* from Sikkim and Assam. Subsequently, Brown (1976) synonymised *O. punctulatus* under the species, *O. monticola*.

5. Genus *Harpegnathos* Jerdon


Type-species: *H. saltator* Jerdon, 1851.

9. *Harpegnathos venator* (Smith)


**Diagnostic characters**: W. TL 16-18 mm. Black; mandibles, clypeus, legs brownish yellow; head and thorax closely coarsely punctate; few short, erect pale hairs; minute pubescence plentiful. Head rectangular, emarginate posteriorly; sickle-shaped mandibles articulated at the sides of the head, more than half as long as head, curved upwards, serrated on inner margin, saw-like serrations terminates in a large triangular laminate tooth; clypeus triangular; antennae 12-segmented, filiform; eyes remarkably large, lower orbits almost reaching base of mandibles. Thorax elongate; pro-mesonotal suture remarkably broad and shallow; meso-metanotal suture obsolete; posterior face of metanotum truncate; legs long, slender. pedicel cylindrical, narrowed anteriorly, vertically truncate posteriorly; abdomen cylindrical, constriction between basal two segments very distinct; powerful sting exerted.

**Distribution**: India: Sikkim, Assam, Tamil Nadu, Meghalaya, Uttar Pradesh and Northern
India. Elsewhere: Myanmar, China.

Remarks: Bingham (1903) reported this species under the genus *Drepanognathus* and mentioned its habitat Sikkim and others.

6. Genus *Leptogenys* Roger


Type-species: *L. falcigera* Roger, 1861.

Key to the species of *Leptogenys*

1. Head more or less striate ........................................2
   - Head either punctured or smooth and shining, never striate ........................................3

2. Clypeus not carinate .........................*kitteli*
   - Clypeus more or less distinctly carinate or subcarinate ..................*hodgsoni*

3. Basal abdominal segment punctured ............. ..................................................*punctiventris*
   - Basal abdominal segment no punctured, smooth ..................................................4

4. Head smooth, shining, not punctured ............. ..........................................................*lucidula*
   - Head punctured, opaque, with a blue metallic tint in certain lights ......................*moelleri*

10. *Leptogenys hodgsoni* Forel


Remarks: This is the first record of this species from the state of Sikkim.

11. *Leptogenys kitteli* (Mayr)


Remarks: Bingham (1903) reported its habitat as "along the foot-hills of the Himalayas from Simla to Sikkim".

12. *Leptogenys lucidula* Emery


Remarks: Bingham (1903) mentioned its habitat 'Sikkim, 4000 ft'.

13. *Leptogenys moelleri* (Bingham)


Distribution: India: Sikkim.

Remarks: Bingham (1903) described this species under the genus *Lobopelta* and mentioned its habitat as 'Sikkim at 4000 ft.'
14. *Leptogenys punctiventris* (Mayr)


**Remarks**: Sikkim along with other places were mentioned as the habitat of this species by Bingham (1903).

7. Genus *Diacamma* Mayr


Type-species : *Ponera rugosa* Le Guillou, 1841.

**Key to the species of Diacamma**

1. First abdominal segment not striate ..............

..............................................................scalpratum

– First abdominal segment striate ..............2

2. Pronotum longitudinally striate........assamense

– Pronotum with transversely arched striae, which are more or less concentric anteriorly ........

..............................................................rugosum

15. *Diacamma assamense* Forel


**Distribution**: India : Sikkim and Assam. Elsewhere : Myanmar.

**Remarks**: This species is recorded here for the first time from the state of Sikkim.

16. *Diacamma rugosum* (Le Guillou)


**Remarks**: Tiwari (1999) recorded *Diacamma vagans* (Smith, 1860) as a species which was later on considered as a mistake. However, going through Bolton's Catalogue (1995b), the mistake has been rectified and the said species is henceforth treated as a junior synonym of *Diacamma rugosum* (Le Guillou, 1841).

**Key to the subspecies of D. rugosum**

1. Pronotum with one or two longitudinal striae in the centre surrounded by concentric arched striae from back to front..................sculptum

– Pronotum with one or two transverse striae in the middle surrounded by concentric striae arched towards the front............sikkimensis

17. *Diacamma rugosum sculptum* (Jerdon)


**Distribution**: India: Sikkim, Karnataka, Maharashtra, Tamil Nadu, Kerala, Andaman and Nicobar Islands, West Bengal. Elsewhere: Philippines, Sri Lanka, Borneo, Singapore, Taiwan.

**Remarks**: Bingham (1903) reported this as a species under the genus *Diacamma* and mentioned 'Sikkim' as one of its habitats.

18. *Diacamma rugosum sikkimensis* Forel


**Remarks**: Chapman and Capco (1951) reported this subspecies as a variety from Sikkim.

19. *Diacamma scalpratum* (Smith)


**Distribution**: India: Sikkim, Assam, Meghalaya, West Bengal. Elsewhere: Myanmar.

**Remarks**: Bingham (1903) reported this species under the genus *Diacamma* and mentioned its locality as 'Sikkim'.

8. Genus *Pachycondyla* Smith


Type-species: *Formica crassinoda* Latreille, 1802.

**Key to the species of Pachycondyla**

1. Episternum of mesothorax separated from sternum by a suture ........................................ 2
   - Episternum of mesothorax not separated from sternum ..................................................... 4

2. Node of pedicel convex in front, upper portion of the posterior face bevelled off towards front ........................................ 3
   - Node of pedicel not bevelled, flat and truncate anteriorly and posteriorly ...... *Leeuwenhoeki*

3. Abdomen finely and closely punctured, opaque, not shining ........................................ *astuta*
   - Abdomen smooth, highly polished and shining .............................................................. 5

4. Middle of front margin of clypeus produced, truncate at apex .................... *amblyops*
   - Middle of front margin of clypeus not produced ......................................................

5. Meso-metanotal suture obsolete .......... *rufipes*
   - Meso-metanotal suture well-marked ........

20. *Pachycondyla astuta* Smith


**Distribution**: India: Sikkim, Meghalaya, Assam. Elsewhere: Myanmar, China, Malaya, Java, Sumatra.

**Remarks**: This is the first record of this species from Sikkim.

21. *Pachycondyla leeuwenhoeki* (Forel)


Remarks: This species is recorded here for the first time from Sikkim.

22. Pachycondyla javana (Mayr)


Distribution: India: Sikkim, Meghalaya, Assam, West Bengal. Elsewhere: Myanmar, China, Java, Malayan subregion, Sumatra.

Remarks: This is the first record of this species from the state of Sikkim.

23. Pachycondyla rufipes (Jerdon)


Distribution: India: Sikkim, Meghalaya, Karnataka, Kerala, Western India, Himalayas from Siwaliks to Assam, West Bengal, Orissa, Andaman and Nicobar Islands. Elsewhere: Myanmar, Sri Lanka.

24. Pachycondyla nigrita (Emery)


Remarks: Bingham (1903) mentioned 'Sikkim' as the only habitat of this species from India.

25. Pachycondyla amblyops (Emery)


Remarks: Sikkim was mentioned as one of the habitats of this species by Bingham (1903).

9. Genus Hypoponera Santschi


Type-species: Ponera abeillei André, 1881.
26. Hypoponera truncata (Smith)


Diagnostic characters: W. TL 3-3.5 mm. Castaneous brown, mandibles, antennae, legs paler, punctate and pubescent. Head without mandibles broadly oval; mandibles with extremely broad masticatory margin; clypeus carinate. Thorax above distinctly flat and depressed. Node of pedicel flat, much broader than long, distinctly thick and rounded above. Constriction between basal two segments of abdomen well-marked, string exerted.


Distribution: INDIA: Sikkim, Meghalaya, Anadaman and Nicobar Islands and almost throughout India. Elsewhere: Myanmar, China, Java, Borneo, Sumatra, Malayan region, Philippines, Singapore.

Remarks: Tiwari (1999) also recorded this species truncata under the genus ponera. But prior to this, Bolton (1995b) in his catalogue mentioned that the species Ponera truncata Smith, 1860 now has been transferred to the genus Hypoponera Santschi, 1938. The present authors accept Bolton's (1995b) view.

This species is recorded here for the first time from the state of Sikkim.

10. Genus Odontoponera Mayr


Type-species: Ponera transversa Smith, 1857.

27. Odontoponera transversa (Smith)


Diagnostic characters: W. TL 9-12 mm. Black; mandibles, antennae, legs castaneous; head almost square, striate, striae outwardly divergent from medial longitudinal line; mandible subtriangular, strongly dentate; clypeus narrow, anteriorly transverse; mandible and clypeus finely longitudinally striate, antennae 12-segmented. Thorax massive, transversely striate; pronotum convex, anterior lateral angles dentate; suture distinct; apical portion of metanotum flat with a denticulate ridge on each side, basal portion with gradual slope. Pedicel cuneiform, transversely striate. Abdomen comparatively short, smooth.


Distribution: INDIA: Sikkim, Meghalaya, Anadaman and Nicobar Islands and almost throughout India. Elsewhere: Myanmar, China, Java, Borneo, Sumatra, Malayan region, Philippines, Singapore.

11. Genus Myopopone Roger


Type-species: Amblyopone castaneus Smith, 1860 (= Myopopone maculata Roger, 1861).

28. Myopopone castanea (Smith)


Diagnostic characters: W. TL 16 mm. Jet-black, shining; legs and apical segment of abdomen
light yellowish brown, pilosity long and fairly dense, more towards apex of abdomen. Head, without mandibles, square; mandibles as broad at apex as at base, the apex and inner margin strongly dentate, puncture run into longitudinal striae; antennae 12-segmented, short, thick; eyes minute. Thorax almost flat above, compressed laterally; pronotum broader than long, transverse posteriorly; mesonotum transverse, highly polished and smooth. Pedicel almost square, anteriorly truncate, posteriorly attached to abdomen by its whole posterior face; abdomen tapering gradually to apex, constriction between basal two segments well-marked; sting long exerted.


**Remarks**: Bingham (1903) described the species *moelleri* under the genus *Myopopone* from Sikkim, which was later on reported as a subspecies of *M. castanea* by Chapman and Capco (1951). But ultimately *M. moelleri* was synonymised as a junior synonym of *M. castanea* (Smith, 1860) by Brown (1960), which was supported by Bolton (1995b).

12. Genus *Amblyopone* Erichson


**Type-species**: *A. australis* Erichson, 1842.

29. *Amblyopone rothneyi* Forel


1903. *Stigmatomma rothneyi*, Bingham, Fauna Brit. India, Hym., 2 : 37, W.


**Diagnostic characters**: W. TL 8.5-9 mm. Black; mandibles, antennae, legs, apices of abdominal segments ferruginous; body densely punctured and covered with short erect pale hairs. Head rectangular, moderately convex above and on the sides, posterior lateral angles rounded; mandibles elongate, obliquely striate, apex smooth, pointed and slightly curved, armed on inner side with double row of acute teeth; antennae 12-segmented, flagellum long, nearly double as mandibles. Pronotum long, convex above; mesonotum depressed; metanotum rounded above, broadening posteriorly; legs comparatively short. Pedicel almost concave anteriorly, rounded and convex above and the sides; abdomen about as long as thorax, 2nd segment distinctly longer than 1st segment.

**Distribution**: India: Sikkim and West Bengal. Elsewhere: China, Philippines.

**Remarks**: Bingham (1903) mentioned its habitat as 'Sikkim'

III. Subfamily CERAPACHYINAE Forel

13. Genus *Cerapachys* Smith


**Type-species**: *C. antennatus* Smith, 1857.

30. *Cerapachys sulcinodis* Emery


**Diagnostic characters**: W. TL 5.5-6.5 mm. Black; mandibles, antennae and legs brownish yellow; abundant fine erect yellowish hairs along the whole body. Head convex in front, posterior lateral angles acute; mandibles triangular, obsoletely dentate; antennae 12-segmented, apical joint of flagellum distinctly much longer than preceding three joints, basal joint very short. Thorax strongly rounded and convex above, posterior face of metanotum flat; legs cylindrical, densely pubescent. Node of pedicel longer than broad, convex above, densely punctured and longitudinally coarsely furrowed or wrinkled;
abdomen elongate, constriction between basal two segments broad and well-marked, apex acute.

**Distribution**: India: Sikkim, Meghalaya. **Elsewhere**: Myanmar, China, Hong-kong, Malayan Peninsula.

**Remarks**: Bingham (1903) also reported the species risii under the genus Cerapachys and mentioned its habitat as ‘Sikkim’. But subsequently, Bolton (1995b) noted in his catalogue that the species risii is the junior synonym of the species C. sulcinodis Emery, 1889.

IV. Subfamily PSEUDOMYRMECINAE Emery

14. Genus *Tetraponera* Smith


**Type-species**: *Eciton nigrum* Jerdon, 1851 (= *Tetraponera atrata* Smith, 1852).

**Key to the species of Tetraponera**

1. Head narrower posteriorly than in front; metanotum with a short basal face; nodes of pedicel longer; abdomen proportionately narrower ..................................... *birmana*
   - Head posteriorly as broad as in front, or broader than in front; nodes of pedicel comparatively short; abdomen comparatively broad .......... *nigra*

31. *Tetraponera birmana* (Forel)


**Distribution**: India: Sikkim. **Elsewhere**: Myanmar, Sumatra.

**Remarks**: Bingham (1903: 112) mentioned its distribution as Sikkim and Burma.

32. *Tetraponera nigra* (Jerdon)


**Distribution**: India: Sikkim, Maharashtra, Meghalaya, Tamil Nadu, Kerala, Karnataka, Malabar coast, West Bengal. **Elsewhere**: Myanmar, Sri Lanka and extends into the Malayan subregion.

**Remarks**: Bingham (1903) also recorded this species under the genus Sima along with some synonyms and mentioned its habitat ‘Sikkim’ and other places.

V. Subfamily MYRMICINAE Lepeletier

**Key to the genera of Myrmicinae**

1. Antennae with less than 12 segments ......... 2
   - Antennae 12-segmented ................................. 6
2. Antennae 10-segmented .................. *Solenopsis*
   - Antennae 11-segmented ................................. 3
3. Pedicel attached to dorsal surface of abdomen ............................................ *Crematogaster*
   - Pedicel attached to middle of front or ventral surface of abdomen ................................. 4
4. Pronotum armed with spines or teeth .......... ............................................ *Lophomyrmex*
   - Pronotum not armed .................................. 5
5. Club of antennae formed of apical two joints of flagellum ............................. *Pheidolegeton*
   - Club of antennae formed of apical three joints of flagellum .............................. *Tetramorium*, pt.
6. Erect hairs on body trifid .......... *Triglyphothrix*
   - Erect hairs on body not trifid, simple .......... 7
7. Flagellum of antennae scarcely thickened towards apex, without distinct club .......... 8
   - Flagellum of antennae with distinct club .......... 9
8. Calcaria of posterior pair of legs pectinate ..................................................... *Myrmica*
   - Calcaria of posterior pair of legs simple ....

..................................................... *Aphaenogaster*
9. Tibiae with simple calcaria .......................... 10
   – Tibiae without calcaria .......... *Cardiocondyla* 10
10. Neuters or workers strongly dimorphous .... ..........................  Pheidole 10
   – Neuters or workers monomorphous .......... 11
11. Maxillary palpi 4-segmented; erect hairs no
body not clavate, antennal furrow generally
present ......................................................... 12
   – Maxillary palpi 5-segmented; erect hairs on
body clavate; no antennal furrow ..........................
..........................................................  Leptothorax 12
12. First joint of pedicel with an appendix beneath
............................................  Rhoptromyrmex 12
   – First joint in pedicel without any appendix
beneath .....................................................  Tetramorium, pt.


3 : 107.

*Type-species :* *A. sardous* Mayr, 1853.

**Key to the species of *Aphaenogaster***

1. Pronotum seen from the front distinctly laterally
bituberculate ........................................... *rothneyi* 1
   – Pronotum not laterally bituberculate .......... 2
2. Antennae very slender; joints 2-7 of flagellum
three times as long as broad .............. *cristata* 2
   – Antennae a little more robust joints 2-7 of
flagellum only a little longer than broad....... ........................................... *smythiesii* 3

33. *Aphaenogaster cristata* Forel

1902. *Stenamma* (Aphaenogaster) cristatus Forel, Rev. Suisse
Zool., 10 : 225, W.

1903. *Aphaenogaster cristata*, Bingham, Fauna Brit. India,
Hym., 2 : 276.

1951. *Aphaenogaster* (Attomyrma) cristatus, Chapman and
Capco, Monogr. Inst. Sci. Tech., Manila (Check List
Ants Asia), 1 : 131.


**Material examined :** India : Sikkim : North Sikkim, Mangan, 14 W, 31.iii.1997, coll. R.N.
Tiwari and party.

**Distribution :** India : Sikkim, Himachal Pradesh, North-West Himalayas.

**Remarks :** This is the first record of this
species from Sikkim.

34. *Aphaenogaster rothneyi* Forel

1902. *Stenamma* (Aphaenogaster) rothneyi Forel, Rev. Suisse
Zool., 10 : 224, W.

1903. *Aphaenogaster rothneyi*, Bingham, Fauna Brit. India,
Hym., 2 : 273.

1951. *Aphaenogaster* (Attomyrma) rothneyi, Chapman and
Capco, Monogr. Inst. Sci. Tech., Manila (Check List
Ants Asia), 1 : 132.

India, 18 (4) : 37.

**Distribution :** India : Sikkim, Meghalaya,
Madhya Pradesh, Tamil Nadu, Uttar Pradesh,
West Bengal, North-West Himalayas.

**Remarks :** Bingham (1903) mentioned its
distribution ‘Sikkim’ alongwith other localities.

35. *Aphaenogaster smythiesii* Forel

1902. *Stenamma* (Aphaenogaster) smythiesi Forel, Rev. Suisse
Zool., 10 : 222, W. F. M.

1903. *Aphaenogaster smythiesi*, Bingham, Fauna Brit. India,
Hym., 2 : 276.

1951. *Aphaenogaster* (Attomyrma) smythiesi, Chapman and
Capco, Monogr. Inst. Sci. Tech., Manila (Check List
Ants Asia), 1 : 132.

Ants World, Harvard Univ. Press, : 73.

**Material examined :** India : Sikkim : East Sikkim, Upper Ranipool, 6 W, 18.v.1994, coll. S.
Chattopadhyay and S.N. Ghosh.

**Distribution :** India : Sikkim, Meghalaya,
North-West Himalayas.

**Remarks :** This species is recorded here for
the first time from Sikkim.
16. Genus *Pheidole* Westwood

Type-species : *Atta providens* Sykes, 1835.

**Key to the species/subspecies of *Pheidole***

1. Club of flagellum of antennae formed of apical four joints .................................................... 2
   - Club of flagellum of antennae formed of apical three joints ................................................ 3

2. Light reddish-brown; head enormous, clypeus not carinate .................................................. *smythiesii*
   - Very dark brown, almost black; head proportionately much smaller, clypeus medially carinate ..................... *bhavanae*

3. First joint of pedicel with a projection or appendix beneath ............................................. 4
   - First joint of pedicel with no projection or appendix beneath .................................................. 5

4. Frontal grooves for reception of scapes of antennae absent .................................................. *grayi*
   - Frontal grooves for reception of scapes of antennae distinct ................................................... *malinsi*

5. Pro- and mesonotum forming a single convexity; transverse mesonotal furrow obsolete ....................... *pronotalis*
   - Pro- and mesonotum not forming a single convexity; transverse mesonotal furrow and ridge or carina, or at any rate the latter, always present .................................................. 6

6. Pronotum convex, lateral tubercles quite or nearly obsolete ................................................. 7
   - Pronotum convex, lateral tubercles sometimes obtuse but always distinct ............................................ *indica himalayana*

7. Base of abdomen finely striate, remaining portion of abdomen smooth and shining ......................... *jucunda fossulata*
   - Abdomen entirely smooth and shining ................................................................. 8

8. Medial portion of clypeus opaque, longitudinally striate ......................................................... *jucunda*
   - Medial portion of clypeus smooth and shining .................................................................................. *roberti*

**Note** : Due to non-availability of detailed description, the species *P. (P) noda stella* Forel could not be included into the key to the species.

**36. Pheidole bhavanae** Bingham


**Distribution** : India : Sikkim (8000 ft.) and Meghalaya.

**Remarks** : Bingham (1903) described this species from Sikkim.

**37. Pheidole grayi** Forel


**Distribution** : India : Sikkim, Western India.

**Remarks** : Bingham (1903) mentioned its distribution as ‘so far only from Western India and Sikkim’

**38. Pheidole indica himalayana** Forel


**Distribution** : India : Sikkim, Kashmir.

**Remarks** : ‘The Himalayas from Kashmir to Sikkim’ was mentioned as the habitat of this species by Bingham (1903).
39. *Pheidole jucunda* Forel


**Distribution**: India: Sikkim, Meghalaya, Western India. Elsewhere: Sri Lanka.

**Remarks**: Bingham (1903) reported this species from Sikkim.

40. *Pheidole jucunda fossulata* Forel


**Distribution**: India: Sikkim, Western India.

**Remarks**: Bingham (1903) mentioned this species extends in Sikkim up to 7000 ft.

41. *Pheidole malinsii* Forel


**Remarks**: Bingham (1903) reported Sikkim as its habitat.

42. *Pheidole pronotalis* Forel


**Remarks**: Bingham (1903) reported Sikkim as its only habitat in India.

43. *Pheidole noda stella* Forel


**Distribution**: India: Sikkim.

**Remarks**: Forel (1911) first described this subspecies as a variety from Sikkim.

44. *Pheidole roberti* Forel


**Distribution**: India: Sikkim, Meghalaya, Karnataka, West Bengal.

**Remarks**: Bingham (1903) mentioned its habitat Sikkim.

45. *Pheidole smythiesii* Forel


**Distribution**: India: Sikkim, Meghalaya, Assam, West Bengal. Elsewhere: Singapore.

**Remarks**: Datta and Raychaudhuri (1983) reported this species as one of the aphidocolous ants of Sikkim.
17. Genus Myrmica Latreille


*Type-species:* *Formica rubra* Linnaeus, 1758.

**Key to the species of Myrmica**

1. Medial portion of clypeus produced, angular, the apex obtuse; the scape of antennae not extending beyond the top of head ............... 2
   - Medial portion of clypeus not produced, not angular, transverse; the scape of antennae extending beyond top of head ............... *ritae*

2. Length 6 mm.; metanotal spines long, as long as the basal face of metanotum ............ *rugosa*
   - Length 3.5-4.5 mm.; metanotal spines short, only about half as long as basal face of metanotum ...................................... *smythiesii*

46. *Myrmica rugosa* Mayr


**Distribution:** India: Sikkim and all Himalayan States, North-West India.

**Remarks:** Datta and Raychaudhuri (1983) reported this species as one of the aphidocolous ants of Sikkim.

47. *Myrmica ritae* Emery


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

**Remarks:** This is the first record of this species from the state of Sikkim.

48. *Myrmica smythiesii* Forel


**Distribution:** India: Sikkim, North-West Himalayas. **Elsewhere:** Siberia, Tibet, Turkestan.

**Remarks:** Bolton (1995b) also recorded the species *smythiesii* under this genus *Myrmica*.

49. *Myrmica smythiesii rupestris* Forel


**Distribution:** India: Sikkim.

**Remarks:** Forel (1902) first reported *rupestris* as a variety of *M. smythiesii* from Sikkim. Chapman and Capco (1951) also listed this one from Sikkim.

18. Genus Pheidologeton Mayr


*Type-species:* *Ocodoma diversa* Jerdon, 1851.
50. *Pheidologeton diversus* (Jerdon)


*Diagnostic characters*: W. TL 2.5-3.5 mm. Dark chestnut brown; mandibles, antennae and legs yellowish brown; body smooth, polished and shining. Head rectangular, sides straight; mandibles strong; clypeus narrow in the middle; antennae 11-segmented, slender; eyes small, round. Anterior portion of thorax convex; meso-metanotal suture distinct, metanotum depressed, two metanotal spines erect and stout; legs slender. Pedicel with two nodes, 2nd is longer than 1st; abdomen broadly oval.


*Remarks*: Bingham (1903) mentioned Sikkim as one of its habitats.

19. Genus *Crematogaster* Lund


Type-species: *Formica scutellaris* Olivier. 1792.

*Key to the species/subspecies of Crematogaster*

1. Head smooth and shining, at most with a few half obsolete striae anteriorly ................... 2
   - Head not smooth, entirely sculptured .......... 10
2. Club of flagellum of antennae 3-segmented. ....................................................................... 3
   - Club of flagellum of antennae 2-segmented ....................................................................... 9
3. Pronotum sculptured .............................*buddhae*
   - Pronotum not sculptured, smooth ............. 4
4. Basal level portion of metanotum sculptured ................................................................. 5
   - Basal level portion of metanotum not sculptured, smooth ............................................. 6
5. Pronotum with distinct lateral obtuse tubercles ................................................................*sagei*
   - Pronotum not tuberculate, convex .......... *walshi*
6. Pro-mesonotal suture obsolete or very slight .................................................................... 7
   - Pro-mesonotal suture well-marked, distinct .... ................................................................. 8
7. Metanotal spines short, much shorter than the length of basal level portion of metanotum .. .......................................................................................................................... *politula*
   - Metanotal spines long, longer than basal level portion of metanotum ......................... *ransonneti*
8. Dark brown, abdomen chestnut-red; 1st joint of pedicel as broad as long ..................... *ebenina*
   - Darker, almost black, abdomen reddish-brown, 1st joint of pedicel little longer than broad ................................................................. *ebenina corax*
9. Yellowish brown; 2nd joint of pedicel with a broad longitudinal groove above ............... ...................................................................................................................... *Crematogaster* sp.
   - Paler yellow; 2nd joint of pedicel with no longitudinal groove above ....................... *ebenina biroi*
10. Metanotal spines shorter than metanotum .... .................................................................................. *rothneyi*
   - Metanotal spines distinctly longer than metanotum ....................................................... 11
11. Pronotum reticulate ............................... *rogenhoferi*
   - Pronotum longitudinally striate .................. ..................................................................... *rogenhoferi flava*

*Note*: Due to non-availability of detailed description of *C. binghamii* Forel, it could not be included in the key to the species.

51. *Crematogaster binghamii* Forel


**Distribution**: India: Sikkim.

**Remarks**: Forel (1904) reported this species from Sikkim.

52. *Crematogaster biroi* Mayr


**Remarks**: Bingham (1903) reported Sikkim as one of its habitats.

53. *Crematogaster buddhae* Forel


**Distribution**: India: Sikkim, Manipur, Andaman and Nicobar Is., West Bengal, North-West Himalayas.

**Remarks**: Bingham (1903) mentioned one of its habitats as Sikkim.

54. *Crematogaster ebenina* (Forel)


**Distribution**: India: Sikkim, Karnataka, Maharashtra, Western India. Elsewhere: Myanmar.

**Remarks**: Bingham (1903) reported the species from Sikkim. Chapman and Capco (1951) also mentioned its distribution ‘Sikkim’ in their Check-List.

55. *Crematogaster ebenina corax* Forel


**Remarks**: Forel (1902) and Chapman and Capco (1951) mentioned its distribution as Sikkim.

56. *Crematogaster rogenhoferi flava* Forel


**Distribution**: India: Sikkim, Assam, Kerala, Tamil Nadu, Meghalaya, Andaman and Nicobar Islands, Orissa, West Bengal. Elsewhere: Nepal.

**Remarks**: Bingham (1903) reported Sikkim as one of its habitats.

57. *Crematogaster ransonneti* Mayr


1903. Cremastogaster ransonneti, Bingham, Fauna Brit. India, Hym., 2: 137, W.


**Remarks**: Bingham (1903) reported this species from Sikkim.
58. Crematogaster rogenhoferi Mayr


Distribution: India: Sikkim, Assam, Manipur, Meghalaya, Andaman and Nicobar Islands, West Bengal, Tamil Nadu, Kerala, Maharashtra, Western India. Elsewhere: Myanmar, Sri Lanka, Sumatra.

59. Crematogaster rothneyi Mayr


Distribution: India: Sikkim, Meghalaya, Gujarat, Maharashtra, Tamil Nadu, West Bengal.

Remarks: Bingham (1903) mentioned one of its habitats as Sikkim.

60. Crematogaster walshi Forel


Distribution: India: Sikkim, Meghalaya, Orissa, West Bengal.

Remarks: Bingham (1903) recorded this species from Sikkim.

61. Crematogaster sagei Forel


Distribution: India: Sikkim, Haryana, the Himalayas (2000-7000 ft.)

62. Crematogaster politula Forel


Distribution: India: Sikkim, Meghalaya, Assam.

Remarks: Datta and Raychaudhuri reported this species as one of the aphidocolous ants from Sikkim.

63. Crematogaster sp.


20. Genus Lophomyrmex Emery


Type-species: Ocodoma quadrispinosa Jerdon, 1851.

Key to the species of Lophomyrmex

1. Pronotum armed with two spines or teeth...
21. Genus *Rhoptromyrmex* Mayr


*Type-species*: *R. globulinodis* Mayr, 1901.

67. *Rhoptromyrmex wroughtoni* Forel


*Diagnostic characters*: W. TL 2.5 mm. Brownish yellow, antennae and legs paler; head and thorax lightly longitudinally striate, abdomen smooth and shining. Head without mandibles trapezoidal, much broader posteriorly than in front mandibles triangular, masticatory margin broad; clypeus convex, anterior margin arched; 12-segmented antennae rather long. Thorax broad and convex anteriorly; constricted at mesonotum; anterior margin of metanotum a little raised behind the distinct meso-metanotal suture, two metanotal spines short, stout, acute and divergent. Pedicel short; 1st node rounded above, anteriorly with a short petiole bearing an appendix beneath; 2nd node transverse, broader than 1st; abdomen oval.


*Remarks*: Datta and Raychaudhuri (1983) reported this species as one of the aphidocolous ant species from Sikkim.
- Antennae 12-segmented ........................................... 2

2. Clypeus carinate; mandibles smooth, not striate .................................................. 3

- Clypeus not carinate or toothed; mandibles finely longitudinally striate ................ christiei

3. The scape of antennae falling short of the top of the head by about one-fourth of its own length; clypeus with three parallel vertical carinae down the middle ............... pacificum

- The scape of antennae falling short of the head by about half of its own length; clypeus with two vertical carinae .................. bicarinatum

68. Tetramorium bicarinatum (Nylander)


Distribution : India : Sikkim, Meghalaya, Andaman and Nicobar Islands, Assam.

Remarks : Datta and Raychaudhuri (1983) reported this species as one of the aphidocolous ant species from Sikkim.

69. Tetramorium christiei Forel


Remarks : Forel (1902) described this species from Sikkim and Bingham (1903) also recorded this species from same locality.

70. Tetramorium pacificum Mayr


Remarks : Bingham (1903) reported T. scabrum from Sikkim which is synonymised as T. pacificum by Bolton, 1977.

71. Tetramorium tortuosum Roger

1863. Tetramorium tortuosum Roger, Berl. ent. Zeitschr., 7 : 181, W.

1903. Tetramorium tortuosum, Bingham, Fauna Brit. India, Hym., 2 : 188.


Remarks : This is the first record of this species from Sikkim.

23. Genus Triglyphothrix Forel


Type-species : T. walshi Forel, 1890.

72. Triglyphothrix striatidens (Emery)


Diagnostic characters : W. TL 2.5 mm.
Head, thorax, pedicel orange-brown, abdomen bright brown; body covered with long, soft dense whitish pilosity. Head very convex, broader posteriorly; mandibles triangular, finely regularly rather closely longitudinally striate; clypeus broad; 12-segmented antennae, scape not reaching to top of the head. Thorax broad, rounded in front; metanotal than broad, 2nd node smaller; abdomen broadly oval.


**Remarks**: Bingham (1903) reported this species from Sikkim. Subsequently, Bolton (1995b) synonymised this species with *Tetramorium Iflnuginosum* Mayr, 1870.

24. Genus *Solenopsis* Westwood


*Type-species*: *Atta geminata* Fabricius, 1804 (=*Solenopsis mandibularis* Westwood, 1841).

73. *Solenopsis geminata* (Fabricius)


**Diagnostic characters**: W. TL 3-4.5 mm. Pale yellow to reddish yellow; abdomen and boarders of mandibles marked with brown; smooth, shining and polished. Head more less square; mandibles short, stout, 4-dentate; clypeus narrow at the sides, in the middle produced back between antennal carinae, apices of each side projected as small teeth beyond the anterior margin; antennae 10-segmented. Thorax narrow, pronotum rounded anteriorly; pro-mesonotal suture obsolete; mesonotum convex; legs long and slender. 1st node of pedicel squamiform; petiolar anteriorly; 2nd node oval, broader; abdomen oval.

**Distribution**: India: Sikkim, Madhya Pradesh, Uttar Pradesh, North-West Himalayas.

**Remarks**: Bingham (1903) recorded one of its habitats as Sikkim. Bolton (1995b) also recorded this species under the same genus.

25. Genus *Leptothorax* Mayr


*Type-species*: *Formica acervorum* Fabricius, 1793.

74. *Leptothorax rothneyi* Forel


**Diagnostic characters**: W. TL 3 mm. Head, abdomen brown to dark brown; thorax and pedicel lighter; mandibles, antennae and legs yellow; head and thorax minutely and closely punctured. Head broadly oval, broader and transverse posteriorly; mandibles minutely longitudinally striate at base; clypeus very convex in the middle antennae 12-segmented; eyes rather large. Thorax anteriorly convex and broad, narrowing posteriorly; basal portion of metanotum rectangular with two triangular erect spines at posterior lateral angles. Pedicel thick, 1st node sloping gradually in front; 2nd node broad, transverse; abdomen oval, anteriorly truncate.

**Distribution**: India: Sikkim, Madhya Pradesh, Uttar Pradesh, North-West Himalayas.

**Remarks**: Bingham (1903) recorded one of its habitats as Sikkim. Bolton (1995b) also recorded this species under the same genus.

26. Genus *Cardiocondyla* Emery


*Type-species*: *C. elegans* Emery, 1869.
75. *Cardiocondyla nuda* (Mayr)


**Diagnostic characters**: W. TL 2.5-3 mm. Head, thorax and pedicel red, abdomen jet-black; head, thorax and pedicel finely granulate; abdomen highly polished and shining. Head nearly as long as thorax, oval, very convex in front, posteriorly rounded; mandibles broad, armed with 5 teeth; clypeus very narrow; elongated antennae 12-segmented. Thorax narrower than head; anterior angles of pronotum rounded; metanotum cubical, basal portion about twice as long as the truncate apical protion. 2-jointed pedicel about half the length of thorax, posterior node much broader than anterior node; abdomen oval.

**Distribution**: India: Sikkim, Meghalaya, Andaman and Nicobar Islands, West Bengal. Elsewhere: Malaysia, Oceania, Sri Lanka.

**Remarks**: Bingham (1903) reported this species from Sikkim.

### VI. Subfamily DOLICHRODERINAE Forel

**Key to the genera of Dolichoderinae**

1. Base of abdomen not gibbous, not overhanging the pedicel ........................................ 2
   - Base of abdomen gibbous, overhanging the pedicel .................................................. 3

2. Metanotum laterally compressed, cuneiform, with a basal face more or less horizontal and apical face truncate, vertical often concave, the former passing into the latter by a sharp angle .................................. *Dolichoderus*
   - Metanotum not laterally compressed, not cuneiform, rounded; its basal face passing into the obliquely truncate sloping apical face by a more or less rounded curve .... *Iridomyrmex*

3. Anal orifice apical ............ *Technomyrmex*
   - Anal orifice inferior, not apical ....................
     .......................................................... *Bothriomyrmex*

27. **Genus Dolichoderus** Lund


**Type-species**: *Formica attelaboides* Fabricius, 1775.

**Key to the species/subspecies of Dolichoderus**

1. Head, thorax and abdomen with abundant fine silky pubescence, but entirely without erect hairs .............................................................. 2
   - Head, thorax and abdomen more or less furnished with erect hairs ............................ 3

2. Head and abdomen brownish, thorax yellow or reddish yellow; presence of long longitudinally impressed line from vertex to between the eyes ........................................... *feae*
   - Head, thorax and abdomen dark fuscous brown; no longitudinally impressed line from vertex to between the eyes .......................................................... *Dolichoderus* sp.

3. Head densely punctured, opaque and pubescent, thorax very coarsely punctured...
   - Head smooth and shining, slightly pubescent; thorax less coarsely and irregularly punctured .............................................................. 4

4. Basal portion of metanotum distinctly longer than apical truncate portion, length over 3 mm .......................................................... 5
   - Basal portion of metanotum distinctly shorter than apical truncate portion, length under 3 mm ............................................................. *mogridgei*

5. Comparatively short; the legs light reddish brown and markedly pilose ........... *affinis*
   - Comparatively long; the legs light yellowish red and comparatively smooth, without pilosity ...
     .......................................................... *affinis glabripes*

**Note**: Due to non-availability of detailed
description, the species *D. moggridgei bicolor* could not be included in the key.

76. **Dolichoderus affinis** Emery


*Remarks*: Bingham (1903) reported this species from Sikkim.

77. **Dolichoderus affinis glabripes** Forel


*Distribution*: India: Sikkim.

*Remarks*: Chapman and Capco (1951) reported the distribution of this species as Sikkim.

78. **Dolichoderus thoracicus** (Smith)


*Distribution*: India: Sikkim, Meghalaya, West Bengal, Western India. *Elsewhere*: Myanmar, Celebes, Philippines, Sulawesi, Java, Malaya.

*Remarks*: Bingham (1903: 295) mentioned one of its habitat as Sikkim.

79. **Dolichoderus feae** Emery


*Remarks*: Bingham (1903) also reported this species from Sikkim.

80. **Dolichoderus moggridgei** Forel


*Distribution*: India: Sikkim (4000 ft.), Assam.

*Remarks*: Bingham (1903) reported this species from Sikkim, though he expressed his doubtfulness whether he had rightly identified the species.

81. **Dolichoderus moggridgei bicolor** Santschi


*Distribution*: India: Sikkim (4000 ft.).

*Remarks*: Santschi (1920) described this subspecies and mentioned its habitat as Sikkim.
82. *Dolichoderus* sp.


28. Genus *Technomyrmex* Mayr


*Type-species*: *T. strenua* Mayr, 1872.

**Key to the species/subspecies of *Technomyrmex***

1. Black, tarsi white or brownish white in marked contrast; pubescence sparse; metanotum rounded ............................................ *albipes*

   – Reddish brown, tarsi slightly paler, not in contrast, pubescence more abundant; metanotum more rounded ..........................................

   ............................................. *albipes brunneus*

83. *Technomyrmex albipes* (Smith)


*Remarks*: This is new record of this species from the state of Sikkim.

84. *Technomyrmex albipes brunneus* Forel


*Remarks*: Bingham (1903) recorded Sikkim as one of its habitats.

29. Genus *Bothriomyrmex* Emery


*Type-species*: *Tapinoma meridionalis* Roger, 1863.

**Key to the species of *Bothriomyrmex***

1. Head, thorax and abdomen brownish black; mandibles armed with 7 teeth; posterior margin of clypeus not clearly defined .............. *walshi*

   – Head, thorax and abdomen pale yellow, slightly tinted with brown; mandibles armed with 4-6 teeth; posterior margin of clypeus well-defined ............................................. *myops*

85. *Bothriomyrmex myops* Forel


*Distribution*: India: Sikkim, Meghalaya, Western India.

*Remarks*: Bingham (1903) mentioned Sikkim as one of its habitats.

86. *Bothriomyrmex walshi* Forel


Distribution: India: Sikkim, West Bengal.

Remarks: Bingham (1903) reported this species under the genus Bothriomyrmex and mentioned "Sikkim" as one of its habitats.

30. Genus Iridomyrmex Mayr


Type-species: Formica purpureus Smith, 1858, (= Formica detecta Smith, 1858).

87. Iridomyrmex anceps sikkimensis Forel


Distribution: India: Sikkim.

Remarks: Forel (1904) described this as a variety of I. anceps and mentioned its distribution as Sikkim.

VII. Subfamily FORMICINAE Lepeletier

Key to the genera of Formicinae

1. Antennae 12-segmented............................2
   - Antennae 11-segmented.............................8
2. Head more or less cordiform; eyes large, mandibles trigonal in shape, multidentate; antennae long, scape passing much beyond the occiput, last segment of flagellum much shorter than the preceding one ............ Oecophylla
   - Alternate set of characters ......................3
3. Antennae inserted at a perceptible distance from posterior margin of clypeus ............4
   - Antennae inserted immediately above posterior margin of clypeus, almost touching it ......... 5
4. Thorax and node of pedicel not dentate nor spinous, nor with the angles markedly produced; basal two abdominal segments equal or subequal in length .................. Camponotus
   - Thorax and node of pedicel spinous or dentate, or with the angles markedly produced; basal segment of abdomen much longer than second segment.......................... Polyrhachis
5. Antennal and clypeal hollows separate............ Polyrhachis
   - Antennal and clypeal hollows confluent ...... 6
6. Ocelli absent...................................... Pseudolasius
   - Ocelli present ......................................7
7. Node of pedicel rounded; 4th segment of maxillary palpi nearly twice as long as 5th .................................. Myrmecocystus
   - Node of pedicel flat; 4th segment of maxillary palpi only a little longer than 5th .................... Formica
8. Scape of antennae very long, extending beyond the top of the head by more than half its length .................................. Anoplolepis
   - Scape of antennae comparatively short; extending very little beyond the top of the head .................................. Plagiolepis

31. Genus Oecophylla Smith


Type-species: Formica smaragdina Fabricius, 1775 (= Formica virescens Fabricius, 1775).

88. Oecophylla smaragdina (Fabricius)


Diagnostic characters: W. TL 8-10 mm. Yellowish red. Head quadrangular without mandibles, posteriorly transverse; mandibles long, dentate, apical tooth acute and curved; clypeus strongly convex, antennae 12-segmented, filiform; eyes large. Thorax elongate; pronotum convex, anteriorly narrowed into a collar; mesonotum saddle-shaped; metanotum rounded above, sutures distinct. Pedicel elongate, scarcely nodiform; abdomen short, oval.

Distribution: India: Sikkim, Meghalaya, Manipur, Orissa, Andaman and Nicobar Is., Tamil Nadu, Karnataka, Kerala, West Bengal and mostly the whole India, except desert and treeless areas. Elsewhere: Australia, Myanmar, China, Java, New Guinea, Malaya, Sri Lanka.

32. Genus Plagiolepis Mayr


Type-species: Formica pygmaea Latreille. 1798.

Key to the species of Plagiolepis

1. Length under 2 mm.; colour pale dull brownish yellow; clypeus strongly convex, not carinate; basal portion of metanotum much shorter than its oblique apical portion ................... dichroa

- Length over 2 mm.; colour deep reddish brown to black; clypeus strongly medially carinate; basal portion of metanotum about the same length as the oblique apical portion ................

........................................................... moelleri

89. Plagiolepis dichroa Forel


Distribution: India: Sikkim, Meghalaya, West Bengal.

Remarks: Bingham (1903) mentioned one of its habitats as Sikkim.

90. Plagiolepis moelleri Bingham

1903 Plagiolepis moelleri Bingham, Fauna Brit. India, Hym., 2 : 321. W


Distribution: India: Sikkim.

Remarks: This species was first described by Bingham (1903) from Sikkim.

33. Genus Anoplolepis Santschi


Type-species: Formica longipes Jerdon. 1851.

91. Anoplolepis longipes (Jerdon)

1851. Formica longipes Jerdon, Madras J. Lit. Sci., 17 : 122, W.


Diagnostic characters: W. TL 3.5-4 mm. Pale yellow, abdomen above with a tinge of brown; very minutely and closely reticulate punctate. Head oval, very rounded posteriorly; mandibles narrow, acutely dentate along the masticatory margin, with the apices crossing; eyes very prominent; antennae long; filiform, joints of flagellum much longer than broad. Thorax narrow, elongate, metanotum rounded and gibbous; legs extremely long and slender. Node of pedicel thick, low, conical; abdomen broadly oval.


Distribution: India: Sikkim, Meghalaya, Kerala, Andaman and Nicobar Islands, West Bengal, throughout India, except the North-West areas. Elsewhere: Australia, Myanmar, Dutch New Guinea, Maffin Bay, Sri Lanka.

Remarks: Bolton (1995b) mentioned this species under the genus Anoplolepis with few comments. However, as he (op. cit.) does not
designate its position properly, the present authors think that it is correct to retain this species under the genus *Anoplolepis*.

34. Genus *Formica* Linnaeus


*Type-species*: *F. rufa* Linnaeus, 1758.

**Key to the species of Formica**

1. Head and thorax clear yellowish red, abdomen light fuscous brown; head comparatively long and narrow; node of pedicel flat or a little convex, both anteriorly and posteriorly ............................................................. *rufibarbis*

- Fuscous or brownish red, head darker than rest of body; head comparatively short and broad; node of pedicel convex in front; more or less flat posteriorly ........................... *fusca*

92. *Formica fusca* Linnaeus


*Remarks*: Bingham (1903) mentioned Sikkim as one of its habitats.

93. *Formica rufibarbis* Fabricius


*Remarks*: Bingham (1903) reported this species from Sikkim.

35. Genus *Cataglyphis* Förster


*Type-species*: *Formica bicolor* Fabricius. 1793 (=*Cataglyphis fairmairei* Förster, 1850).

94. *Cataglyphis setipes* (Forel)


*Diagnostic characters*: W. TL 10 mm. Head, thorax, pedicel dark red, abdomen black, legs almost black; densely setose and spinose. Head without mandibles quadrangular, sides straight; mandibles large, strongly dentate, apical tooth remarkably long, curved and acute; clypeus convex; frontal area triangular; antennae 12-segmented filiform; eyes placed well above the middle line of head; ocelli present. Thorax viewed from side constricted, saddle-shaped, sutures well-marked; pronotum convex; mesonotum long, narrow, rounded above; metanotum short gibbous. Node of pedicel rounded; abdomen comparatively short, oval.


*Distribution*: India: Sikkim, Punjab, Tamil Nadu, Meghalaya, West Bengal, Central India. *Elsewhere*: Persia.
Remarks: This is the first record of this species from the state of Sikkim.

36. Genus *Pseudolasius* Emery


Type-species: *Formica familiaris* Smith, 1860.

95. *Pseudolasius familiaris* (Smith)


Diagnostic characters: W. TL maj. 6-7 mm., min. 3.5 mm. Reddish yellow to creamy buff, abdomen almost reddish brown; very minutely but closely reticulate-punctate; hairs fairly long; erect; pubescence fine; short and silky, dense on abdomen. Head nearly square without mandibles, broader posteriorly; powerful mandibles with four teeth, innermost broad, others acute; clypeus convex in the middle; depressed at the sides; 12-segmented antennae somewhat short, scape stout; eyes small. Thorax short, narrower than head; pronotum rounded, convex; viewed from above mesonotum circular; basal portion of metanotum much shorter than oblique apical portion; sutures distinct. Node of pedicel quadrangular, posteriorly fitted into a hollow in abdomen; abdomen short, broad and convex.


Remarks: Bingham (1903) mentioned Sikkim as one of its habitat.

37. Genus *Polyrhachis* Smith


Type-species: *Formica bihamata* Drury, 1773.

**Key to the species of Polyrhachis**

1. Thorax more or less rounded above, the sides not margined along their whole length ..........2
   - Thorax more or less flat above, the sides margined along their whole length ..........3
2. Pubescence sparse, almost entirely wanting ........................................................... *thompsoni*
   - Pubescence dense, silky and recumbent........ 
     ................................................................ *dives*
3. Pronotum with a short spine or tooth, mesonotum unarmed; metanotum with a lamina, spine or tooth on each side ............... *Polyrhachis* sp.
   - Pronotum with a long spine; mesonotum unarmed; metanotum with a lamina, spine or tooth on each side ...............4
4. Pubescence very dense......................... *mayri*
   - Pubescence absent or very sparse..... *striata*

96. *Polyrhachis dives* Smith


Remarks: Tiwari (1999) reported this species and mentioned its distribution as Sikkim.

97. *Polyrhachis illaudata* Walker


Remarks: Bingham (1903) also reported *P. mayri* Roger, 1863 and mentioned Sikkim as one of its habitats, which was synonymised under *P. illaudata* by Bolton (1995b).

98. *Polyrhachis striata* Mayr


*Remarks*: Sikkim was mentioned as one of the habitats of this species also by Bingham (1903).

99. *Polyrhachis thompsoni* Bingham


*Remarks*: This species is recorded here for the first time from Sikkim.

100. *Polyrhachis* sp.


38. Genus *Camponotus* Mayr


*Type-species*: *Formica ligniperda* Latreille, 1802.

**Key to the species/subspecies of *Camponotus***

1. Thorax viewed from side forming a regular arch ................................................. 2
   - Regular arch of the thorax interrupted by metanotum .................................. 10
2. Head, thorax and abdomen entirely black or pale yellow .................................. 3
   - Head, thorax and abdomen never all black or all yellow .................................... 5
3. Body colour entirely pale yellow; tibiae of legs cylindrical .......................... *invidus*
   - Body colour entirely black; tibiae of legs prismatic ........................................ 4
4. Tibiae of the legs without spines beneath ...................................................... *lamarecki*
   - Tibiae of the legs with spines beneath .................................................................. *compressus*
5. Median lobe of clypeus produced anteriorly ..................................................... 6
   - Median lobe of clypeus not produced anteriorly ................................................ 7
6. Head reddish yellow ................................................... *dolendus*
   - Head and 3rd following segments of abdomen black ........................................... *thoracicus*
7. Tibiae cylindrical .................................................. 8
   - Tibiae compressed .................................................. 9
8. Clypeus medially vertically carinate; without spines on tibiae .......................... *barbatus taylori*
   - Clypeus not carinate, subtectiform; with few spines on apical third of tibiae beneath .. *oblongus*
9. Head massive, occiput strikingly wider than the thorax; tibiae spined beneath ....... *arrogonas*
Head comparatively short tibiae without spines beneath ................................................. *mitis*

10. Regular arch of the thorax interrupted by the metanotum forming an angle with the mesonotum; basal portion of metanotum horizontal, flat or slightly concave; apical portion excavate .......... *sericeus peguensis*

- Regular arch of the thorax interrupted by the metanotum being raised, rounded above the gibbous ........................................................ 11

11. Anterior lateral angles of pronotum dentate or subdentate ........................................... *wasmanni*

- Anterior lateral angles of pronotum rounded, not dentate .............................................. 12

12. Head black ........................................ *camelinus*

- Head blood-red ..................................... *singularis*

101. *Camponotus compressus* (Fabricius)


**Distribution** : India : Sikkim, Manipur, West Bengal. **Elsewhere** : Algeria.

**Remarks** : This is new record of this species from the state of Sikkim.

103. *Camponotus arrogans* (Smith)


**Distribution** : India : Sikkim, Manipur, West Bengal. **Elsewhere** : Myanmar, Malayan Peninsula, Singapore.

**Remarks** : This species is recorded here for the first time from Sikkim.

104. *Camponotus dolendus* Forel


**Material examined** : India : Sikkim : South Sikkim, Namchi, 2 W, April, 1996. coll. R.N. Tiwari and party.

**Distribution** : India : Sikkim, Tamil Nadu, Andaman and Nicobar Is., West Bengal, North-West Himalayas.

105. *Camponotus invidus* Forel


Remarks: This is recorded here for the first time from Sikkim.

106. Camponotus mitis (Smith)


Remarks: This is the first record of this species from the state of Sikkim.

107. Camponotus lamarcki Forel


Distribution: India: Sikkim, Northern India.

Remarks: Bingham (1903) reported this species from Sikkim.

108. Camponotus camelinus (Smith)


Remarks: Bingham (1903) mentioned Sikkim as the only habitat in India of this species.

109. Camponotus oblongus (Smith)


Remarks: Bingham (1903) mentioned Sikkim as one of its habitats.

110. Camponotus sericeus peguensis Emery


Remarks: Chapman and Capco (1951) mentioned its distribution as Sikkim.
111. *Camponotus singularis* (Smith)


*Remarks*: Chapman and Capco (1951) reported this species also from Sikkim.

112. *Camponotus barbatus taylori* Forel


*Distribution*: India : Sikkim, Maharashtra, Orissa, the Nilgiris, North-West Himalayas. Elsewhere : Myanmar, China, Sri Lanka.

*Remarks*: Bingham (1903) recorded this species as a species from Sikkim.

113. *Camponotus wasmanni* Emery


*Remarks*: Bingham (1903) mentioned Sikkim as one of its habitats.

39. Genus *Paratrechina* Motschoulsky


*Type-species*: *Formica longicornis* Latreille, 1802 (= *P. currens* Motschoulsky. 1863).

114. *Paratrechina aseta* (Forel)


*Diagnostic characters*: W. TL 2.5 mm. Head and abdomen brownish yellow, thorax dull reddish yellow, antennae and legs of a lighter shade than thorax; body minutely punctured with fine and short pubescence. Head rectangular, sides straight; mandibles finely sculptured, armed with 6-teeth; clypeus very convex, subcarinate down the middle; 12-segmented antennae long; eyes small. Thorax compressed; sutures distinct, meso-metanotal suture contains two somewhat prominent stigmata; metanotum raised a little. Pedicel short, somewhat quadrangular node inclined forward; abdomen rounded and gibbous.

*Distribution*: India : Sikkim, West Bengal.

*Remarks*: Bingham (1903) reported this species under the genus *Prenolepis* and mentioned one of its habitats as Sikkim.

**SUMMARY**

This paper deals with the ants collected from different districts of Sikkim by the authors in 1996 and other collections by the various survey parties of the department. Prior to this, Bingham (1903) reported 69 species of ants under 30 genera from Sikkim in his “Fauna of British India, including Ceylon and Burma” Subsequently, Chapman and Capco (1951) included another 15 species under 12 genera from the state of Sikkim in their “Check
List of Ants Asia” Dutta and Raychaudhuri (1983) also recorded 20 aphid attending ants under 16 genera from this region. Although several workers have contributed to the knowledge of ants fauna of India, but no one has exclusively studied the ant fauna of Sikkim.

This is the first attempt by the present authors to consolidate the knowledge of ant fauna of Sikkim. Altogether 114 species including previously reported species under 39 genera and 7 subfamilies have been incorporated in this paper from the state of Sikkim. Out of these, 17 species marked with single asterisk (*) in the “List of Taxa” in Systematic Account, are recorded here for the first time from the state of Sikkim.

Key to the subfamilies, genera and species have been incorporated in this paper, but key to the species include only those species which were studied by the authors, other species so far recorded could not be included in the key to the species, because of insufficient literatures.

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INTRODUCTION

The families Apide, Anthophoridae, Megachilidae and Xylocopidae belonging to the Superfamily Apoidea, which include the Bees; the families Vespidae and Eumenidae belonging to the Superfamily Vespoidea which include the yellow-wasps, Hornets and Potter wasps and the family Sphecidae, which includes the Sand-wasps or Mud-Daubers, belonging to the Superfamily Sphecoidea, are mainly dealt herewith, for Aculate Hymenoptera. These insects made their nests in forests and river-sites, from primitive days in this planet Earth and gradually approached near human habitations, afterwards. The bees and honey-bees move from flower to flower with humming sound and collect nectar for honey, which is widely used for medical purpose; they also help pollination while moving among flowers. Wasp-larvae are used as bait for fish-angling. Wasp and Sand-wasps being predatory in nature, can be utilised for biological control of insect-pests in agriculture.

The sting of bee or wasp is fierce and painful, when it bites someone. The Carpenter Bees (Xylocopidae) damage trees by making holes in them for their nests.

Our knowledge about the Aculeate Hymenoptera of Sikkim for Wasps and Bees is due to Bingham (1897), André (1903), Cameron (1904), Turner (1920), Bluthgen (1927), Richards (1934), Mavromoustakis (1937), Soika (1959, 1972, 1976) and Tkalcu (1968).

The morphological characters of the 'Superfamily Apoidea' for the above cited families are having the followings: Length of the specimens varies from 3-30 mm.; antennae geniculate, stout or filiform, 13-segmented in male, 12-segmented in female eyes small or moderately large in male 'Xylocopa'; thorax globose or subglobose or ovate in shape; forewing with 1-3 cubital cell, hindwing with anal and other closed cells; abdomen 7-segmented in male, 6-segmented in female: thoracic hairs branched or plumose: wings at rest with or without a longitudinal fold: posterior tarsal joint dilated.

The morphological characters for 'Superfamily Vespoidea' comprising of the above noted families are having the followings: Length of the specimens varies from 11-32 mm.; antenna 13-segmented in male 12-segmented in female, eyes emarginate: forewing with I Discoidal cell elongate and longer than submedian cell: hindwing with anal and other closed cells: legs are of moderate length, without spines, trochanters undivided, mid-tibia with 1 or 2 apical spurs, posterior tarsal joint not dilated, tarsal claws toothed; thorax and gaster joined by a long slender, short petiole; sting without sheath; male genitalia with spiniform paramere; wings at rest with a longitudinal fold; abdomen 7-segmented in male, 6-segmented in female; thoracic hairs unbranched or plumose.

SYSTEMATICS

There are 250 species known in India of family Apidae, while 5,000 species are recognised from the world; 35 species are recorded from India for family Anthophoridae, while 800 are reported from the world; 55 species are recognised from India, while 1,000 are known from the world for family
1. Distribution of taxa of families Apidae, Anthophoridae, Megachilidae, Xylocopidae, and Eumendae. Number indicates the name of the taxa as treated in the text.
Megachilidae; 33 species are recorded from India, while 4,000 species are known from the world for family Xylocopidae; 100 species are recognised from India, while 350 species are described from the world for family Eumenidae.

MATERIAL AND METHOD

An attempt has been made here to provide a consolidated account of the families Apidae, Anthoporidae, Megachilidae and Xylocopidae (Apoidea) and Eumenidae (Vespoidea) based on the collection of Zoological Survey of India; parties, conducted by Shri D. K. Mandal (1989), Dr. A. K. Hazra (1992), Dr. B. C. Das, Dr. L. K. Ghosh, Shri S. Chattopadhyay and Shri P. H. Roy (1994).

The keys to the families, genera and species for the identification of various taxa; taxonomic terms along with Figures, Distributional Table and Map, are provided for ready reference.

TAXONOMIC TERMINOLOGY

The terms of morphological characters used in the present work are mainly based on the works by Bingham (1897), Bohart and Menke (1976) and Batra (1977); morphological terms are illustrated in figures. A. (1-5).

SYSTEMATIC ACCOUNT

Class INSECTA
Order HYMENOPTERA
Superfamily I APOIDEA

S. No. Name of the species Family
1. Apis Indica Fabricius, 1798 APIDAE
2. Bremus (orientalibombus) orientalis (Smith), 1853 APIDAE
3. Crocisa emarginata Lepel., 1841 APIDAE
4. Nomia clypeata Smith, 1875 APIDAE
5. Anthophora fallax Smith, 1879 ANTHOPHORIDAE
6. Megachile amputata Smith, 1858 MEGACHILIDAE
7. Xylocopa (Ctenoxylocopa) fenestrata (Fabricius), 1792 XYLOCOPIDAE
8. Xylocopa latipes (Drury), 1770 XYLOCOPIDAE
9. Eumenes conica (Fabricius), 1787 EUMENIDAE

Superfamily II VESPOIDEA

Key to the Superfamilies of ACULEATE Hymenoptera
1. Fossorial insects. Lateral angles of pronotum not produced back to the base of wings ...... SPHECOIDEA
2. Non-fossorial insects. Lateral angles of pronotum produced back to the base of wings .................................................. 2
2. Intermediate legs armed with 1/2 tibial calcar VESPOIDEA
3. Intermediate legs armed with 1 tibial calcar APOIDEA

Key to the Families of Superfamily APOIDEA
1. Forewing with 2 cubital cells; radial cell broad MEGACHILIDAE
2. Forewing with 3 cubital cells; radial cell ovate or elongate ..................................................... 2
3. Maxillary palpi 1-jointed APIDAE
4. Maxillary palpi 2/6-jointed ANTHOPHORIDAE
5. Thorax ovate XYLOCOPIDAE
6. Thorax globular APOIDEA

Key to the genera of family APIDAE
1. Specimens more hairy and colourful Bremus Panzer
2. Specimens less hairy and colourful Apis Linnaeus
3. Ocelli present in a triangle on vertex Apis Linnaeus
4. Ocelli present in a curve on vertex Nomia Latreille
5. Mandibles grooved above, apex with 2 teeth Nomia Latreille
Fig. 1: Morphological Characters of a Bee.

- Mandibles narrow and simple, acute at apex

Genus 1. *Apis* Linnaeus, 1767

1. *Apis indica* Fabricius


*Diagnostic characters*: The species comprises medium-sized honey bees (11-12 mm), they choose hollow trees to build in.

*Distribution*: India: Sikkim (new record); throughout India. *Elsewhere*: Sri Lanka, Myanmar, Malaysia, Madagascar.

Genus 2. *Bremus* Panzer, 1801

2. *Bremus (Orientalibombus) orientalis* (Smith)


*Diagnostic characters*: The specimens of this species look very beautiful for having colourful hairs on body.
Distribution: India: Sikkim; throughout India (commonly found in Sikkim and Darjeeling).

Genus 3. Crocisa Jurine, 1807
3. Crocisa emarginata Lepeletier


Diagnostic characters: Forewing with few hyaline spots; scutellum posteriorly with a shallow second-bracket shaped emargination.

Distribution: India: Sikkim; Arunachal Pradesh; throughout India.

Genus 4. Nomia Latreille, 1805
4. Nomia clypeata Smith


Diagnostic characters: Pubescence present only on abdominal margins; clypeus transverse, produced anteriorly.


Family II ANTHOPHORIDAE
Genus 5. Anthophora Latreille, 1802
5. Anthophora fallax Smith

1879. Anthophora fallax Smith, New Sp. Hym. Brit. Mus., p. 120.
1897. Anthophora fallax Smith: Bingham, Fauna Brit. India (Hymenoptera), 1 : 528.


Diagnostic characters: Abdomen with 1–4 with white transverse pubescence on apical margins, 5–6 with black hairs.

Distribution: India: Sikkim (new record); Western India; Uttar Pradesh. Elsewhere: Myanmar, Sri Lanka, South and West Africa.

Family III MEGACHILIDAE
Genus 6. Megachile Latreille, 1802
6. Megachile amputata Smith


Material examined: India: Sikkim: Namchi (South Sikkim); 1 Female, Coll. A. K. Hazra, 10. xi. 1992.

Diagnostic characters: Basal 2 abdominal segments and transverse narrow fasciae on segments 3–5 with fulvous-red pubescence.


Family IV XYLOCOPIDAE
Genus 7. Xylocopa Latreille, 1802
7. Xylocopa (Ctenoxylocopa) fenestrata (Fabricius)


Diagnostic characters: Pubescence of body black; wings dark fuscous with purple and coppery effulgence.

Distribution: India: Sikkim (new record); Rajasthan; throughout India. Elsewhere:
Myanmar, Sri Lanka, Pakistan, Nepal, Iran, Mauritius, Madagascar, Brazil.

8. *Xylocopa latipes* (Drury)


*Material examined:* India: Sikkim: Mellibazar (South Sikkim); 1 Male, Coll. S. Chattopadhyay, 21. v. 1994.

*Diagnostic characters:* Pubescence of body black or sooty-brown; antennal scape flat and broad at apex.

*Distribution:* India: Sikkim; West Bengal; Assam; Uttar Pradesh; Madhya Pradesh; Kerala. *Elsewhere:* Myanmar, China, Malaysia.

Superfamily II VESPOIDEA

Key to the families of superfamily Vespoidea

1. Species social. Claws of tarsi simple.............

                                      ----------------------------- VESPIDAE*

- Species solitary. Claws of tarsi dentate......

                                      ----------------------------- EUMENIDAE

Family I EUMENIDAE

Genus 8. *Eumenes* Latreille, 1805

9. *Eumenes conica* (Fabricius)


*Diagnostic Characters:* II abdominal segment red at base with a black transverse band.

*Distribution:* India: Sikkim (new record) throughout the plains of India. *Elsewhere:* Myanmar, Sri Lanka, China, Malaysia.

**SUMMARY**

9 species belonging to the families Apidae, Anthophoridae, Megachilidae, Xylocopidae and Eumenidae are recorded and discussed in this paper, for Aculeate Hymenoptera, of which 5 species, are found as new locality records from Sikkim. So, at present the total species-record from this state, for these families stand as 125 species (including the species known in Fauna of British India (1897) and after the publication of this, till 1994).

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