State Fauna Series 4

FAUNA OF MEGHALAYA

PART-6

Zoological Survey of India
Calcutta
1999

State Fauna Series 4

FAUNA OF MEGHALAYA

PART–6

INSECTA
(Diptera and Lepidoptera)

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FAUNA OF MEGHALAYA

Part – 6

INSECTA

CONTENTS

Part–6	1998	Pages 1–537

Part–6 **1998** **Pages 1–537**

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INSECTA : DIPTERA

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INTRODUCTION

Meghalaya, a state in the north-east India, lies approximately between 89°53'E and 92°51'E longitudes, and 25°04'N and 26°08'N latitudes, covering an area of 22,429 sq. km. in the south-western part of the erstwhile Assam (*cf.* old literature before 1970). It is elevated to a maximum of about 2,000 m in the East Khasi Hills that experience the highest record rainfall of the world. Hills are covered with thick forests of the tropical and sub-tropical regions, mostly of evergreen trees amidst other green vegetation, and support numerous streams, ditches and pools besides a few waterfalls, lakes, and tributaries and distributaries of the rivers like Bhogai, Someswari, Krishnai, Jadukala, Khri, Kapli, etc. All these beauteous kinds of nature provide insects, especially dipterans with ideal habitats of colonization, shelter and food.

The Diptera fauna of Meghalaya is little-known because of lack of extensive exploration. The oldest collection, reportedly kept in the Zoological Museum of Copenhagen, is that of Fabricius who obtained specimens through the officials of the Danish Civil Service in the eighteenth century (beginning sometime in 1769). The famous dipterists, *viz.*, Wiedemann, Macquart, Walker, Bigot, etc. subsequently during the nineteenth century, studied the Fabricius' and/or other collections of those days from Khasi Hills, deposited in various museums or with private custodians in Europe.

The age-old collection from Khasi Hills recorded in the Indian Museum/Zoological Survey of India, Calcutta, was made by A. Chennell in 1878. Thereafter, La Touche (from Shillong), Sladen (from Khasi Hills), Godwin-Austen (from Khasi Hills), E.A.W. Hall (from Jaintia Hills), T.N. Annandale (from Garo Hills), and S.W. Kemp and Mrs. A. Kemp (from Shillong and Garo Hills) collected during 1900-1922. Most of these collections were considered by E. Brunetti while writing the Fauna of British India, whereas, most of the specimens treated in other volumes of the Fauna by S.R. Christophers; P. J. Barraud; R. Senior-White, D. Aubertin and J. Smart; and F.I. van Emden, were eventually deposited in the National Institute of Communicable Diseases, Delhi; Indian Agricultural Research Institute, New Delhi (along with the Pusa Collection containing specimens from Meghalaya) and elsewhere in India, and mainly in the Natural History Museum, London (formerly the British Museum (Natural History).

However, the National Collection held by the Zoological Survey of India was also significantly enriched with the Meghalayan specimens by the following collectors in early days of this century : F. H. Gravely (from Khasi Hills in 1914 and 1916), T. B. Fletcher (from Shillong in 1916-1918 and 1920), P.J. Barraud (from Nongpoh in 1922), B. N. Chopra (from Garo Hills in 1922), S.L. Hora (from Khasi Hills in 1926 and 1929), G. Ram (from Shillong in 1927), J.L. Bhaduri and H.S. Rao (from Shillong in 1930), and A. P. Kapur (from Khasi Hills in 1959).

Recently, several collecting trips were undertaken by this institute in all 7 districts of Meghalaya for the purpose of addition and revaluation of the faunal components in aid of our comprehensive knowledge. The trips that brought the dipterous material for this study are tabulated below with reference to the district, the personality and the time of the survey.

JAINTIA HILLS	V. D. Srivastava	1988 (September-October)
	M. S. Shishodia	1990 (May-June)
	K. K. Ray	1991 (March)
	B. C. Das	1991 (March)
	A. K. Sanyal	1991 (March)
	A. K. Hazra	1991 (March)
	R. K. Varshney	1991 (September-October)
RI-BHOI	A. R. Lahiri	1988 (September-October)
	M. S. Shishodia	1990 (May-June)
	K. K. Ray	1991 (March)
	A. K. Sanyal	1991 (March)
	A. K. Hazra	1991 (March)
	R. C. Basu	1991 (November)
EAST KHASI HILLS	J. K. Jonathan	1979 (April)
	A. R. Lahiri	1988 (September-October)
	M. S. Shishodia	1990 (May-June)
	K. K. Ray	1991 (March)
	B. C. Das	1991 (March)
	A. K. Sanyal	1991 (March)
	A. K. Hazra	1991 (March)
	S. K. Ghosh	1991 (March-April)
	R. K. Varshney	1991 (September-October)
	R. C. Basu	1991 (November)
WEST KHASI HILLS	A. R. Lahiri	1988 (September-October)
	A. K. Sanyal	1991 (March)
	A. K. Hazra	1991 (March)

EAST GARO HILLS	J. K. Jonathan	1979 (April)
	R. K. Ghosh	1988 (July)
	M. S. Shishodia	1990 (May-June)
	B. C. Das	1991 (March)
	B. N. Das	1991 (April-May)
	R. K. Varshney	1991 (September-October)
WEST GARO HILLS	V. D. Srivastava	1988 (September-October)
	K. K. Ray	1988 (October)
	M. S. Shishodia	1990 (May-June)
	J. R. B. Alfred	1991 (February)
	A. K. Sanyal	1991 (March)
	A. K. Hazra	1991 (March)
	B. N. Das	1991 (April-May)
SOUTH GARO HILLS	B. N. Das	1991 (April-May)

This report embodies the material belonging to the families : Bibionidae, Stratiomyidae, Bombyliidae, Conopidae, Diopsidae, Sepsidae, Celyphidae, Calliphoridae and Sarcophagidae. The families Tabanidae, Asilidae and Syrphidae are, however, dealt with separately.

The species recorded for the first time from Meghalaya are marked with an asterisk and from India with a couple of asterisks.

MATERIALS AND METHODS

Datta, Parui and Mukherjee (1997) laid down the general methods of collecting dipterous specimens from their habitats and of preserving them in proper manner for taxonomic studies. It is, therefore, proposed to stress on certain specific requirements involving family-groups undertaken here rather than dilating on the broad range of procedures once again.

Indeed, specimens of several species are too easy to encounter anywhere in the country-side but the majority require search in special localities at certain times of the year, considering that winter is generally unfavourable for imaginal incidence. Bibionids are herbivores and thereby frequent meadows, grassy hillsides or decaying vegetation. These flies are seasonal and often appear in great numbers during February-June. The flies of the families Stratiomyidae, Bombyliidae and Conopidae are predominantly flower-visitors, and can be taken on flowers or nearby herbages. Both bombyliids and conopids prefer arid and semi-arid areas where they are plentifully met with. Diopsids as well as celyphids are slow-fliers because of their awkward body-form, and can be seen gliding over herbage or grassland bordering pools, streams, etc. Grasslands are, however, much preferred by celyphids, and so picking up single specimens on grasses with the help of glass-tubes appear convenient. Whilist sepsids are invariably encountered on cow-dung or herbage

in its vicinity, calliphorid and sarcophagid flies frequent decaying organic matter of all kinds inclusive of excrement and around it. One can certainly come across these flies in fish-, meat- and fruit-shops or animal farms. Several species of the Calliphoridae alight on flowers or nearby vegetation. Specimens of all these flies are best collected by an insect-net. They are also sampled by means of various baits, i.e., fish, meat, fruits, etc. Collections of all these flies are preserved and kept dry in the manner prescribed by Datta *et al.* (1997).

Finally, it should be borne in mind that the best time of collecting is to begin sometime after the sunrise for the diurnal Diptera and after the sunset for the nocturnal Diptera (*cf.* Datta and Dasgupta, 1972; Datta, 1980).

MORPHOLOGY AND TERMINOLOGY

An account of morphology and terminology of Diptera was presented by Datta *et al.* (1997) in order to acquaint the reader with their taxonomic characteristics in general. Therefore, only the significant features used in the description and key to the various taxa of the families dealt with, are felt necessary to discuss here for better-understanding.

It may be re-called that morphological features of value for specific or supra-specific classification exist with all the head, thorax and abdomen of the insect-body, but the structures of the postabdomen are often of major taxonomic importance, especially for species of Diptera considered here.

The most important characters of the Bibionidae lie with the antenna, wing and leg besides genitalia. The antenna may either be robust or elongate, with 10-12 segments, of which segment 3 may differ in size and shape. The radial sector of the wing may be furcate, and the vein R_{2+3} may be of varied length and vertical or horizontal in position. The cross-vein r-m may be short or long, and the vein M_1 may join directly to it, whereas veins M_2 and M_{3+4} end to or before wing-margin. A pair of spurs or sets of spines with the fore tibia, and their shape and size bear much taxonomic value. In addition, the shape, size and colour of parts of the body may be diagnostic to the specific level. Besides, the configuration of the tergum 9, sternum 9 and the clasper in males are highly valuable in determining species.

The antenna, mesonotum, scutellum and wing offer reliable characters in classifying the family Stratiomyidae. Indeed, the stratiomyids exhibit a great diversity in the antennal form contributed by the flagellomeres numbering up to 8, of which certain segments are fused to form a complex structure, often with an apical style of various length, and an arista may develop apically or subapically. Apart from the configuration of the mesonotum with its pile and the scutellum, the latter is occasionally beset with prominent spines ranging up to 8. Legs are mainly simple but may be with spur on mid-tibia, and the hind basitarsus in males is elongated but may be swollen in certain genera. The wing has the

venation generally characteristic of the family. The vein R_{2+3} coalesce with the vein R_5 in the Stratiomyinae and the disappearance of the vein R_4 in several genera bears a great taxonomic value. The veins M_1 and M_3 are absent in several genera but only M_3 may be partly reduced in some genera. The vein M_4 is distinct from the discal cell in the Stratiomyinae and Sarginae but forms the lower side of the discal cell in certain genera. The wing microtrichia, whether present, reduced or absent, have taxonomic value. The shape of the abdomen and its relative length with the thorax are important in many genera. The male genital complex comprising an epandrium, a compact ventral part and an aedeagus, with their accessory structures is taken into account up to the specific level. The female genital components, such as, tergum 9, cerci, furca and spermatheca are important generally up to the generic level.

The principal characters upon which the species of the Bombyliidae are determined are as follows : facial extension, occipital structure and colour, and the colour of hairs in different parts of the head; position of the antenna and form of its segments, especially the segment 3 and the apical style; colour and hairs of the pleuron, especially the propleuron of the thorax; wing clear, spotted or infuscated and the extent of infuscation as well as the venation of the wing; presence or absence of hair fringe on the hind leg and the colour of its segments; abdomen with or without scales or bristles and the colouration of the general hair-cover, and the configuration of basistyle, dististyle, aedeagus and epandrium of the postabdomen in males. The female genitalia are, however, occasionally useful.

The Conopidae have characters of taxonomic value on the head, thorax and abdomen, and everywhere these are mostly tinctorial in nature rather than structural. The head lacks ocelli or generally palpi also in the Conopinae, and the latter in combination with the former are present in other subfamilies in that their size and colour are important. The form of the proboscis and its colour are helpful in diagnosing certain genera. Likewise, the jowl with its hairs and colours bears value in the generic level. The antennal segment 3 in the Conopinae is with an apical style and in others with a dorsal arista. The relative size of the antenna with the head and that within segments 2 and 3 are very important taxonomic characters. The frontal suture in the Myopinae (not represented here) is short, while it is long in others. The colour of different parts, especially of frons help determine several species. The mesonotum with or without spots or stripes and the pleuron with or without patches are diagnostic. The wing may be clear or spotted, with anterior band. The posterior cell 1 (R_5) is closed in the Conopinae. The relative size of the anal cell (Cu) with the basal cell 2 and the position of the cross-vein r-m on discal cell have generic value. The femur with or without a black spot, with or without a tuft of bristles or rings on hind one in males and the size of the tibia are highly important. Besides, the colour of various parts of the leg is diagnostic in the specific level. The size and the colour pattern of the abdomen and its segments, especially 2 and 3, the form of the theca in females and the presence or absence of the thread-like appendage in male genitalia offer characteristics of species.

The most important characters for the classificatory purpose of the Diopsidae lie with the head and thorax. The length and width of the eye-stalk, presence or absence of the apical bristle with the scutellar spine or its size, if present, and presence or absence or reduced state of the alula and veins M_3 + Cu_1 and Cu_2 +2A are indispensable characters by which the subfamilies of the Diopsidae are defined. Besides, the combination of characters, such as, presence or absence of inner orbital bristle with the eye-stalk, thoracic bristles and spines, especially supra-alar spine and the degree of curvature of the scutellar spine is valuable for generic segregation. The inter-specific difference is, however, attributed by the infuscation on the wing, the colour of different parts of the body, the number and form of the spermatheca in females, and the shape and size of the surstylus and claspers in males.

The Sepsidae are winged ant-like in appearance. The Sepsinae are smaller in size than the Toxopodinae with dull shining body, large mouth-opening and dorsally bent mid femur at its mid- length. The chaetotaxy in the Sepsidae bears high taxonomic importance. Both inner and outer vertical bristles are present in all *Decachaetophora, Dicranosepsis* and *Sepsis*, whereas fronto-orbital bristles are vestigial in *Dicranosepsis* and absent in *Decachaetophora*. Although all these genera have meso-pleural (supra-alar) bristles, there are no downy hairs on the mesonotum and pleura. While *Sepsis* have both humeral and scutellar bristles, *Dicranosepsis* lack the latter. The wing with the basal cells 1 and 2 distinct in all these genera may have a dark spot at the end of the vein R_{2+3} in *Sepsis* and *Dicranosepsis*. The fore femur in both sexes is important and is invariably beset with complex bristles or spines in males. The abdomen in males and often in females also, may have distinct macrochaetae of taxonomic value. The epandrial process in the genitalia of *Dicranosepsis* is bifid apically. Besides, the characters of colouration, glossiness and hairs, spines or bristles of various parts of the head, thorax and abdomen or any of their accessory structures, such as, alula with or without a posterodistal lobe, hind tibia in males with or without an osmeterium, etc. are indispensable for species designation.

The Celyphidae, appearing as beetles due to a great development of the scutellum as a protective shell overlying wings and the dorsum of the abdomen, hold on their head inner and outer vertical bristles, orbital bristles, interfrontal bristles and postvertical bristles, of which the latter are minute in *Celyphus* and *Spaniocelyphus*. The vertex margin is carinate in the latter, while it is rounded over on to the back of the head in the former, but both of them have their face convex medially and the palpus cylindrical apically. The subgeneric segregates are defined by the shape and size of the antennal segment 3 and its arista, and the shape of the scutellum. This antennal segment is pointed apically and is nearly twice as long as wide in *Celyphus* that have an arista broadened and flattened basally, whereas in *Paracelyphus* and *Hemiglobus*, the segment 3 is globular apically with slightly adequal dimensions and the arista is almost entirely setaceous. These two subgenera are distinguished by the nearly circular scutellum with violet or brown colouration of *Hemiglobus* and by the ovoid scutellum with purple or blue colouration of *Paracelyphus* that have, however, two shallow furrows laterally along the periphery of the scutellum. The relative size of the scutellum with the mesonotum and their surface-texture, and

presence or absence of bristles have generic value. The wing with a cross-vein between the basal cell 2 and the discal cell, and the hind tibia without a terminal spine in *Celyphus* and *Spaniocelyphus* are greatly important. The abdominal terga 1-6 in *Spaniocelyphus* are divided into 3 parts : a dorsal plate and two very large lateral plates that lack in *Celyphus*. The male genitalia without a true aedeagus are very simple but are badly indispensable for species determination. The shape of the gonite (as it is called here for the gonapophysis) and the surstylus is the most significant criterion. The genital sternite (sternum 8) of the female genitalia only supplements the determination. The colouration or maculation, the pilosity and details of various parts of the body are useful for diagnosing a species.

The Calliphoridae and Sarcophagidae are two allied groups of Diptera in which general morphological structures appear similar, and hence they are discussed together.

The head provides a good number of characteristics that are important in taxonomic viewpoint. The degree of separation of eyes, the size of eye-facets and the presence or absence of hairs are sometimes diagnostic to species. Besides, the vertex, occiput, ocelli, ocellar triangle, frons, frontal stripe, frontal suture, parafrontalia, face, parafacialia, genae, epistome and antennae with their arista, mainly in respect of form, colour and chaetotaxy are of great taxonomic value, especially in determining a species.

The thorax offers characters of highest importance for defining the supra-generic, generic or specific rank. The scutum with its presutural and postsutural bristles, humerus, scutellum, propleuron, mesopleuron, pteropleuron, hypopleuron, sternopleuron, prosternum and spiracles (stigmata) mainly with their colour and with or without bristles bear much significance in classificatory purpose. Indeed, the number of the notopleural bristles is the principal criterion by which the two families are distinguished. In addition, the sub-alar knob below the wing, the post-alar declivity lying laterally below the edge of the scutellum and the supra-squamal ridge with or without hairs are also equally important. Besides, the squamae with or without hairs, the stem-vein of the wing and parts of legs with or without prominent microchaetae and the disposition of veins R and M with their branches have significant value.

The abdomen consists of 4 visible segments consequent upon fusion of segment 1 with 2 and the genitalia of segments 6-10 in males. The visible segments may show various colours and bear marginal and discal bristles of taxonomic importance. Morphologically, the sternum 5 (actually the sternum of the segment 6) is important in the species level. The epandrium with its processes, *viz.*, inner and outer forceps (cercus) as regards their form, is important in species diagnosis. The aedeagus (in broad sense) with vesica, juxta, harpe, etc. is the most important structure that exhibits the characteristic design for a species.

LIST OF TAXA

Family BIBIONIDAE

Subfamily BIBIONINAE

1. *Bibio flavissimus* Brunetti

Subfamily PLECIINAE

2. *Penthetria indica* (Brunetti)
3. *P. japonica* Wiedemann
4. *Plecia pullata rubicunda* Hardy

Family STRATIOMYIDAE

Subfamily BERIDINAE

5. *Allognosta assamensis* Brunetti

Subfamily SARGINAE

6. *Ptecticus assamensis* Brunetti
7. *P. aurifer* (Walker)
8. *P. australis* Schiner
9. *Sargus gemmifer* Walker
10. *S. metallinus* Fabricius
11. *S. splendidus* Brunetti

Subfamily CLITELLARIINAE

12. *Adoxomyia bistriata* (Brunetti)

Subfamily HERMETIINAE

13. *Campeprosopa longispina* (Brunetti)
14. *Eudmeta diadematipennis* Brunetti

Subfamily PACHYGASTERINAE

15. *Cibotogaster azurea* (Gerstaecker)
16. *Ptilocera fastuosa* Gerstaecker
17. *Stratiosphecomyia variegata* Brunetti
18. *Tinda javana* (Macquart)

Family BOMBYLIIDAE

Subfamily LOMATIINAE

19. *Petrorossia clauseni* (Aldrich)
*20. *P. intermedia* (Brunetti)
21. *P. serata* (Aldrich)

Subfamily ANTHRACINAE

22. *Anthrax distigma* Wiedemann
23. *Villa aperta* (Walker)
24. *V. approximata* (Brunetti)
25. *V. clara* (Walker)
26. *V. manifesta* (Walker)
27. *Hemipenthes referens* (Walker)
28. *Exoprosopa* (*Exoprosopa*) *insulata* (Walker)
29. *E.* (*E.*) *latipennis* Brunetti
30. *E.* (*E.*) *sipho* Aldrich
31. *E.* (*Pterobates*) *pennipes* (Wiedemann)

Family CONOPIDAE

Subfamily CONOPINAE

*32. *Archiconops erythrocephala* (Fabricius)
33. *Conops* (*Asiconops*) *pactyas* Walker
34. *C.* (*Conops*) *annulosus* Bigot
35. *C.* (*C.*) *nigriventris* Brunetti
*36. *Physocephala argentifera* Brunetti
37. *P. bicolorata* Brunetti
38. *P. obscura* Kröber
39. *Physoconops sepulchralis* (Brunetti)

Subfamily STYLOGASTERINAE

40. *Stylogaster orientalis* Brunetti

Family DIOPSIDAE

Subfamily DIOPSINAE

41. *Diopsis indica* Westwood
42. *D.* nr *indica* Westwood
43. *Eurydiopsis subnotata* (Westwood)
44. *Teleopsis quadriguttata* (Walker)

Family SEPSIDAE

Subfamily SEPSINAE

45. *Decachaetophora aeneipes* (de Meijere)
46. *Dicranosepsis bicolor* (Wiedemann)

**47. *D. olfactoria* Iwasa

48. *Sepsis albopunctata* Lamb

49. *S. coprophila* de Meijere

*50. *S. himalayensis* Brunetti

51. *S. nitens* Wiedemann

Family CELYPHIDAE

52. *Celyphus (Hemiglobus) kempi* Datta

53. *C. (Paracelyphus) hyacinthus* (Bigot)

54. *Spaniocelyphus tenorioi* Joseph & Parui

Family CALLIPHORIDAE

Subfamily CALLIPHORINAE

55. *Bengalia escheri* Bezzi

56. *Calliphora (Calliphora) pattoni* Aubertin

57. *Polleniopsis pilosa* Townsend

58. *Onesia khasiensis* (Senior-White)

Subfamily CHRYSOMYINAE

59. *Chrysomya megacephala* (Fabricius)

60. *C. pinguis* (Walker)

Subfamily RHINIINAE

61. *Borbororhinia bivittata* (Walker)

62. *Chlororhinia exempta* (Walker)

63. *Cosmina bicolor* (Walker)

64. *Idiella euidielloides* Senior-White

65. *I. mandarina* (Wiedemann)

66. *Isomyia oestracea* (Séguy)

67. *I. pseudonepalana* (Senior-White, Aubertin & Smart)

68. *I. pseudoviridana* (Peris)

69. *I. versicolor* (Bigot)

70. *I. zelanica* (Senior-White, Aubertin & Smart)

71. *Metallea notata* van der Wulp

72. *Stomorhina discolor* (Fabricius)

Family SARCOPHAGIDAE

Subfamily SARCOPHAGINAE

73. *Bercaea haemorrhoidalis* (Fallén)
74. *Boettcherisca peregrina* (Robineau-Desvoidy)
75. *Parasarcophaga* (*Liopygia*) *ruficornis* (Fabricius)
76. *P.* (*Liosarcophaga*) *brevicornis* (Ho)
77. *P.* (*L.*) *dux* (Thomson)
78. *P.* (*L.*) *jaipurensis* Nandi
79. *P.* (*L.*) *sarupi* Nandi
80. *P.* (*Parasarcophaga*) *albiceps* (Meigen)
81. *P.* (*P.*) *knabi* (Parker)
82. *P.* (*P.*) *macroauriculata* (Ho)
83. *P.* (*P.*) *orchidea* (Böettcher)
84. *Rosellea khasiensis* (Senior-White)
85. *Harpagophalla kempi* (Senior-White)
86. *Seniorwhitea krameri* (Böettcher)

KEY TO THE FAMILIES

1. Adult antenna with more than 5 segments, closely apposed but not fused into a solid structure ..... Bibionidae
   Adult antenna either with fewer than 5 segments (generally 3) or with segments of flagellum fused into a solid structure, usually surmounted by a style or arista 2
2. Adult head without a frontal lunule or a ptilinum 3
   Adult head with a distinct frontal lunule and ptilinum 4
3. Flies devoid of bristles; antennal segment 3 with annulations; wing with cell M_3; leg with pad-like arolium and pulvilli ..... Stratiomyidae

   Flies with dense bristles; antennal segment 3 simple; wing without cell M_3; leg with or without normal pulvilli but arolium always replaced by a rudimentary empodium ..... Bombyliidae
4. Antennal segment 2 above without a distinct external groove; theca not developed at the base of proboscis; squamae small or vestigial 5
   Antennal segment 2 above with a distinct external groove; theca developed at the base of proboscis; squamae well-developed 8
5. Wing with Cu_2 long and reaching or nearly reaching wing-margin ..... Conopidae
   Wing with Cu_2 short, not reaching wing-margin or absent 6

6. Eye and antenna carried out on a short or long stalk; scutellum with two long spines ..... Diopsidae

   Eye and antenna normally located and not on a stalk; scutellum without long spines 7

7. Flies of ant-like appearance; vibrissae present; cross-vein before midway of wing ..... Sepsidae
   Flies of beetle-like appearance; vibrissae absent; cross-vein far away near tip of wing .....Celyphidae

8. Body metallic blue or green; antennal arista generally feathered to tip; thorax nearly always with two notopleural bristles ..... Calliphoridae

   Body dull black or striped grey and black; antennal arista pubescent or feathered generally not much beyond middle; thorax almost invariably with three or four notopleural bristles ..... Sarcophagidae

SYSTEMATIC ACCOUNT

Family BIBIONIDAE

Contributions on the fauna of Meghalaya : Brunetti 1911, 1912, 1925; Hardy 1953.

A total of 3 species and 1 subspecies under 3 genera of 2 subfamilies are hitherto known in Meghalaya vis-à-vis 37 species and 1 subspecies under 4 genera of 2 subfamilies in India.

KEY TO THE SUBFAMILIES

1. Wing with unbranched radial sector; fore tibia with a pair of strong apical spurs or with a ring of apical spines and a set of 4 transverse spines just beyond mid-length ..... Bibioninae
   (1 species only)

   Wing with forked radial sector; fore tibia without spurs or spines.....Pleciinae

Subfamily BIBIONINAE
Genus *Bibio* Geoffroy

1762. *Bibio* Geoffroy, *Hist. abrég. Ins.* Paris, 2:568. Type-species : *Tipula hortulana* L.

Diagnosis : Wing with simple radial sector, basal section being equal to or longer than radio-median cross-vein; fore tibia with strong apical spurs.

1. *Bibio flavissimus* Brunetti

1925. *Bibio flavissimus* Brunetti, *Rec. Indian Mus.*, **27** : 448.

Diagnosis : Females entirely yellow to rufous except for black tibia and tarsus, and flagellomeres of antenna, last 2 and apical half of palpal segment 3 and ocellar triangle; wing more intensely yellow than in males; femur in females entirely rufous; fore tibia with short inner spur and long outer spur; radio-median cross-vein about two-thirds as long as basal section of radial sector.

Distribution : Meghalaya (East Khasi Hills), and West Bengal; East Malaysia, Kalimantan and Philippines (Luzon, Mindanao); New Guinea.

Remarks : The females of this species were described from India, whereas males from Philippines (*vide* Hardy and Delfinado, 1969). The species is, therefore, considered to be widespread.

Subfamily PLECIINAE

KEY TO THE GENERA

1. Wing with vein R_{2+3} elongate, almost horizontal in position; clasper of male genitalia large and lateral in position ..... ***Penthetria*** Meigen

   (2 species only)

   Wing with vein R_{2+3} short, almost vertical in position; clasper of male genitalia small and vertical in position ..... ***Plecia*** Wied.

   (1 subspecies only)

Genus *Penthetria* Meigen

1803. *Penthetria* Meigen, InsektKde, 2 : 264. Type-species : *Penthetria holosericea* Meigen.

KEY TO THE SPECIES

1. Mesonotum entirely rufous ..... *indica* (Brunetti)
   Mesonotum with blackish anterior portion ..... *japonica* Wied.

2. *Penthetria indica* (Brunetti)

1911. *Plecia indica* Brunetti, *Rec. Indian Mus.*, **6** : 271.

Distribution : Meghalaya (Khasi Hills), and Himachal Pradesh, Manipur, Uttar Pradesh and West Bengal; Nepal and Pakistan.

3. *Penthetria japonica* Wied.

1830. *Penthetria japonica* Wiedemann, *Aussereurop. zweifl. Insekt.*, **2** : 618.

1912. *Pleciomyia melanaspis* Wied.: Brunetti, *Fauna Br. India,Dipt. Nematocera* : 161.

Material examined : 1♀, East Khasi Hills, Cherrapunji, 1500 m, 15. ix. 1988, Coll. A.R. Lahiri; 1♂, East Khasi Hills, Shillong, 1600 m, 30. iii. 1991, Coll. S. K. Ghosh.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh, Assam, Himachal Pradesh, Sikkim, Uttar Pradesh and West Bengal; China, Myanmar, Nepal and Taiwan; Japan and Siberia.

Remarks : This is a widespread species and is expected to occur throughout Meghalaya.

Genus *Plecia* Wiedemann

1828. *Plecia* Wiedemann, *Aussereurop. zweifl. Insekt.*, 1:72.Type-species: *Hirtea fulvicollis* Fabricius.

4. *Plecia pullata rubicunda* Hardy

1953. *Plecia pullata rubicunda* Hardy, *Rec. Indian Mus.*, **50** : 98.

Diagnosis : Mesonotum rufous except brownish anterior border; hind tibia parallel-sided and not swollen; sternum 9 in males strongly forcipate towards postero-lateral margins, lobes about twice as long as remainder of sternum; sternum 9 about equal in length to the extended clasper at its narrowest point.

Distribution : Meghalaya (Khasi Hills, lower range).

Family STRATIOMYIDAE

Contributions on the fauna of Meghalaya : Fabricius 1805; Walker 1849, 1854; Schiner 1868; Bigot 1879; Brunetti 1907, 1912, 1913, 1920, 1923, 1925.

A total of 14 species under 10 genera of 5 subfamilies are hitherto known in Meghalaya vis-à-vis 73 species under 34 genera of 6 subfamilies in India.

KEY TO THE SUBFAMILIES

1. Abdomen of at least 7 obvious segments; wing with prefurca beginning at about opposite base of discal cell ..... Beridinae

(1 species only)

Abdomen at the most with 6 segments 2

2. Vein M with only 2 endings ..... Pachygasterinae
   Vein M with 3 endings 3
3. Anterior cross-vein (r-m) joining prefurca to discal cell ..... Sarginae
   Anterior cross-vein (r-m) joining R to discal cell 4
4. Vein M_4 arises from discal cell; antennal flagellum usually with 6 flagellomeres ..... Clitellariinae
   (1 species only)

   Vein M_4 forming a part of discal cell; antennal flagellum comprising 8 flagellomeres ..... Hermitiinae

Subfamily BERIDINAE

Genus *Allognosta* Osten Sacken

1883., *Allognosta* Osten Sacken, *Berl. ent. Z.*, **27** : 297. Type-species: *Beris fuscitarsis* Say.

Diagnosis : Antennal segment 3 with 8 annulations; scutellum semi-circular, unspined; vein R_{2+3} upturned apically, R_4 nearly straight, vein M with 3 endings, discal cell hexagonal; abdomen 8-segmented.

5. *Allognosta assamensis* Brunetti

1920. *Allognosta assamensis* Brunetti, *Fauna Br. India, Dipt.*, **1** : 95.

Diagnosis : Antennal segment 3 with 8 annulations, first one being broadest and longest; femur and tibia yellow except apical half of hind femur, and hind tibia wholly black; wing pale-smoky grey, stigma conspicuously black.

Distribution : Meghalaya (West Garo Hills).

Subfamily SARGINAE

KEY TO THE GENERA

1. Antennal segment 2 with a thumb-like expansion over segment 3, latter being short, broad and without annulations ..... ***Ptecticus*** Leow
   (3 species only)

   Antennal segment 2 not thumb-like, segment 3 not broad and with 4 annulations ..... ***Sargus*** Fabricius
   (3 species only)

Genus *Ptecticus* Loew

1855. *Ptecticus* Loew, *Verh. zool.-bot. Ges. Wien.*, 5 : 142. Type-species : *Sargus testaceus* Fabricius.

KEY TO THE SPECIES

1. Wing yellowish on basal half, rest blackish; apical half of hind tibia brown ..... *aurifer* (Walker)
   Wing uniformly yellowish; hind tibia black 2
2. Scutellum and metanotum wholly orange ..... *australis* Schiner
   Scutellum and metanotum shining violet-blue ..... *assamensis* Brunetti

6. *Ptecticus assamensis* Brunetti

1923. *Ptecticus assamensis* Brunetti, *Rec. Indian Mus.*, 25:148.

Distribution : Meghalaya (West Garo Hills).

7. *Ptecticus aurifer* (Walker)

1854. *Sargus aurifer* Walker, *List Dipt. Colln Br. Mus.*, 5 : 96.

Material examined : 1♂, 1♀, Shillong, Fruit Garden, 1600 m, 26. v. 1981, Coll. M. S. Jyrwa.

Distribution : Meghalaya (Ri-Bhoi, East Khasi Hills), and Arunachal Pradesh, Assam, Sikkim, Uttar Pradesh and West Bengal; China, East Malaysia, Kalimantan, Malaya and Taiwan.

8. *Ptecticus australis* Schiner

1868. *Ptecticus australis* Schiner, *Reise der österreichischen Fregatte Novara, Dipt.*, 2 : 65.

Distribution : Meghalaya (West Garo Hills), and Assam, Bihar, Karnataka, Madhya Pradesh, Nicobar Is., Punjab, Sikkim, Tamil Nadu and West Bengal; Sri Lanka, Taiwan and Thailand.

Genus *Sargus* Fabricius

1798. *Sargus* Fabricius, *Suppl. ent. Syst.* : 549, 566. Type-species: *Musca cupraria* Linnaeus.

KEY TO THE SPECIES

1. Wing dark brown ..... *gemmifer* Walker
   Wing yellowish-brown 2

2. Leg yellow; scutellum metallic green ..... *metallinus* Fabricius
   Femur black, rest paler; scutellum purple.....*splendidus* Brunetti

9. *Sargus gemmifer* Walker

1849. *Sargus gemmifer* Walker, *List Dipt. Colln Br. Mus.*, 3 : 516.

Distribution : Meghalaya (West Garo Hills); Bangladesh, China, Malaya, Myanmar, Sulawesi and Thailand.

10. *Sargus metallinus* Fabricius

1805. *Sargus metallinus* Fabricius, *Syst. Antliat.* : 258.

Distribution : Meghalaya (East Khasi Hills), and Andaman Is., Arunachal Pradesh, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Orissa, Uttar Pradesh and West Bengal; China, Indonesia, Malaysia, Myanmar, Nepal and Sri Lanka.

11. *Sargus splendidus* Brunetti

1923. *Sargus splendens* Brunetti, *Rec. Indian Mus.*, **25** : 154.

1925. *Sargus splendidus* Brunetti, *Rec. Indian Mus.*, **27** : 451 (Replacement name).

Distribution : Meghalaya (West Garo Hills).

Subfamily CLITELLARIINAE

Genus *Adoxomyia* Bezzi

1908. *Adoxomyia* Bezzi, *Wien. ent. Ztg.*, 27 : 75. Type-species : *Clitellaria dahlii* Meigen.

Diagnosis : Eye densely pubescent; antennal flagellum comprising 8 flagellomeres, last 2 segments forming an apical style; scutellum with 2 strong spines; vein R_{2+3} arising beyond r-m cross-vein, vein R_4 present, vein M with 4 terminations.

12. *Adoxomyia bistriata* (Brunetti)

1912. *Clitellaria bistriata* Brunetti, *Rec. Indian Mus.*, **7** : 452.

Diagnosis : Mesonotum black with 2 distinct stripes of short golden-brown hairs; scutellum with minute black pubescence; leg black; wing with anterior one-third deep brown, rest lighter; abdomen black micropubescent.

Distribution : Meghalaya (East Khasi Hills), and Uttar Pradesh.

Subfamily HERMETIINAE

KEY TO THE GENERA

1. Scutellum bears 2-spines; flagellomere 1 filiform ..... ***Campeprosopa*** Macquart

   Scutellum without spines; flagellomere 1 cylindrical .....***Eudmeta*** Wiedemann

Genus *Campeprosopa* Macquart

1850. *Campeprosopa* Macquart, *Mém. Soc. Sci. Agric. Lille*, 1849 : 350 (46). Types-species : *Campeprosopa flavipes* Macquart.

13. *Campeprosopa longispina* (Brunetti)

1913. *Ampsalis longispina* Brunetti, *Rec. Indian Mus.*, **9** : 264.

Diagnosis : Antennal scape and pedicel subequal, flagellum with 8 flagellomeres; leg yellow, except hind tibia wholly, and hind metatarsus two-thirds black; wing yellowish, apical third and hind margin brownish, vein M with 4 terminations.

Distribution : Meghalaya (East Khasi Hills), and West Bengal.

Genus *Eudmeta* Wiedemann

1830. *Eudmeta* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2 : 43. Type-species : *Hermetia marginata* Fabricius.

14. *Eudmeta diadematipennis* Brunetti

1923. *Eudmeta diadematipennis* Brunetti, *Rec. Indian Mus.*, **25** : 108.

Diagnosis : Bright orange species; antenna black; leg orange except hind tibia and tarsus wholly, and anterior tarsus narrowly black at tip; basal half of wing yellowish, rest brownish.

Distribution : Meghalaya (Ri-Bhoi).

Subfamily PACHYGASTERINAE

KEY TO THE GENERA

1. Antenna branched ..... ***Ptilocera*** Wiedemann (1 species only)

   Antenna of different forms but not branched 2

2. Eye pubescent ..... ***Cibotogaster*** Enderlein (1 species only)

   Eye bare 3

3. Scutellum unspined; abdomen elongate, linear and much longer than thorax ..... ***Stratiosphecomyia*** Brunetti (1 species only)

   Scutellum with 4 spines; abdomen elliptical, nearly as long as thorax ..... ***Tinda*** Walker (1 species only)

Genus *Cibotogaster* Enderlein

1914. *Cibotogaster* Enderlein, *Zool, Anz.*, 43 : 305. Type-species : *Acanthina azurea* Gerstaecker.

15. *Cibotogaster azurea* (Gerstaecker)

1857. *Acanthina azurea* Gerstaecker, *Linnaea ent.*, 11 : 335.

Diagnosis : Antennal scape and pedicel orange, flagellum blackish with 4 flagellomeres and 2-segmented style; thorax and abdomen dark shining blue; leg more or less wholly black; wing dark brown except pale costal cell, discal cell, base of posterior cell 4, and anal and axillary cell.

Distribution : Meghalaya (West Garo Hills), and Assam, Karnataka, Nagaland and Tamil Nadu; Andalas, Philippines and Sri Lanka.

Genus *Ptilocera* Wiedemann

1820. *Ptilocera* Wiedemann, *Nova Dipt. Gen.* : 7. Type-species : *Stratiomys quadridentata* Fabricius

16. *Ptilocera fastuosa* Gerstaecker

1857. *Ptilocera fastuosa* Gerstaecker, *Linnaea ent.*, 11 : 332.

Diagnosis : Antennal scape and pedicel shining black, terminal style yellowish-white, sponge-like; thorax black; leg shining black; base of wing, major portion of anal and axillary cell and alula clear, rest dark brown; abdomen shining blue or violet.

Distribution : Meghalaya (West Garo Hills), and Arunachal Pradesh, Karnataka, Kerala and West Bengal; Java, Malaya, Myanmar, Philippines, Sri Lanka, Sulawesi and Thailand.

Genus *Stratiosphecomyia* Brunetti

1913. *Stratiosphecomyia* Brunetti, *Rec. Indian Mus.*, 9 : 261. Type-species : *S. variegata* Brunetti.

17. *Stratiosphecomyia variegata* Brunetti

1913 *Stratiosphecomyia variegata* Brunetti, *Rec. Indian Mus.*, **9** : 262.

Diagnosis : Antennal scape twice as long as pedicel, flagellum with 4 flagellomeres; thorax black with some lemon yellow marks; fore femur yellowish, hind one brownish-yellow; wing pale grey basally, darker apically.

Distribution : Meghalaya (East Khasi Hills and West Garo Hills), and Sikkim and West Bengal.

Genus *Tinda* Walker

1860. *Tinda* Walker, *J. Linn. Soc. Lond.*, 4 : 101. Type-species : *T. modifera* Walker.

18. *Tinda javana* (Macquart)

1838. *Beris javana* Macquart, *Mém. Soc. Sci. Agric. Lille.*, 1838 : 192 (188).

Diagnosis : Antennal scape twice as long as pedicel; scutellum black with 4 short yellowish spines; leg yellow with brownish tarsal segments; wing grey with darker anterior margin; abdomen black.

Distribution : Meghalaya (West Garo Hills), and Assam, Bihar, Orissa and West Bengal; Andalas, Java, Lombok, Philippines, Sri Lanka, Sulawesi and Sumba.

Family BOMBYLIIDAE

Contributions on the fauna of Meghalaya : Brunetti 1909, 1920; Aldrich 1928.

A total of 12 species under 5 genera of 2 subfamilies are hitherto known in Meghalaya *vis-à-vis* 96 species under 23 genera of 9 subfamilies in India.

KEY TO THE SUBFAMILIES

1. Vein R_{2+3} arising before cross-vein r-m, at an acute angle ..... Lomatiinae
   Vein R_{2+3} arising opposite to cross-vein r-m or nearly so, and always at a right angle ..... Anthracinae

Subfamily LOMATIINAE

Genus *Petrorossia* Bezzi

1909. *Petrorossia*, Bezzi, *Z. syst. Hymenopt. Dipterol.*, 8 : 32. Type-species : *Bibio hesperus* Rossi.

Diagnosis : Face rounded, not prominent; antennal segment 3 broad at base, gradually styliform onwards and usually hairy at end; males holoptic; metapleuron bare; wing membrane wrinkled; origin of vein R_{2+3} distant from middle cross-vein, about halfway between it and base of prefurca; discal cell long; ambient vein complete; pulvilli developed.

KEY TO THE SPECIES

1. Hind femur greyish; wing veins R_{2+3} and R_{4+5} diverge halfway between base of discal cell and cross-vein r-m..... *intermedia* (Brunetti)
   Hind femur largely yellowish; vein R_{2+3} branching from vein R_{4+5} opposite extreme base of discal cell 2
2. Mid femur yellow; hind femur without a row of bristles on lower hind edge ..... *clauseni* (Aldrich)
   Mid femur largely black; hind femur with a row of bristles on lower inner edge nearly from base to apex ..... *serata* (Aldrich)

19. *Petrorossia clauseni* (Aldrich)

1928. *Aphoebantus clauseni* Aldrich, *Proc. U.S. natn. Mus.*, 74 : 1.

Distribution : Meghalaya (East Khasi Hills).

*20. *Petrorossia intermedia* (Brunetti)

1920. *Argyramoeba intermedia* Brunetti, *Fauna Br. India, Dipt.*, 1 : 221.

Material examined : 1 ♀, East Garo Hills, Songsak, 1050 m, 16. xi. 1973, Coll. S. Biswas.

Distribution : Meghalaya (East Garo Hills), and Orissa.

Remarks : The species was described from Orissa and is believed to extend its range at least to the north-east India.

21. *Petrorossia serata* (Aldrich)

1928. *Aphoebantus seratus* Aldrich, *Proc. U.S. natn. Mus.*, 74 : 2.

Distribution : Meghalaya (East Khasi Hills).

Subfamily ANTHRACINAE

KEY TO THE TRIBES

1. Antennal style with a brush of setae apically; metapleuron bare; squama with a hairy fringe ..... Anthracini
(1 species only)

Antennal style destitute of hairs apically; metapleuron hairy; squama with a scaly fringe ..... Exoprosopini

Tribe ANTHRACINI

Genus *Anthrax* Scopoli

1763. *Anthrax* Scopoli, *Ent. Carniolica* : 358. Type-species: *Musca morio* L., misidentification, = *anthrax* (Schrank).

Diagnosis : Body scales usually decumbent, often silvery or shining black; ground colour dark brown to black; antennal segment 2 usually subspherical, loosely attached to segments 1 and 3, latter not aberrantly enlarged as bulb at base; anal cell usually open in wing margin; spur vein usually present at bases of veins R_{2+3} and R_4; female genitalia with distinct ejection apparatus; vaginal apodeme L-shaped.

22. *Anthrax distigma* Wiedemann

1828. *Anthrax distigma* Wiedemann, *Aussereurop. zweifl. Insekt.*, 1 : 309.

Material examined : 1 ♀, East Garo Hills, Songsak, 1050 m, 16. xi. 1973, Coll. S. Biswas.

Diagnosis : Wing nearly clear, with dark brown baso-costal oblique band limited to cross-vein r-m and bases of discal and posterior cell 4 (Cu_1); a distinct round brown spot on fork of vein R_{2+3} reaching up to R_{4+5} and a smaller indistinct spot on posterior cell 2 (M_1) present; anal cell open.

Distribution : Meghalaya (Khasi and Garo Hills), and Arunachal Pradesh, Bihar, Karnataka, Kerala, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal; Andalas, Bangladesh, Java, Myanmar, Philippines, Sri Lanka and Sulawesi.

Remarks : The species is certainly widespread in the Orient despite its discontinuous record.

1861 ZSI/99—3B

Tribe EXOPROSOPINI

KEY TO THE GENERA

1. Ocelli more or less close to vertex; antennal style mostly not divided by a suture; wing with 2 submarginal cells only; claws usually without basal tooth, or at most with a small and obtuse tubercle.....2

   Ocellar tubercle a long way from vertex; antennal segment 3 like an elongated cone, usually with style divided from it by a distinct suture; wing with 3 submarginal cells; claws with a long and sharp basal tooth.....***Exoprosopa*** Macq.

2. Metapleural fringe sparse; wing colour patterned and with small basal comb; discal cell outwardly obtuse; pulvilli occasionally developed..... ***Hemipenthes*** Loew (1 species only)

   Metapleural fringe dense; wing mostly hyaline or uniformly pale grey and with large basal comb, discal cell outwardly acute; pulvilli absent.....***Villa*** Lioy (4 species only)

Genus *Villa* Lioy

1864. *Villa* Lioy, *Atti Ist. veneto Sci.*, (3) 9 : 732. Type-species : *Anthrax concinnus* Meigen.

KEY TO THE SPECIES

1. Abdomen uniformly with dense pubescence, without obvious transverse bands of scales..... 2

   Abdomen with transverse bands of yellowish, greyish or whitish scales; pubescence sparse..... 3

2. Wing pale grey with deep brownish-black costa; large species (14-16 mm)..... *manifesta* (Walk.)

   Small species (10-11 mm); wing virtually clear except dark brown costal and subcostal cells..... *clara* (Walk.)

3. Pubescence on sides of abdomen wholly snow-white, except for few bunches of scales on each side near tip. .....*aperta* (Walk.)

   Pubescence on sides of abdomen never wholly white, generally yellowish grey or black and white.....*approximata* (Brunetti)

23. *Villa aperta* (Walker)

1852. *Anthrax aperta* Walker, *Insecta Saundersiana*, 1:180.

Distribution : Meghalaya (Khasi Hills), and Himachal Pradesh and Uttar Pradesh; Myanmar.

24. *Villa approximata* (Brunetti)

1917. *Anthrax approximata* Brunetti, *Rec. Indian Mus.*, **13** : 74.

Distribution : Meghalaya (Khasi Hills), and Himachal Pradesh and West Bengal; Myanmar, Nepal and Sri Lanka.

25. *Villa clara* (Walker)

1852. *Anthrax clara* Walker, *Insecta Saundersiana*, 1:179.

Distribution : Meghalaya (Khasi Hills), and Uttar Pradesh.

26. *Villa manifesta* (Walker)

1852. *Anthrax manifesta* Walker, *Insecta Saundersiana*, 1:178.

Distribution : Meghalaya (Khasi Hills, lower ranges), and Kashmir and Uttar Pradesh.

Genus *Hemipenthes* Loew

1869. *Hemipenthes* Loew, *Berl. Ent. Z.*, 13 : 28. Type-species : *Musca morio* L.

27. *Hemipenthes referens* (Walker)

1852. *Anthrax referens* Walker, *Insecta Saundersiana*, 1:189.

Diagnosis : Antennal segment 3 short onion-shaped, with a long style; antero-proximal half of wing dark brown, cutting posterior cell 4 (Cu_1) and discal cell in middle; a large blob from dark part at two-thirds of wing-length reaching nearly hind margin, a similar smaller blob filling curve in vein R_{2+3}, and a minute blob between vein R_{2+3} and tip of upper branch of vein R_{4+5}.

Distribution : Meghalaya (Khasi Hills), and Himachal Pradesh and Uttar Pradesh.

Genus *Exoprosopa* Macquart

1840. *Exoprosopa* Macquart, *Dipt. exot.*, 2(1) : 35. Type- species : *Anthrax pandora* F.

KEY TO THE SUBGENERA

1. Hind leg feathered; discal cell contracted in middle; upper branch of cubital fork not widely divergent from main stem..... ***Pterobates*** Bezzi (1 species only)

   Hind leg not feathered; discal cell typically short and obtuse or even truncate at end; upper branch of cubital fork widely divergent..... ***Exoprosopa*** Macq. (3 species only)

Subgenus ***Exoprosopa*** Macquart

KEY TO THE SPECIES

1. Wing uniformly dark brown; hind tibia without dense black bristles.....*latipennis* Brunetti.

   Wing mostly clear, with several isolated dark spots; hind tibia usually with dense black bristles..... 2

2. Pleuron with dense bristles confined to upper edge..... *sipho* Aldrich

   Pleuron with dense bristles confined either to lower edge or all over except upper edge..... *insulata* (Walker)

28. *Exoprosopa (Exoprosopa) insulata* (Walker)

1852. *Anthrax insulata* Walker, *Insecta Saundersiana*, 1 : 172.

Distribution : Meghalaya (Khasi Hills, lower ranges), and Bihar, Himachal Pradesh, Karnataka Madhya Pradesh, Tamil Nadu, Uttar Pradesh and West Bengal; ? Myanmar, Nepal and Sri Lanka.

29. *Exoprosopa (Exoprosopa) latipennis* Brunetti

1909. *Exoprosopa latipennis* Brunetti, *Rec. Indian Mus.*, 2 : 464.

Material examined: 1♂, 1♀, West Khasi Hills, Nongstoin, 1370 m, 22. ix. 1988, Coll. A. R. Lahiri.

Distribution : Meghalaya (East and West Khasi Hills).

Remarks : The species was described from Meghalaya and subsequently this was not recorded from elsewhere. This is apparently a species of limited range of distribution.

30. *Exoprosopa (Exoprosopa) sipho* Aldrich

1928. *Exoprosopa sipho* Aldrich, *Proc. U.S. natn. Mus.*, 74 : 2.

Distribution : Meghalaya (East Khasi Hills).

Subgenus ***Pterobates*** Bezzi

1924. *Pterobates* Bezzi, *Bombyliidae Ethiopian Reg.* : 273. Type-species : *Anthrax apicalis* Wiedemann.

31. *Exoprosopa (Pterobates) pennipes* (Wiedemann)

1821. *Anthrax pennipes* Wiedemann, *Dipt. exot.* : 129.

Diagnosis : Pleuron without white tuft of hairs; hind tibia with dense black hairs; squama with black fringe, wing almost entirely blackish brown, without white stripe at end of cell 2 M; cell R_5 open.

Distribution : Meghalaya (Khasi Hills, lower ranges), and Bihar and Nagaland; East Malaysia, Java, Kalimantan, Pakistan and Philippines.

Family CONOPIDAE

Contributions on the fauna of Meghalaya : Brunetti 1912, 1923, 1925; Kröber 1915; Smith 1958.

A total of 7 species under 4 genera of 2 subfamilies are hitherto known in Meghalaya vis-à-vis 47 species under 11 genera of 4 subfamilies in India.

KEY TO THE SUBFAMILIES

1. Flagellomere 1 with apical style; anal cell Cu closed ..... Conopinae

   Flagellomere 1 with subapical arista; anal cell Cu open..... Stylogasterinae (1 species only)

Subfamily CONOPINAE

KEY TO THE GENERA

1. Abdominal segments 2 and 3 nearly equal in length and equally stout 2

   Abdominal segment 2 markedly longer than segment 3, abdomen wasp-like, pedunculate..... 3

2. Wing with anterior cross-vein beyond middle of discal cell; anal segment broader than long.....***Conops*** Linnaeus (3 species only)

   Wing with anterior cross-vein before or at middle of discal cell; anal segment longer than broad..... ***Archiconops*** Kröber (1 species only)

3. Vertex with large swelling; hind femur without any thickening.....***Physoconops*** Szilády (1 species only)

   Vertical swelling comparatively small; hind femur a little thickened..... ..... ***Physocephala*** Schiner (3 species only)

Genus *Archiconops* Kröber

1939. *Archiconops* Kröber, *Ann. Mag. nat. Hist.*, (11) 4 : 381. Type-species : *Conops insularis* Kröber.

*32. *Archiconops erythrocephala* (Fabricius)

1794. *Conops erythrocephala* Fabricius, *Ent. Syst.*, 4 : 392.

Material examined : 1 ♀, Meghalaya : South Garo Hills, Rongra, 29. iv. 1991, Coll. B. N. Das.

Diagnosis : Head with silvery-white reflection, antenna black, basal half of proboscis reddish-brown, rest black; scutum black except dull orange humerus; pleuron black with silvery-white reflection and broad silvery-white stripe from behind humerus to middle coxa; fore femur reddish-brown or orange-brown except at tip, mid and hind femur black or dark brown; wing blackish-brown, violet tinged; abdomen violet black, last segment of males white-dusted.

Distribution : Meghalaya (South Garo Hills), and Bihar, Gujarat, Maharashtra, Sikkim, Tamil Nadu and West Bengal; Cambodia, China, Laos, Myanmar, Sri Lanka, Sulawesi and Vietnam; Africa.

Remarks : The species is widely distributed in the east.

Genus *Conops* Linnaeus

1758. *Conops* Linnaeus, *Syst. Nat. Ed.*, 10 : 640. Type-species : *Conops flavipes* Linnaeus.

KEY TO THE SUBGENERA

1. Frons above antennae blackish but posterior half brownish and with transverse grooves ..... *Asiconops* Chen

   Frons nearly orange-yellow or orange-brown, sometimes somewhat reddish above base of antennae and without any groove ..... *Conops* L.

Subgenus *Asiconops* Chen

1939. *Asiconops* Chen, *Notes Ent. chin.*, 6 (10) : 171. Type-species : *Conops areomaculatus* Kröber.

33. *Conops (Asiconops) pactyas* Walker

1852. *Conops pactyas* Walker, *Insecta Saundersiana*, 1 : 255.

Diagnosis : Antenna with flagellomere 1 black, with a short orange streak on apical half ventrally; thorax and abdomen black with golden dust.

Distribution : Meghalaya (Khasi Hills), and Karnataka and West Bengal; Java.

Remarks : The species is considered to occur in India as per Brunetti (1923) pending re-confirmation from fresh material.

Subgenus *Conops* Linnaeus

KEY TO THE SPECIES

1. Vertex with a large blue-black spot extending over occiput; humerus yellow..... ..... *nigriventris* Brunetti

Vertex generally dark brownish-orange or deep brown; humerus brownish-orange ..... *annulosus* Bigot

34. *Conops (Conops) annulosus* Bigot

1887. *Conops annulosus* Bigot, *Annls Soc. ent. Fr.*, (6) 7:36.

Distribution : Meghalaya (Khasi Hills), and Himachal Pradesh; Moluccas.

35. *Conops (Conops) nigriventris* Brunetti

1923. *Conops nigriventris* Brunetti, *Fauna Br. India, Dipt.*, 3 : 346.

Distribution : Meghalaya (Khasi Hills).

Genus *Physocephala* Schiner

1861. *Physocephala* Schiner, *Wien. ent. Mschr.*, 5 : 137. Type-species: *Conops rufipes* Fabricius.

KEY TO THE SPECIES

1. Femur wholly orange. Wing band dark brown continuing to tip of vein R_{4+5} ..... *argentifera* Brunetti

   Hind femur at least with a black band 2

2. Pedicel as long as scape ..... *obscura* Kröber

   Pedicel 2.5 - 3.0 times as long as scape ..... *bicolorata* Brunetti

*36. *Physocephala argentifera* Brunetti

1923. *Physocephala argentifera* Brunetti, *Fauna Br. India, Dipt.*, 3 : 361.

Material examined : 1♂, Meghalaya : East Garo Hills, Songsak, 1050 m, 5. v. 1979, Coll. J.K. Jonathan.

Distribution : Meghalaya (East Garo Hills), and Bihar and Uttar Pradesh.

Remarks : The species seems to be of limited distributional range.

37. *Physocephala bicolorata* Brunetti

1923. *Physocephala bicolor* Brunetti, *Fauna Br. India, Dipt.*, 3 : 357 (pre-occupied).

1925. *Physocephala bicolorata* Brunetti, *Rec. Indian Mus.*, 27 : 79.

Distribution : Meghalaya (East Khasi Hills), and Himachal Pradesh, Uttar Pradesh and West Bengal; China and Nepal.

38. *Physocephala obscura* Kröber

1915. *Physocephala obscura* Kröber, *Arch. Naturgesch.* (A), **80** (10) : 53.

Distribution : Meghalaya (Khasi Hills); China; Japan and U.S.S.R.

Genus *Physoconops* Szilády

1926. *Physoconops* Szilády, *Annls hist.-nat. Mus. natn. hung.*, 24 : 588. Type-species : *Conops brachyrhynchus* Macquart = *obscuripennis* (Williston)

39. *Physoconops sepulchralis* (Brunetti)

1912. *Physocephala sepulchralis* Brunetti, *Rec. Indian Mus.*, **7** : 498.

Diagnosis : Antenna black, pedicel 2.5 times as long as scape, style 2-segmented, basal cup-shaped and apical pointed; thorax black; femur with a broad black median ring; wing from costa to vein R_{4+5} dark brown; abdomen black.

Distribution : Meghalaya (Khasi Hills), and Mizoram.

Subfamily STYLOGASTERINAE

Genus *Stylogaster* Macquart

1835. *Stylogaster* Macquart, *Hist. nat. Insect. Dipt.*, 2 : 38. Type-species : *Conops stylatus* Fabricius.

Diagnosis : Flagellomere 1 sword-shaped with round tip; proboscis long, thin, geniculate; anal cell shorter than basal cell 2, tarsus as long as or longer than tibia, tibia spurred.

40. *Stylogaster orientalis* Brunetti

1923. *Stylogaster orientalis* Brunetti, *Fauna Br. India, Dipt.*, **3** : 372.

Material examined : 1 ♂, Meghalaya : West Garo Hills, above Tura, 1067-1189 m, 15. vii–30. viii. 1917, Coll. S. Kemp.

Diagnosis : Frons shining black; long black bristles on either side near corner of eye; proboscis geniculated beyond middle of its length; antennal segment 3 less than twice as long as segment 2, bare; scutellum with 2 long apical bristles; hind coxa and femur distinctly enlarged with narrow base but without long postero-dorsal bristly hairs on the latter, hind tibia in distal half with at most an obscure whitish ring; wing with last section of M_2 more evenly curved; abdomen annulated.

Distribution : Meghalaya (West Garo Hills), and Kerala; Sri Lanka.

Family DIOPSIDAE

Contributions on the fauna of Meghalaya : Curran 1936; Datta and Biswas 1985.

A total of 3 species under 3 genera are hitherto known in Meghalaya *vis-à-vis* 9 species under 5 genera of the subfamily Diopsinaė in India.

Subfamily DIOPSINAE

Diagnosis : Face distinctly divided by a vertical median sulcus; eye-stalk medium or long; scutellar spines with or without a short bristle apically; alula of wing lacking; fifth vein (M_3 + Cu_1) present but sixth vein (Cu_2 + 2A) absent.

KEY TO THE GENERA

1. Supra-alar spines well-developed ..... ***Teleopsis*** Rondani (1 species only)

   Supra-alar spines absent (bristles may be present dorsally) 2

2. Facial teeth present; inner orbital bristles weak ..... ***Diopsis*** L. (1 species only)

   Facial teeth and inner orbital bristles absent ..... ***Eurydiopsis*** Frey (1 species only)

Genus *Diopsis* Linnaeus

1775. *Diopsis* Linnaeus, *Dissert. Ent. Bigas Ins. Systens, etc.* : 1. Type-species : *Diopsis ichneumonea* L.

41. *Diopsis indica* Westwood

1837. *Diopsis indica* Westwood, *Trans. Linn. Soc. Lond. (Zool.), 17* : 299.

Material examined : 1 ♀ (badly damaged), West Garo Hills, Tura, 1067 m, 30. viii. 1917, Coll. S. Kemp.

Diagnosis : Face glossy yellowish red, with strong facial teeth; legs yellowish red; wings mainly hyaline, with a round dark spot at tip on vein 3 (R_{4+5}) without touching vein 4 (M_{1+2}).

Distribution : Meghalaya (West Garo Hills), and Arunachal Pradesh, Assam, Gujarat, Uttar Pradesh and West Bengal; Bangladesh to southern China, south to Java.

42. *Diopsis* nr *indica* Westwood

Remarks : The reader is referred to Datta and Biswas (1985) for further information.

Genus *Eurydiopsis* Frey

1928. *Eurydiopsis* Frey, *Notul. ent.*, 8 : 70. Type-species: *Diopsis subnotata* Westwood.

43. *Eurydiopsis subnotata* (Westwood)

1848. *Diopsis subnotata* Westwood, *Cab. orient, Ent.* : 37.

Material examined : 1♂, West Garo Hills, Tura, 1067 m, x. 1917, Coll. S. W. Kemp.

Diagnosis : Face matte grey, with indistinct facial teeth; legs dark brown; wings highly infuscated, with distinct hyaline area at R_5.

Distribution : Meghalaya (West Garo Hills), and Assam; Andalas, Myanmar, Philippines and Sulawesi; New Guinea.

Genus *Teleopsis* Rondani

1875. *Teleopsis* Rondani, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 7 : 442. Type-species: *Diopsis sykesii* Westwood.

44. *Teleopsis quadriguttata* (Walker)

1856. *Diopsis quadriguttata* Walker, *J. Proc. Linn. Soc. Lond. (Zool.)*, 1 : 37.

Material examined : 1♂, 1♀, East Khasi Hills, Cherrapunji, 1500 m, 2-8. x. 1914, Coll. S. W. Kemp.

Diagnosis : Face reddish brown, without any facial teeth; legs reddish brown; wings clear with a band at Rs, two median spots on either side of vein 3 (R_{4+5}) and a wide subapical band.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh, Assam, Uttar Pradesh and West Bengal; China, East Malaysia, Kalimantan, Malaya, Myanmar and Taiwan.

Family SEPSIDAE

Contribution on the fauna of Meghalaya : Brunetti 1910.

A total of 5 species under 3 genera of 1 subfamily are hitherto known in Meghalaya *vis-à-vis* 21 species under 8 genera of 2 subfamilies in India.

Subfamily SEPSINAE

Diagnosis : Medium or small in size, with reddish to black body and at least mesopleuron glossy; inner vertical bristles present; mid-femur normal and not bent at middle.

KEY TO THE GENERA

1. Humeral bristles absent ..... ***Decachaetophora*** Duda
(1 species only)

Humeral bristles present 2

2. Abdomen of both sexes without distinct macrochaetae; wing without a dark spot at the end of vein R_{2+3}; hypopygial process bifurcated apically..... ***Dicranosepsis*** Duda
(1 species only)

Abdomen in males and often in females also, with distinct macrochaetae; wing with or without a dark spot at the end of vein R_{2+3}; hypopygial process not bifurcate apically ..... ***Sepsis*** Fallén
(3 species only)

Genus ***Decachaetophora*** Duda

1926. *Decachaetophora* Duda, *Annln naturh. Mus. Wien*, 39 : 27. Type-species: *Sepsis aeneipes* de Meijere.

45. ***Decachaetophora aeneipes*** (de Meijere)

1913. *Sepsis aeneipes* de Meijere, *Annls hist.-nat. Mus. natn. hung.*, 11 : 119.

Material examined : 15♂♂, 4♀♀, East Khasi Hills, Shillong, Botanical Garden, 1650 m, 18. v. 1990, Coll. M. S. Shishodia.

Diagnosis : A blackish fly with duplicate vibrissae; supra- alar and outer vertical bristles present; fore femur in males with complicated setae and fore tibia with ventral emargination beset with a scraper-like tooth in mid-line; abdomen normal and not constricted between segments 2 and 3.

Distribution : Meghalaya (East Khasi Hills), and Assam, Himachal Pradesh, Punjab, Sikkim, Uttar Pradesh and West Bengal; China (Kansu, Szechuen), Nepal, Pakistan, Sri Lanka and Taiwan; Japan and Nearctic region.

Remarks : The only species of the genus in the Orient is remarkably widespread and is expected to occur throughout India. It is certainly abundant in Meghalaya.

Genus ***Dicranosepsis*** Duda

1926. *Dicranosepsis* Duda, *Annln naturh. Mus. Wien.*, 39 : 43 (As subgenus of *Sepsis* Fallén). Type-species: *Sepsis bicolor* Wiedemann.

KEY TO THE SPECIES

1. Male hind tibia without a distinct osmeterium and metatarsus without antero-ventral bristles ..... *bicolor* (Wied.)

Male hind tibia with a distinct osmeterium and metatarsus with 7- 8 antero-ventral bristles ..... *olfactoria* Iwasa

46. *Dicranosepsis bicolor* (Wiedemann)

1830. *Sepsis bicolor* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2 : 468.

Material examined : 1 ♂, East Khasi Hills, Mawphlang, 1050 m, 2. iii. 1991, Coll. K. K. Ray.

Distribution : Meghalaya (East Khasi Hills), and Andhra Pradesh, Arunachal Pradesh, Assam, Maharashtra, Punjab, Sikkim, Uttar Pradesh and West Bengal; other parts of the Oriental region; Japan and Australian region.

Remarks : The species is widely distributed in the Orient and as far east as in Japan and Australian region. It is also expected to occur throughout India.

**47. *Dicranosepsis olfactoria* Iwasa

1984. *Dicranosepsis olfactoria* Iwasa, *Kontyû*, 52:84.

Material examined : 1 ♂, East Khasi Hills, Shillong, Smit, 1600 m, 5. iii. 1991, Coll. K. K. Ray.

Distribution : Meghalaya (East Khasi Hills); Nepal and Pakistan.

Genus *Sepsis* Fallén

1810. *Sepsis* Fallén, *Sp. Ent. nov. Dipt.* : 17. Type-species: *Musca cynipsea* L.

KEY TO THE SPECIES

1. Wing with a dark spot at the end of vein R_{2+3} 2

   Wing without a dark spot at the end of vein R_{2+3} 3

2. Sternopleuron entirely pruinose; wing spot angular ..... *himalayensis* Brunetti

   Sternopleuron mainly shiny; wing spot rounded ..... *albopunctata* Lamb

3. Male hypopygial process short and slender; male fore femur ventrally with an emargination bearing few short spines nearly at one-half ..... *nitens* Wied.

   Male hypopygial process long and stout; male fore femur ventrally with few spines only and without any emargination ..... *coprophila* de Meij.

48. *Sepsis albopunctata* Lamb

1914. *Sepsis albopunctata* Lamb, *Trans. Linn. Soc. Lond.* (2) *Zool.*, 16 : 323.

Distribution : Meghalaya (Ri-Bhoi), and Andhra Pradesh, Arunachal Pradesh, Assam, Bihar,

Kerala, Uttar Pradesh and West Bengal; Bangladesh, East Malaysia, Java, Kalimantan, Lesser Sunda Is., Nepal, Pakistan, Philippines and Taiwan; Australian and Ethiopian regions and Japan.

49. *Sepsis coprophila* de Meijere

1906. *Sepsis coprophila* de Meijere, *Annls hist.-nat. Mus. natn. hung.*, 4 : 176.

Distribution : Meghalaya (East Khasi Hills), and Assam, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal; Andalas, China, East Malaysia, Java, Kalimantan, Lesser Sunda Is., Malaya, Philippines, Ryukyu Is., Singapore, Sri Lanka and Taiwan; Australian region and Japan.

*50. *Sepsis himalayensis* Brunetti

1910. *Sepsis himalayensis* Brunetti, *Rec. Indian Mus.*, 3 : 345.

Material examined : 6♂♂, 1♀, East Khasi Hills, Shillong, Botanical Garden, 1650 m, 18. v. 1990, Coll. M. S. Shishodia.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh, Sikkim and West Bengal; Myanmar, Nepal and Pakistan.

Remarks : The species is apparently of narrow range of distribution over the Himalaya and mountains to the south-east.

51. *Sepsis nitens* Wiedemann

1824. *Sepsis nitens* Wiedemann, *Analecta Ent.* : 57.

Distribution : Meghalaya (Ri-Bhoi), and Andhra Pradesh, Assam, Bihar, Madhya Pradesh, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal; Bangladesh, Java, Lesser Sunda Is., Nepal, Pakistan, Philippines, Sri Lanka and Taiwan; Australian region and Japan.

Family CELYPHIDAE

Contributions on the fauna of Meghalaya : Tenorio 1972; Joseph and Parui 1978; Datta 1986.

A total of 3 species under 2 genera are hitherto known in Meghalaya *vis-à-vis* 12 species plus 4 unnamed taxa under 2 genera in India.

KEY TO THE GENERA

1. Vertex rounded over on to back of head; scutellum usually greatly convex above and broad ..... *Celyphus* Dalman

Vertex margin carinate, not gently rounded over on to back of head; scutellum longer than broad and a little convex. Discal and second basal cells separated by a cross-vein ..... ***Spaniocelyphus*** Hendel

(1 species only)

Genus *Celyphus* Dalman

1818. *Celyphus* Dalman, *K. Svenska Vetensk. Akad. Handl.*, 39 : 72. Type-species : *Celyphus obtectus* Dalman.

KEY TO THE SUBGENERA

1. Testaceous, testaceous-violet or brown in colour; head testaceous; scutellum more or less circular in outline, broadly rounded at apex ..... ***Hemiglobus*** Frey

(1 species only)

Very large size of 6.0 - 7.5 mm in length; deep purple or blue in colour, including head; scutellum ovoid, tapered apically, at lateral bases with 2 shallow furrows extending along periphery ..... ***Paracelyphus*** Bigot

(1 species only)

Subgenus *Hemiglobus* Frey

1941. *Hemiglobus* Frey, *Notul. ent.*, 21 : 13. Type-species: *Paracelyphus testaceus* Malloch.

52. *Celyphus (Hemiglobus) kempi* Datta

1986. *Celyphus (Hemiglobus) kempi* Datta, *J. Beng. nat. Hist. Soc.* (N.S.), 5 : 113.

Material examined : 1 ♀, West Garo Hills, Tura, 1067-1189 m, 15. vii. 1917-30. viii. 1917, Coll. S. Kemp.

Diagnosis : Brownish in colour; mesonotum smooth; scutellum laterally rugose, entirely covered with punctations; genital sternite with two baso-lateral processes directed inwards.

Distribution : Meghalaya (West Garo Hills).

Subgenus *Paracelyphus* Bigot

1859. *Paracelyphus* Bigot, *Revue Mag. Zool.*, 7:10. Type-species: *Paracelyphus hyacinthus* Bigot.

53. *Celyphus* (*Paracelyphus*) *hyacinthus* (Bigot)

1859. *Paracelyphus hyacinthus* Bigot, *Revue Mag. Zool.*, 7 : 10.

Material examined : 1♂, West Garo Hills, Tura, 1189 m, 15. viii. 1917. Coll. S. Kemp.

Diagnosis : Frons finely striated; post-verticals inconspicuous; palpi dark brown, gradually clubbed on apical half; mesonotum and scutellum smooth; gonites with a fleshy lobe- like attachment; genital sternite highly chitinized antero-laterally.

Distribution : Meghalaya (West Garo Hills), Arunachal Pradesh and Assam; Andalas, Cambodia, Laos, Malaya, Thailand and Vietnam.

Genus *Spaniocelyphus* Hendel

1914. *Spaniocelyphus* Hendel, *Supplta. ent.*, 1 : 92. Type-species: *Celyphus scutatus* Wiedemann.

54. *Spaniocelyphus tenorioi* Joseph & Parui

1978. *Spaniocelyphus tenorioi* Joseph and Parui, *Bull. zool. Surv. India*, 1 : 55.

Material examined : 1♂, West Garo Hills, Tura, 1067 m. 30. viii. 1917, Coll. S. Kemp.

Diagnosis : Head testaceous; bucca dark; mesonotum and scutellum smooth and black but the latter blackish brown posteriorly; surstyli apically knobbed; genital sternite somewhat in form of a horse-shoe.

Distribution : Meghalaya (West Garo Hills).

Family CALLIPHORIDAE

Contributions on the fauna of Meghalaya : Townsend 1917; Senior-White 1922, 1923; Senior-White, Aubertin and Smart 1940; James 1977, Datta 1991.

A total of 18 species under 12 genera of 3 subfamilies are hitherto known in Meghalaya vis-à-vis 97 species and 1 subspecies under 26 genera of 4 subfamilies in India.

KEY TO THE SUBFAMILIES

1. Base of stem vein of wing bare dorsally ..... Calliphorinae
   Base of stem vein of wing with long fine setulae dorsally 2
2. Thoracic squama bare dorsally; subcostal sclerite with fine pubescence ..... Rhiniinae
   Thoracic squama haired dorsally; subcostal sclerite setulose ..... Chrysomyinae

Subfamily CALLIPHORINAE

KEY TO THE GENERA

1. Thoracic squama bare 2

   Thoracic squama at least partially haired ..... ***Calliphora*** Rob.-Desv.

   (1 species only)

2. Brownish flies; presutural acrostichal bristles absent; eyes dichoptic in both sexes ..... ***Bengalia*** Rob.-Desv.

   (1 species only)

   Dark blue or dull black flies; presutural acrostichal bristles present; eyes holoptic or subholoptic in males and dichoptic in females 3

3. Presutural acrostichal bristles 2; facial carina absent..... ***Onesia*** Rob.-Desv.

   (1 species only)

   Presutural acrostichal bristles 0-1, facial carina well-developed ..... ***Polleniopsis*** Townsend

   (1 species only)

Genus *Bengalia* Rob.-Desv.

1830. *Bengalia* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad. Sci. Inst. Fr.* : 425. Type-species : *Bengalia labiata* Rob.-Desv.

55. *Bengalia escheri* Bezzi

1913. *Bengalia escheri* Bezzi, *Ent. Mitt.*, 2 : 76.

Diagnosis : A brownish fly with slightly projecting clypeus; vibrissae on same level of mouth-margin; subalar knob rounded; mid-tibia in females and sometimes in males with distinct median ventral bristle.

Distribution : Meghalaya (West Garo Hills and Khasi Hills), and Uttar Pradesh; Taiwan.

Genus *Calliphora* Rob.-Desv.

1830. *Calliphora* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad. Sci. Inst. Fr.* : 433. Type-species: *Musca vomitoria L.*

Subgenus *Calliphora s. str.*

Diagnosis : Body bluish black; presutural intra-alar bristles present; lower squama entirely with hair on upper surface.

56. *Calliphora (Calliphora) pattoni* Aubertin

1931. *Calliphora pattoni* Aubertin, *Ann. Mag. nat. Hist.*, (10) **8** : 615.

Diagnosis : Eyes in males separated at point of closest approximation by one-half width of antennal segment 3 but in females by slightly less than one-third width of head; frons, parafrontalia, parafacialia and jowls dark greyish black; hair on metacephalon all black; antenna dark brown, segment 3 rufous at base; palpus orange; thorax with four narrow black longitudinal stripes anteriorly; basicostal scale black; subcostal sclerite with soft tawny pubescence.

Distribution : Meghalaya (Khasi Hills), and Arunachal Pradesh, Kashmir, Uttar Pradesh and West Bengal; Myanmar, Nepal, Taiwan and Thailand.

Genus *Polleniopsis* Townsend

1917. *Polleniopsis* Townsend, *Rec. Indian Mus.*, **13** : 201. Type-species: *Polleniopsis pilosa* Townsend.

57. *Polleniopsis pilosa* Townsend

1917. *Polleniopsis pilosa* Townsend, *Rec. Indian Mus.*, **13** : 202.

Diagnosis : Brownish black species; frons parallel-sided in females; parafacialia with short fine hairs; mesonotum with five distinct black vittae in males but indistinct in females, median vitta obsolete before suture in posterior view, submedian vittae also before suture but narrower in posterior view than in anterior view; propleuron hairy; lower squama with a patch of setulae.

Distribution : Meghalaya (East Khasi Hills), and Bihar and West Bengal.

Genus *Onesia* Rob.-Desv.

1830. *Onesia* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad. Sci. Inst. Fr.* : 365. Type-species : *Musca sepulcralis* Meigen.

58. *Onesia khasiensis* (Senior-White)

1923. *Nitella khasiensis* Senior-White, *Mem. Dep. Agric. India (ent. Ser.)*, **8** : 49.

Diagnosis : Parafacialia with fine black setulae on upper half; thorax and abdomen black, with bluish grey dust; mesonotum with four indistinct vittae anteriorly; presutural intra-alar bristle absent; acrostichal bristles 2 + 3; sternopleural bristles 1 + 1 in males but 2 + 1 in females; propleuron with black hairs; lower squama with a patch of setulae; wing with cell R_5 open in females but closed in males.

Distribution : Meghalaya (East Khasi Hills); Bangladesh.

Subfamily CHRYSOMYINAE

Genus *Chrysomya* Rob.-Desv.

1830. *Chrysomya* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad. Sci. Inst. Fr.* : 444. Type-species: *Chrysomya regalis* Rob.-Desv.

Diagnosis : Generally medium-sized flies of metallic green, blue or purple colour; eyes large and bare, usually holoptic and upper facets enlarged in males but dichoptic and with small uniform facets in females; presutural acrostichal bristle absent; propleuron and prosternum hairy; supra-squamosal ridge usually with anterior parasquamosal tuft; subcostal sclerite hairy; tergum 5 with fine erect bristles on disc.

KEY TO THE SPECIES

1. Eyes in males with markedly enlarged facets on upper 2/3, lower 1/3 with small facets; parafacialia and genae yellowish orange, both covered with yellowish-white hairs; antennal segment 3 entirely orange ..... *megacephala* (F.)

   Eyes in males with slightly enlarged facets anteriorly; parafacialia and genae fuscous, both with black hairs; antennal segment 3 not uniformly orange ..... *pinguis* (Walker)

59. *Chrysomya megacephala* (Fabricius)

1794. *Musca megacephala* Fabricius, *Syst. Ent.*, 4 ; 317.

Material examined : 2♂ ♂♂ 1♀, East Khasi Hills, Cherrapungi, 1500 m, 15. ix. 1988, Coll. A.R. Lahiri.

Distribution : Meghalaya (East Khasi Hills), and also common in other states in India and in other parts of the Oriental region; North China and Japan of the Palaearctic region; Australasian region; Malagasy subregion of the Ethiopian region.

Remarks : Notwithstanding its reportedly wide occurrence, the species is definitely recorded from the state.

60. *Chrysomya pinguis* (Walker)

1858. *Lucilia pinguis* Walker, *Trans. ent. Soc. Lond.* (n.s.) , 4 : 213.

Distribution : Meghalaya (Khasi Hills), and Arunachal Pradesh, Himachal Pradesh, Tamil Nadu and West Bengal; Bangladesh, China, Indonesia (Java, Moluccas), Japan, Korea, Malaysia (Malaya), Philippines (Palawan, Tawi Tawi), Sri Lanka, Taiwan and Thailand.

Subfamily RHINIINAE

KEY TO THE GENERA

1. Arista pectinated, *i.e.*, ciliate on upper side only 2

   Arista pubescent or plumose 3

2. Body slender and equilateral; hind tibia without a conspicuous row of anterodorsal setae but with 2-3 setae as long as or longer than tibial diameter; abdomen mostly testaceous ..... ***Idiella*** Brauer and Bergenstamm

   (2 species only)

   Body rather stout, with ovate abdomen; hind tibia with a conspicuous row of subequal anterodorsal setae longer than normal hairs, sometimes 2-3 rather strong anterodorsal setae developed among them; abdomen usually of dark colour ..... ***Stomorhina*** Rondani

   (1 species only)

3. Arista pubescent 4

   Arista plumose, *i.e.*, fairly long hairs on both upper and lower surfaces 5

4. Wing cell R_5 well open ..... ***Metallea*** Wulp

   (1 species only)

   Wing cell R_5 petiolate at level of vein R_{4+5} ..... ***Chlororhinia*** Townsend

   (1 species only)

5. Outer posthumeral and prostigmatic bristle absent ..... ***Borbororhinia*** Townsend

   (1 species only)

   Outer posthumeral and prostigmatic bristle present..... 6

6. Presutural acrostichal and dorsocentral bristles indistinct..... ***Cosmina*** Rob.-Desv.

   (1 species only)

   Presutural acrostichal and dorsocentral bristles prominent ..... ***Isomyia*** Walker

   (5 species only)

Genus *Borbororhinia* Townsend

1917. *Borbororhinia* Townsend, *Rec. Indian Mus.*, **13** : 188. Type-species : ***Borbororhinia pubescens*** Townsend.

61. *Borbororhinia bivittata* (Walker)

1856. *Idia bivittata* Walker, *J. Proc. Linn. Soc. Lond., Zool.*, **1** : 128.

Diagnosis : Face and facialia polished pale testaceous, lower half of parafacialia shining black being confluent with large shining black area of facialia; palpus obscurely fulvous; thorax and abdomen also fulvous.

Distribution : Meghalaya and Kerala; Bangladesh, Indonesia (Buru, Java, Kalimantan, Moluccas), Laos, Malaysia, Philippines (Mindoro, Palawan, Tawi Tawi), Sri Lanka and Taiwan.

Genus ***Chlororhinia*** Townsend

1917. *Chlororhinia* Townsend, *Rec. Indian Mus.*, **13** : 191. Type-species: *Chlororhinia viridis* Townsend.

62. ***Chlororhinia exempta*** (Walker)

1856. *Musca exempta* Walker, *J. Proc. Linn. Soc. Lond., Zool.*, **1** : 128.

1917. *Chlororhinia viridis* Townsend, *Rec. Indian Mus.*, **13** : 191.

Diagnosis : Bright green species; frons in females very little wider than one of the parafrontalia; wings hyaline, with slight infuscation only at base.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh and Manipur; East Malaysia, Kalimantan, Laos, Nepal and Philippines.

Genus ***Cosmina*** Rob.-Desv.

1830. *Cosmina* Robineau-Desvoidy, *Mém. prés. div. Sav. Acad, Sci. Inst. Fr.* : 423. Type-species: *Cosmina fuscipennis* Rob.-Desv.

63. ***Cosmina bicolor*** (Walker)

1856. *Idia bicolor* Walker, *J. Proc. Linn. Soc. Lond., Zool.*, **1** : 23.

Diagnosis : A shining coppery green species; face shining black; antenna yellowish brown; propleuron with fine yellowish white hair centrally and covered with white tomentum; mesonotum reddish brown with four faint black longitudinal stripes; epaulet of wing also reddish brown; ovipositor unspined apically.

Distribution : Meghalaya, and Arunachal Pradesh, Assam, Bihar, Karnataka, Tamil Nadu and West Bengal; Bangladesh, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand and Vietnam.

Genus ***Idiella*** Brauer and Bergenstamm

1889. *Idiella* Brauer and Bergenstamm, *Denkschr. Acad. Wiss., Wien*, 56 : 154. Type-Species: *Idia mandarina* Wiedemann.

KEY TO THE SPECIES

1. Antenna black; pleuron with whitish yellow hairs; mid-tibia in males without a tuft of hairs distally ..... *euidielloides* S.-W.

Antennal segment 2 at least reddish; pleuron with golden hairs; mid-tibia in males with 2 posterior setae and a tuft of hairs distally ..... *mandarina* (Wied.)

64. *Idiella euidielloides* Senior-White

1923. *Idiella euidielloides* Senior-White, *Mem. Dep. Agric. India (ent. Ser.)*, **7** : 166.

Distribution : Meghalaya (East Khasi Hills), and Kerala, Orissa, Sikkim and West Bengal; Indonesia (Java, Timor), Malaysia (Malaya), Philippines (Palawan), Sri Lanka, Taiwan and Thailand.

65. *Idiella mandarina* (Wiedemann)

1830. *Idia mandarina* Wiedemann, *Aussereurop. zweifl. Insekt.*, **2** : 350.

Distribution : Meghalaya, and Assam, Bihar, Gujarat, Haryana, Kerala, Madhya Pradesh, Maharashtra, Orissa, Uttar Pradesh and West Bengal; Bangladesh, China, Indonesia (Andalas, Kalimantan, Timor), Malaysia, Myanmar, Sri Lanka, Taiwan and Thailand; Key Is.

Genus *Isomyia* Walker

1860. *Isomyia* Walker, *J. Proc. Linn. Soc. Lond., Zool.*, **4** : 134. Type-species : *Musca delectans* Walker (As subgenus of *Musca* L.)

KEY TO THE SPECIES

1. Thoracic squama strongly lobulate; postalar declivity at least partially haired ..... *oestracea* (Séguy)

   Thoracic squama not so lobulate; postalar declivity bare 2

2. Parafacialia and mesopleura (excepting upper border) in males with yellow hairs ..... *pseudonepalana* (S.-W., Aub. and Smart)

   Parafacialia and mesopleura in males with black hairs 3

3. Acrostichal bristles 2+4; vein R_{4+5} with bristles beyond node..... *versicolor* (Bigot)
   Acrostichal bristles 1+2; vein R_{4+5} with bristles on node only 4

4. Femur green and tibia yellowish..... *pseudoviridana* (Peris)

   Femur black and tibia light brown ..... *zelanica* (S.-W., Aub. and Smart)

66. *Isomyia oestracea* (Séguy)

1934. *Pachycosmina oestracea* Séguy, *Encycl. ent. (B) II, Dipt.*, **7** : 18.

Distribution : Meghalaya (Khasi Hills); Bangladesh, China, Indonesia (Java), Laos and Malaysia (Malaya).

67. *Isomyia pseudonepalana* (S.-W., Aub. and Smart)

1940. *Strongyloneura pseudonepalana* (Senior-White, Aubertin and Smart), *Fauna Br. India, Dipt.*, **6** : 162.

Distribution : Meghalaya (Khasi Hills), and Assam; Bangladesh, Myanmar, Nepal and Sri Lanka.

68. *Isomyia pseudoviridana* (Peris)

1952. *Thelychaeta pseudoviridana* Peris, *An. Estac. Exper. Aula Dei*, 3 : 183 (replacement name).

1940. *Strongyloneura tibialis* (Vill.): Senior-White, Aubertin and Smart, *Fauna Br. India, Dipt.*, **6** : 167.

Distribution : Meghalaya (East Khasi Hills), and Orissa, Tamil Nadu and Uttar Pradesh; Myanmar, Nepal, Sri Lanka and Taiwan.

69. *Isomyia versicolor* (Bigot)

1877. *Somomyia versicolor* Bigot, *Annls Soc. ent. Fr.*, (5) **7** : 42.

1940. *Strongyloneura pseudocoerulana* Senior-White, Aubertin and Smart, *Fauna Br. India, Dipt.*, **6** : 165.

Distribution : Meghalaya (Ri-Bhoi and East Khasi Hills), and Bihar and West Bengal; Myanmar, Philippines (Mindanao) and Sri Lanka.

70. *Isomyia zelanica* (S.-W., Aub. and Smart)

1940. *Strongyloneura zelanica* Senior-White, Aubertin and Smart, *Fauna Br. India, Dipt.*, 6 : 164.

Distribution : Meghalaya (Khasi Hills); Indonesia (Java), Malaysia (Malaya) and Sri Lanka.

Genus *Metallea* van der Wulp

1880. *Metallea* van der Wulp, *Tijdschr. Ent.*, **23** : 174. Type-species: *Metallea notata* van der Wulp.

71. *Metallea notata* van der Wulp

1880. *Metallea notata* van der Wulp, *Tijdschr. Ent.*, 23 : 175.

Diagnosis : Generally metallic green species; arista pubescent; all femora black; abdominal segments 1 and 2 yellowish, 3 with greenish band posteriorly and remainder with greenish patches laterally.

Distribution : Meghalaya (East Khasi Hills), and Andaman Is., Assam, Bihar, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal; China, Indonesia (Java), Malaysia (Malaya) and Sri Lanka.

Genus *Stomorhina* Rondani

1861. *Stomorhina* Rondani, *Dipt. Ital. Prodr.*, 4 : 9. Type-species: *Musca lunata* F.

72. *Stomorhina discolor* (F.)

1794. *Musca discolor* Fabricius, *Ent. Syst.*, 4 : 320.

Diagnosis : Antenna and palpus brown; cell R_5 narrowly open; abdomen yellowish, with black bands posteriorly on terga 1 and 2 and with a median longitudinal black stripe.

Distribution : Meghalaya, and Andhra Pradesh, Assam, Bihar, Kerala, Manipur, Uttar Pradesh and West Bengal; other parts of the Oriental region; Moluccas.

Family SARCOPHAGIDAE

Contributions on the fauna of Meghalaya : Senior-White 1924, Senior-White, Aubertin and Smart 1940, Nandi 1979, 1990, 1991.

A total of 14 species under 6 genera of the subfamily Sarcophaginae are hitherto known in Meghalaya vis-à-vis 95 species under 29 genera of 3 subfamilies in India.

Subfamily SARCOPHAGINAE

Diagnosis : Basal two-thirds of arista pubescent to plumose; notopleurals invariably 3 or 4; stem-vein of wing setulose on posterior upper side of its basal section.

KEY TO THE GENERA

1. Acrostichal bristles absent..... ***Bercaea*** Rob.-Desv. (1 species only)
   Acrostichal bristles present..... 2
2. Propleuron bare..... 3
   Propleuron haired..... 5
3. Sternite 4 with mat of hair..... 4
   Sternite 4 without mat of hair..... ***Parasarcophaga*** Johnston and Tiegs
4. Phallosome very large; theca long; apical plate of paraphallus rounded and entirely membranous..... ***Seniorwhitea*** Rohdendorf (1 species only)
   Paraphallus normal size; theca short; apical plate of paraphallus long and slender, and slightly sclerotized..... ***Harpagophalla*** Rohdendorf (1 species only)

5. Sternite 5 with a prominent conical protuberance in the middle part.... ***Rosellea*** Rohdendorf (1 species only)

Sternite 5 without protuberance in the middle part..... ***Boettcherisca*** Rohdendorf (1 species only)

Genus *Bercaea* Robineau-Desvoidy

1863. *Bercaea* Robineau-Desvoidy, *Hist. nat. Dipt. Paris.*, **2** : 549. Type-species: *Musca haemorrhoidalis* Fallén

73. *Bercaea haemorrhoidalis* (Fallén)

1816. *Musca haemorrhoidalis* Fallén, *Vetensk. Akad. Handl.* : 237.

Diagnosis : Antenna and palpus black; propleuron bare; posterior dorsocentral 6, anterior 4 weak; abdominal segment 2 without marginal bristles; costal segment iii and v equal; mid femur with comb but no basal fringe; hind tibia double-fringed; genital tergites orange.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh, Himachal Pradesh, Uttar Pradesh and West Bengal; Nepal and Thailand; Africa, Americas, Europe, Hawaii, Korea and Seychelles.

Genus *Boettcherisca* Rohdendorf

1937. *Boettcherisca* Rohdendorf, *Fauna USSR*, Dipt., 19(1) : 270. Type-species: *Myophora peregrina* Robineau-Desvoidy.

74. *Boettcherisca peregrina* (Robineau-Desvoidy)

1830. *Myophora peregrina* Robineau-Desvoidy, *Mém. prés. Acad. Sci. Inst. Fr.*, (2) **2** : 356.

Diagnosis : Frons in males half the width of an eye; lateral vertical absent; prescutellar acrostichal 2, posterior dorsocentrals 5, anterior 3 weak; costal segment iii longer than v; hind femur with postero-ventral macrochaetal row, mid tibia bare, hind tibia with apical fringe; apical plate of paraphallus with short, curved lateral process.

Distribution : Meghalaya (East Khasi Hills), and Andaman Islands, Assam, Bihar, Himachal Pradesh, Maharashtra, Orissa, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal; Hainan Is., Indonesia, Malaysia, Myanmar, Nepal, South China, Sri Lanka, Taiwan and Thailand; Australia, Fiji, Gilbert Islands, Hawaii, Japan, Korea, Mariana Islands, New Britain, New Guinea, Ogasawara, Samoa, Seychelles and Society Islands.

Genus *Parasarcophaga* Johnston and Tiegs

1921. *Parasarcophaga* Johnston and Tiegs, *Proc. R. Soc. Qd.*, 33 : 86. Type-species: *Sarcophaga omega* Johnston and Tiegs.

KEY TO THE SUBGENERA

1. Lateral plate of paraphallus in form of an unpaired pendunculate process..... ..... ***Parasarcophaga*** Johnston and Tiegs (4 species only)

   Lateral plate of paraphallus either short and tuberculate or in form of broad lamellate hook-shaped or narrow and slender paired process..... 2

2. Lateral plate of paraphallus in form of rudimentary process, its apical part with 2 lateral processes..... ***Liopygia*** Enderlein (1 species only)

   Lateral plate of paraphallus with a single pair of lamellate processes and apical part with no lateral process..... ***Liosarcophaga*** Enderlein (4 species only)

Subgenus *Liopygia* Enderlein

1928. *Liopygia* Enderlein, *Arch. Klass. phyl. Ent.*, 1(1) : 41. Type-species: *Musca ruficornis* Fabricius.

75. *Parasarcophaga (Liopygia) ruficornis* (Fabricius)

1794. *Musca ruficornis* Fabricius, *Ent. Syst.*, 4:314.

Material examined : 1 ♂, West Khasi Hills : Nongstoin, 1050 m, 9. vii. 1983, Coll. St. Peter's School; 1 ♂, Nongstoin, 1050 m, 24. ix. 1988, Coll. A.R. Lahiri.

Diagnosis : Antenna and palpus orange; propleuron bare; only prescutellur acrostichal present, posterior dorsocentral 5, anterior 4 very weak; mid femur with comb and a few long basal setae; genital tergites orange.

Distribution : Meghalaya (West Garo Hills, West Khasi Hills), and Andaman Islands, Bihar, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal; Andalas, China, Malaya, Pakistan, Philippines, Ryukyu Islands, Sri Lanka, Taiwan and Thailand; Africa, Brazil, Hawaii, Japan, Madagascar, Mariana Islands, Moluccas, Samoa and Socotra.

Subgenus *Liosarcophaga* Enderlein

1928. *Liosarcophaga* Enderlein, *Arch. Klass. phyl. Ent.*, 1(1) : 18; Rohdendorf, 1937, *Fauna USSR, Dipt.*, 19(1) : 205. Type-species: *Cynomyia madeirensis* Schiner.

KEY TO THE SPECIES

1. Hind femur fringed 2

   Hind femur not fringed 3

2. Hind tibia double-fringed; apex of paraphallus pointed with a subapical process having bifurcated tip ..... *dux* Thomson

   Hind tibia with a single fringe; apical process of paraphallus finger-like with bifurcated tip ..... *brevicornis* Ho

3. Postsutural acrostichal 1; ventralia straight ..... *jaipurensis* Nandi

   Postsutural acrostichal 5; ventralia curved ..... *sarupi* Nandi

76. *Parasarcophaga (Liosarcophaga) brevicornis* (Ho)

1934. *Sarcophaga brevicornis* Ho, *Bull. Fan Mem. Inst. Biol.*, 5 : 23.

Distribution : Meghalaya (Ri-Bhoi), and Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Mizoram, Nagaland, Orissa, Rajasthan, Tamil Nadu and West Bengal; Hainan Island, Kalimantan, Malaysia, Ryukyu Islands, South China, Sri Lanka, Taiwan and Thailand; Japan and North China.

77. *Parasarcophaga (Liosarcophaga) dux* (Thomson)

1868. *Sarcophaga dux* Thomson, *K. Svenska Fregatten Eugenies Resa*, Dipt., 2 : 534.

Distribution : Meghalaya (Ri-Bhoi), and other parts of India; Bangladesh, China, Hainan Is., East Malaysia, Java, Kalimantan, Ryukyu Is., Sri Lanka and Taiwan; Australia, Hawaii, Japan, Korea and New Guinea.

78. *Parasarcophaga (Liosarcophaga) jaipurensis* Nandi

1990. *Parasarcophaga (Liosarcophaga) jaipurensis* Nandi, *J. Beng. nat. Hist. Soc.* (n.s.), 9 : 50.

Distribution : Meghalaya (East Khasi Hills), and Haryana and Himachal Pradesh.

79. *Parasarcophaga (Liosarcophaga) sarupi* Nandi

1979. *Parasarcophaga (Liosarcophaga) sarupi* Nandi, *Orient. Insects*, 13 : 191.

Distribution : Meghalaya (Ri-Bhoi), and Uttar Pradesh.

Subgenus *Parasarcophaga* Johnston and Tiegs

1921. *Parasarcophaga* Johnston and Tiegs, *Proc. R. Soc. Qd.*, 33 : 86.

KEY TO THE SPECIES

1. Posterior dorsocentral 5-6. Inner forceps swollen at two-thirds its length, with a few spines on it; apex of paraphallus long, curved, with 2 knobs at basal part on outer surface..... *macroauriculata* (Ho)

   Posterior dorsocentral only 4..... 2

2. Acrostichal 1:1; apical process of paraphallus well-curved..... 3

   Only posterior acrostichal distinct; apical process of paraphallus slightly curved..... *knabi* (Parker)

3. Sternite 5 with uniformly wide arms; mid femur with comb and sparse basal fringe; segment iii of costa longer than v..... *orchidea* Böettcher.

   Sternite 5 without uniformly wide arms; mid femur with comb and long basal fringe; segment iii of costa twice as v..... *albiceps* (Meigen)

80. *Parasarcophaga (Parasarcophaga) albiceps* (Meigen)

1826. *Sarcophaga albiceps* Meigen, *Syst. Beschr. europ. zweifl. Insekt.*, **5** : 22.

Distribution : Meghalaya (Ri-Bhoi, East Khasi Hills, West Garo Hills), and other parts of India; China, Kalimantan, Malaysia, Nepal, Philippines, Ryukyu Is., Taiwan and Thailand; Bismarck Archipelago, Europe, Hawaii, Israel, Japan, Korea, New Britain, New Guinea, Solomon Is. and Turkey.

81. *Parasarcophaga (Parasarcophaga) knabi* (Parker)

1917. *Sarcophaga knabi* Parker, *Proc. U.S. natn. Mus.*, 54 : 66.

Distribution : Meghalaya (East Khasi Hills), and Andaman Is., Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal; Bangladesh, China, Hainan Is., Indonesia, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Taiwan and Thailand; Australia, Caroline Is., Korea, Mariana Is., Marshall Is., New Guinea, Society Island and the erstwhile U.S.S.R.

82. *Parasarcophaga (Parasarcophaga) macroauriculata* (Ho)

1932. *Sarcophaga macroauriculata* Ho, *Bull. Fan. meml. Inst. Biol.*, **3** : 347.

Distribution : Meghalaya (East Khasi Hills), and Nagaland, Sikkim, Uttar Pradesh and West Bengal.

83. *Parasarcophaga (Parasarcophaga) orchidea* Böettcher

1913. *Sarcophaga orchidea* Böettcher, *Annls hist.-nat. Mus. natn. hung.*, **11** : 375.

Material examined : 1♂, South Garo Hills : Siju Cave area, 27. iv. 1991, Coll. B. N. Das.

Distribution : Meghalaya (South Garo Hills, East Khasi Hills and Ri-Bhoi), and Andaman Is., Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal; Andalas, Bangladesh, China, East Malaysia, Hainan Is., Java, Kalimantan, Myanmar, Nepal, Philippines, Ryukyu Is., Sri Lanka, Taiwan and Thailand; Afganistan, Korea, Japan; widespread in the Pacific Islands to New Guinea and Australia.

Genus *Rosellea* Rohdendorf

1937. *Rosellea* Rohdendorf, *Fauna USSR*, Dipt., 19(1) : 242. Type-species: *Sarcophaga aratrix* Pandelle.

84. *Rosellea khasiensis* (Senior-White)

1924. *Sarcophaga khasiensis* Senior-White , *Rec. Indian Mus.*, **26** : 246.

Diagnosis : Frons more than half of eye width ; flagellomere 1 brownish; presutural acrostichal absent, notopleural 3, disc and lateral margin of scutellum each with 1 pair of bristles; costal segment iii longer than v; fore femur with 2 rows of bristles postero-dorsally and hind femur with 2 rows of bristles antero-dorsally; apical plate of paraphallus curved downwards and its lateral plate curved upwards.

Distribution : Meghalaya (East Khasi Hills), and Assam and Kashmir; China, Nepal and Thailand.

Genus *Harpagophalla* Rohdendorf

1937. *Harpagophalla* Rohdendorf, *Fauna USSR, Dipt., 19(1): 276.* Type-species: *Sarcophaga sera* Rohdendorf.

85. *Harpagophalla kempi* (Senior-White)

1924. *Sarcophaga kempi* Senior-White, *Rec. Indian Mus.*, **26** : 247.

Diagnosis : Lateral vertical absent, genal black and whitish; flagellomere 1 grey pollinose; prescutellar acrostichal 1, posterior dorsocentral 5; segment iii of costa equal to v; mid femur with comb and basal fringe, hind femur with postero-ventral macrochaetal row and fringe, hind tibia double-fringed; sternite 5 swollen apically.

Distribution : Meghalaya (East Khasi Hills), and Arunachal Pradesh, Assam, Bihar, Kerala, Mizoram, Nagaland and West Bengal; China, Hainan Is., Java, Laos, Myanmar, Sri Lanka and Thailand; New Guinea.

Genus *Seniorwhitea* Rohdendorf

1937. *Seniorwhitea* Rohdendorf, *Fauna USSR*, Dipt., 19 (1) : 297. Type-species: *Sarcophaga orientaloides* Senior-White.

86. *Seniorwhitea krameri* (Böettcher)

1912. *Sarcophaga krameri* Böettcher, *Ent. Mitt.*, 1 : 165.

Diagnosis : Only prescutellar acrostichal present, posterior dorsocentral 4, anterior 2 weak; mid femur with strong comb and basal fringe, hind tibia double-fringed.

Distribution : Meghalaya (Ri-Bhoi and East Khasi Hills), and Andaman Is., Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Nagaland, Orissa, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal; China, Hainan Is., Laos, Malaya, Myanmar, Nepal, Singapore, Sri Lanka, Taiwan and Thailand; Hawaii.

ZOOGEOGRAPHICAL REMARKS

Meghalaya consists of 7 districts, *viz.*, Ri-Bhoi, East Khasi Hills, West Khasi Hills, Jaintia Hills, East Garo Hills, West Garo Hills and South Garo Hills (Map 1), and is close to Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Sikkim and West Bengal as its neighbouring states in the north- east India. Although Bangladesh adjoins Meghalaya in the south and south-west with the obvious faunal likeness, there are countries like Myanmar (Burma), Thailand (Siam), Laos, Vietnam, Cambodia (Kampuchea), Nepal, Bhutan and China (southern part up to the limit of the Palaearctic region) that exhibit certain common zoogeographical affinity despite their situation afar and varied physiographical features. Indeed, beyond the limit what is mentioned above, several faunal elements have migrated to and fro in the north and south through the peninsular Thailand to and from Malaysia, Singapore and Indonesia or Philippines via Taiwan (Formosa) and south China in the far east up to the Weber's Line or even further away to the Australian region, and to Japan (Palaearctic region). Pakistan and Sri Lanka, however, lying in the Oriental region have owned a fraction of the fauna. In extreme cases, certain species have colonized the other regions too.

Meghalaya is known to harbour 3 species and 1 subspecies of the Bibionidae, of which *Penthetria japonica* is the most widespread Oriental species extending its range northward to the Palaeartic region. To the contrary, *Bibio flavissimus*, though less widespread, shows southward distribution to the Australian region. *P. indica*, however, appears mainly as a Himalayan species occurring in Pakistan, India and Nepal (Hardy, 1973).

The Stratiomyidae are represented in Meghalaya by 14 species, of which *Sargus metallinus* is the most widespread Oriental species extending its range eastward to the Melanesia of the Australian region, whereas *S. gemmifer*, *Ptilocera fastuosa* and *Tinda javana* are certainly

the widespread species of the east but seem not to cross the Weber's Line. *Ptecticus aurifer* is mainly a Himalayan species with its range northward to China up to Taiwan, and southward to Kalimantan (south of North Borneo) through the peninsular Malaya with discontinuous records both in Myanmar and Thailand, whereas *P. australis* is colonized well in India and radiated eastward to Taiwan probably through south China (unrecorded), and southward to Sri Lanka and Thailand (most possibly through Myanmar in the latter case despite lack of record). Likewise, *Cibotogaster azurea* is an Indian species migrating eastward as far as Philippines and southward as far as Andalas (Sumatra). The remaining 7 other species amounting to 50%, seem confined to the north and the north-east India with a Himalayan bias. However, *Allognosta assamensis, Ptecticus assamensis, Sargus splendidus* and *Eudmeta diadematipennis* might eventually be discriminated as endemic to Meghalaya (James, 1975).

The bombyliid fauna in Meghalaya is known to contain 13 species including *Petrorossia intermedia* that, originally described from Orissa, is recorded from the state. The other two species of the genus, *viz., clauseni* and *serata*, and two species of *Exoprosopa* (*Exoprosopa*), *viz., latipennis* and *sipho* are so far known to occur only in this state and are likely to be endemic. *E.* (*E.*) *insulata* is, however, colonized well in India, with northward migration to Nepal and southward to Sri Lanka and probably also eastward to Myanmar (Bowden, 1975), whereas *E. (Pterobates) pennipes*, though not established throughout India, is widely distributed in Pakistan in the west, Philippines in the east, and Kalimantan in the south despite absence of records both in Myanmar and Thailand considered to be the possible route of radiation. Of the 4 species of *Villa, clara* and *manifesta*, and *Hemipenthes referens* are confined to India, but the other two species of *Villa*, namely, *aperta* extends its range eastward to Myanmar, whereas *approximata* furthers northward to Nepal and southward to Sri Lanka. All these species are, however, likely to have their primary seat of colonization along the Himalayan belt. Indeed, *Anthrax distigma* is well-known for its widespread distribution not only in India but elsewhere in the Orient in that it extends its range eastward to Bangladesh, Myanmar and Philippines and southward to Andalas, Java and even Sulawesi (Celebes) despite lack of knowledge about the peninsular Thailand, Malaysia and Kalimantan held as the possible course of dispersal.

The Conopidae in their larval stage are endoparasites of certain genus-groups, mainly of Hymenoptera or less frequently of Orthoptera and, therefore, their distribution corresponds to that of their hosts. Indeed, the range of their distribution in most cases is always with utter interruption and appears arbitrary usually for lack of knowledge because their hosts are reportedly of wide occurrence.

The most widespread Oriental species *Archiconops erythrocephala* (the sole species under the genus new to the state) is known from China in the north to Sri Lanka in the south through India wherein the northern and the central parts predominantly show absence of records. Similarly, it extends its distributional range as far east as in Vietnam and even Sulawesi but it remains to be known from the intervening Thailand, Malaysia, Indonesia (west and central) or Philippines, the probable route of migration. The western limit of

distribution of the species is marked off to Africa without any record in Pakistan or in the Middle East (Smith, 1975). The other exotic species are *Conops pactyas, C. annulosus, Physocephala bicolorata, P. obscura* and *Stylogaster orientalis,* of which *bicolorata* exhibits northward distribution up to China through Nepal, and *obscura* further up to Japan and the erstwhile U.S.S.R.; and to the contrary, *orientalis* extends its range southward to Sri Lanka. The remaining 2 species are known only from the eastern and southern edges of Indonesia with disjunct distribution throughout India and abroad beyond the state. Of the 3 species so far known to remain confined in India, *C. nigriventris* is not represented outside Meghalaya, *Physoconops sepulchralis* is known from one of its neighbouring state Mizoram only and *Physocephala argentifera* (new record) from two far-off states: Bihar and Uttar Pradesh.

Knowledge on the Diopsidae, Sepsidae and Celyphidae in Meghalaya is extremely inadequate, especially when very many species of the Orient are distributed far and wide in spite of impoverishment in species. The diopsids are represented by 3 genera with a single species under each, however, excluding a little-known species relegated as an ally to *Diopsis indica* which is known to occur in a vast stretch of land from the southern China to Java encompassing India and Bangladesh. The other 2 species, *viz., Eurydiopsis subnotata* and *Teleopsis quadriguttata* are also quite widespread in the east, and the latter is reported to intrude into the Australian region too. Both of them, however, lack records of distribution in certain intermediate territories (Steyskal, 1977; Datta and Biswas, 1985).

The Sepsidae are known only by 7 species including the present record of 2 that at most account for 20% of the fauna presumed to exist in Meghalaya. All the species except *Dicranosepsis olfactoria* and *Sepsis himalayensis* (new records) that are hitherto known only from certain parts of the Orient, are distributed far beyond either to the Australian region (excepting *Decachaetophora aeneipes*) in the east or to the Ethiopian region (*Sepsis albopunctata* only) in the west or even to the Nearctic region (*D. aeneipes* only) in the extreme north through the Palaeartic region (Zuska, 1977; Iwasa, 1989; Iwasa *et al.,* 1991).

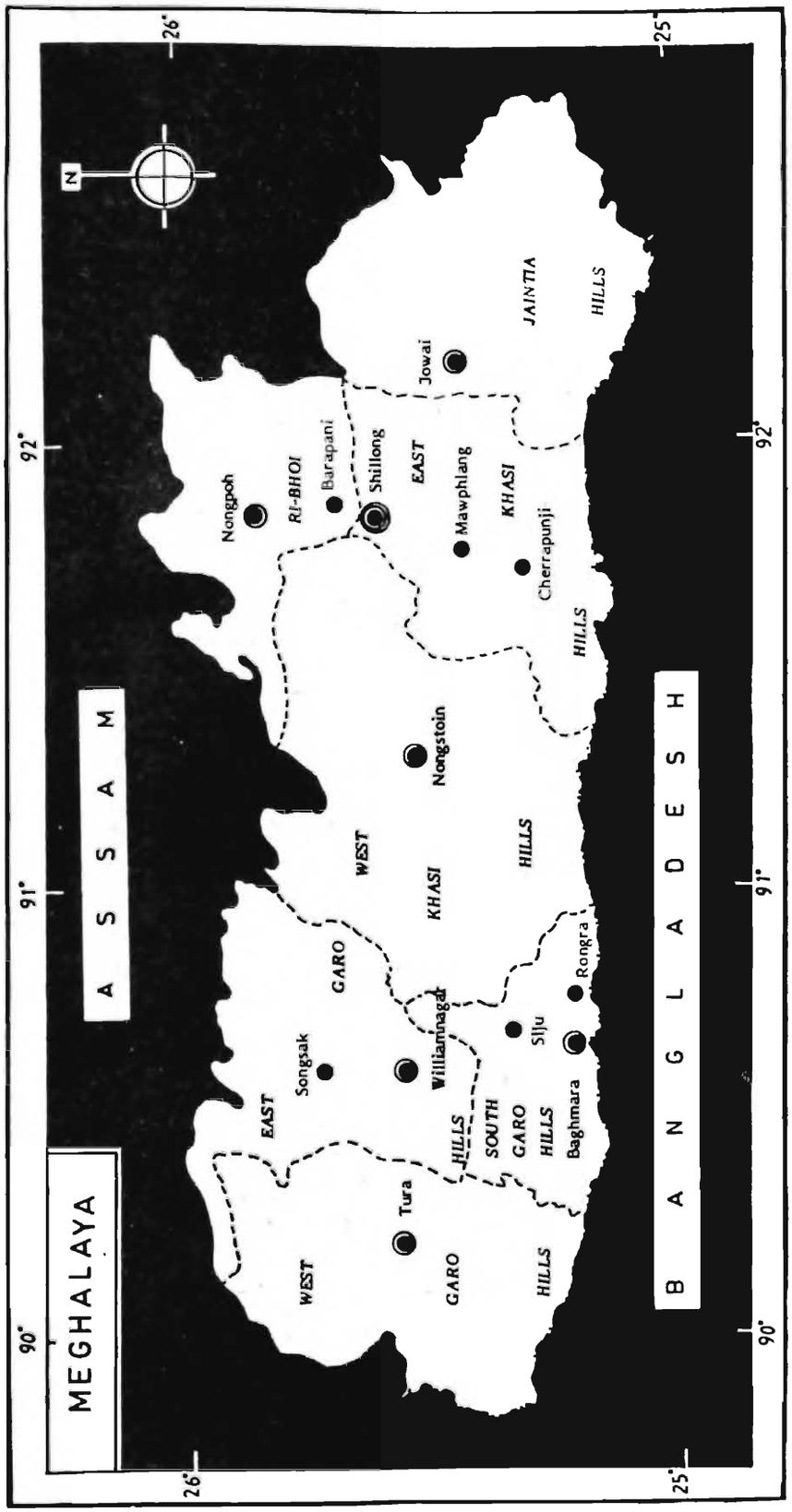
Of the 3 species of the Celyphidae, *Celyphus hyacinthus* is known from the north-east India to as far east as Vietnam, and as far south as Andalas but it remains unrecorded in Myanmar (Tenorio, 1977), the most probable pathway of migration. The other 2 species, *viz., C. kempi* and *Spaniocelyphus tenorioi* are not so far known from elsewhere but they might eventually be found to exist at least in the north-east India and adjoining countries in the east.

The Calliphoridae are represented in Meghalaya by 18 species belonging to 3 subfamilies, of which the Rhiniinae overwhelmingly outnumbers the other 2 in species or deliberately in genera too (James, 1977). The Chrysomyinae has 2 species under a single genus, but both of them have the widest distributional range in that *Chrysomya megacephala* occurs not only in the Orient everywhere in high population but also in the Palaearctic region up to Japan through China, in the Australian region in the east and in the Malagasy subregion of the Ethiopian region in the west. And *C. pinguis,* though remaining unrecorded

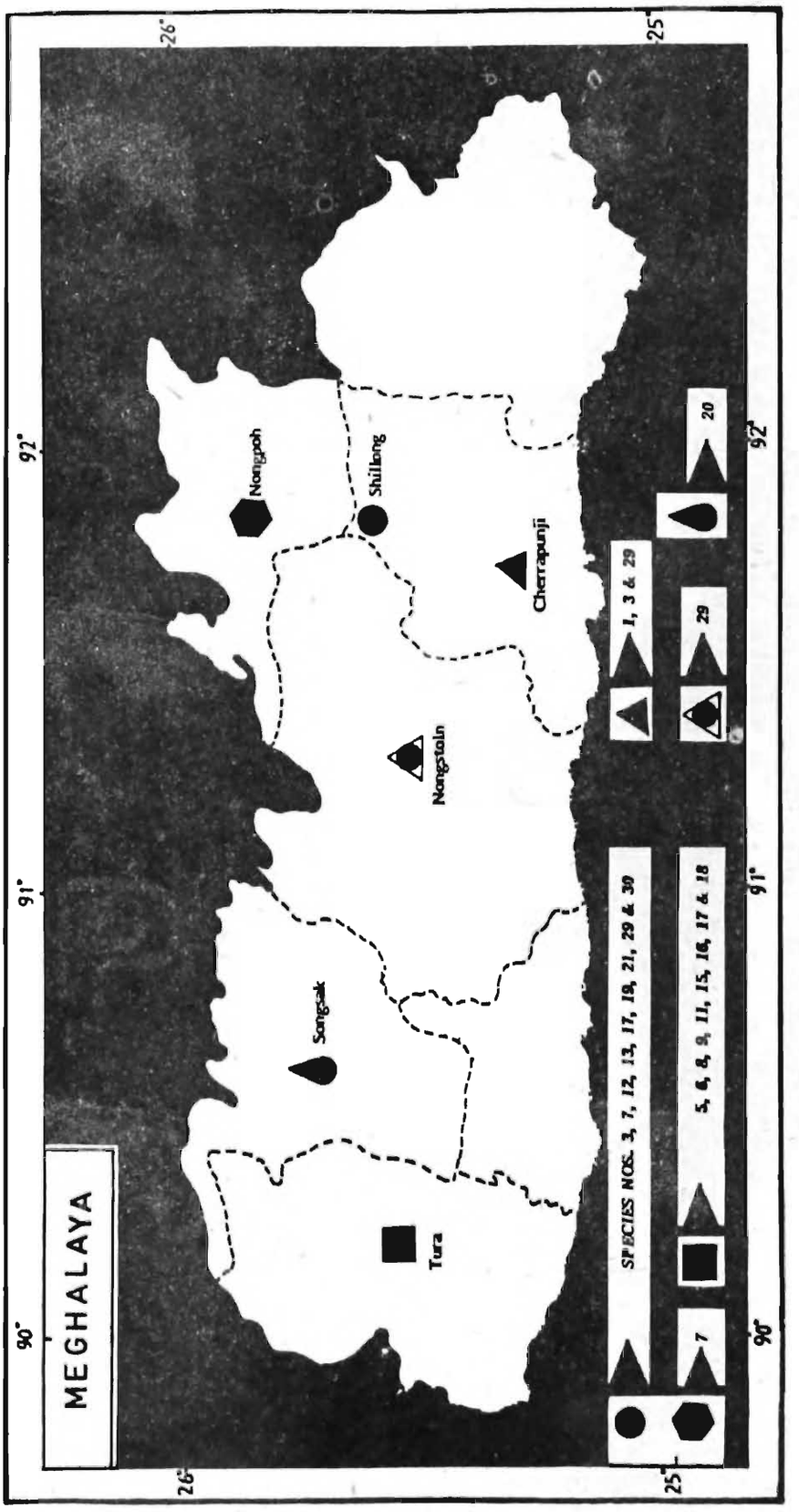
in most parts of India, has successfully colonized the vast stretch of land as far north as Korea and Japan (Palaearctic region) through China, and as far south as Java or even the Moluccas beyond the Weber's Line without any record either in the East Malaysia or in the North Indonesia. The eastern limit of the species marks off to Philippines with a discontinuity of records in the intervening countries like Myanmar, Laos, Cambodia and Vietnam. The Calliphorinae has 4 species, of which *Calliphora pattoni* is known from India along the Himalayan belt (presumably occurring in Himachal Pradesh and Sikkim) through Nepal, and extends its range in the east up to Taiwan with a long bound over Laos, Vietnam and China. Similarly, *Bengalia escheri* is known to occur in Taiwan but is unknown from the intervening countries beyond India where it is hitherto reported from Meghalaya and Uttar Pradesh only. Whereas, *Onesia khasiensis* is known only from Bangladesh outside Meghalaya (India), *Polleniopsis pilosa* is so far limited to India, occurring in Bihar and West Bengal beyond this state. The Rhiniinae comprises 12 species under 7 genera, of which the greatest number to 5 belongs to *Isomyia*. All these species are either not well-established or unrecorded in the major part of India as well as of the Orient. Both *pseudonepalana* and *pseudoviridana* exhibit the distributional range as far north as Nepal and as far south as Sri Lanka but the eastward pattern is different in that the former has reached Myanmar through Bangladesh but the latter has shown its limit to Taiwan without any record in Bangladesh, Thailand, Laos, Vietnam or even China that might have been the possible course of migration. *I. oestracea* is distributed in the north up to China, in the south up to Java through Malaya and in the east up to Laos but this is neither known from Myanmar nor from Thailand nor from Andalas in Indonesia. The southward migration of *zelanica* overlaps *oestracea* but it encompasses Sri Lanka in addition. Although *versicolor* is known only from Myanmar and Philippines in the east, the route of migration is difficult to conceive, and whereas, it is so far seemingly restricted to the eastern part of India, its occurrence in Sri Lanka appears interesting. Of the 2 species of *Idiella, mandarina* is better-represented nearly throughout the plains of India and is more widespread in the Orient including Sri Lanka, with its range up to Taiwan through China in the north and up to Timor, the southern extremity of Indonesia through Myanmar, Thailand, Malaysia, and West and North Indonesia. Finally, it has reached the Key islands (Australian region). Although *euidielloides* has its north-south distributional range from Taiwan to Timor, our knowledge on its occurrence in China or Myanmar, East Malaysia and North Indonesia through which it might have dispersed in either of two ways to Taiwan or to Philippines via Thailand and Malaya, is lacking. The remaining 5 genera have a lone species under each. Indeed, *Borbororhinia bivittata* and *Chlororhinia exempta* are unkwnon from a greater part of India, and outside the country the former is much more widespread than the latter in that the former is extensively distributed in Bangladesh, Sri Lanka, Laos, Taiwan, Philippines, Malaysia and Indonesia beyond the Weber's Line but there is no record of its occurrence in Myanmar, China, Thailand and Vietnam, the most probable passage of migration. The latter is, however, distributed northward to Nepal, southward to East Malaysia and North Indonesia, and eastward to Laos and Philippines only but it is unrecorded in the intervening territories. Although *Metallea notata* like *Cosmina bicolor* and *Stomorhinia discolor* is fairly well-known from the major parts of India and Sri Lanka, there

is an evident discontinuity of distribution southward beyond China between India and Malaya, and Malaya and Java. Both *bicolor* and *discolor* presumably exist everywhere in the Oriental region, probably excepting Pakistan, and *bicolor* so far remaining unrecorded from China, Taiwan, Philippines, Laos and Cambodia is apparently another instance to call for a deficient knowledge.

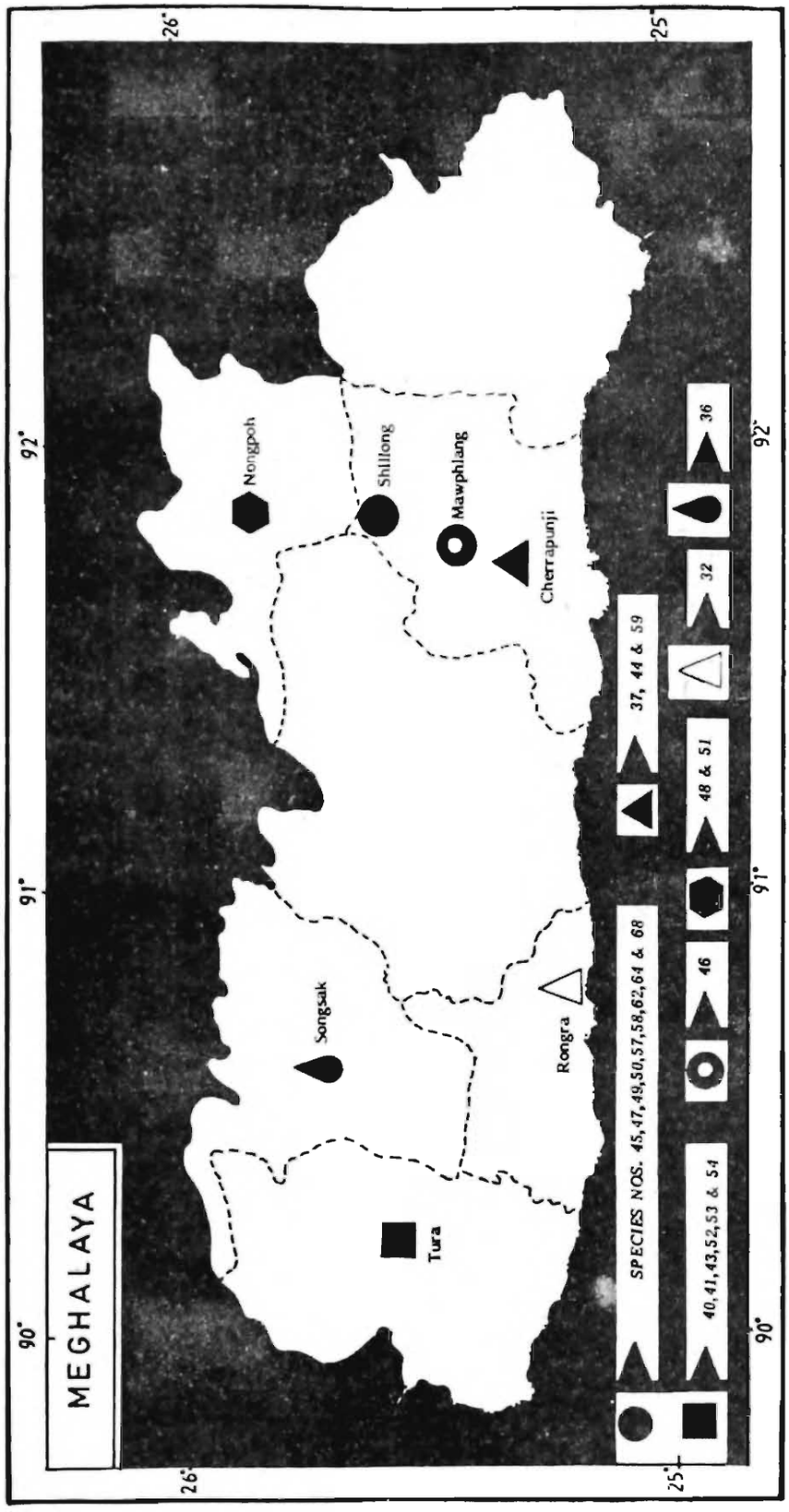
The family Sarcophagidae has 14 species, of which 3 species, *viz., Parasarcophaga jaipurensis, P. sarupi* and *P. macroauriculata* are known only from India (north and north-east), and *Rosellea khasiensis* has crossed over to Nepal and China in the north, and bounded over the intervening Myanmar to Thailand in the east, but the great majority of the species are spread far and far along the tropical belt of the globe or even across that limit in certain instances (Lopes *et al.*, 1977). However, *Bercaea haemorrhoidalis, P. ruficornis* and *Harpagophalla kempi* are also unknown from the major part of India. Although *haemorrhoidalis* is known only from India, Nepal and Thailand in the Orient, it is represented in the Palaearctic, Ethiopian, Nearctic as well as Neotropical region with an encroachment in the Hawaiian islands. *Harpagophalla kempi* exhibits its distributional range to China in the north, Sri Lanka and Java in the south and New Guinea in the far east through Myanmar and Thailand with disjunct records in Malaysia and the rest of Indonesia. The intrusion in the Hainan islands might have brought about northward through China because its occurrence eastward beyond Laos is unknown. *P. ruficornis* is further extended to Pakistan in the west, Philippines in the east, the Ryukyu islands in the north across China and Taiwan, and Sri Lanka and Andalas in the south, but its existence in Myanmar, Laos and Vietnam is unknown, whereas it is distributed all through the Palaearctic, Ethiopian, Australian and Neotropical regions, and as far as the Hawaiian islands. Of the other species of *Parasarcophaga, brevicornis* seems restricted to the Oriental and at most adjoining parts of the Palaearctic region only in that the species shows its distributional range northward to Japan continuously across China, Hainan Is., Taiwan and Ryukyu Is., and southward to Sri Lanka and Kalimantan with a discontinuity in Myanmar, but it is presumed to occur not only in Myanmar but also in Laos, Cambodia and Vietnam at least when it is widespread in China and the neighbouring islands. Both *albiceps* and *knabi* are unknown from several parts of the Orient but are known from the Palaearctic as well as the Australian region or even far beyond to the Hawaiian islands in case of the former species. While *knabi* is not known northwardly beyond Nepal, *albiceps* extends to the Ryukyu islands, probably across Philippines and Taiwan because it is unknown from China supposed to be the most possible passage of migration. However, *knabi* does exist in Java with an apparent disjunction in Myanmar where *albiceps* is also unknown. The matter of ingress of these species eastward in Philippines remains dilemmatic so long as their occurrence in Laos, Vietnam, East Malaysia or Kalimantan in addition to China is undiscovered. Both *dux* and *orchidea* on the other hand are represented well in the Orient in that these two species exhibit their range of distribution northward from China and the Hainan Is. to the Ryukyu islands and southward from Sri Lanka and Java to Kalimantan across Bangladesh but are unknown from Laos, Cambodia and Vietnam, whereas *dux* is unknown also from Myanmar, Napal, Thailand, Andalas and Philippines, implying no



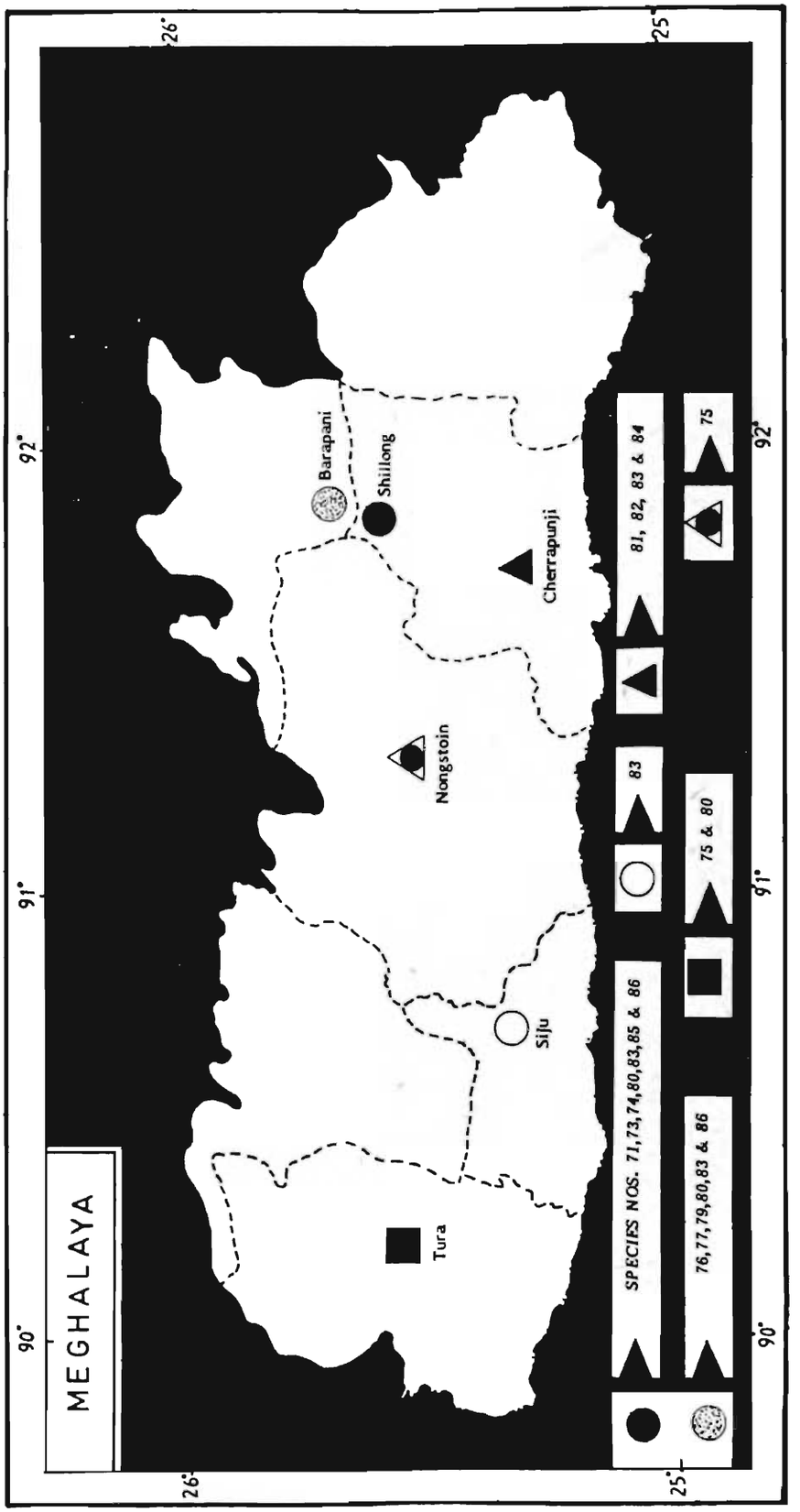
Map 1. Meghalaya showing its location, districts, district headquarters and recorded places of occurrence of Diptera dealt with



Map 2. Recorded places of occurrence of the Bibionidae, Stratiomyidae and Bombyliidae in Meghalaya



Map 3. Recorded places of occurrence of the Conopidae, Diopsidae, Sepsidae, Celyphidae and Calliphoridae in Meghalaya



Map 4. Recorded places of occurrence of the Calliphoridae and Sarcophagidae in Meghalaya

APPENDIX : Diptera fauna known from Meghalaya (Up to 1992)

SUBORDER/ Family (no./name)	Subfamily (no.)	Genus (no.)	Species (no.)	Subspecies (no.)
(3/46)	(73)	(255)	(602)	(10)
NEMATOCERA	(17)	(68)	(270)	(7)
Tipulidae	3	33	128	6
Psychodidae	1	2	2	-
Phlebotomidae	-	2	3	-
Blephariceridae	1	2	2	-
Culicidae	2	11	95	-
Ceratopogonidae	2	4	12	-
Chironomidae	2	2	2	-
Simuliidae	1	1	8	-
Bibionidae	2	3	3	1
Mycetophilidae	2	4	7	-
Sciaridae	-	2	4	-
Cecidomyiidae	1	2	4	-
BRACHYCERA	(19)	(55)	(123)	(-)
Solvidae	-	2	4	-
Stratiomyidae	5	10	14	-
Tabanidae	2	3	32	-
Rhagionidae	-	1	1	-
Therevidae	-	1	2	-
Asilidae	4	21	39	-
Nemestrinidae	1	1	1	-
Acroceridae	1	1	2	-
Bombyliidae	2	5	13	-
Empididae	1	1	1	-
Dolichopodidae	3	9	14	-

CYCLORRHAPHA	(37)	(132)	(209)	(3)
Phoridae	2	2	3	-
Pipunculidae	1	1	1	-
Syrphidae	2	34	67	-
Conopidae	2	5	9	-
Diopsidae	1	3	3	-
Tephritidae	3	9	10	-
Sepsidae	1	3	7	-
Celyphidae	-	2	3	-
Agromyzidae	2	8	11	-
Milichiidae	1	1	1	-
Chloropidae	2	13	15	-
Ephydridae	3	7	9	-
Drosophilidae	1	4	8	-
Sphaeroceridae	1	2	3	-
Hippoboscidae	2	3	5	-
Nycteribiidae	2	2	3	-
Anthomyiidae	-	3	3	-
Muscidae	3	7	8	3
Calliphoridae	3	12	18	-
Sarcophagidae	1	6	14	-
Tachinidae	1	2	3	-
Gasterophilidae	1	1	3	-
Oestridae	2	2	2	-

clue to its dispersal. However, *orchidea* extends its range throughout the Australian region, while *dux* does it to Korea and Japan (Palaearctic) besides the Australian region. *Seniorwhitea krameri* is known to occur in the Orient from China in the north to Singapore and Sri Lanka in the south through Myanmar, Thailand and Malaya, extending eastward to Laos, Taiwan and the Hainan islands with disjunct distribution in Vietnam and the intervening territories to reach the Hawaiian islands. The extremely widespread species so far recorded in Meghalaya is certainly *Boettcherisca peregrina* that is known nearly from the entire Oriental region as well as from the Palaearctic, Ethiopian and Australian regions and as far as the Hawaiian islands. Indeed, it may be re-called that the parasitic species may not usually exhibit a continuous distribution across successive land-masses, if and when it is secured in effect of being associated or invaded with the host-animal in a land with barriers.

To conclude, Meghalaya harbours 86 species under the families : Bibionidae, Stratiomyidae, Bombyliidae, Conopidae, Diopsidae, Sepsidae, Celyphidae, Calliphoridae and Sarcophagidae, of which 13 species are hitherto known only from the state, and moreover, 12 species are confined to India, but the majority accounting for 35 species are spread over the Oriental region, and there are 26 species that extend their range of distribution beyond the Orient.

SUMMARY

The paper treats 86 species under 49 genera belonging to 9 families of Diptera : Bibionidae, Stratiomyidae, Bombyliidae, Conopidae, Diopsidae, Sepsidae, Celyphidae, Calliphoridae and Sarcophagidae, of which 5 species including 1 from India, are recorded for the first time from Meghalaya.

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TABLE 1. Distribution of the Meghalayan Tabanidae in other states and Union territories of India*

STATES AND UNION TERRITORIES / SPECIES	ASSAM	ARUNACHAL PRADESH	MANIPUR	MIZORAM	TRIPURA	WEST BENGAL	SIKKIM	BIHAR	UTTAR PRADESH	HIMACHAL PRADESH	JAMMU & KASHMIR	PUNJAB	HARYANA	DELHI	MADHYA PRADESH	ORISSA	MAHARASHTRA	GOA	KARNATAKA	KERALA	TAMIL NADU
Chrysops																					
dispar	+	+			+	+	+	+	+	+					+	+	+	+	+	+	+
flavocinctus																					
indianus																					+
Tabanus																					
albofasciatus							+														
assamensis	+?																				
birmanicus				+																	
diversifrons	+					+															
explicatus							+														+
gertrudae																			+?		+?
indianus																			+		
khasiensis									+												
leucocnematus				+																	
meghalayensis																					
miniatus		+																			
monotaeniatus	+	+				+	+														
rubicundus	+	+				+															
rubidus	+	+				+		+	+		+	+	+	+		+	+			+	+
rufiventris	+																				
striatus	+	+	+		+	+	+	+	+	+	+	+		+	+	+	+		+	+	+
Haematopota																					
annandalei		+															+				
assamensis		+																			
equina																					
fasciata																					
indiana	+		+																		
javana				+		+		+												+	+
lata						+															
latifascia																					
limbata						+															
marginata	+					+		+													
montana																			+		+
nigrifrons																					
schmidi																					

* Reported from the literature without any scope of verification in most cases

TABLE 2. Distribution of the Meghalayan Tabanidae in the Oriental region*

COUNTRIES AND TERRITORIES / SPECIES	PAKISTAN	SRI LANKA	BANGLADESH	NEPAL	BHUTAN	CHINA	MYANMAR	THAILAND	LAOS	VIETNAM	CAMBODIA	MALAYSIA	SINGAPORE	ANDALAS	NIAS IS.	JAVA	KALIMANTAN	SULAWESI	PHILIPPINES	TAIWAN
Chrysops																				
dispar	+	+	+	+		+	+	+	+	+		+	+	+		+	+		+	+
flavocinctus		+				+	+	+				+					+?			
indianus																				
Tabanus																				
albofasciatus																				
assamensis																				
birmanicus						+	+	+		+		+								+
diversifrons			+					+		+										
explicatus																				
gertrudae																				
indianus						+				+								+		+
khasiensis												+		+						
leucocnematus						+	+					+?								
meghalayensis																				
miniatus																				
monotaeniatus						+	+													
rubicundus			+						+											
rubidus		+	+	+		+	+	+	+	+	+	+	+	+	+	+				
rufiventris			+			+														
striatus	+	+	+	+	+	+	+	+	+	+	+									
Haematopota																				
annandalei						+	+													
assamensis						+		+		+										
equina																				
fasciata							+?	+												
indiana																				
javana			+			+	+	+	+	+		+		+		+				
lata						+	+	+	+											
latifascia							+	+	+											
limbata			+																	
marginata			+																	
montana																				
nigrifrons																				
schmidi																				

* Reported from the literature

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INSECTA : DIPTERA : TABANIDAE

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Zoological Survey of India, Calcutta

INTRODUCTION

The family Tabanidae includes horse flies or gad flies, deer flies and clegs that are often known as gnats, and belongs to the suborder Brachycera of the order Diptera. Broadly speaking, they can be found almost everywhere in nature with warm sunny weather without wind. Most usually both males and females visit flowers for feeding on nectar. Any shrubby bushes are almost equally attractive to many of them. Some may be seen hovering or flying fast about sunny open spaces or alighted on roads. Yet females of the majority that suck blood may often be encountered on or after beasts of pasture or rarely they attack humans too in broad daylight. Their swift movement with a darting sound alerts their hosts that show ready restlessness in fright for ensuing danger. Some horse flies are seen either flying about street lights or striking on window glasses or entering lighted houses at night. Besides, most of them are liable to frequent weedy swamps, rivers, streams or moist ground for oviposition. Larvae are generally aquatic or semi-aquatic but pupae occur in relatively dry soil. However, the immature stages of only a very few Indian species are known (Fletcher, 1916, 1917, 1921; Isaac, 1924, 1925, 1932, 1933; Singh, 1968). I am, therefore, much reluctant to deal with the immature stages in the text.

The Tabanidae by virtue of their role in the transmission of diseases consequent upon biting, and annoyance with livestock and man received serious attention in various parts of the world. In India, there are considerable contributions not only in the field of parasitology but also in the taxonomy and behaviour (*vide* Datta, 1985). A few references, however, exist also on the fauna pertaining to the state of Meghalaya, the south-western part of the erstwhile Assam in the north-east India (Map 1). Although this is the first attempt to bring together our knowledge on the Tabanidae of Meghalaya, it is to be re-called that at least two species were described by Bigot (1892) a century ago, if not earlier than this by the great masters like Fabricius (1805), Wiedemann (1824), Macquart (1846, 1855) and Walker (1848, 1850). All these workers most frequently used to cite a vast territory or a group of territories, such as, Ind. Orient., East Indies, East India, Indes, India, etc. for Assam to indicate the type-locality of a species and, therefore, the exact place of occurrence of a species described from the erstwhile Assam can never be defined with the help of such indefinite citation in the literature. In the beginning of this century, Ricardo (1902, 1906, 1909, 1911), while actively working on the Oriental fauna, described and recorded most of the species known to occur in Meghalaya. A few other important

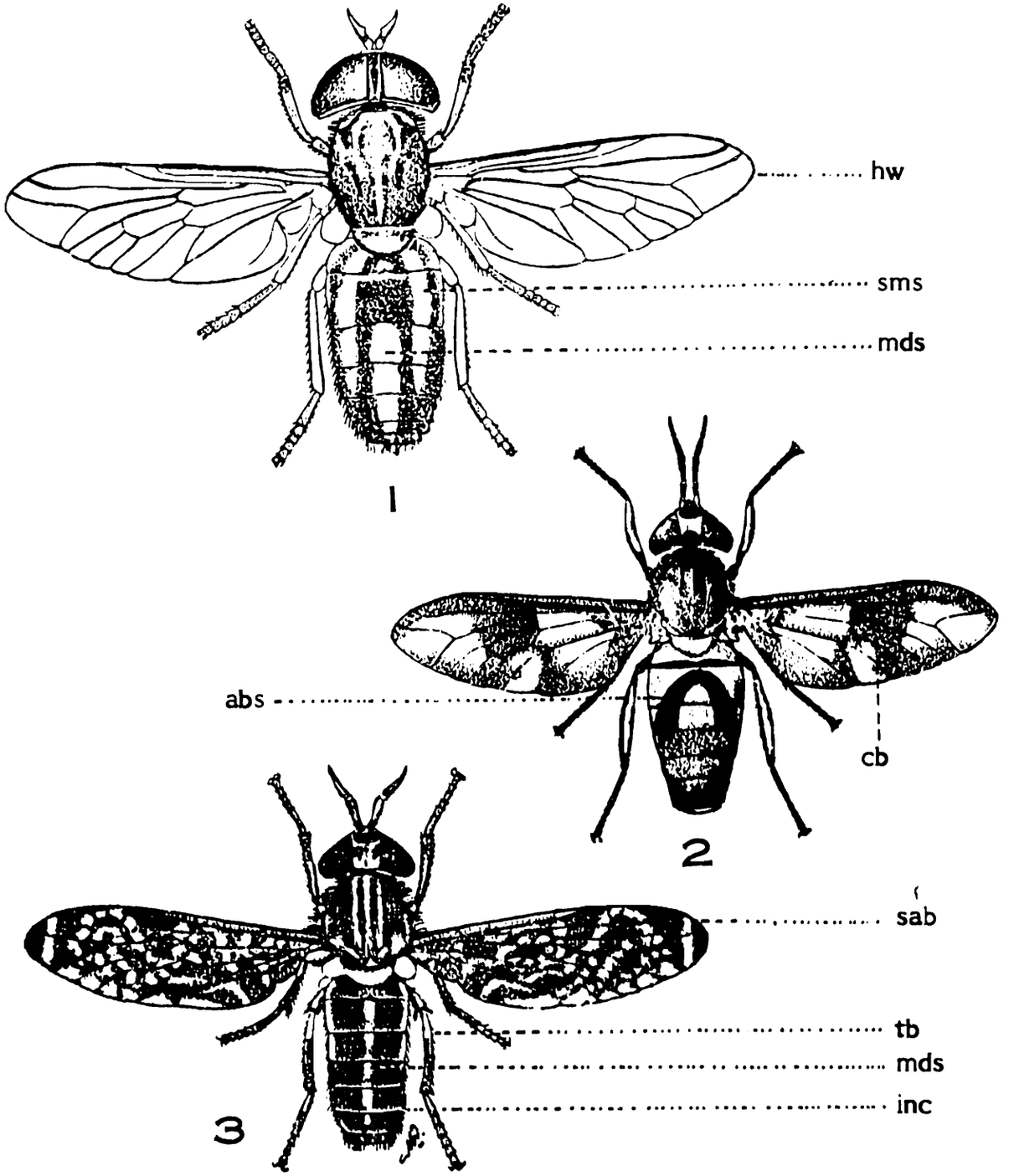


Fig. 1 A female of *Tabanus* (*Tabanus*) *striatus* F.; **Fig. 2** A female of *Chrysops dispar* (F.); **Fig. 3** A female of *Haematopota indiana* Bigot.

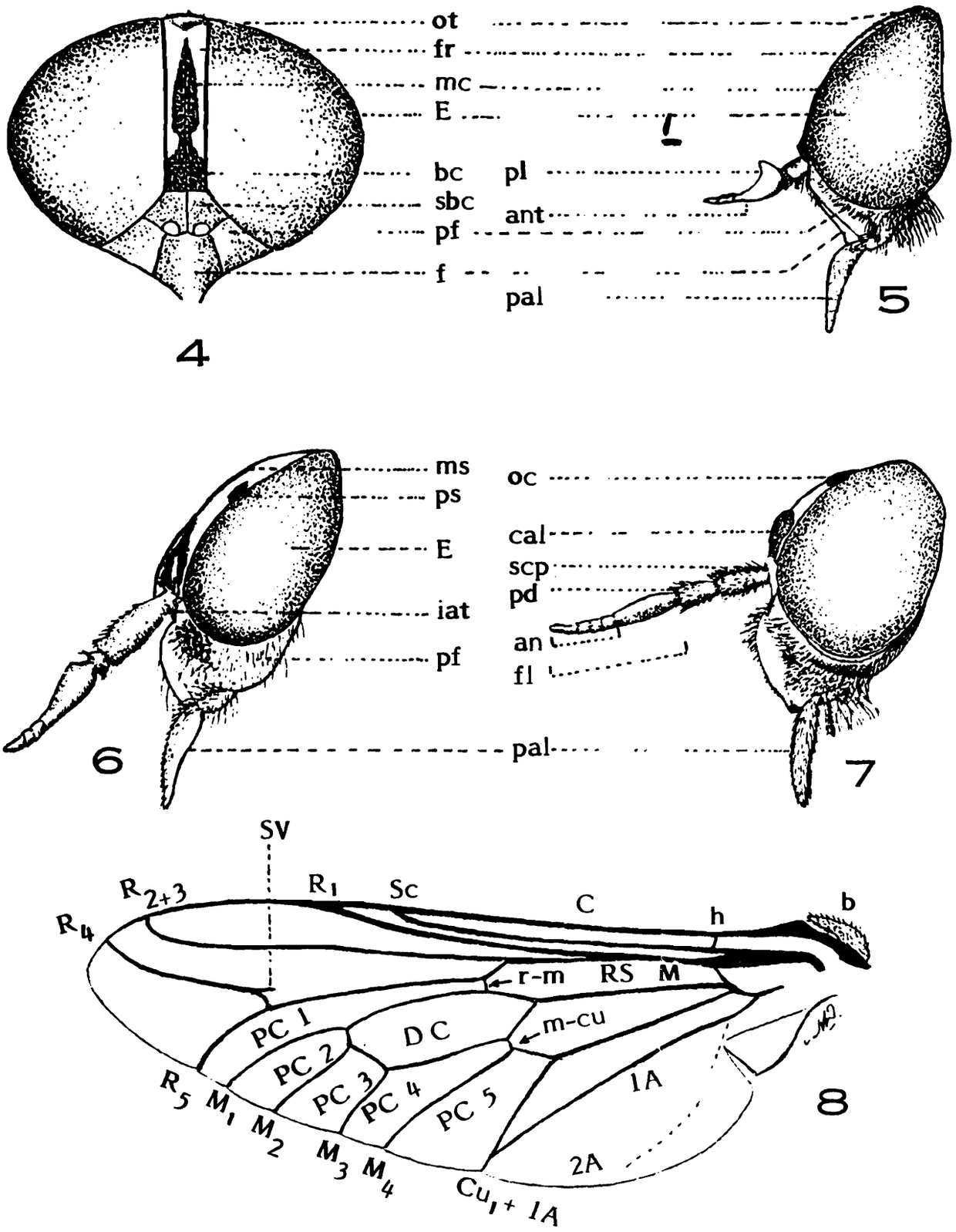


Fig. 4 Head of *Tabanus* (frontal view); **Fig. 5** Head of *Tabanus* (lateral view); **Fig. 6** Head of *Haematopota* (lateral view); **Fig. 7** Head of *Chrysops* (lateral view); **Fig. 8** Wing (left) of *Tabanus*.

contributions are due to Brunetti (1924), Senior-White (1927) and Basu, Menon and Sen Gupta (1952). After a lapse of over six decades Datta and Biswas (1977) described three species from this state. As a result, 32 species under 3 genera in 2 subfamilies are known from Meghalaya (till 1992) vis-à-vis 197 species and 4 subspecies under 12 genera belonging to 3 subfamilies in India. Indeed, it is a golden opportunity to re-examine the invaluable specimens of species accumulated through ages by many-an-entomologist of this institute despite no addition of species to heretofore known fauna.

The reader is referred to Stone (1975) for further information on bibliographic indication and synonyms of all taxa.

FIELD AND LABORATORY TECHNIQUES

Tabanids can be best collected in places of their common occurrence with the help of an insect net. Both males and females can be taken by sweeping on the vegetation, preferably with flowers or on roads in warm sunny weather or from lights at night. They can also be taken by capturing wasps as they prey upon tabanids. Females can be taken on the host or on car and window glass. Traps, especially the Malaise trap and the canopy trap are very effective in obtaining a large collection in a short time with minimum effort. Larvae and pupae can be collected from any moist situation, preferably edges of watersources like swamps, ponds, streams, etc. and reared to adults in the natural media brought to the laboratory.

Adults are killed in killing jars (*vide* Datta, Parui and Mukherjee, 1997) and should be pinned immediately for convenient studies. Specimens kept in packets may get spoiled and be useless for studies. Specimens wet in alcohol are still more useless. Care should also be taken to pin a specimen through one side (left or right) of the thorax. Ethyl acetate may be used to clean a dirty or greasy specimen by dipping into it for hours. Finally, each specimen must be accompanied by collection-data and be kept in the box containing fungicide as per Datta *et al.* (1997).

MORPHOLOGY AND TERMINOLOGY

The Tabanidae are bristleless flies of stout build with their porrect antennae of two basal segments and the annulated apical segment. Their eyes are very large and laterally extended. They have a strong proboscis, sclerotized and rigid labium, well-developed mandibles in females, wings with widely divergent veins R_4 and R_5 near apex, extremely large squamae and a pulvilliform arolium.

The tabanids exhibit a considerable intergeneric heterogeneity in appearance but not much interspecific diversity is evident to help readily identify a species. I present here a generalized account of characters helpful in understanding the key and definition of 3 genera, *viz.*, *Chrysops* Meigen (Fig. 2), *Tabanus* Linnaeus (Fig. 1) and *Haematopota* Meigen (Fig. 3) that are known to occur in Meghalaya. Flies of the genus *Tabanus* are usually larger and stronger than those of the other two genera but the latter are usually more

colourful and ornamental than the former. The dimensions and colourations of the insect and its certain parts are useful in determining several species.

Head (Figs. 4, 5, 6 & 7) is that part of the body where lie most of the important taxonomic characters, especially in *Tabanus* and *Haematopota*. Eyes (E) occupy a large area of the head on either side of the frons (fr), subcallus (sbc) and parafacials (pf), and are contiguous in males (holoptic) but are separated by the frons (fr) down to the subcallus (sbc) in females (dichoptic). The frons (fr) in females of *Tabanus* and *Chrysops* is, however, comparatively narrow and not like that of *Haematopota*. The frons index is usually important in *Tabanus* and *Haematopota*. It is the ratio between the length of the frons from the vertex to the subcallus and the width of the frons at its mid point in *Tabanus*, whereas between the frons width at the vertex and the height from the vertex to the lower margin of the callus in *Haematopota*. A raised, more hairy, dark and shiny triangular area at the vertex, called the vertical triangle, occasionally contains an indistinct tubercle (ot) at or near its apex in *Tabanus* and in *Chrysops* males. In the females of *Chrysops* the ocelli (oc) are distinctly visible. The ocellar tubercle and ocelli are absent in *Haematopota*. The colour of the subcallus, parafacials and face, and of their tomentum or hairs is important. The colouration, especially of the interantennal area (iat) in *Haematopota* also carries much importance. The more useful character in the frons is the absence or presence of the callosity or callosities and their shape and size. The genus *Tabanus* usually does have two callosities : basal (frontal) callus (bc) above the subcallus (sbc) and median callus (mc) above the basal callus. The basal callus in *Chrysops* is transverse and shiny but the median callus is usually lacking. The basal callus in *Haematopota* is also transverse, strongly protuberant to smooth and variously coloured. The callus is usually located as a small shiny area at the lower part of the frontal triangle in males. There are two large spots (ps) above the frontal callus on either side near eyes and often a midfrontal spot (ms) above the paired spots (ps) far below the vertex. The upper parts of parafacials in *Haematopota* have great importance due to various specific ornamentations.

The antenna (ant) is basically 3-segmented : scape (scp), pedicel (pd) and flagellum (fl), the latter comprising the basal plate (pl) of certain fused segments and annuli (an) of 4 visible segments in both *Chrysops* and *Tabanus*, and of 3 in *Haematopota*.

The palpus (pal) is composed of 2 segments, of which the apical segment is conspicuous.

Both the antenna and the palpus bear great taxonomic value.

Thorax (Figs. 1, 2 & 3) is generally dark, sometimes with pale lines or stripes on the mesonotum that may be useful. The colour of the scutellum may also stand important. The colour pattern of legs, especially of *Haematopota* species mainly in the form of pale bands on tibiae (tb) is certainly important in several species determination. The hair-tuft or fringe of hairs with hind femur and tibia counts much in a number of species. The most important specific distinction lies in wings, more especially of *Chrysops* and *Haematopota* than of *Tabanus*. These are generally hyaline (hw) or smoky in *Tabanus*, cross-banded (cb) in *Chrysops* and maculate in *Haematopota*. There is, however, a single or double narrow cross-band (sab), complete or broken, near the tip of the wing in

several species of *Haematopota* (Fig. 3). The venation recognized here is illustrated with a wing of *Tabanus* (Fig. 8). The basicosta (b) arising from the base of the costa (C) is with or without setae that serve the classificatory purpose of the family. The humeral cross-vein (h) joins the costa with the subcosta shortly after its origin from the base of the radius (R). The first branch (R_1), and R_{2+3}, R_4 and R_5 given out from the radial sector (RS) are characteristic to most Brachycera. The extension of the vein R_4 called appendix or stump vein or spur vein (SV) is present in certain *Tabanus* species. The media (M) is 4-branched leaving in the discal cell (DC). There follow the first cubitus (Cu_1) and the first anal cell (1A) fused apically. The second anal (2A) is, however, not always visible. The radio-medial cross-vein (r-m) and the medio-cubital cross-vein (m-cu) are generally located basally on either side of the discal cell (DC). The posterior cells (PC) occasionally become characteristic to certain species.

Abdomen (Figs. 1, 2 & 3) is usually orange-yellow in *Chrysops*; yellowish, brownish or blackish in *Tabanus* and nearly always blackish in *Haematopota*. The abdominal terga may be partially or entirely designed by bands or spots of various shapes and sizes (abs) and/or with one median (mds) and/or two submedian (sms) stripes. There may also be tomentose or haired incisures (inc) apically on some or all terga.

Indeed, the genitalial structures often indispensable for identification of species in most dipterous families, are seldom helpful in the family Tabanidae.

SYSTEMATIC ACCOUNT

Family TABANIDAE*

Key to the subfamilies

1. Vertex with well-developed ocelli; hind tibiae each with 2 apical spurs. ..... Chrysopsinae
   Vertex with rudimentary or no ocelli; hind tibiae without apical spurs ..... Tabaninae

Subfamily CHRYSOPSINAE

Genus ***Chrysops*** Meigen

1803. *Chrysops* Meigen, *Magazin InsektKde*, **2** : 267.
Type-species : *Tabanus caecutiens* Linnaeus.

Diagnosis : Small slender and greatly patterned flies with colourfully maculate eyes in life; slender antenna much longer than width of head; face highly developed; wing with cross-bands.

* The species hitherto known from Meghalaya are keyed but only those that are available for studies are accounted for.

Key to the species

1. Abdomen extensively yellowish (excepting stripes or bands or spots), with a distinct bifid black stripe on tergum 2 or often extending to 3 2
   Abdomen black, tergum 2 anteriorly with a yellow band only ..... *flavocinctus*
2. Posterior cell 5 with a large hyaline area up to hind margin; tibia normal ..... *dispar*
   Posterior cell 5 infuscated leaving a small slit-like faint hyaline area in middle; tibia swollen ..... *indianus*

1. ***Chrysops dispar*** (Fabricius)

1798. *Tabanus dispar* Fabricius, *Ent. Syst. Suppl.* : 567.

Material examined :2 ♂♂, 7 ♀♀, taken on flowers, 650 m, Nongpoh, Ri-Bhoi, 21. iv. 1974, Coll. M. Datta; 3 ♀♀, Sericulture Farm, 1590 m, Shillong, East Khasi Hills, 19. iv. 1979, Coll. J.K. Jonathan; 1♂, 2♀♀, Shangpung, 1320 m, Jaintia Hills, 13. iii. 1991, Coll. K.K. Ray.

Distribution : India : Meghalaya (Ri-Bhoi, East Khasi Hills and Jaintia Hills), Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Orissa, Sikkim, Tripura and West Bengal. Elsewhere : Andalas, Bangladesh, China, Java, Kalimantan, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand and Vietnam.

Remarks : There are intra-specific variations in the colour, especially of the abdomen. This is the most common and widespread of all *Chrysops* in Meghalaya.

Subfamily TABANINAE

Key to the tribes

1. Frons in females much longer than broad, frontal callus usually longitudinal, when present; antenna short, flagellum with broad basal plate and 4 annuli; wing hyaline or smoky; basicosta with strong setae ..... Tabanini
   Frons in females broader than long, frontal callus transverse; antenna long and slender, flagellum with slender base and 3 annuli; wing patterned with pale marks; basicosta with sparse setae ..... Haematopotini

Tribe TABANINI

Genus ***Tabanus*** Linnaeus

1758. *Tabanus* Linnaeus, *Syst. Nat. Ed.*, 10 : 601.
Type-species : *Tabanus bovinus* Linnaeus.

Diagnosis : Generally robust flies with colourful eyes in life; vertex without a distinct ocellar tubercle; in males, if present, entirely pollinose; eyes bare.

Subgenus ***Tabanus*** Linnaeus

Diagnosis : Head hemispherical; vertex smoothly flat or slightly concave; postocular rim present; banding on eyes often present; frons usually much narrow; antennal scape nearly as long as wide, hairy.

Key to the species

1. Small species (8-12mm); frons broad, nearly 4-5 times as long as its width, with 2 (basal and median) callosities 2
   Generally large species (16-22mm), excepting *miniatus*; frons narrow nearly 5-10 times as long as its width, with a single (basal) square, rectangular or elliptical or so callosity always having a linear extension towards vertex 3
2. Frons nearly parallel-sided; wing hyaline; abdominal terga except 1 with narrow yellow-haired band ..... *gertrudae*
   Frons narrower anteriorly; wing tinged brown anteriorly; abdominal terga 3 and 4 with yellow-haired band ..... *leucocnematus*
3. Abdomen with or without distinct bands or apical incisures but never with distinct stripes or triangles 4
   Abdomen with distinct median and/or lateral stripes or triangles or spots, occasionally along with incisures 8
4. Abdomen generally blackish, with distinct bands or with incisures only at least up to tergum 5 5
   Abdomen orange brown basally to darkened apically, without bands but incisures seen at times on certain terga especially in midline forming a faint stripe or triangles of pale hairs 7
5. Abdomen brownish black, with white bands 6
   Abdomen entirely black, with narrow reddish incisures on each tergum..... *explicatus*
6. Wing with posterior cell 1 very narrowly open to hind margin..... *albofasciatus*
   Wing with posterior cell 1 normally open to hind margin ..... *khasiensis*
7. Basal (frontal) callosity inverted U- or V-shaped; tibia nearly all whitish and in strong contrast to body ..... *birmanicus*
   Basal callosity quadriangular, elliptical or dome-shaped; tibia nearly all yellowish ..... *diversifrons*
8. Abdomen with a median and two lateral tomentose and/or haired equilateral stripes or truncated confluent median triangles and/or lateral spots 9

Abdomen with a median tomentose and/or haired equilateral stripe or a series of triangles but without any lateral stripes, triangles or spots (excepting occasional dark patches laterally) 10

9. Median pale tomentose stripe present on terga 1-6, sometimes as a series of confluent triangles; lateral pale spots present on terga 2-5 diagonally ..... *rubidus*

   Median strongly white tomentose and white-haired stripe present from base of tergum 3 to somewhere of tergum 6; lateral white tomentose and white-haired stripe present from tergum 1 to somewhere of tergum 4 ..... *striatus*

10. Median stripe of tomentum and hairs present up to tergum 5 and occasionally 6 also 11

    A series of median triangles present on terga 1-5 and occasionally 6 also 13

11. Median stripe of white tomentum and hairs on terga 1-5; terga 2 and 3 rather uniformly blackish, especially on sides ..... *monotaeniatus*

    Median stripe of yellow tomentum and hairs invariably beginning from tergum 3, occasionally inconspicuous on terga 1 and 2; terga 2 and 3 or even 1 and 4 reddish brown 12

12. Rather small species (10-12mm); antenna reddish brown to brick-red up to entire plate but annuli black ..... *miniatus*

    Larger species (15-17mm); antenna reddish brown up to basal half of plate and rest dark to black ..... *meghalayensis*

13. Median triangles white with white hairs, distinctly seen on terga 2-5; subcallus and face entirely whitish 14

    Median triangles of pale or yellowish white tomentum and hairs, distinctly seen on terga 2-5; subcallus not concolourous with entire face 15

14. Wing with costal cell strongly tinted brown; a brown band lateral to antennal bases absent; abdomen mostly reddish brown ..... *rufiventris*

    Wing with costal cell yellowed; a brown band lateral to antennal bases present; abdomen mostly brownish grey to black ..... *assamensis*

15. Subcallus and upper cheek dull yellowish, rest of face yellowish white; fore tibia mostly pale becoming darkened apically; anterior branch of wing vein 3 somewhat angulate ..... *rubicundus*

    Subcallus orange yellow to orange brown, parts of face ranging from dark brown to white; fore tibia whitish on basal half and blackish on distal half; anterior branch of wing vein 3 not angulate ..... *indianus*

2. *Tabanus (Tabanus) albofasciatus* Ricardo

1911. *Tabanus albofasciatus* Ricardo, *Rec. Indian Mus.*, 4 : 146.

Material examined : 1 ♀, Cherrapunji, 1500 m, East Khasi Hills, 16. ix. 1988, Coll. A.R. Lahiri.

Distribution : India : Meghalaya (East Khasi Hills) and Sikkim.

Remarks : The species seems to be rare.

3. *Tabanus (Tabanus) assamensis* (Bigot)

1892. *Atylotus assamensis* Bigot, *Mém. Soc. zool. Fr.*, 5 : 653.

Material examined : 1 ♀ Mawphlang, 1050m, East Khasi Hills, 2. iii. 1991, Coll. K. K. Ray.

Distribution : India : Meghalaya (East Khasi Hills) and ? Assam.

Remarks : The species was resurrected by Burton (1978) heretofore known as a synonym of *T. rufiventris* Fabricius along with *T. crassus* Walker described from East India (*vide* Stone, 1975 : 68). With a unique specimen before me I incline now to agree to this resurrection (*cf.* Datta, 1985). Indeed, *T. crassus* is distinguishable by the following combination of characters : presence usually of some whitish yellow tomentum laterally on antennal bases, a light brown tint only at the base of the costal cell near the humeral cross-vein and the brownish grey to black abdomen.

4. *Tabanus (Tabanus) birmanicus* (Bigot)

1892. *Atylotus birmanicus* Bigot, *Mém. Soc. zool. Fr.*, 5 : 653.

Material examined : 1 ♀, Barapani, 1175 m, Ri-Bhoi, 1. iii. 1991, Coll. K. K. Ray.

Distribution : India : Meghalaya (Ri-Bhoi) and Mizoram. Elsewhere : China, Malaya, Myanmar, Taiwan, Thailand and Vietnam.

Remarks : This is an uncommon species in Meghalaya as compared to the countries in the east.

5. *Tabanus (Tabanus) diversifrons* Ricardo

1911. *Tabanus diversifrons* Ricardo, *Rec. Indian Mus.*, 4 : 214.

Material examined : 1 ♀, Nongpoh, 650 m, Ri-Bhoi, 12 xi. 1991, Coll. R. C. Basu.

Distribution : India : Meghalaya (Ri-Bhoi), Assam and West Bengal. Elsewhere : Bangladesh, Thailand and Vietnam.

Remarks : Burton (1978) discussed the taxonomic as well as the distributional confusion about the species *T. diversifrons* along with *T flaviventris* Bigot (a pre-occupied name). The species presumably occurs in the entire north-east India.

6. *Tabanus (Tabanus) khasiensis* Ricardo

1909. *Tabanus khasiensis* Ricardo, *Ann. Mag. nat. Hist.*, (8) 3 : 487.

Material examined : 2 ♀ ♀, Upper Shillong, 1675 m, East Khasi Hills, 3. iii. 1991, Coll. K. K. Ray.

Distribution : India : Meghalaya (East Khasi Hills) and Uttar Pradesh. Elsewhere : Andalas and Malaya.

Remarks : The species is presumably not uncommon in Meghalaya, especially in upper ranges.

7. *Tabanus (Tabanus) meghalayensis* Datta & Biswas

1977. *Tabanus meghalayensis* Datta & Biswas, *Proc. Indian Acad. Sci.* (B), **86** : 128.

Material examined : **3 ♀ ♀**, Songsak, 1050 m, East Garo Hills, 2. v. 1991, Coll. B. N. Das.

Distribution : India : Meghalaya (East Garo Hills).

Remarks : The species is commonly encountered in summer.

8. *Tabanus (Tabanus) miniatus* Datta & Biswas

1977. *Tabanus miniatus* Datta & Biswas, *Proc. Indian Acad. Sci.* (B), 86 : 130.

Material examined : **1 ♀**, Songsak, 1050 m, East Garo Hills, 2. v. 1991, Coll. B. N. Das.

Distribution : India : Meghalaya (East Garo Hills) and Arunachal Pradesh.

Remarks : This is a common species in Garo Hills.

9. *Tabanus (Tabanus) monotaeniatus* (Bigot)

1892. *Atylotus monotaeniatus* Bigot, *Mém. Soc. zool. Fr.*, **5** : 655.

Material examined : **1 ♀**, Barapani, 1175 m, Ri-Bhoi, 26. vii. 1969, Coll. B. Dutta; **1 ♀** , Mawphlang, 1050 m, East Khasi Hills, 2. iii. 1991, Coll. K. K. Ray; **1 ♀**, Williamnagar, 900 m, East Garo Hills, 8. iii. 1991, Coll B. C. Das.

Distribution : India : Meghalaya (Ri-Bhoi, East Garo Hills and East Khasi Hills), Arunachal Pradesh, Assam, Sikkim and West Bengal. Elsewhere : China and Myanmar.

Remarks : This is generally common in the north-east India. Burton (1978 : 123) discussed the probable range of distribution of the species in the east. One may find the species striking at light in hot summer night.

10. *Tabanus (Tabanus) rubicundus* Macquart

1846. *Tabanus rubicundus* Macquart, *Dipt. exot. Suppl.*, **1** : 33 (160).

Material examined : **1 ♀**, Pynursla, 1500 m, East Khasi Hills, 11. xi. 1991, Coll. R.C. Basu.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Assam and West Bengal. Elsewhere : Bangladesh and Laos.

Remarks : Burton (1978 : 106-107) discussed the range of distribution of the species alongside the treatment of *T laotianus* (Bigot) as its synonym.

11. *Tabanus (Tabanus) rubidus* Wiedemann

1821. *Tabanus rubidus* Wiedemann, *Dipt. exot.*, 1 : 69.

Material examined : 3 ♀♀, Darugiri, 1000 m, East Garo Hills, 10. iv. 1973, Coll. S. Biswas; 2 ♀ ♀, Pynursla, 1500 m, East Khasi Hills, 11. xi. 1991, Coll. R.C. Basu; 2 ♀ ♀, Barapani, 1175 m, Ri-Bhoi, 1. iii. 1991, Coll. K.K. Ray.

Distribution : India : Meghalaya (Ri-Bhoi, East Khasi Hills and East Garo Hills), Arunachal Pradesh, Assam, Bihar, Delhi, Haryana, Jammu and Kashmir, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere : Andalas, Bangladesh, Cambodia, China, Java, Laos, Malaya, Myanmar, Nepal, Nias island, Singapore, Sri Lanka, Thailand and Vietnam.

Remarks : Burton (1978) discussed the synonymy and distributional records of the species extensively. This is a very common species not only in India but also in most countries of the east.

12. *Tabanus (Tabanus) rufiventris* F.

1805. *Tabanus rufiventris* Fabricius, *Syst. Antliat.* : 96.

Material examined : 1 ♀, Dauki, 50 m, Jaintia Hills, 12. v. 1974, Coll. M. Datta.

Distribution : India : Meghalaya (Jaintia Hills) and Assam. Elsewhere : Bangladesh and China.

Remarks : *T rufiventris* F. was treated as the senior synonym of a number of nominal species including *T assamensis* (Bigot) that also occurs in Meghalaya (*vide* Stone, 1975). Burton (1978) was the first observer to re-establish the independent identity of these two species. Now, I am also in favour of this treatment (*cf.* Datta, 1985). In view of the resurrection, the range of occurrence of this species should be critically assorted and hence the distributional records are restricted for the time being upon considerable verification.

13. *Tabanus (Tabanus) striatus* F.

1787. *Tabanus striatus* Fabricius, *Mantissa Insect.*, 2 : 356.

Material examined : 2 ♀ ♀, Jowai, 1350 m, Jaintia Hills, 23. i. 1975, Coll. M. Datta; 1 ♂, Shillong, 1600 m, East Khasi Hills, 16. iii. 1991, Coll. B.C. Das; 1 ♀, Rongra, South Garo Hills, 29. iv. 1991, Coll. B. N. Das.

Distribution : India : Meghalaya (East Khasi Hills, South Garo Hills and Jaintia Hills), Arunachal Pradesh, Assam, Bihar, Delhi, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Punjab, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. Elsewhere : Bangladesh, Bhutan, Cambodia, China, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam.

Ramarks : There was taxonomic misinterpretation through ages and hence the distributional records associated with the species were in a mess everywhere before Burton (1978) who took pains to sort out the perplexed identity of the species from its allies. Later, Burger and Thompson (1981) aptly illustrated, keyed and discussed these species with a view to making away with the recurrent confusion. This is a very common and widespread species in India, and is often found to enter the house, being attracted by light in hot summer night.

Tribe HAEMATOPOTINI

Genus *Haematopota* Meigen

1803. *Haematopota* Meigen, *Magazin InsektKde*, 2 : 67.

Type-species : *Tabanus pluvialis* Linnaeus.

Diagnosis : Generally small and slender flies of blackish grey colour; eyes with several undulating bands in life; frons with a velvety black spot on either side just above frontal callus and often a midfrontal spot above these; wing usually dark with a pattern of pale spots; mid tibia and often hind tibia also usually with pale rings.

Key to the species

1. Hind femur with long hairs dorsally, at least distally forming dense tuft and fringe of long hairs ventrally 2

   Hind femur without dense tuft of long hairs dorsally and ventral hair fringe usually not strongly developed (except *latifascia* having fringe of fairly developed hairs on femur ventrally)..... 4

2. Interantennal black spot absent; upper parafacial with irregular dark spots ..... *lata*

   Interantennal spot strongly black; upper parafacial also with strong black spot 3

3. Frontal callus orange brown, both upper and lower margins sinuous; scutellum distinctly with pale basal half and darker distally; wing with double subapical band ..... *javana*

   Frontal callus usually black, upper margin trilobed and lower margin deeply concave; scutellum mostly greyish except pale hind margin; wing with a single subapical band ..... *assamensis*

4. Legs almost uniformly yellow or brown without banding 5

   Legs distinctly bicoloured, with tibial bands 6

5. Antennal scape slender; interantennal spot dark; upper parafacial with solid black spot ..... *limbata*

   Antennal scape swollen; interantennal spot light brown; upper parafacial with irregular brown spotting ..... *equina*

6. Antennal scape swollen; upper parafacial with solid black spot (or triangular dark streak in *schmidi*) 7

   Antennal scape slender; upper parafacial ornamented otherwise 10

7. Notum with broad pale band covering scutoscutellar suture; subapical band of wing broad and usually complete from fore margin to hind margin ..... *latifascia*

   Notum without such band over scutoscutellar suture; subapical band usually broken and not reaching hind margin in cell R_4 (except in *schmidi*) 8

8. Subcallar area yellow with large black interantennal spot; fore tibia with narrow pale subbasal band; legs mostly dark reddish brown with yellowish banding ..... *schmidi*

   Subcallar area brownish to greyish with darker spots; fore tibial pale subbasal band on one-third of its length; legs dark with white bands 9

9. Frontal callus with nearly straight margins and centrally with a pair of protuberances ..... *annandalei*

   Frontal callus wrinkled centrally, with nearly straight lower margin but wavy upper margin with high middorsal projection ..... *nigrifrons*

10. Hind tibia unbanded or with a single broad basal band or in case of a narrow band, a small subapical spot present anteriorly; abdominal middorsal stripe or lateral spots often present 11

    Hind tibia with two indistinct pale bands; abdomen with middorsal stripe and lateral spots. Upper parafacial speckled with brown ..... *marginata*

11. Antennal scape shiny; mid tibia with two pale bands 12

    Antennal scape pollinose; mid tibia mostly with pale base, rarely having faint division. Upper parafacial with a patch of irregular brown spotting; abdomen with middorsal grey stripe only ..... *indiana*

12. Antennal scape shorter than flagellum and nearly equilateral; upper parafacial with transversely broken brown spot; abdomen without middorsal stripe or lateral spots ..... *fasciata*

    Antennal scape longer than flagellum, basal half thicker than distal half with concavity beyond basal half; upper parafacial irregularly mottled with dark brown; abdomen with narrow middorsal stripe and lateral spots on posterior terga ..... *montana*

14. *Haematopota annandalei* Ricardo

1911. *Haematopota annandalei* Ricardo, *Rec. Indian Mus.*, 4 : 335.

Material examined : **2♀♀**, Ward Lake area, 1550 m, Shillong, East Khasi Hills, 10. v. 1975, Coll. M. Datta; **1 ♀**, Nongpoh, 650 m, Ri-Bhoi, 18. iv. 1990, Coll. M.S. Shishodia.

Distribution : India : Meghalaya (Ri-Bhoi and East Khasi Hills), Arunachal Pradesh, Maharashtra and West Bengal. Elsewhere : China and Myanmar.

Remarks : The species appears to be fairly common in Khasi Hills.

15. *Haematopota assamensis* Ricardo

1911. *Haematopota assamensis* Ricardo, *Rec. Indian Mus.*, 4 : 343.

Material examined : 1 ♀, Nongpoh, 650 m, Ri-Bhoi, 12. xi. 1991, Coll. R.C. Basu.

Distribution : India : Meghalaya (Ri-Bhoi) and Arunachal Pradesh. Elsewhere : China, Thailand and Vietnam.

Remarks : The species is presumed to be very common in hot summer days.

16. *Haematopota indiana* Bigot

1891. *Haematopota indiana* Bigot, *Bull. Soc. zool. Fr.*, **16** : 78.

Material examined : 1 ♀, Umling, 200 m, Ri-Bhoi, 5. xi. 1991, Coll. R.C. Basu.

Distribution : India : Meghalaya (Ri-Bhoi), Assam and Manipur.

Remarks : The specimen agrees fairly well with the re-description of the species by Ricardo (1911 b). This is an uncommon species in Meghalaya, and probably inhabits the lower range of hills and plains.

17. *Haematopota javana* Wied.

1821. *Haematopota javana* Wiedemann, *Dipt. exot.*, **1** : 100.

Material examined : 2 ♀ ♀, 1 ♀, Dauki, 150 m, Jaintia Hills, 24. v. 1974, Coll. M. Datta; 2 ♀ ♀, Mawphlang, 1000 m, East Khasi Hills, 2. iii. 1991, Coll. K.K. Ray.

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Bihar, Kerala, Mizoram and Tamil Nadu. Elsewhere : Andalas, Bangladesh, China, Java, Laos, Malaya, Myanmar, Thailand and Vietnam.

Remarks : This is a common and widespread species, and hence it shows certain amount of variable characters (*vide* Stone and Philip, 1974).

18. *Haematopota lata* Ricardo

1906. *Haematopota lata* Ricardo, *Ann. Mag. nat. Hist.*, (7) **18** : 121.

Material examined : 1 ♀, Shillong, 1550 m, East Khasi Hills, 15. iv. 1975, Coll. M. Datta.

Distribution : India : Meghalaya (East Khasi Hills) and West Bengal. Elsewhere : China, Laos, Myanmar and Thailand.

Remarks : This is an uncommon species in Meghalaya.

19. *Haematopota limbata* Bigot

1891. *Haematopota limbata* Bigot, *Bull. Soc. zool. Fr.*, **16** : 78.

Material examined : **1 ♀**, Jarain, 850 m, Jaintia Hills, 10. iii. 1991, Coll. K.K. Ray.

Distribution : India : Meghalaya (Khasi Hills and Jaintia Hills) and West Bengal. Elsewhere : Bangladesh.

Remarks : The species appears to be uncommon in Meghalaya.

20. *Haematopota marginata* Ricardo

1911. *Haematopota marginata* Ricardo, *Rec. Indian Mus.*, **4** : 347.

Material examined : **2 ♀ ♀**, Barni Hat, 190 m, Ri-Bhoi, 15. iv. 1975, Coll. M. Datta.

Distribution : India : Meghalaya (Ri-bhoi), Assam, Bihar and West Bengal. Elsewhere : Bangladesh.

Remarks : This is probably a species of lowland and plains, and hence this is rarely encountered in Meghalaya.

21. *Haematopota nigrifrons* Datta

1977. *Haematopota nigrifrons* Datta & Biswas, *Proc. Indian Acad. Sci.* (B) **86** : 131.

Material examined: **2 ♀ ♀**, Wagensi, 1100m, East Garo Hills, 6-7. iv. 1973, Coll. S. Biswas.

Distribution : India : Meghalaya (East Garo Hills).

Remarks : The species is hitherto unknown elsewhere in India.

DISCUSSION

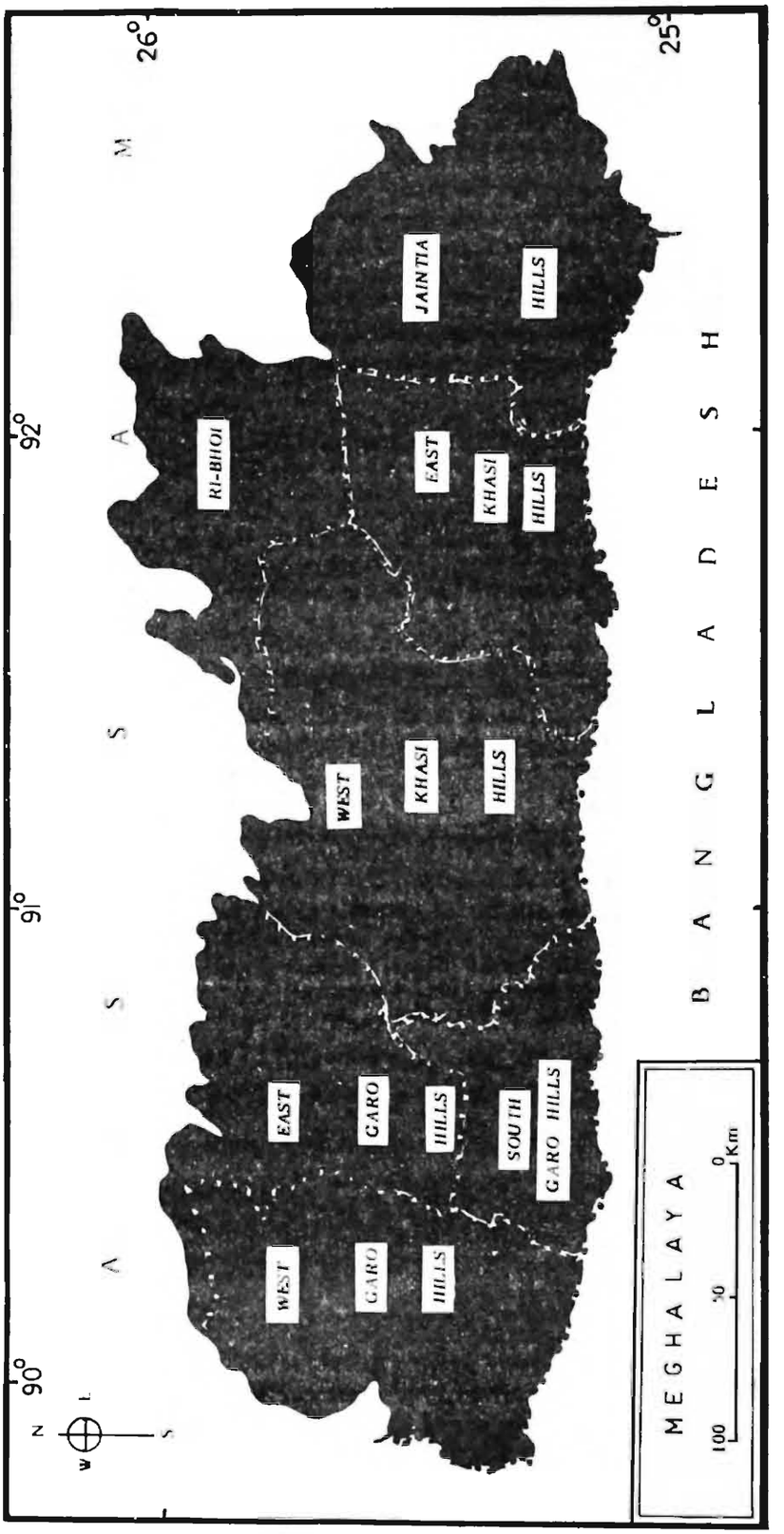
Meghalaya, comprising 7 districts : Ri-Bhoi, East Khasi Hills, West Khasi Hills, East Garo Hills, West Garo Hills, South Garo Hills and Jaintia Hills, is bounded by Assam in the east, north and north-west, and Bangladesh in the south and south-west (Map 1). The nearest other states in the north-east India are Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Sikkim and West Bengal, and zoogeographically, not too far off countries are Myanmar, Thailand, Laos, Vietnam, Cambodia, Nepal, Bhutan and China (southern part virtually up to 30°N. latitude). This vast area under the jurisdiction of the Indian, Indo-Chinese and Indo-Malayan subregions of the Oriental region is certainly remarkable because of its varied physiographical features from montane- submontane to lowland-plains covering plateaux and a long stretch of coastal edges, with diverse and interesting flora and fauna.

The Tabanidae are abundant throughout the area and can be seen throughout the year

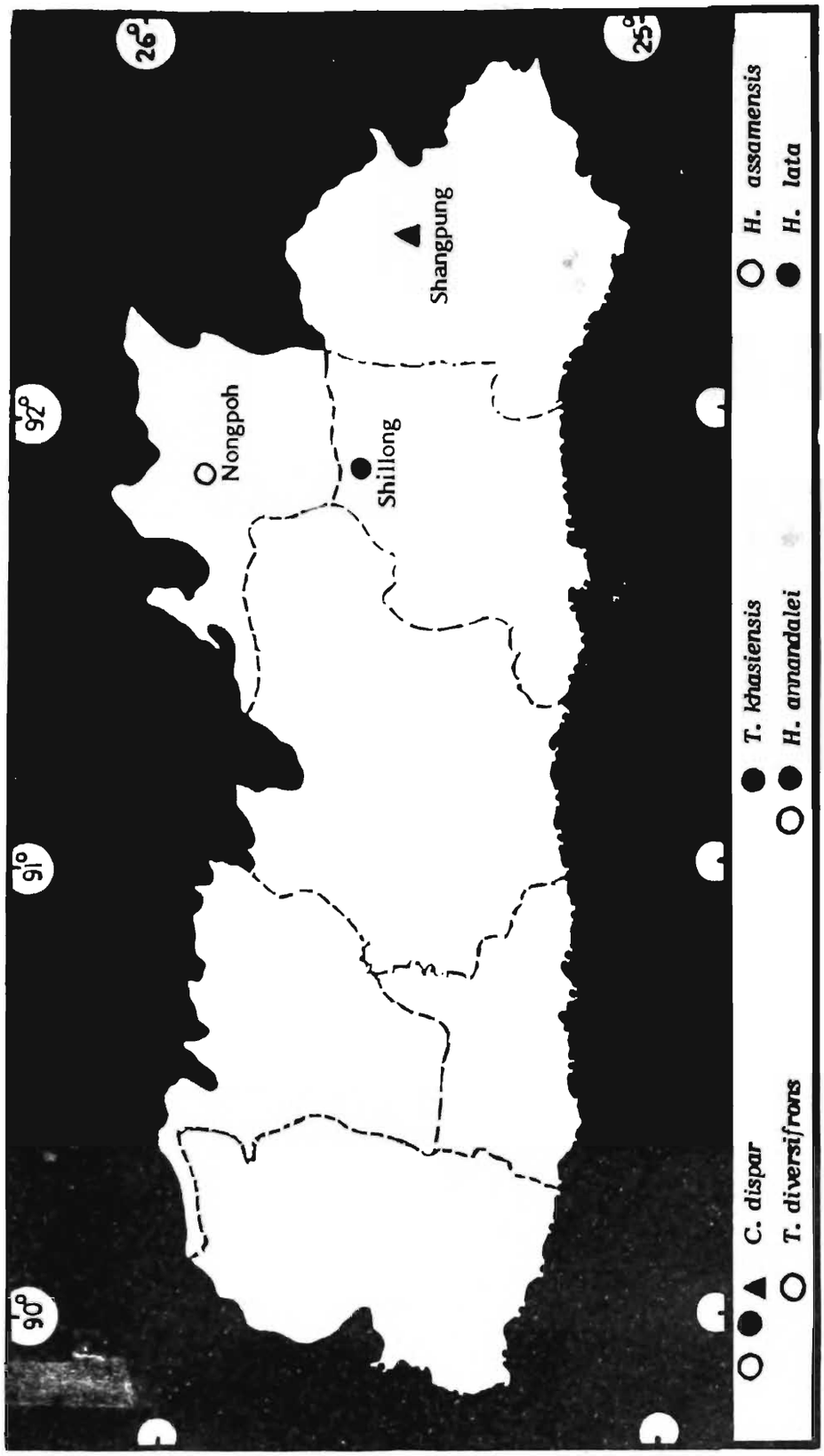
with a little decline at higher elevations during winter. Insofar as the qualitative richness of the fauna is in view, some 18 genera are represented with many-a native genus. Of these, only 3 that are far widespread and nearly cosmopolitan, are known from Meghalaya.

Meghalaya harbours 3 species of *Chrysops*, 16 species of *Tabanus* and 13 species of *Haematopota* (*vide* Table 1), and several species are widely distributed elsewhere in the Orient but seemingly none of them extends to the Palaearctic region (*vide* Table 2). Three species, *viz.*, *C. dispar*, *T. birmanicus* and *T. indianus* have distributional range as far east as Taiwan; Philippines too in case of *dispar* and Sulawesi for *indianus* (*cf.* Burton, 1978 : 154). *C. dispar* exhibits continuous distribution southward through East Malaysia and Kalimantan up to Java where *T. rubidus* and *H. javana* are known to occur. The only other species recorded from East Malaysia and Kalimantan as *C. flavocinctus* is dubious (*cf.* Burger, 1981). *T. khasiensis* has but southern distribution up to Malaya and Andalas with disjunct records. Two species, *viz.*, *T diversifrons* and *H. assamensis* extend their range as far east as Vietnam through Thailand but are not yet known from intervening Myanmar, Laos and Cambodia. The former species is, however, known from Bangladesh but not from China, whereas the latter species still remains unrecorded from Bangladesh despite its reported occurrence in China. The three species of ever successful colonization are *C. dispar*, *T. rubidus* and *T. striatus*, of which the last is known far and wide from China and Nepal in the north as the first two, extending its range westward with *dispar* only to Pakistan and eastward to Vietnam (*cf.* Burger and Thompson, 1981 : 345). The extreme northern part of the Oriental region, *i.e.*, the southern China has exhibited several species, such as, *C. dispar*, *C. flavocinctus*, *T birmanicus*, *T. indianus*, *T monotaeniatus*, *T. leucocnematus*, *T rubidus*, *T rufiventris*, *H. annandalei*, *H. assamensis*, *H. javana* and *H. lata* alongside *T striatus* (Zun-Ming, 1983; Rong-Man, 1989). It is, however, quite likely th .t certain species occurring in Meghalaya may emigrate at least to the adjoining or neighbouring countries, such as, Bangladesh, Bhutan, Myanmar, Thailand, etc. or immigrate from those countries in the influence of alike topographic and climatic conditions. Indeed, nearly all the species show discontinuous distribution, and this appears to be due to the want of thorough exploration of the area, unfavourable natural conditions in the area for survival and colonization, misinterpretation of facts upon obscure and insufficient collecting data or mis-identification of species. It is a wise appeal at present to leave the dilemmatic matter because our knowledge in India itself does not permit to warrant any worthwhile outcome.

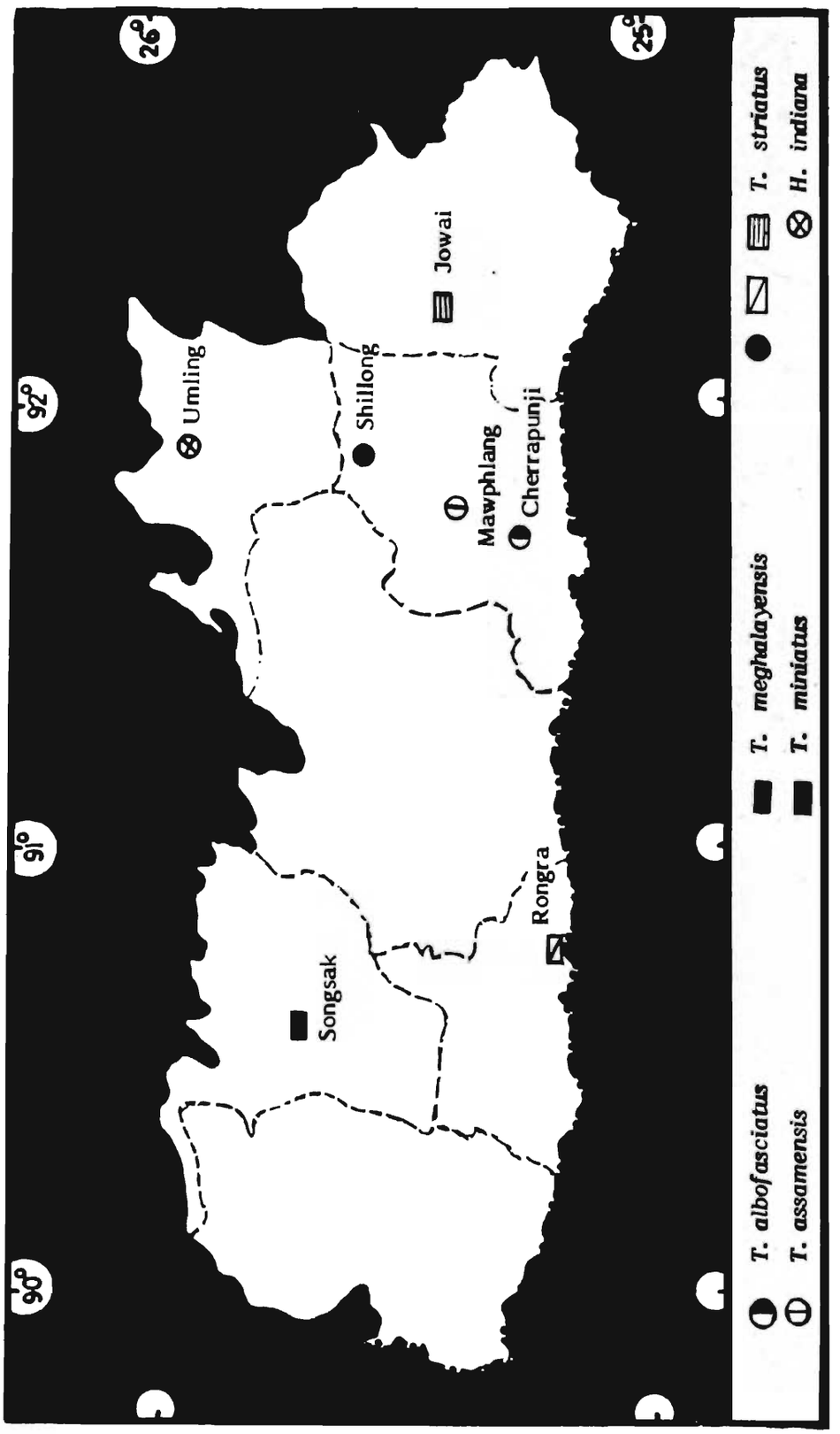
Concerning the fauna within India, three species, *viz.*, *C. dispar*, *T. rubidus* and *T. striatus* are widespread, nearly displaying continuous distribution (Table 1). The remaining species are either known only from the type-locality or from one or more states usually situated apart. Twelve species, such as, *C. indianus*, *T. albofasciatus*, *T. assamensis*, *T. explicatus*, *T. gertrudae*, *T. meghalayensis*, *T. miniatus*, *H. equina*, *H. indiana*, *H. montana*, *H. nigrifrons* and *H. schmidi* are so far not known to occur outside India (Table 2). And again, *C. flavocinctus*, *T. meghalayensis*, *H. equina*, *H. fasciata*, *H. latifascia* and *H. nigrifrons* described from Meghalaya till remain unrecorded elsewhere in India. Most of the species are, however, expected to show extensive distribution pattern in the long run.



Map 1. MEGHALAYA showing its location and districts.

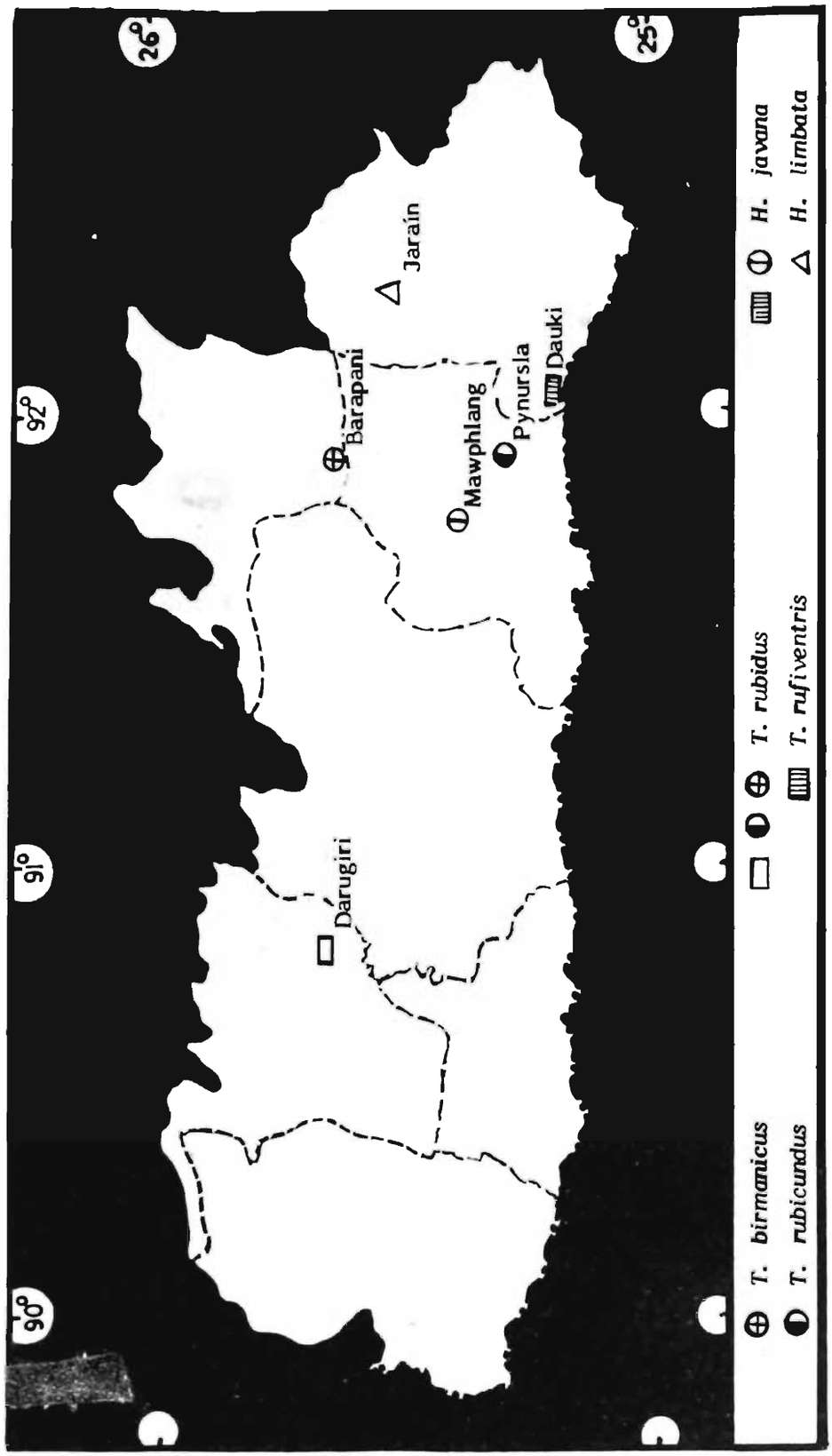


Map 2. Recorded places of collection of *C. Dispar*, *T. (T.) diversifrons*, *T. (T.) khasiensis*, *H. annandalei*, *H. assamensis* and *H. lata*.

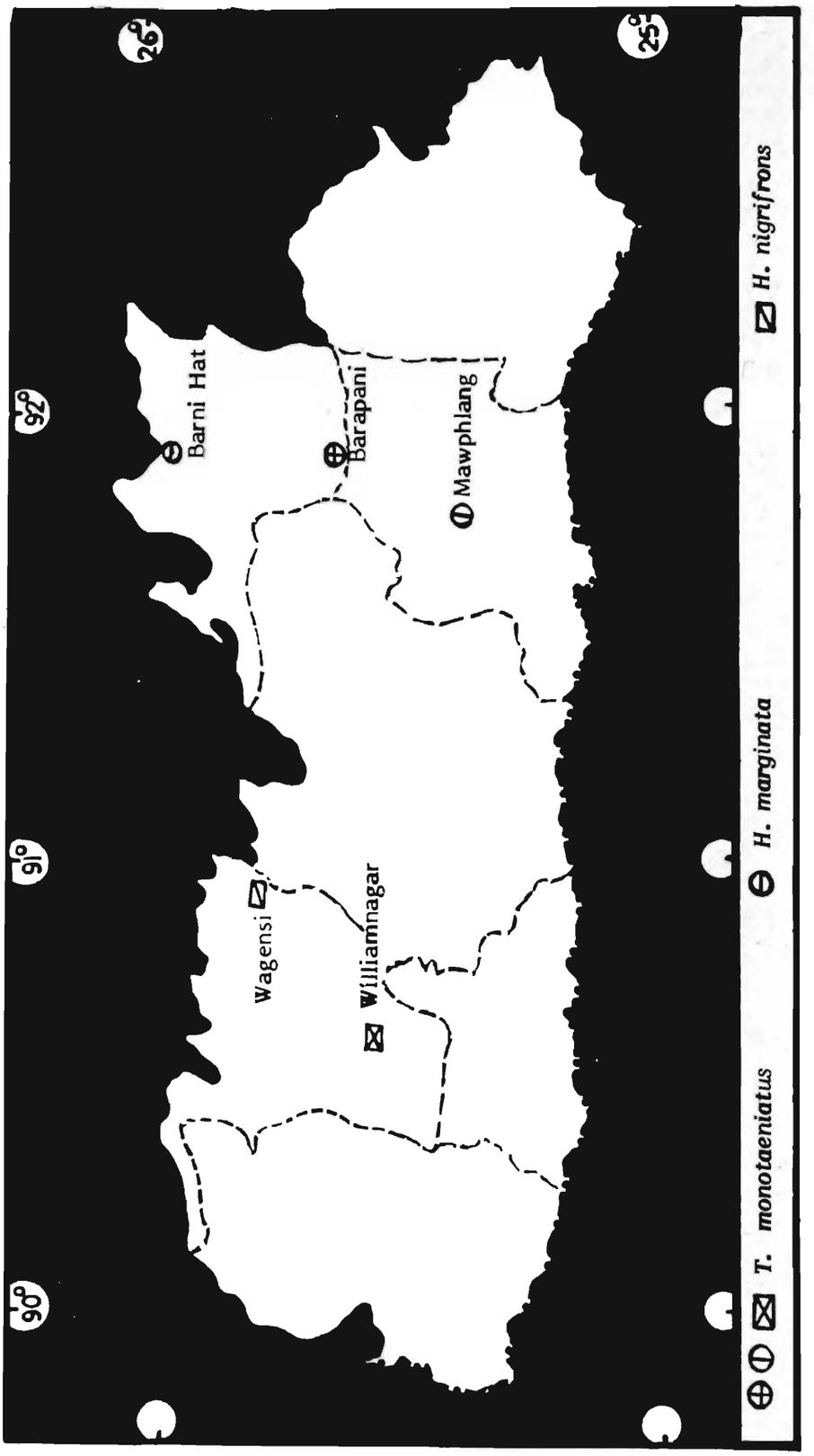


Map 3. Recorded places of collection of *T. (T.) albofasciatus*, *T. (T.) assamensis*, *T. (T.) meghalayensis*, *T. (T.) miniatus*, *T. (T.) striatus* and *H. indiana*.

1861 ZSI/99—7B



Map 4. Recorded places of collection of *T. (T.) birmanicus, T. (T.) rubicundus, T. (T.) rubidus, T. (T.) rufiventris, H. javana* and *H. limbata.*



Map 5. Recorded places of collection of *T.(T.) monotaeniatus*, *H. marginata* and *H. nigrifrons*.

SUMMARY

Thirty two species belonging to the genera *Chrysops* Meigen: subfamily Chrysopsinae, and *Tabanus* L. and *Haematopota* Meigen: subfamily Tabaninae so far known from Meghalaya, are keyed, and discussed wherever deemed necessary, along with the morphology and methodology in aid of understanding the family Tabanidae.

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ASILID (DIPTERA)

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The insect fauna of Meghalaya is poorly known and therefore the Zoological Survey of India recently undertook a number of faunistic surveys : Garo Hills by Dr. R. K. Ghosh in June—July 1988, by Dr. A. K. Hazra in March-April 1991, and by Sri B.N. Das and Sri P. Parui in April-May 1991; Khasi Hills by Dr. A. R. Lahiri in August-September 1988, by Dr. S. K. Ghosh in March 1991, by Dr. A. K. Sanyal in March-April 1991, and by Dr. R. C. Basu in November 1991; Garo and Khasi Hills by Dr. M. S. Shishodia in May-June 1990, and by Dr. B. C. Das in May-June 1991; and Jaintia Hills by Dr. V. D. Srivastava in December 1988-January 1989. The asilid material collected during these surveys as well as those species that are reported in literature are included in the paper to give uptodate knowledge of robberflies of Meghalaya.

The species whch are reported from literature are indicated in asterik.

We owe mainly to Ricardo (1919, 1922) and Bromerly (1935) for the pioneering work on Asilidae from Meghalaya. For over a decade Joseph & Parui have been studying Asilidae extensively from India and adjacent countries and they have considerably enhanced our knowledge, including that from Meghalaya.

MORPHOLOGY AND TERMINOLOGY

Morphological characters of taxanomic importance are dealt by us in *'The Fauna of India and the adjacent countries,,* Diptera, Asilidae, Part I' (in press), which we have followed in this paper.

SYSTEMATIC ACCOUNT

FAMILY ASILIDAE

KEY TO SUBFAMILIES

1. Palpus one segmented 2
   Palpus two segmented 3

** The subfamily Leptogastrinae is not so far recorded from Meghalaya.

2. Elongate and very slender species, marginal cell open, alula absent, first flagellomere short, ovoid with a long bristle-like style ..... Leptogastrinae**
   Slender or robust species, marginal cell closed, first flagellomere long and slender with microsegment bearing short, bristle-like style..... Asilinae
3. Marginal cell open, first flagellomere spindle-shaped with apical microsegment, fourth posterior cell generally open or closed in the margin, females usually with circlet of spines on acanthophorites..... Dasypogoninae
   Marginal cell closed, first flagellomere rodlike or clavate with apical pit, fourth posterior cell generally closed and stalked..... Laphriinae

Key to tribes of subfamily Laphriinae

1. Vein M_3 straight and parallel with outer margin of discal cell, often in line with it ..... Atomosini
   Vein M_3 curved and not paralled with outer margin of discal cell, and not in line with it except in *Orthogonis* ..... Laphriini

Key to genera of tribe Laphriini

1. Proboscis laterally flattened like paper knife on edge 2
   Proboscis dorsoventrally compressed, short and pointed at apex 3
2. Bare species, scutum and abdomen brilliant metallic green, blue or purple, facial gibbosity medially developed ..... ***Maira***
   Comparatively setate, scutum usually not metallic coloured but abdomen partly so, facial gibbosity more developed ..... Laphria
3. Wing with three submarginal cells, ambient vein complete.....***Pogonosoma*** (1 species only)
   Wing with two submarginal cells, ambient vein absent ..... ***Nusa*** (1 species only)

Genus 1. ***Laphria*** Meigen

1803. *Laphria* Meigen, *Magazin Insektkde*, 2 : 270

Key to species of ***Laphria*** Meigen

1. Wing dimidiate being basal third clear, hypandrium bifurcate, mystax yellowish-brown ..... *assamensis*
   Wing not dimidiate 2
2. Wing dark brown at distal one-fourth which continues along hind half upto alula,

femur yellowish-brown, first flagellomere black, rest brown ..... *orientalis*

Wing uniformly brown, femur black with yellowish brown apex, antenna black ..... *luteopilosa*

1. *Laphria assamensis* Joseph & Parui, 1981

1981. *Laphria assamensis* Joseph & Parui, *Ent. Scand.* 12 : 215- 216.

Material examined : 1 ♀, West Garo Hills district : Tura, 1067-1189m., 15.vii-19.viii. **1917,** Coll. S. Kemp.

Distribution : Meghalaya (Garo Hills).

2. *Laphria luteopilosa* Joseph & Parui, 1981

1981. *Laphria luteopilosa* Joseph & Parui, *Ent. Scand.* 12 : 216.

Material examined : 1 ♂, West Garo Hills district : Tura, 1067-1189 m., 15.vii-30.viii. 1917, **Coll.** S. Kemp.

Distribution : Meghalaya (Garo Hills), Assam and Sikkim.

3. *Laphria orientallis* Joseph & Parui, 1981

1981. *Laphria orientalis* Joseph & Parui, *Ent. Scand.* 12 : 214-215.

Material examined : 2 ♀, West Garo Hills district : Tura, 1067-1189 m., 15.vii - 30.viii. **1917,** Coll. S. Kemp.

Distribution : Meghalaya (Garo Hills), Assam and Nagaland.

Genus 2. *Maira* Schiner

1866. *Maira* Schiner, *Verh. Zoo.-bot. Ges. Wien,* 16 : 673.

Key to species of *Maira* Schiner

Mystax black, thorax and abdomen with metallic purplish reflection ..... *longirostrata*

Mystax black with a few pale yellow bristles below thorax and abdomen with metallic green reflection ..... *delfinadoi*

4. *Maira delfinadoi* Joseph & Parui, 1981

1981. Maira delfinadoi Joseph & Parui, *Ent. Scand. 12* : 220-221.

Material examined : 1 ♀, West Garo Hills district : Tura, 1067-1189m., 15.vii - 30.viii. 1917, coll. S. Kemp.

Distribution : Meghalaya (Garo Hills) and West Bengal.

5. *Maira longirostrata* Bromley, 1935

1935. *Maira longirostrata* Bromley, *Rec. Indian Mus. 37* : 227.

1990. *Maira longirostrata* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 17.

Material examined : 1 ♀, West Garo Hills district : Above Tura, 380480 m., 15.vii - 15.viii. 1917, Coll. S. Kemp.

Distribution : Meghalaya (Garo Hills) and West Bengal.

Genus 3. *Nusa* Walker

1851. *Nusa Walker, Insecta Saundersiana*, 1 : 105.

6. *Nusa premilaae* n. sp.
(Fig. 1)

A medium to rather large sized black species with dense grey tomentum, black and pale yellow to yellowish-brown legs, and infuscated wings. Male : length 15-17 mm, wing 7-8 mm; female : length 12-13 mm, wing 7-9 mm.

Males : Head as broad as or broader than thorax, black covered with dense grey tomentum; mystax pale yellow, fronto-orbital bristles pale yellow or white, ocellar bristles and postocular bristles pale yellow, postgena with dense white setae. Antennal scape and pedicel black, first flagellomere, bicoloured, black basally and yellowish-brown distally, pedicel subequal to scape, first flagellomere longer than scape. Palpus and proboscis white setose.

Thorax black, gren tomentose; pronotum with a transverse row of white bristles, laterally white setose; scutum with a mediolongitudinal black stripe extending from anterior border to slightly before the hind border, the stripe in paratype faintly divided anteriorly by a narrow, grey stripe, laterally with 2 black, coalescent spots; chaetotaxy : 2 notopleurals, 3 postalars, 3 supra-alars, anterior to the transverse suture laterally with 3 or more additional bristles; scutellar disc with black setae and border with a transverse row of pale yellow or pale yellow and black bristles; laterotergite with elongate bristly setae. Haltere pale yellow.

Legs black and pale yellow to yellowish-brown, coxa blac, trochanter yellowish-brown, femur black above and pale yellow to yellowish-brown below, fore and mid tibiae ale yellow to yellowish brown with black apex, hind tibia more than half black distally, tarsal segments in fore and mid legs pale yllow or yellowish-brown basally and black apically, hind tibia predominantly black; vestiture wholly pale yellow or with some black setae,

bristles pale yellow; fore tibia and basitarsus ventrally with a mat of golden yellow pubescence.

Wing infuscated with the base hyaline; R5 and M1 united well before the border.

Abdomen with terga on sides and hind border golden yellow leaving a median, triangular blac, area, tomentum sparese on terga 6 and 7, tergum 1 laterally with a few white bristles, terga 2-5 with one or three white bristles; vestiture pale yellow. Male genitalia (Fig. 1A) black with pale yellow setae.

Females : Similar but with the following differences : comparatively darker coloured; abdomen with black and pale yellow vestiture. Genitalia (Fig. 1B) figured.

Holotype ♂, Reg. No. 7850/H6, Meghalaya : West Garo Hills Dist : Tura : Damalgiri, 21. iv. 1991, Coll. P. Parui, Paratypes 1 ♂, 2 ♀, Reg. No. 7851/H6 to 7853/H6, rest of data as in holotype.

It is similar to *Nusa aequalis* Walker from which it can be differentiated in the bicoloured first flagellomere, wholly pale yellow mystax and postocular bristles and bicoloured femora. Male of *N. aequalis* Walker is not known for comparison. The species is named in honour of Miss P. Premila, our colleague, who has typed the draft and the final manuscript of the *Fauna of India* Asilidae, Part I, and many of our papers on Asilidae.

Genus 4. Pogonosoma Rodani

1856. *Pogonosoma* Rondani, Dipterol. ital. Prodr. 1 : 160.

7. *Pogonosoma cedrusa* Ricardo*

1927. *Pogonosoma cedrusa* Ricardo, *Ann. Mag. nat. Hist. (9) 20* : 211.

1990. *Pogonosoma cedruse* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 19.

Diagnosis : Mystax black with a few fine, white setae; thorax and abdomen shining purple bluish; legs dull bluish but anterior pair more brownish than blue; wing hyaline at base, rest brown tinged, frist posterior cell widely open.

Distribution : Meghalaya (Khasi Hills) and Himachal Pradesh.

Tribe Atomosini

Genus 5. *Opeatocerus* Hermann

1912. *Opeatocerus* Hermann, *Nova Acta Leop.-carol Akad. Naturf.96* : 16.

8. *Opeatocerus purpurata* (Westwood), 1849

1849. *Atomosia purpurata* Westwood, *Trans. Ent. Soc. London* 5 : 233.

1990. *Opeatocerus purpurata* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 21.

Material examined : 3♀, South Garo Hills district : Siju Cave area, 27. iv. 1991, Coll. B.N. Das.

Diagnosis : Antenna and mystax black; scutum and scutellum purple blue, their posterior margins yellowish tomentose; wing uniformly brown; legs yellow, hind tibia dark brown, tibiae with scatterd long, black setae; abdomen dull blue.

Distribution : Meghalaya (Garo Hills), Assam and Tamil Nadu.

Remarks : Here it is recorded for the first time from Meghalaya.

Key to tribes of subfamily Dasypogoninae

1. Prosternum isolated and surrounded by membrance, ninth sternum divided into two acanthophorites ..... Saropogonini
   Prosternum complete with little or without membranous area 2
2. Frons and vertex strongly diverge, a vertex eyes much apart than at antenna, first flagellomere with plumose arista except in *Clinopogon*, *Stichopogon* and *Holopogon* ..... Stichopogonini
   Frons and vertex not strongly divergent, eyes very large, first flagellomere with bristle-like terminal style, scutum elevated and arched..... Damalini

Tribe Damalini

Genus 6. ***Damalis*** Fabricius

1805. *Damalis Fabriius, Systema Antliatorum* : 147.

9. *Damalis danieli* Joseph & Parui (*in press*)

Damalis danieli Joseph & Parui, Colemania (*in press*)

Material examined : 2♂, Ri-Bhoi district : Nongpoh, 5. v. 1985. Coll. K. Ghorpade.

Diagnosis : Antenna blck with style distally white; scutum bears a broad longitudinal black stripe, scutellum ridged on hind border bearing a few long, pale yellow setae; wing pale yellow; fore and mid femur yellowish-brown with dark brown apex; abdomen black with each tergum basally and laterally yellowish-brown to a varying extent.

Distribution : Meghalaya (Khasi Hills) and Assam.

Tribe Saropogonini

Genus 7. ***Cyrtopogon*** Loew

1847. *Cyrtopogon* Loew·Linn. *Ent.* 2 : 516.

10. ***Cyrtopogon khasiensis*** Bromley, 1935*

1935. *Cyrtopogon khasiensis* Bromley, *Rec. Indian Mus. 37* : 228.

1990. *Cyrtopogon khasiensis* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 23.

Diagnosis : Scutum with two median black lines, scutellum whitish tomentose with **black** setae; wing hyaline; legs black except base of tibiae brownish; abdomen shining **black,** tufts of yellowish setae laterally on terga 1 and 2, terga 5 and 6 wth a white patch; **ovipositor** with brownish spines.

Distribution : Meghalaya (Khasi Hills) and West Bengal.

Tribe Stichopogonini

Genus 8. ***Stichopogon*** Loew

1847. *Stichopogon* Loew, *Linn. Ent.2* : 499.

1. Wing hyaline with some dark brown patches, lamellae gradually narrowed to tip ..... *ramakrishnai*
   Wing lightly infuscated, shape of lamellae different 2
2. All femora black, lamellae broder at apex than at base ..... *indicus*
   All femora orange except fore and hind femora black dorsally on distal two-thirds, lamellae almost uniformly broad ..... *tomentosus*

11. ***Stichopogon indicus*** Joseph & Parui, 1984

1984. *Stichopogon indicus* Joseph & Parui, *Bull. zool. Surv. India 6* : 249.

Material examined : 2♂, 2♀, South Garo Hills district : Gasuapara, 28 iv. 1991, Coll. **B.N. Das.**

Distribution : Meghalaya (Garo Hill), Andhra Pradesh, Assam, Maharashtra and **Rajasthan.**

Remarks : Here it is recorded for the first time from Meghalaya. Male genitalia in these **specimens** shows minor variations.

12. *Stichopogon ramakrishnari* Joseph & Parui, 1988

1988. *Stichopogon Ramakrishnai* Joseph & Parui, *Oriental Ins. 22 :* 92-93.

Material examined : 4 ♀, South Garo Hills district : Baghamara, from river bed, 29.iv,1991, Coll. B.N. Das.

Distribution : Meghalaya (Garo Hills) and Andhra Pradesh.

Remarks : The species was described from Andhra Pradesh. This is the second record of the species and for the first time from Meghalaya.

13. *Stichopogon tomentosus* Oldroyd, 1948

1948. *Stichopogon tomentosus* Oldroyd, *Ent. Monthly Mag. 84 :* 263.

1990. *Stichopogon tomentosus* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 42.

Material examined : 1 ♂, 3 ♀, 2 exs. tip of abdomen lost, South Garo Hills district : Sibbari, 26.iv.1991, Coll. B.N. Das.

Distribution : Meghalaya (Garo Hills), Andaman Islands, Bihar, Karnataka, Rajasthan, Uttar Pradesh and West Bengal.

Remarks : This is the first record from Meghalaya.

Key to tribes of subfamily Asilinae

Antennal style plumose .... Ommatini
Antennal style bare .... Asilini

Key to genera of tribe Ommatini

1. Hind femur with tooth-like projection near base ..... Merodontina Enderlein (1 species only)
   Hind femur without any tooth-oke projection 2
2. Style plumose in one row, a tuft of stiff setae medial to the haltere and below the postnotal callosity, epandrium straight with a long, sigmoid, apically hooked process ..... *Cophinopoda* (1 species only)
   Style plumose in one or two rows, such tuft of setae absent, epandrium curved and apically apposed ..... *Ommatus*

Genus 9. *Cophinopoda* Hull

1958. *Cophinopoda* Hull, Proc. etc. Soc. Wash. 6 : 251.

14. *Cophinopoda chinensis* (Fabricius), 1794*

1794. *Asils chinensis* Fabricius, *Ent. Syst.* 4 : 383.

1990. *Cophinopoda chinensis* : Joseph & Parui *Rec. zool. surv. India*, Occ. Paper No. 113 : 35.

Diagnosis : Mystax yellow, a tuft of yellow setae on fronto-orbital plate along eye margin and another tuft on either side of antenna; legs black except yellow tibiae; epandrium convex with a long curved with a long curved ventral process.

Distribution : Meghalaya (Garo Hills), Andhra Pradesh, Assam, Bihar, Kerala, Orissa, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal; China; Japan; Java; Korea; Sri Lanka; Sumatra.

Genus 10. *Merodontina* Enderlein

1914. *Merodontina* Enderlein, *Zool. Anz.* 44 : 262.

15. *Merodontina spinulosa* Joseph & Parui (*in press*)

Merodontina spinulosa Joseph & Parui, *Colemania (in press).*

Material examined : 1 ♂, Ri-Bhoi district : Nongpoh, 2 km. S., 5.v.1985, Coll. K. Ghorpade.

Diagnosis : Mystax white, antenna dark brown; scutum with mediolongitudinal black stripe; all femora yellow with black apex, tibiae yellow, hind tibia black at apex; wing basally hyaline and distally infuscated; epandrium spinose at apex.

Distribution : Meghalaya (Khasi Hills).

Genus 11. *Ommatius* Wiedemann

1821. *Ommatius* Wiedemann, *Dipt. exot.* 1 : 213.

Key to species of *Ommatius* Wiedemann

1. All femora black 2
   All femora dark brown dorsally and yellowish-brown ventrally, fore and mid tibiae with dense, long setare above ..... *kempi*
2. Abdomen claate, epandrium curved with no apical projection ..... *bengalensis*
   Abdomen not clavate, epandrium straight with a finger-like projectin dorsally ..... *meghalayensis*

16. *Ommatius bengalensis* Joseph & Parui, 1987

1987. *Ommatius bengalensis* Joseph & Parui, *Bull. zool. Surv. India,* **8** (1-3) : 228-229.

Material examined : 1 ♂, 3 ♀, South Garo Hills district: Sibbari, 26.iv.1991; 1 ♂, 1 ♀, West Garo Hills district : Gasuapara, 28.iv.1991, all Coll, B.N. Das.

Distribution : Meghalaya (Garo Hills) and West Bengal.

Remarks : This is the first record from Meghalaya.

17. *Ommatius kempi* Joseph & Parui, 1983

1983. *Ommatius kempi* Joseph & Parui, *Ent. Scand. 14* : 96.

Material examined : 1 ♂, West Garo HIlls district : Tura, 1967-1189 m., 15.vii - 30.viii.1917, Coll. S. Kemp.

Distribution : Meghalaya (Garo Hills).

18. *Ommatius meghalayensis* Joseph & Parui (in press)

Ommatius meghalayensis Joseph & Parui, *Colemania (in press)*

Material examined : 5 ♂, 3 ♀, South Garo Hills district : Siju Cave area, 27.iv.1981, Coll, B.N. Das.

Distribution : Meghalaya (Garo and Khasi Hills).

Tribe Asilini

Key to genera of tribe Asilini

1. Submarginal cells three, radial fork longer than second posterior cell, in female tenth segment with numerous short spines, the apical pair being longer .... ***Philodicus***
   Submarginal cells two 2
2. Fourth posterior cell bulged forward making discal cell strongly constricted, in male marginal and submarginal cells bulged outwards with costa, first vein almost fused with costa, ovipositor strongly compressed laterally.....***Clephydroneura***
   Fourth posterior cell not bulged forward, discall cell of normal shape, ovipositor of different pattern 3
3. Basitarsi of all legs well developed, at least equal to the length of following two segments 4
   Basitarsi not so developed 5
4. Male genitalia pedunculate, epandrium long, arched upwardsw and hypandrium arched downwards forming a distinct gap, basitarsus of fore leg highly

swollen ..... *Astochia*

Male genitalia not so pendunculate, epandrium not long, broad at base and with a deep lateral constriction, basitarsus of fore leg not so swollen ..... *Neoitamus*

5. Disc of scutellum and abdominal terga from second to fifth matred wit stiff piles, antenal style quite short and stout ..... *Trichomachimus*

Scutellum and abdomen not densely pilose 6

6. Facial tubercle highly developed extending almost upto antenna, aedeagus three pronged 7

Facial tubercle less developed, aedeagus with prongs 8

7. Eighth sternum rounded at apex, scutellar disc with dense, long, bristly setae ..... *Machimus*

Eighth sternum excised at apex, scutellar disc with a few, short, scattered bristles or setae ..... *Eutolmus* (1 species only)

8. Mid femur with a cluster of spinous bristles and mid tibia with a row of spinous bristles along base ..... *Hoplopheromerus*

Mid femur and tibia without such spines but may be with strong, isolated setae 9

9. Epandrium highly developed and complicated, ovipositor small, not laterally compressed, antennal style as long as the combined scape and pedicel..... *Orophotus* (1 species only)

Epandrium less developed and less complicated, ovipositor long, laterally compressed, atennal style much shorter than combined scape and pedicel.....*Neomochtherus* (1 species only)

Genus 12. *Astochia* Becker

1913. *Astochia* Becker, *Ann. Mus. Zoo. Acad. St. Petersburg 17* : 538.

Key to species *Astochia* Becker

Scape and pedicel combined together one-and-half times and length of first flagellomere, style almost double the length of first flagellomere, femora black.....*femorata*

Scape and pedicel combined together as long as the first flagellomere, style slightly longer than first flagellomere, femora yellowish-brown ..... *determinatus*

19. *Astochia determinatus* (Walker), 1860*

1860. *Asilus determinatus* Walker, *J. Linn. Soc. Lond. 4* : 107.

1975. *Astochia determinatus* : Oldroyd, *A Catalog of Diptera of the Oriental Region* 2 : 139.

Distribution : Meghalaya (Garo Hills), and West Bengal; Cnelebes; Sri Lanka.

20. *Astochia femorata* Joseph & Parui (*in press*)

Astochia femorata Joseph & Parui, *Rec. zool. Surv. India (in press).*

Material examined : 2♂, South Garo Hills district : Gasuapara, 28.iv.181, Coll. B.N. Das.

Distribution : Meghalaya (Garo Hills) and West Bengal.

Remarks : Here it is recorded for the first time from Meghalaya.

Genus 13. *Clephydroneura* Becker

1925. *Clephydroneura* Becker, *Ent. Mitt.* 14 : 68.

Key to species of *Clephydroneura* Becker

Anterior border of wing in male highly bulged, epandrium uniformly brown coloured ..... *thangavelui* n. sp.

Anterior border of wing in male not bulged, epandrium black and red..... *minor*

21. *Clephydroneura minor* Oldroyd, 1938*

1938. *Clephydroneura minor* Oldroyd, *Ann. Mag. nat. Hist.* (11)1 : 461.

1990. Clephydroneura minor : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 51.

Distribution : Meghalaya (Khasi Hills) and Assam.

22. *Clephydroneura thangavelui* n. sp.
(Fig. 2)

A medium black species with black or dark brown and pale yellow legs and apically infuscated wings; in male wings bulged anteriorly. Male : length 16-17 mm, wing 11 mm; female : 14-19 mm, wing 12-13 mm.

Males : *Head* as broad as thorax, black with dense grey tomentum; mystax pale yellow, fronto-orbital setae pale yellow, ocellar bristles black, postcular bristles black, postcranium with sparse white setae, postgena white setose. Antenna wholly yellowis-brown, or scape black, pedicel yellowish- brown, first flagellomere black basally and yellowish-brown distally, scape and pedicel with black setae, pedicel about half the length of scape, first flagellomere shorter than scape. Palpus and proboscis black with pale yellow setae.

Thorax black sparsely grey tomentose; pronotum with a transverse row of 4 pale yellow bristles; scutum with a mediolongitudinal black stripe extending from anterior border to well beyond the middle of transverse suture and hind border, the stripedivided by an orange stripe which is faint in holotype, laterally with the 3 usual confluent black spots; vestiture black except for a few pale yellow setae laterally, bristles black; chaetotaxy : 2 notopleurals, 1 postalar, 1 supraalar; scutellar disc with black setae, border devoid of bristles; laterotergite wi a few long, setae. Haltere dark brown with the stalk pale yellow.

Legs black or dark brown and pale yellow; coxa and trochanter black, fore femur posteriorly black in holotype and dark brown in paratype, the remainder pale yellow, tibia pale yellow with dark brown apex which increases from fore to hind tibia, tarsus pale yellow to yellowish-brown with dark brown apex, vestiture predominantly pale yellow with a few black setae, bristles black, mid and hind femora with an anteroventral row of bristles.

Wing apically infuscated which along the border extends into the fifth posterior cell; fore border bulging, discal cell strongly constricted.

Abdomen dark brown or black, tergum 1 laterally with a few, long, pale yellow setae amidst which with 1 or 2 black or black and pale yellow bristles, terga 2-5 laterally with 2 pale yellow bristly setae, vestiture pale yellow. Genitalia (Fig. 2) black with black setae.

Females : Similar to male but with the following differences : in one paratype antennae wholly dark brown; legs in one example comparatively lighter coloured; vestiture of abdomen predominantly black. Genitalia black, 8th tergum and sternum elongate, the latter extends upto the middle of tergum 9, tergum 9 slender apically, proctiger about half the length of tergum 9.

Holotype ♂, Reg. No. 7854/H6, Meghalaya : Jaintia Hills : Jawai, 21.v.1990, Coll. M.S. Shishodia. *Paratypes* 1♂, 2♀, Reg. No. 7855/H6 to 7857/H6, rest of data as in holotype.

Clephydroneura thangavelui n. sp. is generally similar to *Clephydroneura suknaensis* Joseph & Parui, but the former is much smaller with the anterior border of wing in male being well bulged and the epandrium is without subapical projection. The species is named in honour of our colleague Mr. C. Thangavelue who has helped us in drawing a large number of our text-figures on Asilidae, including the ones given in the *Fauna of India*, Asilidae, Park 1.

Genus 14. *Eutolmus* Loew

1848. *Eutolmus Loew, Linn. Ent.* 3 : 459.

23. *Eutolmus tolmeroides* (Bromley), 1928*

1928. *Dysmachus tolmeroides* Bromley, *Amer. Mus. Novit.*, 336 : 3.

1962. *Eutolmus tolmeroides* : Hull, *Robberflies of the World.* The genera of the family Asilidae, Smithsonian Institution, Bulletin 224, part 2 : 566.

Diagnosis : Mystax predominantly black with a few pale yellow bristles; legs black with black setae and bristles; fore and hind tibiae and tarsi thickly covered with minute ferruginous setae; wings hyaline with apex and posterior border grey; dorsal setae of abdomen black and lateral setae and bristles yellowish.

Distribution : Meghalaya (Khasi Hills) and in Palaearctic Region.

Genus 15. *Hoplopheromerus* Becker

1925. *Hoplopheromerus* Becker, *Ent. Mitt. 14* : 24.

24. *Hoplopheromerus armatipes* (Macquart), 1855

1855. *Asilus armatipes* Macquart, *Dipt. Exot. Suppl.* 5 : 63.

1990. *Hoplopheromerus armatipes* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 54.

Material examined : 1♂, West Garo Hills district : Tura, 1067-1189 m., 15.vii - 30.viii. 1917, Coll. S. Kemp.

Diagnosis : Mystax golden yellow with a few black setae; antenna reddish; legs reddish-yellow, mid femur with a double row of stout, short, bristles; abdomen black with black bristles, last segment with deep golden yellow pubescence; epandrium bifid.

Distribution : Meghalaya (Garo Hills); Formosa; Japan; Mongolia.

Remarks : Here it is recorded for the first time from India.

Genus 16. *Machimus* Loew

1849. *Machimus* Loew, *Linn. Ent.* 4 : 1.

Key to species of Machimus Loew

1. Eighth sternum of male produced.....2
   Eighth sternum of male not produced.....5
2. Eighth sternum highly produced conically with long setae at apex.....3
   Eighth sternum not so produced and of different shape.....4
3. Epandrium almost straight and uniformly broad, eighth sternum with a brush of long setae on apical half, femora black..... *khasiensis*
   Ependrium curved and gradually narrowed at apex, eighth sternum with scattered long setae, femora anteriorly and ventrally black, rest yellowish-brown..... *montanus*
4. Femora yellowish-brown posteriorly, rest blac, epandrium yellowish-brown with black appex, eighth sternum with long, black setae at apex.....*hirtipes*
   Femora yellowish-brown to dark brown, epandrium black, eighth sternum with a mat of orange yellow setae at apex.....*pallipes*
5. Mystax pale yellow with some black bristles above, fore femur ventrally with a

row of long, pale yellow setae decreasing in length from base to apex.....*ricardoi*
Mystax whitish surrounded by black bristles, fore femur ventrally with a row of long, white setae basally.....*incisularis*

25. *Machimus hirtipes* Ricardo, 1919

1919. *Machimus hirtipes* Ricardo, *Ann. Mag. nat. Hist.* (9)3 : 49.

1990. *Machimus hirtipes* : Joseph & Parui, Rec. zool. Surv. India, Occ. Paper No 113 : 56.

Material examined : 1♂, Meghalaya : Khasi Hills, date of collection not given, Coll. A. Chennel, B.M.N.H., London.

Distribution : Meghalaya (Khasi Hills), Kerala and Tamil Nadu.

26. *Machimus incisularis* Bromley, 1935

1935. *Machimus incisularis* Bromley, *Rec. Indian Mus* 37. : 220.

1990. *Machimus incisularis* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 56.

Material examined : 1♂, 1♀, East Khasi Hills : Cherrapunji, 3.x.1961, Coll. E.S. Ross and D.Q. Cavagnaro.

Distribution : Meghalaya (Khasi Hills) and West Bengal.

27. *Machimus khasiensis* Ricardo, 1919

1919. *Machimus khasiensis* Ricardo, Ann. Mag. nat. Hist. (9)3 : 51.

1990. *Machimus khasiensis* : Joseph & Parui, Rec. zool. Surv. India, Occ. Paper Np. 113 : 56.

Material examined : 1♂, 1♀, East Khasi Hills district, upper Shillong, 6.vi.1974, Coll. M. Vasanth; 1♂, Jainti Hills district : Jawai, 20.ix.1988, Coll. V.D. Srivastava; 1♂, 4♀, East Khasi Hills district : Shillong, Tripura Castle Road, Coll. M.S. Shishodia.

Distribution : Meghalaya (Khasi Hills and Jaintia Hills)

Remarks : The species has so far been recorded only from Meghalaya, its type locality.

28. *Machimus montanus* Ricardo, 1919*

1919. *Machimus montanus* Ricardo, *Ann. Mag. nat. Hist.* (9)3 : 52.

1990. *Machimus montanus* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 56.

Distribution : Meghalaya (Khasi Hills), Maharashtra, Tamil Nadu and Uttar Pradesh.

29. *Machimus pallipes* Ricardo, 1922

1922. *Machimus pallipes* Ricardo, *Ann. Mag. nat. Hist.* (9)10 : 65.

1990. *Machimus pallipes* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 57.

Material examined : 1 ♂, East Khasi Hills district : Shillong, 1676-1950 m., 29.viii.1915, Coll. S. Kemp; 1 ♂, Shillong, 15.xi.1930, Coll. H.S. Rao.

Distribution : Meghalaya (Khasi Hills), Himachal Pradesh, Punjab, Uttar Pradesh and West Bengal.

30. *Machimus ricardoi* (Bromley), 1935

1935. *Asilus ricardoi* Bromley, *Rec. Indian Mus.* 37 : 219.

1990. *Machimus ricardoi* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 57.

Material examined : 1 ♀, East Khasi Hills district : Shillong, near college, 16.vi.1973, Coll. M.S. Jyrwa.

Distribution : Meghalaya (Khasi Hills), Himachal Pradesh, Sikkim, Uttar Pradesh and West Bengal.

Remarks : Here it is recorded for the first time from Meghalaya.

Genus 17. *Neoitamus* Osten Sacken

1878. *Neoitamus* Osten Sacken, *Smithson. Misc. Coll.* **16** : 82, 235.

Key to species of *Neoitamus* Osten Sacken

Femora yellowish with a black line anteriorly, wing greyish apically, mystax mostly black with some white ones below ..... *khasiensis*

Femora black, wing apically infuscated which continued along posterior border upto fifth posterior cell, mystax pale yellow surrounded by black ones ..... *sedlaceki*

31. *Neoitamus khasiensis* Bromley, 1935

1935. *Neoitamus khasiensis* Bromley, *Rec. Indian Mus.* **37** : 223.

1990. *Neoitamus khasiensis* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 59.

Material examined : 1 ♂, East Khasi Hills district : Mawphlong 1720 m., 7.v.1985, Coll. K. Ghorpade.

Distribution : Meghalaya (Khasi Hills).

32. *Neoitamus sedlaceki* Joseph & Parui, 1987

1987. *Neoitamus sedlaceki* Joseph & Parui, *Bull. zool. Surv. India*, **8** (1-3) : 231-232.

Material examined : 1 ♂, East Khasi Hills district : Shillong Botanic Garden, 20.iv.1980; 2 ♂, Shillong, Elephant Falls, 21.iv.1980; 1 ♂, Ri-Bhoi district : Nongpoh Forest, 25-28.iv.1980, all Coll. Freidburg.

Distribution : Meghalaya (Khasi Hills).

Remarks : The species was described from Nepal. Here it is recorded for the first time from India.

Genus 18. *Neomochtherus* Osten Sacken

1878. *Neomochtherus* Osten Sacken, *Smithson Misc. Coll.* **16** : 82, 235.

33. *Neomochtherus gnavus* (van der Wulp) 1872*

1872. *Mochtherus gnavus* van der Wulp, *Tijdschr Ent.* **15** : 243.

1990. *Neomochtherus gnavus* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 60.

Diagnosis : Mystax pale yellow with a few black bristles above and below; thorax black with black setae and bristles except humeri bearing pale yellow bristles; legs yellow except middle and hind femora black at apex; wing hyaline with apex and posterior margin infuscated; abdomen black.

Distribution : Meghalaya (Khasi Hills), Arunachal Pradesh, Assam, Sikkim and Uttar Pradesh; Borneo; Celebes; Java; Thailand; Sri Lanka.

Genus 19. *Orophotus* Becker

1925. Orophotu Becker, *Ent. Mitt.* **14** : 137.

34. *Orophotus montanus* (Ricardo), 1922*

1922. *Asilus montanus* Ricardo, Ann. Mag. nat. Hist. (9)10 : 72.

1990. *Orophotus montanus* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 61.

Diagnosis : Mystax white; thorax and abdomen blackish-brown, last segment of the latter fringed with yellow setae ventrally; legs reddish-yellow with apex of femora darker; wings hyaline with grey shading at apex and along posterior border.

Distribution : Meghalaya (Khasi Hills), Sikkim and West Bengal.

Genus 20. *Philodicus* Loew

1848. *Philodicus* Loew, *Linn. Ent.* **3** : 391.

Key to species of Philodicus Loew

Epandrium with a well developed projection ventrally, in female eighth sternum bifurcate at apex.....*femoralis*

Epandrium without such projection, eighth sternum in halves from base.....*chinensis*

35. *Philodicus chinensis* Schiner, 1868*

1868. *Philodicus chennsis* Schiner, In *Reise der Osterrichischen Fregatte Novara, Dipt.* : 179.

1990. *Philodicus chinensis* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper N. 113 : 61.

Distribution : Meghalaya (Khasi Hills) and Kerala; Borneo; China; Formosa; Malaya; Thailand.

36. *Philodicus femoralis* Ricardo, 1921

1921. *Philodicus femoralis* Ricardo, *Ann. Mag. nat. Hist.* (9)8 : 190.

1990. *Philodicus femoralis* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 61.

Material examined : 3♂, 5♀, West Garo Hills district : Tura : Damalgiri, 21.iv.1991; 3♂, 4♀, West Garo Hills district : Barangapara, 23.iv.1991, all Coll. B.N. Das.

Distribution : Meghalaya (Garo Hills), Assam, Arunachal Pradesh, Bihar, Boa, Himachal Pradesh, Karnataka, Orissa, Rajasthan, Uttar Pradesh and West Bengal; Myanmar.

Genus 21. *Trichomachimus* Engel

1933. *Trichomachimus* Engel, Ark. Zool. (A) 25(22) : 10.

Key to species of *Trichomachimus* Engel

1. Legs wholly black 2
   Tibiae and tarsi black and yellowish-brown, abdomen with black setae except for a few pale yellow setae on basal two segments.....*hirsutus*
2. Mystax predominantly black with a few pale yellow bristles below, eighth sternum of male well produced with dense elongate golden yellow setae.....*arnàudi*
   Mystax predominantly golden yellow with a few black bristles above, eighth sternum of male not produced.....*orientalis*

37. *Trichomachimus arnaudi* Joseph & Parui (*in press*)

Trichomachimus arnaudi Joseph & Parui, *Wasmann J. Biol. (in press).*

Material examined : 1♂, East Khasi Hills district : Cherrapunji, 1738 m., 3.x.1961, Coll. E.S. Ross and D.Q. Cavagnaro.

Distribution : Meghalaya (Khasi Hills).

38. *Trichomachimus hirsutus* Bromley, 1935*

1935. Trichomachimus hirsutus Bromley, *Rec. Indian Mus.* 37 : 220.

1990. *Trichomachimus hirsutus* : Joseph & Parui, *Rec. zool. Surv. India,* Occ. Paper No. 113 : 67.

Distribution : Meghalaya (Khasi Hills).

39. *Trichomachimus orientalis* (Ricardo), 1922*

1922. *Asilus orinetalis* Ricardo, *Ann. Mag. nat. Hist.* (9)10 : 46.

1990. *Trichomachimus orientalis* : Joseph & Parui, *Rec. zool. Surv. India*, Occ. Paper No. 113 : 67.

Distribution : Meghalaya (Khasi Hills), Delhi, Kashmir, Orisa, Uttar Pradesh and West Bengal.

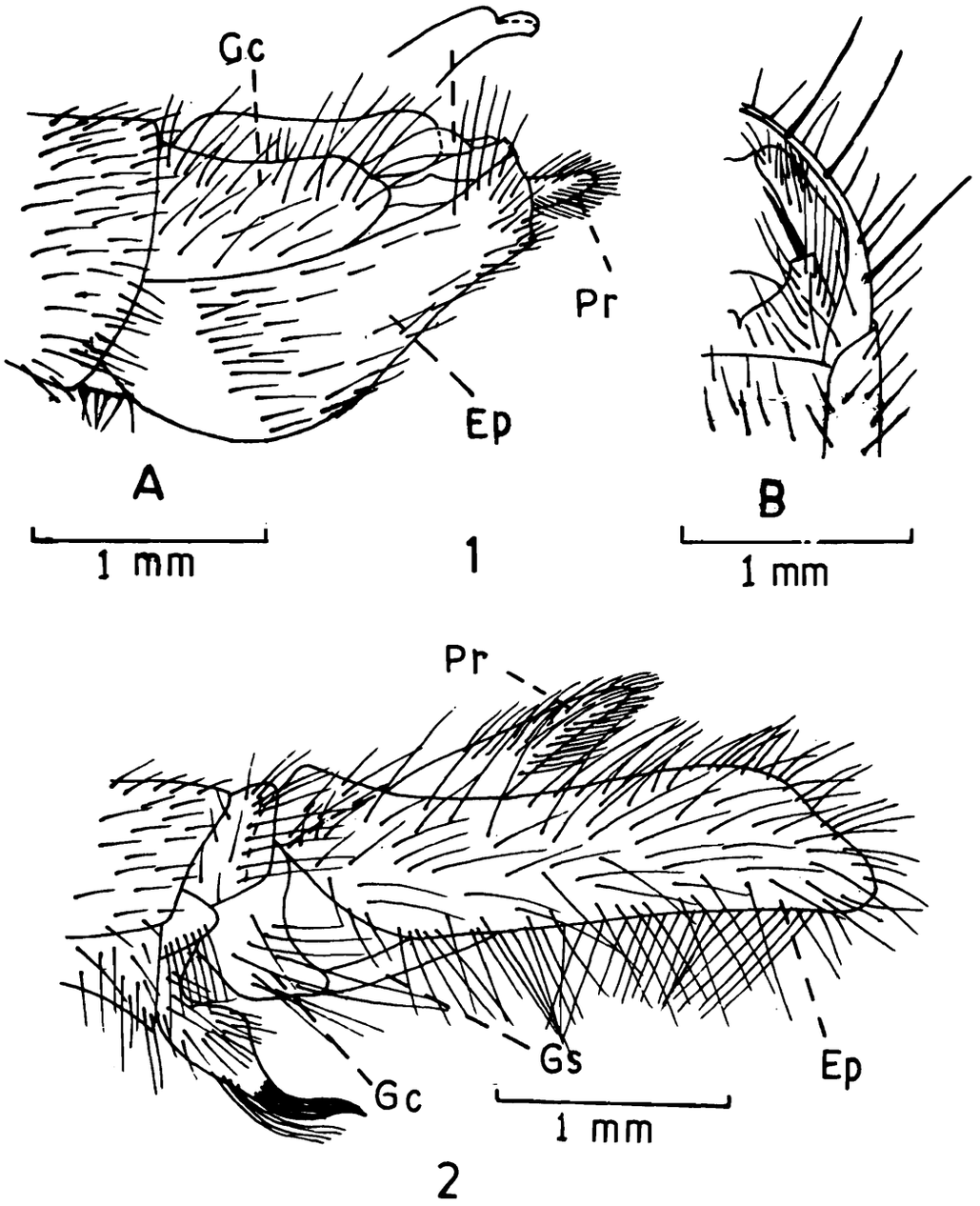
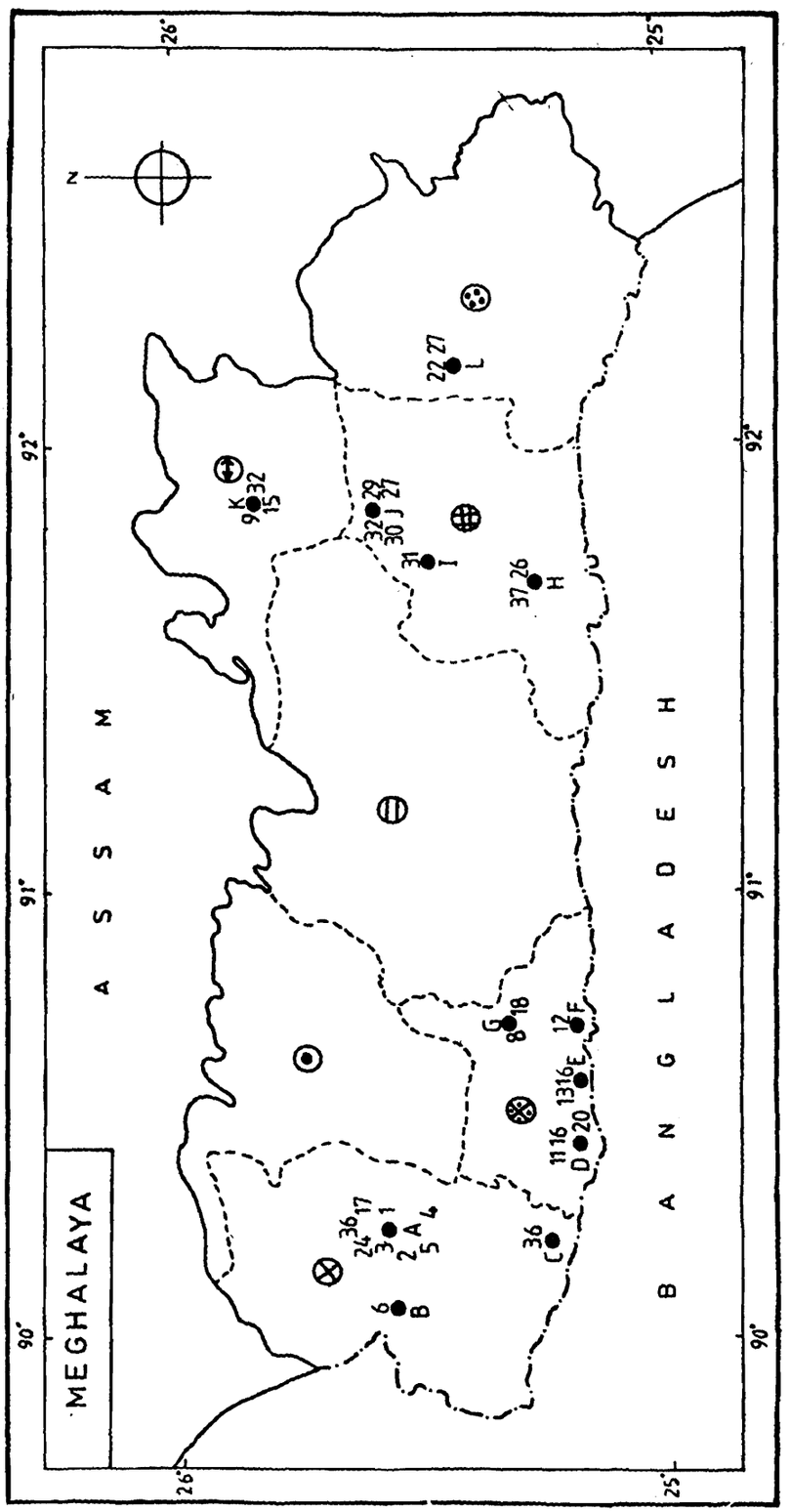


Fig. 1. *Nusa premilaae* n. sp. : A, lateral view of male genitalia; B, ventral view of female genitalia.
Fig. 2. *Clephydroneura thangavelui* n. sp., lateral view of male genitalia.



Distribution of Asilid. Numbers represent the species in the paper.
A, Tura; B, Damalgiri; C, Barangapara; D, Gasuapara; E, Sibbari; F, Baghmara; G, Siju; H, Cherrapunjee; I, Mauphlong; J, Shillong; K, Nongpoh; L, Jowai

SUMMARY

It is the first detailed report of Asilidae from Meghalaya. A total of 39 species of 21 genera are reported, 8 species of which are endemic. Of the 39 species, 7 species are recorded for the first time from Meghalaya, another 2 are reported for the first time from India, *Hoplopheromerus armatipes* (Macquart) and *Neoitamus sedlaceki* Joseph & Parui, and 2 are new to science, *Nusa premilaae* and *Clephydroneura thangavelui*. Key to subfamilies, tribes and genera are given; in cases where more than one species are present under a genus key to species is also included. Diagnostic characters of species are given where only one speices under a genus is reported.

From the view of zoogeography Meghalaya is quite interesting with its multiform ecosystem, excepting coastal zone, which harbours many endemic species as is reported in this paper.

ACKNOWLEDGEMENT

We are extremely thankful to Dr. A.K. Ghosh, Director, Zoological Survey of India Calcutta, for encouragements.

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Abreviations : Ep, epandrium; Gc, gonocoxite; Gs, gonostylus; Pr, proctiger.

1. *Nusa premilaae* n. sp. : A, lateral view of male genitalia; B, ventral view of female genitalia.
2. *Clephydroneura thangavelui* n. sp., lateral view of male genitalia.

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State Fauna Series 4 : Fauna of Meghalaya, Part 6 : 113–176, 1998

INSECTA : DIPTERA : SYRPHIDAE

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INTRODUCTION

The Syrphidae, commonly known as hover flies, flower flies or sun flies, belonging to the Aschiza of the suborder Cyclorrhapha, constitute one of the largest and most distinctive families of the order Diptera. These flies in general are attractive for their brilliant colouration, but they are more remarkable for their act of hovering that they usually exhibit over flowers and nearby herbage (hence the name 'hover flies'). They feed almost exclusively on flowers (hence the name 'flower flies') and are highly beneficial as pollinators. Most of them are sun-lovers and occur everywhere in sunny weather (hence the name 'sun flies'). Many syrphids may be mistaken for various wasps and bees frequenting flowers but they can not escape notice because of their beautiful colouration, characteristic hovering and droning sound they produce while flying. The larval habitats of the syrphid flies often synchronize with their feeding habits and, therefore, the phytophagous larvae generally occur in different parts of plants both externally and internally, the saprophagous larvae may occur either in decaying organic matter or in dirty water or rarely on plants, and the carnivorous larvae usually inhabit plants infested with aphids and nymphs of other Homoptera. Pupae are generally encountered in the larval habitat or in soil in its vicinity. Our knowledge on the immature stages of these flies is, however, very inadequate and much more remains to be learned after Howlett (1909), Fletcher (1916), Bhatia (1931), Bhatia and Shaffi (1993), and Lal and Gupta (1953).

Economically, the Syrphidae are looked upon as more beneficial than detrimental to human beings. Adults greatly help in pollination of flowers, while larvae of the great majority are notable for their role in destructing insect-pests of plants (*cf.* Ghorpade, 1981). Indeed, cases of the larvae of *Eristalis tenax* L. (popularly called 'drone fly') causing intestinal myiasis in humans are known in India. The Syrphidae interest people in their economic importance rather than their attractive appearance. Truly speaking, our knowledge on the behavioural activities of these flies in India is very poor, even the faunal richness too in comparison with that of the countries, especially in the Palaearctic, Nearctic and Ethiopian regions. Meghalaya (Map 1), a remote state lying adjacent to the south-western corner of Assam in the north-east India and to the north of Bangladesh is likely to harbour a rich and interesting fauna but has been deprived of being thoroughly explored since long. Collecting these flies from Meghalaya (in different names for the former Assam cited below) came up with Fabricius who impelled the Danish officials of the Civil Service in India to obtain insect specimens regularly during the last decades of the eighteenth century (*vide* Datta and Parui, 1991), and it

is certain that he had in his possession a few specimens from Khasi Hills remained easily accessible to the visitors of those days, but he could not describe any species. It is true to the fact that Wiedemann (1824) who later seriously studied the Fabricius' Collection kept in the Copenhagen Museum, must have described the first species from the state. Thereafter, Walker (1852) might have described one or more species out of the collections of W. W. Saunders in the British Museum (Nat. Hist.) (now the Natural History Museum, London). Indeed, Bigot (1884, 1885), if not earlier also Macquart (1846), added more species from specimens of the French collectors, because he was the only worker of his time to deal with a good number of dipterous specimens from the erstwhile 'Assam', usually referred to as East Indies, East India, E. Ind., Indes, Indostan, Hindostan, Indes Orientales, India Orientali, Ind. Or., Ostindien, etc. during past centuries. Bigot's large and valuable collection of Diptera including the Indian species, along with some of the Macquart's types was eventually housed in the then British Museum (Natural History) and the Oxford University Museum. After a long lapse, Brunetti (1915, 1923) described eleven species and recorded a good many from certain parts of Khasi, Garo and Jaintia Hills, now under the jurisdiction of the districts : Ri-Bhoi, East Khasi Hills, West Garo Hills and Jaintia Hills wherefrom A. Chennel (in 1878), La Touche (?), F.W.L. Sladen (in 1898), Godwin-Austen (?), E.A.W. Hall (in 1906), S.W. Kemp (in 1910, 1914, 1915, 1917), Mrs. A. Kemp (in 1917) and T.B. Fletcher (in 1916-1918) collected for his works. Yet he borrowed several specimens of this state from abroad for his studies. Subsequently, Hull (1944) described one species and Thompson (1974) recorded another from East Khasi Hills and Ri-Bhoi districts respectively. Besides a number of new records made by Biswas, Lahiri and Ghosh (1974), Hippa (1990) described two species from the state while revising the genus *Milesia* Latr. As a result of these contributions, 60 species under 31 genera of 2 subfamilies were heretofore known from Meghalaya vis-à-vis 256 species and 5 subspecies under 62 genera belonging to 2 subfamilies in India.

Recently, several collecting trips (*vide* Datta and Parui, 1998) were organized by this institute in all 7 districts of Meghalaya for the purpose of addition and revaluation of the faunal components in aid of our comprehensive knowledge. Those trips that brought the syrphid material for this study were led by the following personalities: J. K. Jonathan (April, 1979), P.T. Cherian (April, 1980), R.K. Ghosh (July, 1988), A. R. Lahiri (September-October, 1988), K. K. Ray (March, 1991) and S. K. Ghosh (March-April, 1991). Besides, the material collected by A. K. Ghosh (August, 1972). S. Biswas (November, 1973), M. S. Jyrwa (July, 1977 & May, 1981) and S.J.S. Hattar (May, 1978), and received from our institute at Shillong is incorporated in it. However, the rich collection held by the Zoological Survey of India in Calcutta is taken into consideration only for re-examination and comparison.

The species (marked with an asterisk) and the species with the genus too (with double asterisks) are recorded for the first time from Meghalaya.

MATERIALS AND METHODS

The methods prescribed by Datta (1998) were employed here for collecting, killing and preserving adult syrphid flies and it is, therefore, needless to review here. Indeed, it is a

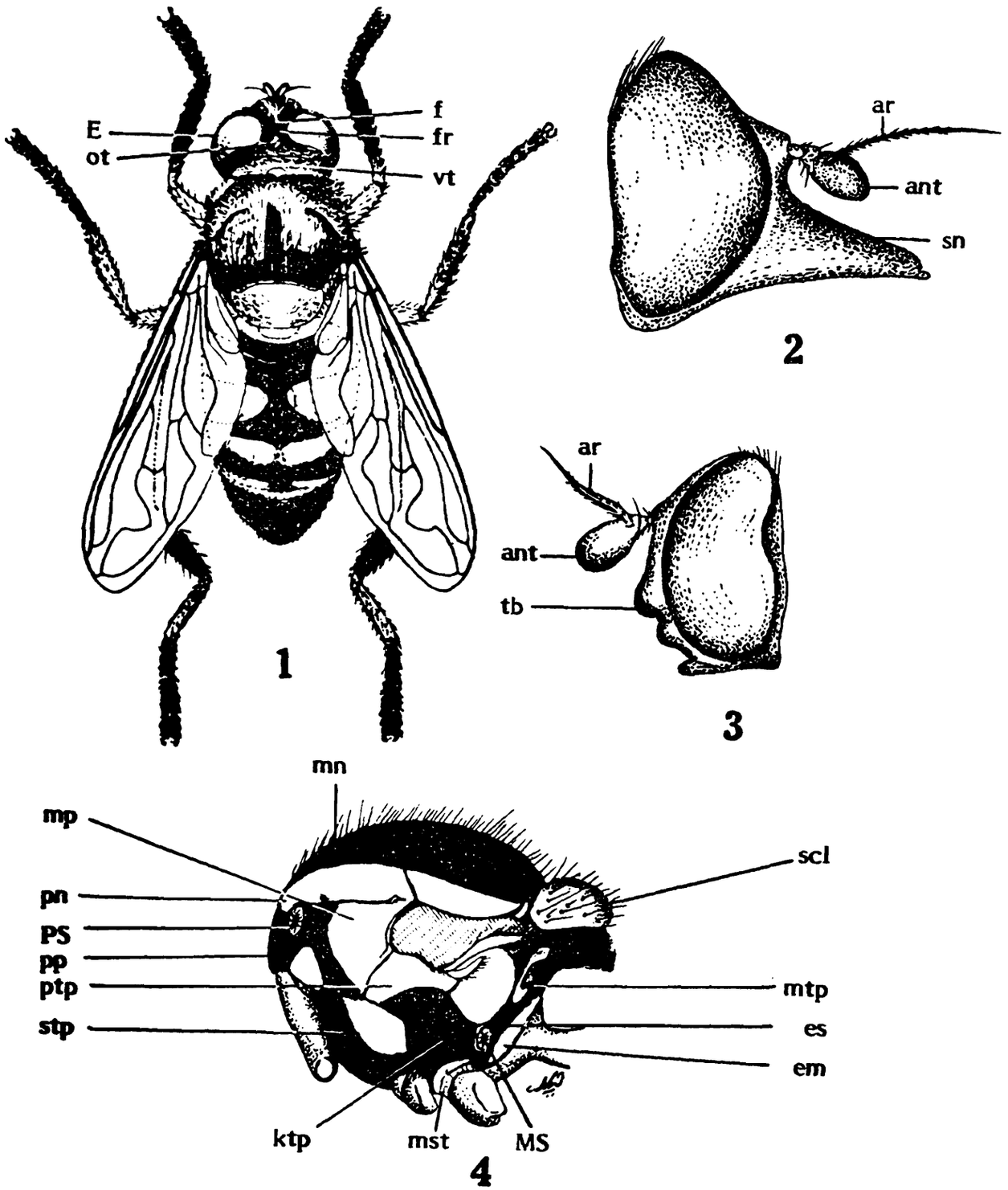
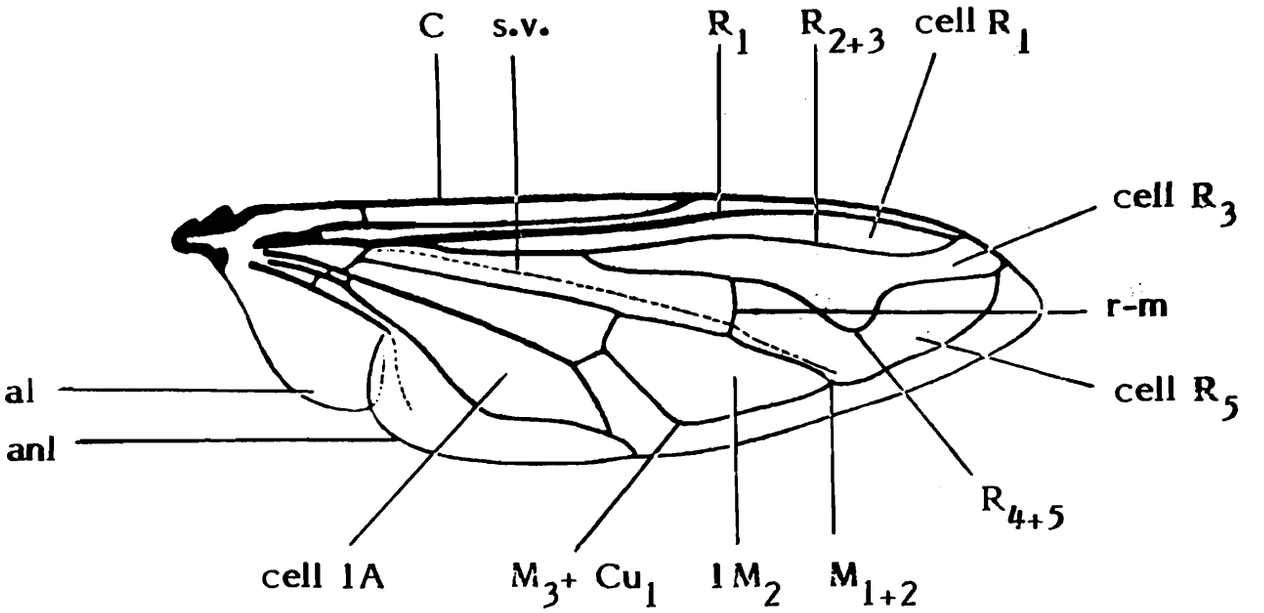


Fig. 1. A female of *Eristalis (Eristalis) tenax* (L.) (Dorsal view); **Fig. 2.** Head of *Rhingia cincta* de Meijere (Lateral view); **Fig. 3.** Head of *Melanostoma orientale* (Wied.) (Lateral view); **Fig. 4.** Thorax of *Sphaerophoria indiana* Bigot (Lateral view).



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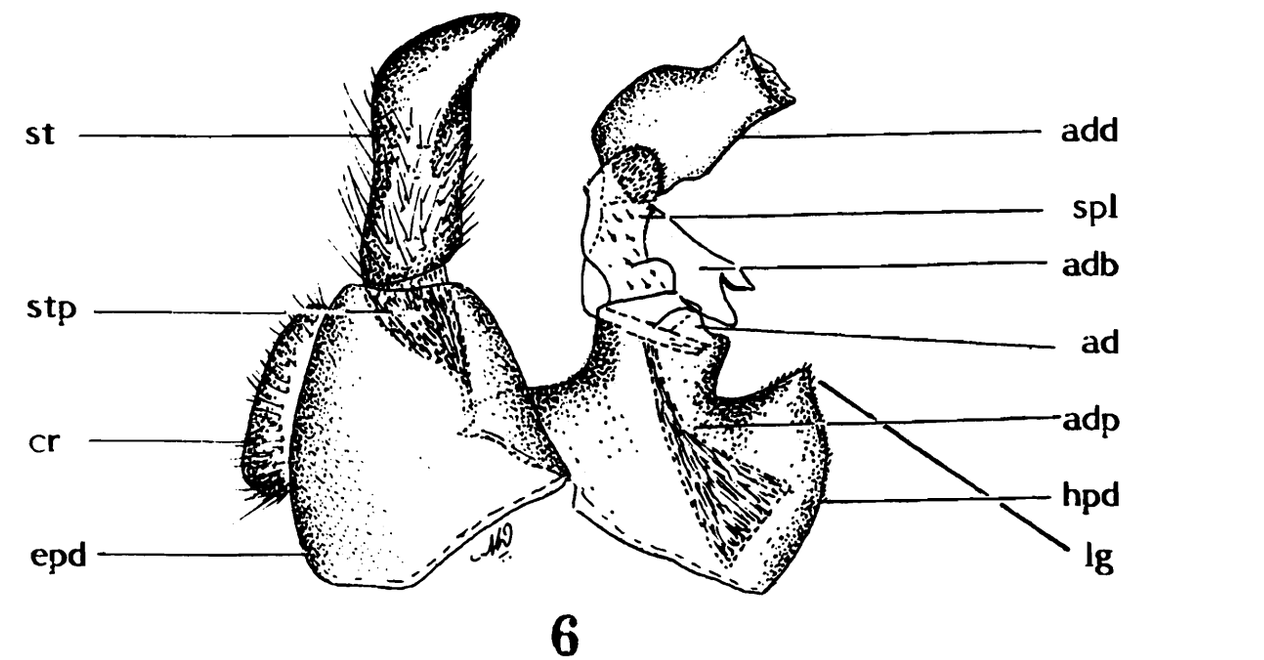

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Fig. 5. Wing of *Eristalis* (*Eristalis*) *tenax* (L.) (Dorsal view); Fig. 6. Male terminalia of *Metasyrphus* (s.s.) *corollae* (F.) (Lateral view).

great pleasure to collect these flies while hovering over flowers or nearby herbages almost motionless in the air, and this is commonly done by sweeping with the help of an insect-net. It should, however, be borne in mind that captured and killed specimens are to be taken out of the net immediately after one or two sweeps only so as to avoid damage because their head gets easily detached on repeated strike.

MORPHOLOGY AND TERMINOLOGY

The Syrphidae (Fig. 1) are almost bristleless flies measuring 4-25 mm in length and are characterized by the presence of an arista usually on the dorsal aspect of the last antennal segment, a false vein called vena spuria or spurious vein between veins R and M (except in *Graptomyza*) and long basal cells and closed apical cells in wings.

I feel to review here the essential features of different taxa of the family occurring in the area for easy access to the keys provided for the purpose of identification.

Head (Figs. 1, 2 & 3) : Eyes (E) are generally contiguous (holoptic) but may be separated from each other slightly in males, and are always wide apart (dichoptic) by the intervening frons (fr) from the vertex (vt) to the base of the face (f) across the ocellar triangle (ot) in females. These are usually haired but the size, density and the location of hairs are diagnostic for certain genera. *Betasyrphus, Dideoides, Paragus, Volucella,* etc. have the eyes always with dense hairs. Whereas *Didea, Epistrophe, Mallota, Rhingia,* etc. have thinly or partially haired eyes, the species of *Allograpta, Episyrphus, Meliscaeva, Baccha, Melanostoma, Phytomia,* etc. are practically with bare eyes. The facial shape is another important character in that the face (f) is generally produced forward and below, resulting in its concavity, convexity and tuberculation, and in different forms and dimensions of the oral opening. In *Volucella, Graptomyza* and especially *Rhingia,* the face takes the shape of a strong and long snout (sn). The face is also moderately produced forward below in *Asarkina* with the oral opening 3-4 times as long as broad. In *Baccha* and *Melanostoma,* the face is usually flat, often with a tubercle (tb) whether it is weak as in *Baccha* or strong in *Melanostoma.* The tubercle is much more developed in the Eristalini, Volucellini and Milesini, whenever present. The oral margin in the Milesinae is usually notched anteriorly. The face may either be unicoloured (e.g. *Didea, Dideoides, Melanostoma, Platycheirus,* etc.) or ornamented by a median stripe, occasionally indistinct (e.g. *Paragus, Sphaerophoria, Graptomyza, Volucella, Eristalis, Mallota, etc.*). It may either be predominantly bare or tomentose (e.g. *Brachypalpus, Criorhina, Xylota,* etc.) or pollinose with sparse pubescence (e.g. *Asarkina, Dideopsis, Episyrphus, Melanostoma, Spheginobaccha,* etc.) or pilose (e.g. *Epistrophe, Baccha, Merodon, Milesia,* etc.).

The 3-segmented porrect (e.g. *Chrysotoxum* and *Monoceromyia*) or drooping antenna (ant) (e.g. other genera) is longer in the former genera and shorter in other genera. The segment 3 is generally in different forms, *viz.*, rounded, oblong, ovate, obovate or elongate, occasionally pointed apically, and holds a terminal style (e.g. *Monoceromyia*) or normally an arista (ar) located dorsally, that may be usually bare (e.g. *Asarkina, Didea, Paragus, Rhingia, Merodon,* etc.) or plumose (e.g. *Volucella, Graptomyza,* etc.) or pilose sparsely on the base (e.g. *Eristalis* (*Eoseristalis*)).

Thorax (Fig. 4): The thorax is usually quadrate (e.g. *Paragus, Volucella,* etc.), subquadrate (e.g. *Episyrphus, Metasyrphus, Melanostoma, Rhingia, Merodon,* etc.), oblong (e.g. *Milesia, Xylota,* etc.) or broader than long (e.g. *Phytomia,* etc.) or broadest behind middle (e.g. *Sphaerophoria,* etc.), and somewhat arched and occasionally punctate (e.g. *Chrysotoxum,* etc.). This may either be markedly pollinose (e.g. *Betasyrphus, Dideoides, Episyrphus, Meliscaeva,* etc.) or pilose (e.g. *Scaeva, Eristalis, Mallota, Milesia,* etc.) or bristled (e.g. *Rhingia, Volucella, Graptomyza,* etc.). Although its sides (pleura) provide characteristics of high taxonomic value, its dorsum is often useful for distinguishing certain genera. The pronotum (pn) or humerus is bare in the Syrphinae but pilose in the Milesinae. Its colour is more accountable when it is striped (e.g. *Allograpta, Citrogramma, Sphaerophoria,* etc.). The mesonotum (mn) may also be striped (e.g. *Dideoides, Merodon, Paragus,* etc.) or variously coloured (e.g. *Metasyrphus, Meliscaeva,* etc.), and sometimes with a collar of hairs anteriorly (e.g. *Asarkina* (*Asarkina*), *Dideopsis* and occasionally *Baccha,* etc.). The scutellum (scl) is generally rounded apically with (e.g. *Merodon, Milesia,* etc.) or without (e.g. *Rhingia, Monoceromyia,* etc.) an apical rim and is pilose (also denticulate) marginally in *Paragus serratus* (F.). The presence (e.g. *Episyrphus, Platycheirus, Rhingia, Milesia,* etc.) or absence (e.g. *Graptomyza, Volucella, Monoceromyia,* etc.) of the subscutellar fringe or whether the fringe is entire (e.g. *Episyrphus, Allograpta, Rhingia,* etc.) or incomplete (e.g. *Citrogramma, Sphaerophoria,* etc.) is taxonomically significant. Likewise, the colouration of the scutellum is also very important. The metanotum is always much reduced as in most other Diptera and does not have much value. The propleuron (pp) or pro-anepisternum is swollen and is beset with a row of hairs in *Spheginobaccha* but it is normal and free from hairs in other genera. The mesopleuron (mp) or meso-anepisternum is greatly blackish (e.g. *Betasyrphus, Metasyrphus,* etc.) or yellowish (e.g. *Citrogramma*), and may be partially or wholly pilose (set examples below) or pollinose (e.g. *Didea, Betasyrphus,* etc.) but its anterior flat portion just behind the prothoracic spiracle (PS) or anterior spiracle with hair or pubescence carries much more importance in certain genera (e.g. *Meliscaeva, Episyrphus, Dideopsis, Melanostoma, Baccha, Merodon, Milesia,* etc.) than its posterior convex portion that is always with some piles. The pteropleuron (ptp) or meso-anepimeron is always pilose at its anterior portion but it may be pilose at its posterior portion too in some milesine genera. Besides, its colouration may occasionally be accountable. The sternopleuron (stp) or katepisternum may be spotted as in *Ischiodon* but much more importance lies in the extent of isolation and confluence of its upper and lower hair patches antero-posteriorly especially in several syrphine genera (e.g. *Epistrophe, Metasyrphus, Citrogramma,* etc.) and a few milesine species among *Rhingia, Eristalis, Mallota, Milesia,* etc. The meso-katepimeron (ktp) or meropleuron (part of hypopleuron *sensu* Vockeroth) at its upper usually convex edge (barrette of Thompson) is always haired in the Syrphini but the presence or absence of hairs on this edge and in front of the metathoracic spiracle (MS) in the milesines (e.g. *Volucella, Eristalis, Phytomia,* etc.) with pilose barrette as also of the latter area in the Syrphini (e.g. *Asarkina, Episyrphus, Didea,* etc.) is highly significant. The lower part (meta-episternum and meta-epimeron) of the metapleuron (mtp) is taxonomically much more useful than its upper part in that the episternum (es) or the epimeron (em) or both may hold a tuft of hairs in certain genera (e.g. *Didea, Asarkina, Citrogramma,* etc.). Likewise, the metasternum

(mst) or basisternum may give rise to a tuft of hairs or at least a few hairs of taxonomic value in certain genera (e.g. *Episyrphus, Didea, Asarkina, Merodon, Milesia,* etc.).

The *wing* (Fig. 5) in its shape is uniform almost in all genera but the disposition of its veins differs in several genera. However, the alula (al) and the anal lobe (anl) are reduced in some Bacchini. The wing membrane, characteristic of certain genera, is entirely (e.g. *Citrogramma,* etc.) or partially (e.g. *Meliscaeva, Betasyrphus, Ischiodon,* etc.) trichose, densely (e.g. *Meliscaeva, Metasyrphus,* etc.) or sparsely (e.g. *Betasyrphus, Scaeva,* etc.). That a series of sclerotized dots along the posterior margin of the wing in *Episyrphus* and *Meliscaeva* is a useful character. Moreover, the wing may be unicoloured (e.g. *Allograpta,* etc.) or bicoloured with a broad dark brown transverse band across median third or a little more (e.g. *Dideopsis*) or with dark base or stigma only (e.g. *Betasyrphus, Dideoides,* etc.) or with infuscation at the costal or subcostal region only (e.g. *Asarkina, Metasyrphus, Baccha, Xylota,* etc.). The costa (C) ends well behind the apex of the wing and the first vein (R_1) may reach the tip of the costa or the second vein (R_{2+3}) (e.g. *Ischiodon*) but the costa and the third vein (R_{4+5}) end well beyond the apex of the wing in *Rhingia.* The third vein may either be straight or nearly so (e.g. *Metasyrphus* (*Metasyrphus*), *Xylota, Baccha,* etc.) or dipped into the first posterior cell (R_5) (e.g. *Didea, Asarkina* (*Asarkina*), *Eristalis,* etc.). The submarginal cell (R_3) is always widely open but the marginal cell (R_1) may either be open (e.g. *Epistrophe, Baccha, Monoceromyia, Xylota,* etc.) or closed and petiolate (e.g. *Eristalis, Eristalinus, Milesia,* etc.). The apical cell (first posterior cell) may also be closed and petiolate as in the genera mentioned above. The apical cross-vein (apex of M_{1+2}) between the third (R_{4+5}) and fourth (M_{1+2}) veins may either be straight and perpendicular (e.g. among species of *Volucella and Graptomyza*) or oblique in various angles (e.g. *Asarkina, Eristalis, Milesia,* etc.) and is often continuous with the posterior cross-vein (M_3 + Cu_1). The position of the anterior cross-vein (r-m) on the discal cell (1st M_2) is greatly significant in that the cross-vein is located before or at (e.g. *Epistrophe, Metasyrphus, Baccha, Graptomyza, etc.*) or beyond the middle of the discal cell (e.g. *Monoceromyia, Xylota, Criorhina, Milesia,* etc.). The apical cell or the discal cell or both may have (e.g. *Metasyrphus, Ischiodon, Baccha, Rhingia,* etc.) or may not have a spur (appendix) at its posterior angle (e.g. *Xylota, Milesia, Eristalis,* etc.). The anal cell (1A) with the petiole meets the wing margin usually perpendicularly in *Milesia* but forms an acute angle in most other genera. The spurious veins (s.v.) may vary in length. Besides, the squamae, especially the lower one, with hair fringe or at least some piles (e.g. *Metasyrphus, Didea, Betasyrphus, Xylota, Eristalis,* etc.) have some diagnostic value.

The *leg,* especially the hind leg has certain features of great taxonomic value. The hind coxa may be with a tuft of distinct hairs postero-medially (e.g. *Betasyrphus, Dideoides, Didea,* etc.) and the trochanter in males of *Ischiodon* has a conspicuous spur ventrally. The femur may also be armed with (e.g. *Merodon, Eristalis, Mallota, Phytomia,* etc.) or without (e.g. *Rhingia, Spheginobaccha, Graptomyza, Volucella, Milesia,* etc.) a basal patch of setulae. Indeed, all the other femora in the eristalines are provided with this patch of setulae. Moreover, the hind femur may be with (e.g. *Spheginobaccha, Merodon, Mallota, Phytomia, Eristalis, Milesia,* etc.) or without (e.g. *Rhingia, Graptomyza, Volucella,* etc.) apical ventral spines. However, *Milesia,* etc. possess an apical ventral spur in addition to the spines. The presence or absence of an apical ventral spur in other femora or trochanter

or tibia, especially in males, may be diagnostic of certain species. The extent of thickness of the hind femur (such as, greatly swollen in *Mallota*) sometimes offers value in diagnosis.

Abdomen : The shape of the abdomen may be oval, sub-oval, equilateral or petiolate. The tergites in *Asarkina, Betasyrphus, Metasyrphus, Scaeva, Rhingia,* etc. have margins laterally at the point of folding ventrally. The margin is usually more conspicuous on tergites of the last two pregenital segments than on those of the preceding segments. This margin is lacking in *Allograpta, Sphaerophoria, Milesia,* etc. that are said to have unmargined abdomen. On the whole, the broad and oval abdomen is margined, and the slender one remains normally unmargined. Males have 4 pregenital segments in the Milesinae, whereas 5 in the Syrphinae. The colour pattern as well as the sclerotization of the tergites, especially in females, is an important diagnostic character. The pattern may, however, be in the form of transverse bands, spots or rarely stripes.

The terminalia (Fig. 6) in males formed by the abdominal segment 9 and the structures associated with it, offer excellent support for the determination of species. The large genital tergite 9 or epandrium (epd) is located apico-ventrally and surrounds partially (e.g. *Episyrphus, Metasyrphus,* etc.) or perfectly (e.g. *Sphaerophoria*) a pair of lobular structures called cerci (cr) beset usually with dense hairs. A pair of usually haired surstyli (st) are attached to the tergite apico-laterally (e.g. *Episyrphus, Epistrophe,* etc.) or all along postero- ventrally (e.g. *Citrogramma*). Each surstylus is extended basally as a surstylar apodeme (stp) that unites with each other medially to form a flat plate. The semi-cylindrical genital sternite 9 or hypandrium (hpd) in which the base of the aedeagus (ad) and the aedeagal apodeme (adp) lie, is attached to the surstylar apodeme dorso-laterally and to the tergite 9 laterally. Sometimes, a median tapered projection called lingula(lg) is produced anteriorly from the sternite consequent upon its postero-ventral emargination (e.g. *Dideoides, Ischiodon, Scaeva,* etc.). Whereas it is entirely absent in *Meliscaeva, Asarkina,* etc., it is of varied form in others. The sternal emargination also varies and an extreme condition is notable in *Citrogramma.* However, the sternite at its apico-lateral processes is so modified as to attach itself to different forms of the superior lobe (spl), the one of the most important structures for species diagnosis, and is usually bare except its pilose antero-ventral (e.g. *Metasyrphus,* etc.) or ventral (e.g. *Milesia,* etc.) or setose lateral (e.g. *Dideopsis,* etc.) surface. The shape of the sternite and its median projection, when present, and the extent of the emargination bear significant value. The superior lobe (spl) is generally thick and broad basally, and compressed apically (except *Asarkina s. s.* with a hook-like lobe). It is often provided with one, two or three or more teeth-like projections apically (e.g. *Meliscaeva,* etc.) or laterally (e.g. *Episyrphus, Dideoides, Milesia,* etc.). Besides being usually beset with sparse setae laterally, it may have piles on its inner surface (e.g. *Metasyrphus,* etc.). Indeed, the lobes are fused the apico-lateral processes of the sternite in *Allograpta* and most Milesinae but are only articulated in other Syrphinae and a few Milesinae. The aedeagus (ad) in the Paragini, Melanostomatini, a few Syrphini and Bacchini, and almost all Milesinae is simple undivided and usually tubular in appearance but in others it is clearly divisible into two segments articulated with each another. The aedeagal base (adb) is articulated anteriorly to the apex of the aedeagal apodeme (adp), a heavy rod-like structure encased within the sternite 9 and is often provided with one, two or more processes or denticles of various kinds antero-ventrally

(except in *Episyrphus, Meliscaeva,* etc.). The distal portion of the aedeagus (add) is articulated to the aedeagal base (adb) postero-dorsally and appears more or less as a tubular structure of extremely varied shape and size, and (except in *Betasyrphus, Dideoides,* etc.) often bears spicules anteriorly at its apex. This portion of the aedeagus is, however, not demarcated in the Milesinae. A small rod-like sclerotized structure called the ejaculatory apodeme (not seen in the figure) above the anterior end of aedeagal apodeme lies inside the sternum 9 in most species.

The female terminalia in the Syrphidae do not have much taxonomic significance as in most other Diptera and are not, therefore, discussed here.

LIST OF TAXA

Subfamily SYRPHINAE

Tribe Syrphini

1. *Allograpta javana* (Wiedemann)
**2. *Asarkina (Asarkina) ericetorum* (Fabricius)
3. *Betasyrphus serarius* (Wiedemann)
4. *Citrogramma citrinum* (Brunetti)
5. *Didea fasciata* Macquart
6. *Dideoides kempi* Brunetti
7. *D. ovatus* Brunetti
8. *D. tigerinus* (Bigot)
**9. *Dideopsis aegrotus* (Fabricius)
10. *Epistrophe (Epistrophe) griseocincta* (Brunetti)
11. *E. (Epistrophella) horishana* (Matsumura)
12. *Episyrphus balteatus* (De Geer)
**13. *Ischiodon scutellaris* (Fabricius)
14. *Meliscaeva cinctella* (Zetterstedt)
15. *Metasyrphus (Metasyrphus) confrater* (Wiedemann)
16. *M. (M.) corollae* (Fabricius)
17. *Scaeva selenitica* (Meigen)
18. *Sphaerophoria indiana* Bigot

Tribe Bacchini

19. *Baccha (Allobaccha) amphithoe* Walker
20. *B. (A.) apicalis* Loew
21. *B. (A.) nigricosta* Brunetti
22. *B. (A.) nubilipennis* Austen
23. *B. (Baccha) maculata* Walker
24. *B. (?) plumbicincta* Brunetti

Tribe Melanostomatini

25. *Melanostoma orientale* (Wiedemann)
26. *M. univittata* (Wiedemann)
27. *Platycheirus albimanus* (Fabricius)

Tribe Chrysotoxini

28. *Chrysotoxum baphyrus* Walker
29. *C. quadrifasciatum* Brunetti

Tribe Paragini

*30. *Paragus (Paragus) serratus* (Fabricius)
31. *P. (Pandasyophthalmus) tibialis* (Fallén)

Subfamily MILESINAE

Tribe Cheilosini

32. *Rhingia cincta* de Meijere

Tribe Volucellini

33. *Graptomyza angustimarginata* Brunetti
34. *G. nigripes* Brunetti
35. *G. sexnotata* Brunetti
36. *Volucella peleterii* Macquart
37. *V. trifasciata* Wiedemann

Tribe Spheginobacchini

38. *Spheginobaccha macropoda* (Bigot)

Tribe Eumerini

39. *Merodon varicolor* Walker

Tribe Cerioidini

40. *Monoceromyia tredecimpunctata* (Brunetti)

Tribe Erisalini

41. *Catacores cyanea* (Brunetti)
*42. *Eristalinus (Eristalinus) arvorum* (Fabricius)
43. *E. (E.) laetus* (Wiedemann)
44. *E. (E.) quinquestriatus* (Fabricius)
45. *E. (Eristalodes) paria* (Bigot)
*46. *E. (E.) taeniops* (Wiedemann)
47. *E. (Merodonoides) multifarius* (Walker)
48. *Eristalis (Eristalis) tenax* (Linnaeus)
*49. *E. (Eoseristalis) arbustorum* (Linnaeus)
50. *E. (E.) cerealis* Fabricius
51. *E. (E.) suturalis* Brunetti

52. *E.* (?) *angustimarginalis* Brunetti
53. *Mallota orientalis* (Wiedemann)
54. *Phytomia (Phytomia) chrysopyga* (Wiedemann)
55. *P. (P.) zonata* (Fabricius)
56. *P. (Dolichomerus) crassa* (Fabricius)

Tribe Milesini

57. *Brachypalpus dives* Brunetti
58. *Criorhina bomboides* Hull
59. *Milesia balteata* Kertész
60. *M. cretosa* Hippa
61. *M. ferruginosa* Brunetti
62. *M. illustris* Hippa
63. *M. semifulva* de Meijere
64. *M. variegata* Brunetti
65. *M. verticalis* Brunetti
66. *Xylota annulata* Brunetti
67. *X. penicillata* Brunetti

SYSTEMATIC ACCOUNT

Family SYRPHIDAE

Key to the subfamilies

1. Pronotum bare (excepting a few long hairs occasionally in *Baccha*); abdomen in males with 5 pregenital segments ..... Syrphinae
   Pronotum pilose; abdomen in males with 4 pregenital segments ..... Milesinae

Subfamily SYRPHINAE

Key to the tribes
(Modified after Vockeroth, 1969)

1. Tergite 1 well-developed and distinctly extended well beyond scutellum; scutellum at its posterior margin inconspicuously or strongly denticulate; abdomen robust and usually oval ..... Paragini
   Tergite 1 small and practically covered by scutellum (excepting some Bacchini with petiolate abdomen); scutellum posteriorly smooth and not denticulate; abdomen usually slender 2

2. Antenna porrect, elongate and occasionally longer than head; abdomen very strongly convex dorsally ..... Chrysotoxini
   Antenna drooping and usually short; abdomen scarcely convex 3
3. Abdomen distinctly petiolate; anterior flat portion of mesopleuron at its postero-dorsal corner with a few distinct, erect and coarse hairs; metasternum bare; face usually flat and with very weak tubercle ..... Bacchini
   Abdomen usually equilateral or oval; mesopleural hairing, if present, different or disposed otherwise; metasternum bare or haired; face neither distinctly produced nor narrowed below but usually with well-developed tubercle 4
4. Face and scutellum entirely black; anterior flat portion of mesopleuron with only microscopic pubescence; aedeagus undivided, strongly swollen basally and slender tube-like apically ..... Melanostomatini
   Face and scutellum usually yellow or yellowish brown; mesopleural hairing variable; aedeagus nearly always 2-segmented, with complex associated structures ..... Syrphini

Tribe SYRPHINI

Key to the genera
(Modified after Vockeroth, 1969)

1. Mesopleuron at its anterior flat portion with long, fine, erect or sub-erect hairs at least postero-dorsally 2
   Mesopleuron at its anterior flat portion with only microscopic pubescence or pollinose 3
2. Metasternum haired; male terminalia with broad and somewhat flat surstylus, superior lobe with a short stout tooth apically ..... ***Episyrphus***
   Metasternum bare; male terminalia with slender and somewhat curved surstylus, superior lobe with a small obscure tooth apically ..... ***Meliscaeva***
3. Wing with distinct transverse brown band at mid-length extending from costa at least across posterior cross-vein ..... ***Dideopsis***
   Wing occasionally darkened otherwise and never with distinct transverse dark band 4
4. Metasternum haired 5
   Metasternum bare (excepting a few *Epistrophe* with haired eyes) 12
5. Hypopleuron with tuft of fine hairs below metathoracic spiracle or in front of its lower end 6
   Hypopleuron bare below metathoracic spiracle and in front of its lower end 8
6. Hair-tuft present in front of lower end of spiracle (on meso-katepimeron) and in addition (in *Asarkina*), a postero-ventral tuft on lower end of spiracle (on meta-epimeron); lower lobe of squama with only microscopic pubescence above 7

Hair-tuft present below spiracle (on meta-episternum); lower lobe of squama with a few fine scattered erect hairs above ..... ***Didea***

7. Face moderately to strongly produced forward below; oral opening more than 3-4 times as long as broad; mesonotum with anterior collar of long erect hairs; sternite 9 in male terminalia developed ..... ***Asarkina***

   Face not produced forward below; oral opening not more than twice as long as broad; mesonotum without anterior collar of long hairs; sternite 9 in male terminalia greatly reduced ..... ***Citrogramma***

8. Eye distinctly haired; abdomen broadly oval and with strong margin 9

   Eye entirely or predominantly bare; abdomen slender and parallel-sided, and unmargined (somewhat oval in *Epistrophe* with a trace of margin on tergite 4) 10

9. Eye densely haired; postero-median apical angle of hind coxa with tuft of strong hairs ..... ***Dideoides***

   Eye sparsely haired; postero-median apical angle of hind coxa without tuft of strong hairs ..... ***Metasyrphus***

10. Male terminalia usually small and inconspicuous (especially *Allograpta*), if enlarged then tergite 9 much narrower than preabdomen, cerci placed in U-shaped notch of tergite 9 11

    Male terminalia greatly enlarged, globose, tergite 9 as broad as preabdomen, cerci entirely surrounded by tergite 9 ..... ***Sphaerophoria***

11. Abdomen with at least a trace of margin on tergite 4; pleura without distinct pale markings; antennae separated by about length of antennal segment 1 .....***Epistrophe*** (part)

    Abdomen entirely unmargined; pleura with very dull but distinct and well-defined pale markings; antennae separated by length of first two antennal segments .....***Allograpta***

12. Eye usually very distinctly haired.....13

    Eye bare or very nearly so (excepting a few *Epistrophe* with haired metasternum).....14

13. Wing membrane almost densely and uniformly trichose at least beyond level of end of spurious vein; male eye without distinctly demarked area of larger facets above.....***Betasyrphus***

    Wing membrane with very sparse microtrichia scattered over entire surface; male eye with distinctly demarked area of larger facets above.....***Scaeva***

14. Antennal segments 3 rounded apically; lateral mesonotal stripe less-defined, dull or pale yellow; sternopleuron without distinct spot; hind trochanter in males without any process; female tergite 8 normal.....***Epistrophe*** (part)

    Antennal segment 3 subacute apically; lateral mesonotal stripe comparatively well-defined, usually bright yellow; sternopleuron at its upper margin with distinct yellow spot; hind trochanter in males with ventral spine-like process; female tergite 8 well-developed, sclerotized and exposed.....***Ischiodon***

Genus *Allograpta* Osten Sacken

1875. *Allograpta* Osten Sacken, *Bull. Buffalo Soc. nat. Sci.*, 3 : 49. Type-species : *Scaeva obliqua* Say.

1. *Allograpta javana* (Wiedemann)

1824. *Syrphus javanus* Wiedemann, *Analecta Ent.* : 34.

Diagnosis : Eye bare; face with black median stripe in females, sometimes brown in males; antenna orange, segment 3 as broad as long; mesonotum shining black, with sharply defined bright yellow lateral margin at least presuturally; scutellum black-haired; hind femur more or less blackish on apical third, hind tibia black or blackish brown on basal and apical third, rest of legs yellow; aedeagal base in male terminalia strongly sclerotized cylinder with round apex, posteriorly beset with small spicules.

Distribution : India : Meghalaya (West Garo Hills), Arunachal Pradesh, Assam, Karnataka, Sikkim, Tamil Nadu and West Bengal. Elsewhere: Andalas, China, E Malaysia, Java, Kalimantan, Malaya, Philippines, Sri Lanka, Taiwan and Thailand; Australia, Fiji, Guadalcanal, Hawaii, Japan, Korea and New Guinea (Map 2 and Diags. 1 & 5).

Genus *Asarkina* Macquart

1842. *Asarkina* Macquart, *Dipt. exot.*, 2(2) : 77(137). Type-species: *Scaeva rostrata* Wiedemann.

Subgenus *Asarkina* Macquart

Diagnosis : Mesonotum with dense anterior collar of long erect hairs; vein R_{4+5} distinctly dipped into cell R_{4+5}; surstylus strongly convergent and nearly transverse in position.

**2. *Asarkina (Asarkina) ericetorum* (Fabricius)

1781. *Syrphus ericetorum* Fabricius, *Spec. Insect.*, 2:425.

Material examined : 1 ♀, Nongpoh forest, 650 m, 6 km S of Circuit House, Ri-Bhoi, 30. ix. 1988, Coll. A. R. Lahiri; 1 ♀, Jarain, 850 m, Jaintia Hills, 10. iii. 1991, Coll. K. K. Ray.

Diagnosis : Male frons bright sulphur yellow with long black erect pubescence, a semi-circular shining blackish brown spot on upper side of small antennal prominence; female frons at vertex about one-ninth of head rather rapidly widening to double that width at level of antenna; surstylus broad basally, only slightly narrowed to subtruncate apex.

Distribution: India: Meghalaya (Ri-Bhoi and Jaintia Hills), Arunachal Pradesh, Assam, Jammu & Kashmir, Sikkim, Tamil Nadu and West Bengal. Elsewhere : Other parts of the Oriental region; Africa, Australia, Fiji, Moluccas, New Guinea and Samoa (Map 2 and Diags. 1 & 5).

Genus *Betasyrphus* Matsumura

1917. *Betasyrphus* Matsumura, *Ent. Mag. Kyoto*, **2** : 143. Type-species : *Syrphus serarius* Wiedemann.

3. *Betasyrphus serarius* (Wiedemann)

1830. *Syrphus serarius* Wiedemann, *Aussereurop. zweifl. Insekt.*, **2** : 128.

Diagnosis : Eye densely haired; face orange with blackish tinge; antenna black, base of antennal segment 3 dull orange; mesonotum shining black, yellow-haired anteriorly and black-haired posteriorly at wing-base along lateral margin; scutellum dull yellow with yellow hairs basally and rest black; lower lobe of squama with few erect, fine, white hairs above; greyish-pollinose abdominal markings; aedeagus in male terminalia tubular, not produced apically and not with setulae anteriorly; aedeagal base with 2 long distinct tooth-like processes on each side antero-ventrally.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills), Arunachal Pradesh, Assam, Bihar, Karnataka, Sikkim, Uttar Pradesh and West Bengal. Elsewhere : Other parts of the SE Asia; Australia, Japan, Korea and New Guinea (Map 2 and Diags. 1 & 5).

Genus *Citrogramma* Vockeroth

1969. *Citrogramma* Vockeroth, *Mem. ent. Soc. Can.*, **62** : 92. Type-species : *Syrphus harvebazini* Curran.

4. *Citrogramma citrinum* (Brunetti)

1923. *Xanthogramma citrinum* Brunetti, *Fauna Br. India, Dipt.*, **3** : 95.

Material examined: 1♂, 1♀, Pynursla, 1500 m, East Khasi Hills, 11. xi. 1973, Coll. S. Biswas.

Diagnosis: Eye bare; face and frons orange yellow; antenna brownish orange; mesonotum shining black with broad entire bright yellow margin; scutellum bright lemon yellow, dark centrally; wing membrane entirely trichose; abdomen with tergite 2 with a pair of bright yellow spots, tergites 3 and 4 each with an entire yellow band; sternite 9 very broadly and deeply emarginate postero-ventrally leaving only a very slender ring in ventral view.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Assam, Karnataka, Manipur and West Bengal. Elsewhere : Bhutan, Malaya, Sri Lanka and Thailand (Map 2 and Diags. 1 & 5).

Genus *Didea* Macquart

1834. *Didea* Macquart, *Hist. nat. Ins. Dipt.*, 1 : 508. Type-species : *Didea fasciata* Macquart.

5. *Didea fasciata* Macquart

1834. *Didea fasciata* Macquart, *Hist. nat. Ins. Dipt.*, **1** : 508.

Material examined : 1♂, Shillong, 1550m, East Khasi Hills, 2.iii.1991, Coll. K. K. Ray.

Diagnosis : Eye with sparse hairs; face shining yellow; antenna blackish, segment 3 twice as long as scape and pedicel together; mesonotum shining black with 2 inconspicuous greyish stripes anteriorly; scutellum brownish yellow with yellow apex, border long black-haired; abdomen broadly oval, strongly flattened, black, with a strong, broad margin on tergites 2-5, yellowish bands strongly incised; aedeagus in male terminalia with a postero-lateral finger-like process on each side; superior lobe very large, laterally ending in a short subacute tooth.

Distribution : India : Meghalaya (East Khasi Hills) and Assam. Elsewhere : Taiwan; Palaearctic region (Map 2 and Diags. 1 & 5).

Genus *Dideoides* Brunetti

1908. *Dideoides* Brunetti, *Rec. Indian Mus.*, **2** : 54. Type-species: *Dideoides ovatus* Brunetti.

Key to the species

1. Femora entirely yellow..... *tigerinus*
   Femora black at base or even extending half of their length, rest orange 2
2. Abdominal segment 2 with a pair of triangular yellow spots and 3 with a narrow yellow band proximally; scutellar disc with intermixed yellow and brown hairs ..... *kempi*
   Abdominal segment 2 with a pair of transversely placed elongate orange spots and 3 with a broad orange band across centre; scutellar disc with black hairs ..... *ovatus*

6. *Dideoides kempi* Brunetti

1923. *Dideoides kempi* Brunetti, *Fauna Br. India, Dipt.*, **3** : 59.

Distribution : India : Meghalaya (Ri-Bhoi and West Garo Hills) (Map 2).

7. *Dideoides ovatus* Brunetti

1908. *Dideoides ovatus* Brunetti, *Rec. Indian Mus.*, **2** : 54.

Material examined : 1♀, Mawphlang, 1050 m, East Khasi Hills, 21, iv. 1980, Coll. P.T. Cherian.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and West Bengal; Elsewhere : Laos (Map 2 and Diags. 1 & 5).

8. *Dideoides tigerinus* (Bigot)

1885. *Ischyrosyrphus tigerinus* Bigot, *Annls Soc. ent. Fr.*, (6) 5 : 249.

Distribution : India : Meghalaya (Ri-Bhoi) (Map 2).

Genus *Dideopsis* Matsumura

1917. *Dideopsis* Matsumura, *Ent. Mag. Kyoto*, 2 : 142. Type-species : *Eristalis aegrotus* F.

** 9. *Dideopsis aegrotus* (Fabricius)

1805. *Eristalis aegrotus* F., *Syst. Antliat.* : 243.

Material examined : 1♂, (headless), Khasi Hills, 25. viii. 1972, Coll. A.K. Ghosh; 1♂ (headless), Songkhama, 950 m, West Garo Hills, 15. xi. 1973, Coll. S. Biswas.

Diagnosis : Eye bare; frons black with black hairs; face black with yellow hairs; a black stripe extending from base of antennae to central bump; mesonotum black with brownish hairs except yellowish humerus with yellow hairs, mesonotum with anterior collar of long erect hairs; vein R_{4+5} indistinctly dipped into cell R_{4+5}; upper and lower sternopleural hair-patches widely separated throughout; postero-median apical angle of hind coxa with a strong tuft of hairs; abdomen oval, with broad yellow bands; sternite 9 in male terminalia with short but distinct setae laterally; distal portion of aedeagus with broad flattened apically rounded postero-dorsal process.

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), Assam, Kerala and West Bengal. Elsewhere : Nepal and other parts of the SE Asia; Australia; Moluccas and New Guinea (Map 2 and Diags. 1 & 5).

Genus *Epistrophe* Walker

1852. *Epistrophe* Walker, *Insecta Saundersiana*, 3 : 242. Type-species : *Epistrophe conjungens* Walker = *Syrphus grossulariae* Meigen.

Key to the subgenera

1. Eye bare or with short hairs above; face usually entirely yellow, at most indistinctly darkened medially; metasternum haired or bare; abdominal tergite 4 with undivided or partly divided yellow band; in male terminalia antero-ventral process of aedeagal base vertical, ending in a pair of distinct teeth.....*Epistrophe* (*s. str.*)
   Eye bare; face with a distinct black median stripe; metasternum bare; abdominal tergite 4 always with a pair of yellow spots; in male terminalia antero-ventral process of aedeagal base with lower margin turned obliquely outward, antero-dorsal and antero-ventral apex each with 2-5 small teeth ..... *Epistrophella*

Subgenus *Epistrophe* Walker (*s. str.*)

10. *Epistrophe (Epistrophe) griseocincta* (Brunetti)

1923. *Syrphus griseocinctus* Brunetti, *Fauna Br. India, Dipt.*, **3** : 77.

Diagnosis : Eye with short hairs; mesonotum greenish aeneous with dense yellow hairs; hind leg entirely black; abdominal segment 1 aeneous, rest black; segment 2 with a narrow greyish band across middle; segments 3 and 4 with similar bands just behind base.

Distribution : India : Meghalaya (East Khasi Hills) and Uttar Pradesh (Map 2 and Diag. 1).

Subgenus *Epistrophella* Dušek & Láska

1967. *Epistrophella* Dusek and Láska, *Prírodov. Pr. Cesk Acad. Věd.*, **1** : 369. Type-species : *Syrphus euchromus* Kowarz.

11. *Epistrophe (Epistrophella) horishana* (Matsumura)

1917. *Syrphus horishana* Matsumura, *Ent. Mag. Kyoto*, 3 : 24.

1923. *Syrphus quinquevittatus* Brunetti, *Fauna Br. India, Dipt.*, 3 : 81.

Diagnosis : Eye bare; mesonotum aeneous with bronze tinge except yellowish hind corners and with 5 distinct bronze-coloured stripe from anterior margin to scutellum; leg orange; abdomen bright yellow, segment 1 aeneous, segments, 2, 3 and 4 with black hind margin.

Distribution : India : Meghalaya (East Khasi Hills) and West Bengal. Elsewhere : Laos, Philippines and Taiwan; Japan (Map 3 and Diags. 1 & 5).

Genus *Episyrphus* Matsumura & Adachi

1917. *Episyrphus* Matsumura and Adachi, *Ent. Mag. Kyoto*, **2** : 134. Type-species : *Musca balteata* De Geer.

12. *Episyrphus balteatus* (De Geer)

1776. *Musca balteata* De Geer, *Mém. pour serv. Hist. Ins.*, **6** : 116.

Material examined : 1♀, Mawphlang, 1050 m, East Khasi Hills, 21, iv. 1980, Coll. P.T. Cherian; 6♂♂, 3♀♀, Nongstoin, 1370 m, West Khasi Hills, 24-28. ix. 1988, Coll. A.R. Lahiri; 5♂♂, 2♀♀, Shangpung, 950 m, Jaintia Hills, 12. iii. 1991, Coll. K.K. Ray.

Diagnosis : Eye bare; face orange with orange hairs; base of antenna with a black dot above; mesonotum black, with a narrow median and 2 lateral greyish stripes; posterior margin of wing with a series of sclerotized dots; abdomen linear, orange, tergites 3 and 4 mostly yellow with narrow sub-basal and broad apical black bands;

surstylus in male terminalia straight, not more than twice as long as broad; superior lobe stout, with ventro-laterally directed tooth apically; distal portion of aedeagus not expanded apically.

Distribution : India : Meghalaya (East Khasi Hills, West Khasi Hills and Jaintia Hills), Arunachal Pradesh, Assam, Jammu & Kashmir, Kerala, Orissa, Sikkim and West Bengal. Elsewhere : China, Malaya and other parts of the Oriental region; Australia, Bonin Is. and Palaearctic region (Map 2 and Diags. 1 & 5).

Genus *Ischiodon* Sack

1913. *Ischiodon* Sack, *Ent. Mitt.*, 2 : 5. Type-species : *Ischiodon trochanterica* Sack (= *Scaeva scutellaris* Fabricius).

** 13. *Ischiodon scutellaris* (Fabricius)

1805. *Scaeva scutellaris* Fabricius, *Syst. Antliat.* : 252.

Material examined : 2♂♂, 1♀, Dainadubi, 170 m, East Garo Hills, 5-8, iv. 1979, Coll. J.K. Jonathan.

Diagnosis : Eye bare; wing with vein R_{4+5} upcurved apically and ending well before wing-apex; hind femur with a sub-apical black ring; surstylus in male terminalia elongate, broadened beyond base, dorsally curved and serrate, ventrally straight and smooth; aedeagal base very large and strongly sclerotized.

Distribution : India : Meghalaya (East Garo Hills), Jammu & Kashmir, Karnataka, Orissa, Tamil Nadu and West Bengal. Elsewhere : Java, Philippines, Taiwan and other parts of the SE Asia; Australia, Hawaii, Japan and Micronesia (Map 3 and Diags. 1 & 5).

Genus *Meliscaeva* Frey

1946. *Meliscaeva* Frey, *Notul ent.*, 25 : 164 (as subgenus of *Epistrophe* Walker). *Type-species* : *Scaeva cinctella* Zetterstedt.

14. *Meliscaeva cinctella* (Zetterstedt)

1843. *Syrphus cinctellus* Zetterstedt, *Dipt. Scandinaviae*, 2 : 742.

Diagnosis : Eye bare; frons in males shining chrome yellow with a black spot above antennae, in females frons above shining black; mesopleuron at its anterior flat portion extensively haired; posterior margin of wing with a series of sclerotized dots; abdomen slender and parallel-sided; tergites 2-4 each with a pair of yellow spots; distal portion of aedeagus in male terminalia almost tubular in shape.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim and West Bengal. Elsewhere : Nepal, Sri Lanka and Taiwan; Palaearctic region (Map 3 and Diags. 1 & 5).

Genus *Metasyrphus* Matsumura

1917. *Metasyrphus* Matsumura, *Ent. Mag. Kyoto*, **2** : 147. Type-species : *Scaeva corollae* F.

Subgenus *Metasyrphus* Matsumura

Diagnosis : Wing with vein R_{4+5} straight or nearly so; sternite 9 in male terminalia without lateral and dorso-lateral grooves.

Key to the species

1. Abdomen with 3 complete bands lying across middle of segments; surstylus in male terminalia short and broad, and produced postero-ventrally .....*confrater*
   Abdomen with 3 pairs of spots passing over lateral margins; surstylus in male terminalia (Fig. 6) slender and curved sharply forward near apex with distinct anterior flange .....*corollae*

15. *Metasyrphus (Metasyrphus) confrater* (Wiedemann)

1830. *Syrphus confrater* Wiedemann, *Aussereurop. zweifl. Insekt.*, **2** : 120.

Material examined : 1♂, 2♀♀, Mawphlang, 1050 m, East Khasi Hills, 21.iv. 1980, Coll. P.T. Cherian.

Distribution : India : Meghalaya (Ri-Bhoi and East Khasi Hills), Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Uttar Pradesh and West Bengal. Elsewhere : China and other parts of the Oriental region; Japan and New Guinea (Map 2 and Diags. 1 & 5).

16. *Metasyrphus (Metasyrphus) corollae* (Fabricius)

1794. *Scaeva corollae* Fabricius, *Ent. Syst.*, **4** : 306.

Distribution : India : Meghalaya (East Khasi Hills) and West Bengal. Elsewhere : Other Asian countries including Taiwan; N Africa and Palaearctic region (Map 3 and Diags. 1 & 5).

Genus *Scaeva* Fabricius

1805. *Scaeva* Fabricius, *Syst. Antliat.* : 248. Type-species : *Musca pyrastri* Linnaeus.

17. *Scaeva selenitica* (Meigen)

1822. *Syrphus seleniticus* Meigen, *Syst. Beschr. europ. zweifl. Insekt.*, **3** : 304.

Diagnosis : Eye densely haired, sparser posteriorly; antenna black except yellowish

segment 1 and base of 3; mesonotum shining black, with dense yellowish brown hairs; wing clear; leg predominantly bright yellow; hind tibia with a dark brown ring; abdomen black, tergites 2-4 each with a pair of bright yellow spots being lunulate on 3-4.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh and Uttar Pradesh. Elsewhere : Cambodia, China, Laos and Vietnam; Europe (Map 3 and Diags. 2 & 5).

Genus *Sphaerophoria* Lep. & Serv.

1828. *Sphaerophoria* Lepeletier and Serville, *Encycl. méth. (Ins.)*, **10** : 513 (as subgenus of *Syrphus* F.). Type-species : *Musca scripta L.*

18. *Sphaerophoria indiana* Bigot

1884. *Sphaerophoria indiana* Bigot. *Annls Soc. ent. Fr.*, (6) **4** : 99.

1915. *Sphaerophoria nigritarsis* Brunetti, *Rec. Indian Mus.*, **11** : 216 (as form).

Material examined : 3♂♂, 2♀♀, Shillong Sericulture Farm, 1550 m, East Khasi Hills, 19.iv. 1979, Coll. J.K. Jonathan; 1♂, Happy valley at Shillong, 1600 m, East Khasi Hills, 31. iii. 1991, Coll. S. K. Ghosh; 2♂♂, Shillong, 1600 m, East Khasi Hills, 10. iv. 1991, Coll. S. K. Ghosh.

Diagnosis : Face entirely yellow, without median stripe; frons in females with a broad black median stripe; mesonotum (Fig. 4) black, with 2 more or less distinct greyish submedian stripes; scutellum bright yellow; subscutellar fringe absent; leg entirely yellow; abdomen predominantly bright yellow except blackish tergite 1 and a median yellow band on tergite 2.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Sikkim, Uttar Pradesh and West Bengal. Elsewhere : China and ? Sri Lanka; Korea and eastern part of the erstwhile U.S.S.R. (Map. 3 and Diags. 2 & 6).

Tribe BACCHINI

Genus *Baccha* Fabricius

1805. *Baccha* Fabricius, *Syst. Antliat.* : 199. Type-species : *Syrphus elongatus* Fabricius.

Diagnosis : Flies with head broader than thorax and more than hemispherical, hollowed behind; eye practically bare; frons slightly prominent; antenna short, with bare dorsal arista; wing with rudimentary or almost no alula; squama inconspicuous; leg long and thin, hind femur much longer than others and slender; abdomen very much longer than thorax, segments 2 and 3 very long and narrow, succeeding segments widening gradually before tip.

Key to the subgenera

1. Humerus with a row of hairs behind or almost half haired ..... *Allobaccha*
   Humerus bare entirely ..... *Baccha*

Subgenus *Allobaccha* Curran

1928. *Allobaccha* Curran, *J. fed. Malay St. Mus.*, **14** ; 251 (as subgenus of *Baccha* F.). Type-species: *Baccha rubella* van der Wulp.

Key to the species

1. Wing with a large median diffused dark spot apically above vein R_{4+5} in continuation with costal and subcostal darkening in smoky ground-colour 2
   Wing with deep infuscation in middle, gradually fading towards base but apex occasionally with faint infuscation above vein R_{4+5} 3
2. Antennal process nearly absent; abdomen predominantly yellow with black bands much more distinct on tergites 3 and 4 ..... *amphithoe*
   Antennal process well-developed; abdomen metallic aeneous black with golden yellow markings forming an inverted-V at least on tergite 4 ..... *apicalis*
3. Antennal process well-developed; face with a prominent tubercle; abdominal segment 1 laterally with outstanding pale yellow hairs, elsewhere abdomen clothed with minute appressed black hairs ..... *nubilipennis*
   Antennal process nearly absent; face without a tubercle; abdominal segment 1 semi-circular like scutellum and without prominent yellow hairs but long black hairs laterally on segments 2 and 3 ..... *nigricosta*

19. *Baccha (Allobaccha) amphithoe* Walker

1849. *Baccha amphithoe* Walker, *List Dipt. Colln Br. Mus.*, **3** : 549.

1913. *Baccha flavopunctata* Brunetti, *Rec. Indian Mus.*, **8** : 165.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim and West Bengal. Elsewhere : Sri Lanka and Taiwan south to Flores Is. (Indonesia) (Map 3 and Diags. 2 & 6).

20. *Baccha (Allobaccha) apicalis* Loew

1858. *Baccha apicalis* Loew. *Wien. ent. Mschr.*, **2** ; 106.

1893. *Baccha pulchrifrons* Austen, *Proc. zool. Soc. Lond.*, 1893 : 139.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Goa, Uttar Pradesh and West Bengal. Elsewhere : Java, Malaya, Philippines, Sri Lanka and Taiwan; Bonin Is. and Japan (Map 3 and Diags. 2 & 6).

21. *Baccha (Allobaccha) nigricosta* Brunetti

1908. *Baccha nigricosta* Brunetti, *Rec. Indian Mus.*, **2** : 50.

Distribution : India : Meghalaya (Ri-Bhoi), Bihar and Uttar Pradesh. Elsewhere : Pakistan (Map 2 and Diags. 2 & 6).

22. *Baccha (Allobaccha) nubilipennis* Austen

1893. *Baccha nubilipennis* Austen, *Proc. zool. Soc. Lond.*, 1893 : 136.

Material examined : 1 ♀, Fruit Garden, Shillong, 1600 m, 26. v. 1981, Coll. M. S. Jyrwa.

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), Karnataka, Kerala and Tamil Nadu. Elsewhere : Nepal, Sri Lanka and Taiwan; Japan (Map 2 and Diags. 2 & 6).

Subgenus *Baccha* Fabricius

23. *Baccha (Baccha) maculata* Walker

1852. *Baccha maculata* Walker, *Insecta Saundersiana*, **1** : 223.

Diagnosis : Antenna bright yellow; antennal process shining black in males, bluish black in females; humerus, a longitudinal stripe on mesopleura in front of wing-base cupreous in males, yellowish in females; leg predominantly yellowish, hind femur with a sub-apical brownish ring and hind tibia with an indistinct dark median band; abdomen mainly shining brown, sometimes with pale spots.

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), Himachal Pradesh, Uttar Pradesh and West Bengal. Elsewhere : Andalas, Java, Kalimantan, Malaya, E Malaysia, Nepal, Philippines and Taiwan; Japan and Korea (Map 3 and Diags. 2 & 6).

24. *Baccha (?) plumbicincta* Brunetti

1915. *Baccha plumbicincta* Brunetti, *Rec. Indian Mus.*, **11** : 222.

Diagnosis : Antenna black; antennal process distinct; thorax bright yellow except lead-coloured mesonotum and scutellum; leg predominantly yellowish; hind femur with an indistinct brownish ring on apical half and hind tibia blackish on apical half; abdomen slightly constricted at segment 2, remainder barely wider, nearly shining bluish black with lead-coloured band on tergites 3, 4 and 5.

Distribution : India: Meghalaya (East Khasi Hills) (Map 3).

Tribe MELANOSTOMATINI

Key to the genera

1. Males devoid of dilated fore tarsi; surstylus usually not bifid; superior lobe usually triangular ..... ***Melanostoma***
   Males with dilated fore tarsi; surstylus bifid; superior lobe sickle-shaped ..... ***Platycheirus***

Genus *Melanostoma* Schiner

1860. *Melanostoma* Schiner, *Wien. ent. Mschr.* 4 : 213. Type-species : *Musca mellina* L.

Key to the species

1. Face with 2 distinct small bumps (Fig. 3) ..... *orientale*
   Face nearly flat forming a single angle only on lower end ..... *univittata*

25. *Melanostoma orientale* (Wiedemann)

1824. *Syrphus orientalis* Wiedemann, *Analecta Ent.* : 36.

Material examined : 1♀ Mawphlang, 1050 m, East Khasi Hills, 21. vi. 1980, Coll. P.T. Cherian; 2♂♂, Jowai, 1300 m, Jaintia Hills, 16. ix. 1988, Coll. V. D. Srivastava; 3♀♀, Jarain, 850 m, Jaintia Hills, 18. ix. 1988, Coll. V. D. Srivastava; 3♀♀, Shangpung, 950 m, Jaintia Hills, 9. iii. 1991, Coll. K.K. Ray.

Distribution : India: Meghalaya (East Khasi Hills and Jaintia Hills), Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Bhutan, Nepal, Pakistan, Sri Lanka and other parts of the Oriental region; Palaearctic region (Map 3 and Diags. 2 & 6).

26. *Melanostoma univittata* (Wiedemann)

1824. *Syrphus univittatus* Wiedemann, *Analecta Ent.*, : 36.

Distribution : India: Meghalaya (East Khasi Hills), Assam, Bihar, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Andalas, E Malaysia, Myanmar, Nepal, Sri Lanka and other parts of the SE Asia; ?Australian and Palaearctic regions (Map 3 and Diags. 2 & 6).

Genus *Platycheirus* Lepeletier & Serville

1828. *Platycheirus* Lepeletier and Serville, *in* Latreille *et al.*, *Encycl. Méth.* (Ins.) 10 (2) : 513. Type-species : *Syrphus scutatus* Meigen.

27. *Platycheirus albimanus* (Fabricius)

1781. *Syrphus albimanus* Fabricius, *Spec. Insect.*, 2 : 434.

Diagnosis : Antenna brownish black, segment 3 reddish basally; face moderately produced, not more than half width of eye in profile; mesonotum aeneous black in males but shining blue black in females; fore femur at extreme base and tibia about middle yellowish in males and in females fore femur and basal half of tibia dull orange; fore tarsus in males at base no wider than tip of tibia, gradually decreasing in width to tip; abdominal spots in females bluish and brownish yellow in males.

Distribution : India: Meghalaya (East Khasi Hills), Himachal Pradesh and West Bengal. Elsewhere : ? Nepal and Philippines; Holarctic (Map 3 and Diags. 2 & 6).

Tribe CHRYSOTOXINI

Genus *Chrysotoxum* Meigen

1803. *Chrysotoxum* Meigen, *Magazin InsektKde*, 2 : 275. Type-species : *Musca bicincta* L.

Diagnosis : Rather large flies with semi-circular head as broad as thorax; eye haired; frons and face prominent; long antennae placed in between produced frons and face, arista sub-basal, bare; mesonotum finely punctate, with a pair of faint greyish stripes anteriorly in addition to yellowish lateral lines; leg predominantly yellowish; wing yellowish anteriorly; abdomen mainly ovate, finely punctate and usually with a pair of curved yellow spots on tergites 2-5.

Key to the species

1. Abdomen nominally yellowish, with black markings; tergites 2, 3 and 4 each with a definite yellow triangle on posterior margin, tergite 5 with a pair of large yellow elongate spots diagonally and a single apically ..... *baphyrus*
   Abdomen black, with bright yellow markings; tergites without any posterior marginal triangle; tergite 5 with a large brownish orange spot centrally ..... *quadrifasciatum*

28. *Chrysotoxum baphyrus* Walker

1849. *Chrysotoxum baphyrus* Walker, *List Dipt. Colln Br. Mus.*, 3 : 542.

Distribution : India: Meghalaya (Ri-Bhoi), Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Cambodia,? Java, Laos, Nepal, Sri Lanka and Vietnam (Map 3 and Diags. 2 & 6).

29. *Chrysotoxum quadrifasciatum* Brunetti

1923. *Chrysotoxum quadrifasciatum* Brunetti, *Fauna Br. India, Dipt.*, **3** : 300.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills) and West Bengal. Elsewhere: Laos (Map 4 and Diag. 6).

Tribe PARAGINI

Genus *Paragus* Latreille

1804. *Paragus* Latreille, *Nouv. Dict. Hist. nat.*, 24 : 94. Type-species : *Syrphus bicolor* F.

Diagnosis : Head slightly flattened and broader than thorax; eye pilose; face produced to a large central bump; antennal arista bare; thorax quadrate and arched; mesonotum striped; wing with veins M_{1+2} and M_3 + Cu_1 undulating apically and cross-vein r-m distinctly before middle of discal cell; abdomen as wide as thorax, nearly parallel-sided; aedeagus in male terminalia undivided, simple and tubular medially with a complex lateral lobe at base on either side.

Key to the subgenera

1. Eye with bicolourous pile, with alternating vittae of pale and dark hairs; spurious vein shoter, not extending beyond discal (r-m) cross-vein ..... ***Paragus***
   Eye with unicolourous pile; spurious vein long, extending beyond discal (r-m) cross-vein. ..... ***Pandasyophthalmus***

Subgenus *Paragus* Latreille

*30. *Paragus (Paragus) serratus* (F.)

1805. *Mulio serratus* Fabricius, *Syst. Antliat.* : 186.

Material examined : 1♂, Mawphlang, 1050 m, East Khasi Hills, 21. iv. 1980, Coll. P. T. Cherian.

Diagnosis : Eye with 3 vittae of white hairs; scutellum black with yellow margin, strongly denticulate posteriorly; abdomen yellow with brown markings; punctate; tergites 3 and 4 each with a whitish band on each side anteriorly, broken in mid-line; tergite 5 with a similar but continuous band placed diagonally.

Distribution : India: Meghalaya (East Khasi Hills), Assam, Bihar, Goa, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Jakarta, Java, E Malaysia, Nepal, Pakistan and Sri Lanka; Africa and Papua. (Map 4 and Diags.2 & 6).

Subgenus *Pandasyophthalmus* Stuckenberg

1954. *Pandasyophthalmus* Stuckenberg, *Revue Zool. Bot. afr.*, **49** : 100. Type-species : *Paragus longiventris* Loew.

31. *Paragus (Pandasyophthalmus) tibialis* (Fallén)

1817. *Pipiza tibialis* Fallén. *Syrphici Sveciae* : 60.

Diagnosis : A blackish species with a distinct median black stripe on face from below antennae to epistome; mesonotum shining black with golden hairs posteriorly; abdomen also shining black; surstylus in male terminalia about a half as long as tergite 9; superior lobe short, slightly longer than surstylus.

Distribution : India: Meghalaya (East Khasi Hills), Bihar, Himachal Pradesh, Jammu & Kashmir, Kerala, Uttar Pradesh and West Bengal. Elsewhere: Nepal and other parts of the Oriental region; Palaearctic region (Map 4 and Diags. 2 & 6).

Subfamily MILESINAE

Key to the tribes

(Modified after Thompson, 1972)

1. Hind femur with well-developed anterior, basal patch of setulae; anterior portion of mesopleuron bare ..... Eristalini
   Hind femur without basal patch of setulae; anterior portion of mesopleuron pilose, if with basal patch of setulae on hind femur..... 2
2. Wing usually with perpendicular anterior cross-vein (r-m) before middle of discal cell, neither greatly slanted nor extended to outer third of cell; if located at mid-point of cell, then either thorax with bristles or fore and mid femur with ventral spines or hind femur with basal patch of setulae 3
   Wing always with slanted anterior cross-vein, usually beyond middle of discal cell, often greatly slanted and extended to outer third or more of cell; if located at mid-point of cell, then either thorax without bristles or fore and mid femur without ventral spines or hind femur without basal patch of setulae 6
3. Propleuron greatly swollen and produced dorso-ventrally, with a vertical row of long stiff hairs ..... Spheginobacchini
   Propleuron neither greatly swollen nor produced and without a row of hairs 4
4. Wing with apical cross-vein (apex of M_{1+2}) either strongly recessive or straight; arista plumose; a distinct patch of hairs in front of metathoracic spiracle ..... Volucellini
   Wing with apical cross-vein, usually not recessive or straight; if recessive or straight, then metathoracic spiracle without hair-patch at its front 5

5. Mesopleuron at its anterior portion pilose; scutellum with an apical rim; hind femur with ventral spines ..... Eumerini
   Mesopleuron with bare anterior portion; scutellum without an apical rim; hind femur without ventral spines ..... Cheilosini
6. Antenna long, at least as long as face; segment 3 tapering to a point, always with a terminal style ..... Cerioidini
   Antenna short, always shorter than face; segment 3 orbicular or elongate, with a bare arista ..... Milesini

Tribe CHEILOSINI

Genus *Rhingia* Scopoli

1763. *Rhingia* Scopoli, *Ent. Carniolica* : 358. Type-species : *Conops rostrata* L.

Diagnosis : Eye partially haired; face with lower part drawn out into a long, porrect snout (Fig. 2); antenna short, segment 3 sub-oval, as long as or longer than segments 1 and 2 together; arista practically bare; thorax subquadrate, with bristles; subscutellar fringe entire; upper and lower sternopleural hair-patches distinct; costa and vein R_{4+5} end well beyond wing-apex; abdomen oval and emarginate.

32. *Rhingia cincta* de Meijere

1904. *Rhingia cincta* de Meijere, *Bijdr. Diërk.*, 18 : 101.

Material examined : 1♂, 2♀♀ Cherrapunji, 1500 m, East Khasi Hills, 15. ix. 1988, Coll. A. R. Lahiri.

Diagnosis : Face and snout orange brown, shining, bare; antenna brownish orange; mesonotum olive-grey with 2 median and 2 lateral black stripes, often united anteriorly; pleura with brownish orange tomentum and pale yellow hairs; leg bright yellow, mainly with pale yellow hairs; abdomen predominantly black.

Distribution : India: Meghalaya (East Khasi Hills and West Garo Hills) and West Bengal. Elsewhere: Java and Taiwan (Map 3 and Diags. 2 & 6).

Tribe VOLUCELLINI

Key to the genera

1. Wing without spurious vein between R and M; marginal cell (R_1) open; apex of vein M_{1+2} strongly divergent from wing-margin ..... *Graptomyza*
   Wing with spurious vein between R and M; marginal cell (R_1) closed; vein M_{1+2} strongly recurrent at tip ..... *Volucella*

Genus *Graptomyza* Wiedemann

1820. *Graptomyza* Wiedemann, *Nova Dipt. Gen.* : 16. Type-species : *Graptomyza longirostris* Wiedemann.

Key to the species

1. Abdomen mainly black except yellowish spots on tergites 1-4 laterally and 2-3 posteriorly; coxa of leg black ..... *angustimarginata*
   Abdomen predominantly yellowish with black markings on tergites; coxa of leg yellow 2
2. Abdominal tergites 2, 3 and 4 each with a pair of large but well-separated spots ..... *sexnotata*
   Abdominal tergite 2 with a large median transverse spot and tergites 3 and 4 each with a pair of large spots very closely apposed together ..... *nigripes*

33. *Graptomyza angustimarginata* Brunetti

1923. *Graptomyza angustimarginata* Brunetti, *Fauna Br. India, Dipt.*, **3** : 141.

Distribution : India: Meghalaya (West Garo Hills) (Map 2).

34. *Graptomyza nigripes* Brunetti

1913. *Graptomyza nigripes* Brunetti, *Rec. Indian Mus.*, **8** : 167 (as variety of *G. ventralis* Wiedeman).

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), Arunachal Pradesh, Assam, Himachal Pradesh, Sikkim and West Bengal. Elsewhere : Malaya (Map 4 and Diags 3 & 7).

35. *Graptomyza sexnotata* Brunetti

1908. *Graptomyza sexnotata* Brunetti, *Rec. Indian Mus.*, **2** : 63.

Distribution : India: Meghalaya (East Khasi Hills) and Sikkim (Map 4 and Diag. 3).

Genus *Volucella* Geoffroy

1762. *Volucella* Geoffroy, *Hist. Insect. Paris*, **2** : 540. Type-species : *Musca pellucens* L.

Key to the species

1. Abdomen mainly reddish yellow with a large triangular greyish spot centrally on tergite 3; wing without central infuscation ..... *peleterii*

Abdomen mainly black with 2 narrow pale cross-bands on tergites 2-3 and 3-4; wing with a narrow infuscation in middle from anterior margin dying away posteriorly and at wing-tip..... *trifasciata*

36. *Volucella peleterii* Macquart

1834. *Volucella peleterii* Macquart, *Hist. nat. Ins. Dipt.*, **1** : 495.

1923. *Volucella signata* Brunetti, *Fauna Br. India, Dipt.*, **3** : 146.

Distribution : India: Meghalaya (East Khasi Hills and West Garo Hills). Elsewhere: Java (Map 4 and Diag. 7).

37. *Volucella trifasciata* Wiedemann

1830. *Volucella trifasciata* Wiedemann, *Aussereurop. zweifl. Insekt.*, 2: 196.

Distribution : India : Meghalaya (Ri-Bhoi) and Sikkim. Elsewhere : Cambodia, China, Java, Kalimantan, Malaya, E Malaysia, Myanmar, Philippines, Sulawesi, Taiwan, Thailand and Vietnam (Map 4 and Diags. 3 & 7).

Tribe SPHEGINOBACCHINI

Genus *Spheginobaccha* de Meijere

1908. *Spheginobaccha* de Meijere, *Tijdschr. Ent.*, 51 : 327. Type-species : *Sphegina macropoda* Bigot.

Diagnosis : Eye pilose or bare; face with weak tubercle; occiput produced on upper half, with a deep crease on upper two-thirds; antennal arista bare; scutellum without a rim and hair-fringe, mesopleuron at its anterior portion bare; metathoracic spiracular hair-patch absent; metasternum pilose; wing with vein R_{4+5} straight, apical cross-vein directed outward, a distinct spur on vein M_{1+2} and marginal cell open at margin; hind femur with ventral spines.

38. *Spheginobaccha macropoda* (Bigot)

1883. *Sphegina macropoda* Bigot, *Annls Soc. ent. Fr.*, (6) **3** : 331.

Diagnosis : Eye pilose, anterior ocellus not sunken into a cleft and divided; wing with basal cell 2 microtrichose on apical third; abdominal pattern always with more extensive dark areas except 2 pairs of yellow lateral spots on tergites 2 and 3, and 1 pair of silvery spots on 4; sternite 9 in male genitalia pilose on dorso-lateral surface posteriorly; superior lobe apically like a hook.

Distribution : India: Meghalaya (Ri-Bhoi), Sikkim and West Bengal. Elsewhere : Anambas Is., China, Hainan Is., Java, Kalimantan, Laos, Malaya, E Malaysia, Myanmar, Thailand and Vietnam (Map 4 and Diags. 3 & 7).

Tribe EUMERINI

Genus *Merodon* Meigen

1803. *Merodon* Meigen, *Magazin InsektKde*, **2** : 274. Type-species : *Syrphus clavipes* F.

Diagnosis : Eye pilose; face concave; antennal arista bare; scutellum with a distinct flattened crenate rim and a fringe of hairs; metathoracic spiracular pile-patch absent; metasternum pilose; wing with vein R_{4+5} strongly looped into apical cell; apical cross-vein recessive; marginal cell open at margin; hind femur with a basal patch of setulae.

39. *Merodon varicolor* Walker

1857. *Merodon varicolor* Walker, *J. Linn. Soc. Lond.*, **1** : 122.

Diagnosis : A large species of about 20 mm.; mesonotum pale yellow but brownish anteriorly, with 2 median and 2 sub-median narrow indistinct bluish grey stripes; abdomen elongate-conical, a little longer than thorax; hind femur almost entirely black, with a distinct tubercle towards base and another swelling towards apex on inner surface; hind tibia with a groove inside in middle.

Distribution : India: Meghalaya (West Garo Hills) and West Bengal. Elsewhere : E Malaysia (Map 4 and Diags. 3 & 7).

Tribe CERIOIDINI

Genus *Monoceromyia* Shannon

1922. *Monoceromyia* Shannon, *Bull. Brooklyn ent. Soc.*, **17** : 32 (as subgenus of *Cerioides* Rondani). Type-species: *Ceria tricolor* Loew.

Diagnosis : Eye bare; frons at its lower part slightly produced; antenna porrect, placed on an elongate peduncle; segment 3 as long as or longer than segment 2, with a narrow terminal style instead of arista; scutellum without a ventral pile fringe and without distinct apical rim; metathoracic spiracular pile-patch absent; anterior portion of mesopleuron pilose only on upper half; metasternum always with a few short distinct hairs; wing long, narrowed apically and broadly darkened all along anterior margin; marginal cell broadly open; apical cell closed at wing-margin; vein R_{4+5} with a pointed loop downwards into apical cell; anterior cross-vein always beyond middle, usually at outer third of discal cell; hind femur slightly swollen and with ventral spines.

40. *Monoceromyia tredecimpunctata* (Brunetti)

1923. *Ceria tredecimpunctata* Brunetti, *Fauna Br. India, Dipt.*, **3** : 336.

Diagnosis : Face with a broad median black stripe and similar stripe on either cheek; thorax black, with yellow spots on humerus, at end of transverse suture, on mesopleuron and sternopleuron, and on post-suture each side; abdomen mainly black, segment 2 always distinctly longer than 3; tergite 1 with a pair of contiguous yellow spots and tergites 2, 3 and 4 with only yellow hind margins.

Distribution : India: Meghalaya (Ri-Bhoi) and Assam. Elsewhere: Cambodia, Laos, Myanmar and Vietnam (Map 4 and Diags. 3 & 7).

Tribe ERISTALINI

Key to the genera

1. Wing with marginal cell (R_1) open 2
   Wing with marginal cell (R_1) closed..... 3
2. Brilliantly metallic species with slightly flattened hind femur .....***Catacores***
   Non-metallic but densely hairy species with greatly swollen and arcuate hind femur.....***Mallota***
3. Eye bare; wing with normal submarginal cell (R_3) due to normal length of anterior cross-vein (r-m); metathoracic spiracular pile-patch present ..... ***Phytomia***
   Eye at least partially pilose; if bare, then submarginal cell narrowed basally due to longer anterior cross-vein; metathoracic spiracular pile-patch usually absent 4
4. Antennal arista practically bare; if with microscopic pubescence at base, then abdominal tergites with transversely located spots ..... ***Eristalinus***
   Antennal arista plumose at least on basal half; if bare, then eye invariably with 2 distinct bands of dense, dark-coloured piles ..... ***Eristalis***

Genus *Catacores* Hull

1944. *Catacores* Hull, *Ent. News*, **55** : 205. Type-species : *Axona cyanea* Brunetti.

41. *Catacores cyanea* (Brunetti)

1913. *Axona cyanea* Brunetti, *Rec. Indian Mus.*, **9** : 272.

Diagnosis : A violet-blue species with head, thorax and abdomen approximated; antennal segment 3 rounded, with arista beset with a few hairs at base; wing with marginal cell very narrowly open; anterior cross-vein just beyond mid-point of discal cell; anal vein running nearly to wing-margin; hind femur without spines or bristles; hind tibia barely curved and slightly thickened in middle.

Distribution : India: Meghalaya (West Garo Hills), Arunachal Pradesh, Sikkim and West Bengal (Map 4 and Diag. 3).

Genus *Eristalinus* Rondani

1845. *Eristalinus* Rondani, *Nuovi Annali Sci. nat. Bologna*, **2** (2) : 453. Type-species : *Musca sepulchralis* L.

Key to the subgenera

1. Metathoracic spiracle at its front with a distinct patch of hairs ..... ***Eristalodes***
   Metathoracic spiracle at its front without any patch of hairs 2
2. Hind femur greatly thickened ..... ***Merodonoides***
   Hind femur normal and not thickened ..... ***Eristalinus***

Subgenus *Eristalinus* Rondani

Key to the species

1. Femur normally orange or brownish orange.....*arvorum*
   Femur black, at most narrowly pale apically.....2
2. Tarsi black except yellowish fore tarsomere 1 and mid tarsomeres 1 and 2 ..... *laetus*
   Tarsi with tarsomeres 1 and 2 entirely and 3 basally yellowish .....*quinquestriatus*

* 42. *Eristalinus (Eristalinus) arvorum* (F.)

1787. *Syrphus arvorum* Fabricius, *Mantissa Insect.*, **2** : 335.

Material examined : 1♂, 1♀, Mawphlang, 1050 m, East Khasi Hills, 21. iv. 1980, Coll. P. T. Cherian.

Distribution : India: Meghalaya (East Khasi Hills), Arunachal Pradesh, Jammu & Kashmir, Orissa, Sikkim and West Bengal. Elsewhere : China and other parts of the SE Asia; Australia, Hawaii, Japan and Micronesia (Map 4 and Diags. 3 & 7).

43. *Eristalinus* (*Eristalinus*) *laetus* (Wied.)

1830. *Eristalis laetus* Wiedemann, *Aussereurop. zweifl. Insekt.*, **2** : 192.

1986. *Eristalinus (Eristalinus) laetus* (Wiedemann) : Datta & Chakraborti, *Opusc. zool. flumin.*, **6** : 14.

Material examined : 1♂, 1♀, Polo ground forest, Shillong, 1500 m, East Khasi Hills, 10. iv. 1991, Coll. S. K. Ghosh.

Distribution : India: Meghalaya (East Khasi Hills), Bihar, Jammu & Kashmir, Karnataka, Rajasthan, Tamil Nadu and West Bengal. Elsewhere : China, Nepal, Philippines, Sri Lanka and Taiwan (Map 4 and Diags. 3 & 7).

44. *Eristalinus* (*Eristalinus*) *quinquestriatus* (F.)

1794. *Syrphus quinquestriatus* Fabricius, *Ent. Syst.*, **4** : 289.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills), Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Orissa, Uttar Pradesh and West Bengal. Elsewhere: China and other parts of the Oriental region; Japan (Map 4 and Diags. 3 & 7).

Subgenus *Eristalodes* Mik

1897. *Eristalodes* Mik, *Wien. ent. Ztg.*, **16** : 114. Type-species: *Eristalis taeniops* Wiedemann.

Key to the species

1. Thorax yellowish, with 4 distinct black stripes; abdominal segment 3 mainly or entirely black ..... *paria*

   Thorax dull yellowish grey, with 4 but indistinct black stripes; abdominal segment 3 predominantly bright yellow..... *taeniops*

45. *Eristalinus* (*Eristalodes*) *paria* (Bigot)

1880. *Eristalomyia paria* Bigot, *Annls Soc. ent. Fr.*, (5) **10** : 218.

1923. *Eristalis quinquelineatus* var. *orientalis* Brunetti, *Fauna Br. India, Dipt.*, **3** : 183.

Material examined : 1 ♀,, Fruit Garden, Shillong, 1550 m, East Khasi Hills, 28. vii. 1977, Coll. M. S. Jyrwa.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Jammu & Kashmir, Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere : Java, Laos, Malaya, Nepal, Sri Lanka and Taiwan; Japan and Moluccas (Map 5 and Diags. 3 & 7).

*46. *Eristalinus* (*Eristalodes*) *taeniops* (Wied.)

1818. *Eristalis taeniops* Wiedemann, *Zool. Mag.*, **2** : 42.

Material examined : 1 ♀, Polo ground forest, Shillong, 1500 m, East Khasi Hills, 10 iv. 1991, Coll. S. K. Ghosh.

Distribution: India: Meghalaya (East Khasi Hills), Himachal Pradesh and West Bengal. Elsewhere: Nepal and Pakistan; Ethiopian and Palaearctic regions (Map 5 and Diags. 3 & 7).

Subgenus *Merodonoides* Curran

1931. *Merodonoides* Curran, *J. fed. Malay St. Mus.*, **16** : 333. Type-species : *Merodonoides circularis* Curran=*Eristalis multifarius* Walker.

47. *Eristalinus (Merodonoides) multifarius* (Walker)

1852. *Eristalis multifarius* Walker, *Insecta Saundersiana*, **1** : 248.

Diagnosis : Eye reddish brown, bare, with 2 distinct black stripes; antenna black; mesonotum ash-grey, with 4 shining black stripes; scutellum entirely orange; wing with narrowed submarginal cell at base due to considerably long anterior cross-vein; abdominal tergite 3 mainly orange, with a large semi-circular black spot posteriorly.

Distribution : India: Meghalaya (Ri-Bhoi), Gujarat, Kerala, Madhya Pradesh, Rajasthan, Tamil Nadu and West Bengal. Elsewhere: Java, Malaya, Nepal, Sri Lanka and Vietnam (Map 5 and Diags. 3 & 7).

Genus *Eristalis* Latreille

1804. *Eristalis* Latreille, *Nouv. Dict. Hist. nat.*, 24:194. Type-species : *Musca tenax* L.

Key to the subgenera

1. Meropleuron at its upper edge (barrette) pilose; antennal arista bare ..... ***Eristalis***
   Meropleuron entirely bare; antennal arista usually plumose on basal half ..... ***Eoseristalis***

Subgenus *Eristalis* Latreille

48. *Eristalis (Eristalis) tenax* (L.)

1758. *Musca tenax* Linnaeus, *Syst. Nat. Ed.*, **10** : 591.

Material examined : 1 ♀, Fruit Garden, Shillong, 1550 m, East Khasi Hills, 26. v. 1981, Coll. M. S. Jyrwa, 1 ♂, 1 ♀, Shillong, 1560 m, East Khasi Hills, 5. iii. 1991, Coll. K. K. Ray; 1 ♂, Cherrapunji, 1500 m, East Khasi Hills, 3. iv. 1991, Coll. S. K. Ghosh; 1 ♀, Polo ground forest, Shillong, 1500 m, 11.iv 1991, Coll. S. K. Ghosh.

Diagnosis : Eye brown-haired with 2 longitudinal bands of dense hairs; antenna usually brownish black, arista bare; mesonotum shining brownish black; scutellum brownish yellow; subscutellar fringe absent; abdominal colouration bright reddish yellow to black.

Distribution : India: Meghalaya (East Khasi Hills); nearly cosmopolitan (Map 5 and Diags. 3 & 7).

Subgenus *Eoseristalis* Kanervo

1938. *Eoseristalis* Kanervo, *Annls Univ. fenn. abo.*, (A) **6** : 12. Type-species : *Eristalis cerealis* F.

Key to the species

1. Eye practically bare, with a little very short indistinct pubescence anteriorly; abdominal

tergites 3 and 4 each with an inverted-V mark of velvet-black reaching laterally as well as posteriorly ..... *suturalis*

Eye distinctly pilose; abdominal tergites patterned otherwise 2

2. Mesonotum without any transverse stripe; abdominal tergite 3 with a black spot filling half of anterior margin, tergite 4 shining black like 5 ..... *arbustorum*

Mesonotum with a transverse stripe of greyish pubescence along suture; abdominal tergite 3 in males with a triangular or oblong spot on anterior margin, reaching laterally, in females spots smaller and narrower but always on anterior margin ..... *cerealis*

*49. *Eristalis* (*Eoseristalis*) *arbustorum* (L.)

1758. *Musca arbustorum* Linnaeus, *Syst. Nat. Ed.*, **10** : 591.

Material examined : 1♀, Shillong, 1560 m, East Khasi Hills, 3. vii. 1977, Coll. M. S. Jyrwa; 1♂, Rongrengiri, 340 m, East Garo Hills, 9. vii. 1988, Coll. R. K. Ghosh.

Distribution : India: Meghalaya (East Khasi Hills and East Garo Hills), Jammu & Kashmir and West Bengal. Elsewhere: Holarctic (Map 5 and Diags. 4 & 7).

50. *Eristalis* (*Eoseristalis*) *cerealis* Fabricius

1805. *Eristalis cerealis* Fabricius, *Syst. Antliat.*, : 232.

1849. *Eristalis solitus* Walker, *List Dipt. Colln Br. Mus.*, **3** : 619.

Material examined : 1♂, Fruit Garden, Shillong, 1550 m, East Khasi Hills, 28.vii. 1977, Coll. M. S. Jyrwa; 1♂, Shillong, 1560 m, East Khasi Hills, 12. v. 1978, Coll. S.J.S. Hattar; 1♀, Mawphlang, 1050 m, East Khasi Hills, 4. iii. 1991, Coll. K. K. Ray.

Distribution : India: Meghalaya (East Khasi Hills), Assam, Himachal Pradesh, Jammu & Kashmir, Sikkim and West Bengal. Elsewhere: China, Myanmar and other parts of the Oriental region; Japan, Korea and Sakhalin (Map 5 and Diags. 4 & 8).

51. *Eristalis* (*Eoseristalis*) *suturalis* Brunetti

1923. *Eristalis suturalis* Brunetti, *Fauna Br. India, Dipt.*, **3** : 193.

Distribution : India: Meghalaya (East Khasi Hills and West Garo Hills). Elsewhere: Laos and Vietnam (Map. 5 and Diag. 8).

52. *Eristalis* (?) *angustimarginalis* Brunetti

1923. *Eristalis angustimarginalis* Brunetti, *Fauna Br. India, Dipt.*, **3** : 176.

Diagnosis : Eye densely pilose; antennal arista strongly plumose on two-thirds basally; thorax entirely haired, with a band of greyish hairs across suture; hind femur entirely black or at most with orange apex; abdominal tergite 3 with a pair of linear spots located transversely over centre and not extended laterally.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills). Elsewhere: Myanmar (Map 5 & Diag. 8).

Genus *Mallota* Meigen

1822. *Mallota* Meigen, *Syst. Beschr. europ. zweifl. Insekt.*, 3 : 377. Type-species : *Syrphus fuciformis* Fabricius.

53. *Mallota orientalis* (Wiedemann)

1824. *Eristalis orientalis* Wiedemann, *Analecta Ent.* : 38.

Diagnosis : Eye densely pilose at least anteriorly; antennal arista bare; wing greyish; abdomen black, tergite 2 with a large triangular spot of yellowish hairs on either side; tergites 3 and 4 each with a broad band of dense yellow hairs anteriorly.

Distribution : India: Meghalaya (East Khasi Hills), Sikkim and West Bengal. Elsewhere: Java, Laos, Malaya and Taiwan (Map 5 and Diags. 4 & 8).

Genus *Phytomia* Guérin-Méneville

1834. *Phytomia* Guérin-Méneville, *in* Bélanger, *Voyage Ind.-Orient.*, 7 : 509. Type-species : *Eristalis chrysopygus* Wied.

Key to the subgenera

1. Hind femur with a conspicuous subapical tooth on front side; scutellum with apical rim ..... ***Dolichomerus***
   Hind femur unarmed; scutellum without apical rim ..... ***Phytomia***

Subgenus *Phytomia* Guérin-Méneville

Key to the species

1. Wing at its basal half diagonally all black; subscutellar fringe absent ..... *chrysopyga*
   Wing yellowish grey, with dark brown suffusion anteriorly, extending to apex of basal cell 1 and base of submarginal cell (R_3); subscutellar fringe present ..... *zonata*

54. *Phytomia* (*Phytomia*) *chrysopyga* (Wied.)

1819. *Eristalis chrysopygus* Wiedemann. *Zool. Mag.*, 1 : 15.

1923. *Megaspis chrysopygus* Wiedemann: Brunetti, *Fauna Br. India, Dipt.*, 3 : 200.

Distribution : India: Meghalaya (East Khasi Hills), Assam and Sikkim. Elsewhere: Andalas, Java, Laos, Malaya, Myanmar and Thailand (Map 5 and Diags. 4 & 8).

55. *Phytomia (Phytomia) zonata* (Fabricius)

1787. *Syrphus zonatus* Fabricius, *Mantissa Insect.*, **2** : 337.

1923. *Megaspis zonatus* Fabricius : Brunetti, *Fauna Br. India, Dipt.*, **3** : 203.

Material examined : 1♂, Pynursla, 1500 m, East Khasi Hills, 11. xi. 1973, Coll. S. Biswas; 1♀, Nongpoh forest, 650 m, Ri-Bhoi, 30. xi. 1988, Coll. A. R. Lahiri.

Distribution : India: Meghalaya (Ri-Bhoi, East Khasi Hills and West Garo Hills), Arunachal Pradesh, Assam, Karnataka, Kerala, Sikkim, Tamil Nadu and West Bengal. Elsewhere: Bangladesh, China, Philippines and other parts of the SE Asia; Japan, Korea and Manchuria (Map 5 and Diags. 4 & 8).

Subgenus *Dolichomerus* Macquart

1850. *Dolichomerus* Macquart, *Dipt. exot. Suppl.*, **4** : 131. Type-species : *Syrphus crassus* Fabricius.

56. *Phytomia (Dolichomerus) crassa* (F.).

1787. *Syrphus crassus* Fabricius, *Mantissa Insect.*, **2** : 334.

1923. *Megaspis crassus* Fabricius : Brunetti, *Fauna Br. India, Dipt.*, **3** : 197.

Diagnosis : Frons and face together nearly parallel-sided; antenna black, arista orange; wing clear at base except an oblique line reaching from stigma across outer side of basal cell 2 and thence middle of anal cell to alula; femora bright reddish brown, blackish apically; hind pair with a fringe of coarse hairs on apical half of front side; abdomen shining black, tergites 2, 3 and 4 each with a deep impression of a large circle, touching anterior margin.

Distribution : India: Meghalaya (West Garo Hills), Andhra Pradesh, Assam, Bihar, Goa, Karnataka, Kerala, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Laos, Malaya, Nepal, Sri Lanka, Sulawesi and Thailand (Map 5 and Diags. 4 & 8).

Tribe MILESINI

Key to the genera

1. Wing with marginal cell (R_1) open 2
   Wing with marginal cell closed, with a long petiole ..... ***Milesia***
2. Face tuberculate; metasternum pilose ..... ***Criorhina***
   Face non-tuberculate; metasternum bare 3
3. Densely haired species with subscutellar fringe ..... ***Brachypalpus***
   Thinly and inconspicuously haired species without subscutellar fringe ..... ***Xylota***

Genus *Brachypalpus* Macquart

1834. *Brachypalpus* Macquart, *Hist. nat. Ins. Dipt.*, **1** : 523. Type-species : *Brachypalpus tuberculatus* Macquart = *valgus* (Panzer).

57. *Brachypalpus dives* Brunetti

1908. *Brachypalpus dives* Brunetti, *Rec. Indian Mus.*, **2** : 86.

Diagnosis : Male head at its hind margin entirely encircled by a fringe of bright yellow hairs; scutellar edge ridged all around; hind femur slightly thickened and with a tooth ventrally at apex, followed by a semi-circular protuberance; abdomen brilliantly shining golden yellow with golden yellow hairs.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills) and Nagaland (Map 6 and Diag. 4).

Genus *Criorhina* Meigen

1822. *Criorhina* Meigen, *Syst. Beschr. europ. zweifl. Insekt.*, **3** : 236. Type-species : *Syrphus asilicus* Fallén.

58. *Criorhina bomboides* Hull

1944. *Criorhina bomboides* Hull, *Ann. Mag. nat. Hist.*, (11) **11** : 37.

Diagnosis : Male eyes approximate for a short distance and almost touching; epistome produced chiefly downward; thorax velvety black with purplish brown hairs; legs chiefly light brownish red; hind femur laterally two-thirds and apically, and tibia all along laterally with long, bushy golden red hairs; wing at apical fifth, together with posterior cross-vein pale brown; no stigmal cross-vein but a small yellow stigmal spot; abdomen black, with black hairs.

Distribution : India: Meghalaya (East Khasi Hills) (Map 6).

Genus *Milesia* Latreille

1804. *Milesia* Latreille, *Nouv. Dict. Hist. nat.*, **24** : 194. Type-species : *Syrphus crabroniformis* F.

Key to the species

1. Vertex conspicuously elevated and eyes behind with a bright orange-yellow band ..... *verticalis*
   Vertex normal, in that it is nearly or quite flush with eyes 2
2. Abdominal tergites with distinct pairs of spots as well as transverse bands 3

Abdominal tergites only with transverse pale bands 4

3. Surstylus in male terminalia gradually narrowed to apex; superior lobe not produced apico-dorsally ..... *variegata*

Surstylus in male terminalia abruptly narrowed to apex forming a right angle on inner side; superior lobe produced apico-dorsally ..... *illustris*

4. Abdominal tergite 2 with very wide band along anterior margin, reaching middle or beyond ..... *balteata*

Abdominal tergite 2 with very narrow band anteriorly, never filling even 1/4 of tergite..... 5

5. Wing rather clearly divisible at spurious vein into a brown anterior half and a subhyaline posterior half 6

Wing yellowish grey gradually diffusing posteriorly ..... *semifulva*

6. Mesonotum with a distinct yellow pollinose prescutellar patch; meso- and sternopleuron with distinct yellow pollinose patch ..... *cretosa*

Mesonotum, meso- and sternopleuron without such distinct patches, if with inconspicuous patches, then of ferruginous brown ..... *ferruginosa*

59. *Milesia balteata* Kertész

1901. *Milesia balteata* Kertész, *Természetr. Füz*, **24** : 414.

1908. *Milesia himalayensis* Brunetti, *Rec. Indian Mus.*, **2** : 82.

Material examined : 1♂, Nongpoh, 650 m, Ri-Bhoi, 30.ix1988, Coll. A. R. Lahiri.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills), Assam, Sikkim and West Bengal. Elsewhere: Hainan Is., Laos, Malaya, Myanmar, Nepal and Thailand (Map 6 and Diags 4 & 8).

60. *Milesia cretosa* Hippa

1990. *Milesia cretosa* Hippa, *Acta zool. fenn.*, **187** : 122.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills). Elsewhere: Myanmar (Map 6 and Diag. 8).

61. *Milesia ferruginosa* Brunetti

1913. *Milesia ferruginosa* Brunetti, *Rec. Indian Mus.*, 9 : 268.

Material examined : 1♂, Shillong, 1560 m, East Khasi Hills, 3. vii. 1977, Coll. M. S. Jyrwa.

Distribution : India: Meghalaya (Ri-Bhoi and East Khasi Hills), Assam, Sikkim, Uttar Pradesh and West Bengal. Elsewhere: China, Laos, Myanmar, Nepal and Thailand (Map 6 and Diags. 4 & 8).

62. *Milesia illustris* Hippa

1990. *Milesia illustris* Hippa, *Acta zool. fenn.*, **187** : 129.

Distribution : India : Meghalaya (Ri-Bhoi), Assam, Sikkim and West Bengal. Elsewhere : Laos (Map 6 and Diags. 4 & 8).

63. *Milesia semifulva* de Meijere

1904. *Milesia semifulva* de Meijere, *Bijdr. Diërk.*, **17** : 99.

1923. *Milesia decora* Brunetti, *Fauna Br. India, Dipt.*, **3** : 274.

1923. *Milesia gigas* Macquart : Brunetti, *Fauna Br. India, Dipt.*, **3** : 271.

Distribution : India : Meghalaya (Ri-Bhoi and East Khasi Hills), Assam, Tamil Nadu and West Bengal. Elsewhere : Andalas, Java, Laos, Malaya, Myanmar and Thailand (Map 6 and Diags. 4 & 8).

64. *Milesia variegata* Brunetti

1908. *Milesia variegata* Brunetti, *Rec. Indian Mus.*, 2 : 80.

Distribution : India : Meghalaya (Ri-Bhoi and East Khasi Hills), Assam, Sikkim and West Bengal. Elsewhere : Laos, Myanmar and Thailand (Map 6 and Diags. 4 & 8).

65. *Milesia verticalis* Brunetti

1923. *Milesia verticalis* Brunetti, *Fauna Br. India, Dipt.*, **3** : 269.

Distribution : India : Meghalaya (West Garo Hills) (Map 6).

Genus *Xylota* Meigen

1822. *Xylota* Meigen, *Syst. Beschr. europ. zweifl. Insekt.*, 3 : 211. Type-species : *Musca sylvarum* L.

Key to the species

1. Fore and mid femora entirely bright yellow; mid femur without a tooth below basally; hind femur exceedingly swollen, bright yellow, black apically, with a broad black median ring ..... *annulata*

   Male femora mainly all black, mid femur with a distinct tooth below basally; hind femur laterally compressed towards apex, with about 6 black spines and a bunch of long, coarse yellow hairs on underside in middle, 2 rows of strong black spines on underside and a number of similar spines on upper outer side apically ..... *penicillata*

66. *Xylota annulata* Brunetti

1913. *Xylota annulata* Brunetti, *Rec. Indian Mus.*, 9 : 270.

Distribution : India : Meghalaya (West Garo Hills) and West Bengal. Elsewhere : Laos and Malaya (Map 6 and Diags. 4 & 8).

67. *Xylota penicillata* Brunetti

1923. *Xylota penicillata* Brunetti, *Fauna Br. India, Dipt.*, 3 : 242.

Distribution : India : Meghalaya (Ri-Bhoi) (Map 6).

ZOOGEOGRAPHICAL COMMENTS

Meghalaya is lately composed of 7 districts, *viz.*, Ri-Bhoi, East Khasi Hills, West Khasi Hills, East Garo Hills, West Garo Hills, South Garo Hills and Jaintia Hills (Map 1), and is one of the states as Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram and Tripura in the north-east India that was formerly as a whole (or excepting Tripura) referred to as 'Assam' in the literature. The state is a hilly terrain with luxuriant floriferous vegetation that provides the Syrphidae with ample opportunity to flourish well and that supports their abundance throughout the year with a little decline at higher altitude with the fall of chilly weather. Insofar as the qualitative richness of the fauna that appeals much, as many as 67 species under 34 genera are represented in Meghalaya, accounting for nearly 25% of the species India holds (*cf.* Brunetti, 1923; Knutson, Thompson and Vockeroth, 1975; Hippa, 1990).

The dominant genus in the state is *Milesia* Latreille comprising 7 species, *i.e.*, very nearly 10% of the fauna, followed by *Baccha* Fabricius and *Eristalinus* Rondani with 6 species under each and *Eristalis* Latreille with 5. The genera *Dideoides* Brunetti, *Graptomyza* Wiedemann and *Phytomia* Guérin-Méneville are represented by 3 species each, and 2 pertain to each of *Epistrophe* Walker, *Metasyrphus* Matsumura, *Melanostoma* Schiner, *Chrysotoxum* Meigen, *Paragus* Latreille, *Volucella* Geoffroy and *Xylota* Meigen, while for the rest, each contains a single species coming in total to 20.

The Meghalayan fauna contains 7 species, namely, *Dideoides kempi* Brunetti, *D. tigerinus* (Bigot), *Baccha plumbicincta* Brunetti, *Graptomyza angustimarginata* Brunetti, *Criorhina bomboides* Hull, *Milesia verticalis* Brunetti and *Xylota penicillata* Brunetti, that remain unrecorded elsewhere in India and abroad since their discovery, may eventually be known at least from the neighbouring states. By the way, one of 3 *Graptomyza*, *viz.*, *sexnotata* Brunetti, *Catacores cyanea* (Brunetti) and *Brachypalpus dives* Brunetti have been subsequently recorded from one or two nearest states (Diags. 3 & 4) but one of 2 *Epistrophe*, *viz.*, *griseocincta* (Brunetti) does extend its range of distribution beyond that limit up to Uttar Pradesh, even though its occurrence in the intervening states is unknown (Diag.1).

However, the remaining other species are known to spread over the Orient or even beyond it over the Palaearctic, Australian and Ethiopian or other regions in certain instances. In fact, the dispersal of a species from India and the rest of the Orient or

even beyond that limit predominantly brought about through China (lying largely both in the Oriental and Palaearctic regions) northward as well as eastward or southward up to the Australian region across Myanmar, Thailand and the peninsular Malaya or *vice versa*. The shortest range so far exhibited, is by *Eristalis angustimarginalis* Brunetti and *Milesia cretosa* Hippa that cross over the east-end of the country to Myanmar (Diag. 8). Both *Chrysotoxum quadrifasciatum* Brunetti and *Eristalis suturalis* Brunetti further extend their range eastward to Laos with disjunct record in other parts of India and Myanmar, the most probable pathway of radiation (Diags. 6 & 8). The latter species, however, still advances eastward to Vietnam through Laos (Diag. 8). One of *Volucella, viz., peleterii* Macquart is known to occur as far south as in Java, but there is no record of its distribution in between these territories (Diag. 7).

The tribe Syrphini is represented by 18 species, of which 8, *viz., Allograpta javana* (Wiedemann), *Asarkina ericetorum* (Fabricius), *Betasyrphus serarius* (Wiedemann), *Dideopsis aegrotus* (Fabricius), *Episyrphus balteatus* (De Geer), *Ischiodon scutellaris* (Fabricius), *Metasyrphus confrater* (Wiedemann) and *M. corollae* (Fabricius) are amusingly widespread, mostly throughout the Orient with an encroachment in the neighbouring regions or beyond the limit in certain instances. *A. javana*, known only from certain parts of the east and south of India (Diag. 1) despite its existence throughout the country in all likelihood, has successfully colonized the vast stretch of land as far north as Korea and Japan (Palaearctic region) or even the Hawaiian Islands at the farthest, through China, and as far south as Sri Lanka, Andalas and Java or even the Australian region far beyond the Weber's Line through Thailand, Malaysia, Philippines and North Indonesia, evidently without any record either in Bangladesh or in Myanmar or in Sulawesi, the most probable land-bridge easing distribution all along (Diag. 5). Both *ericetorum* and *serarius* are distributed far and wide almost throughout the Oriental region but both of them are unknown from most parts of the north, east, west and central India (Diag. 1) and yet they are known to occur in the Palaearctic and Australian regions, and in the Ethiopian region too in case of the former (Diag. 5). *Citrogramma citrinum* (Brunetti) is seemingly confined to the Orient and is hitherto known only from certain parts of the east and south India (Diag. 1), and from Sri Lanka, Bhutan, Thailand and Malaya but not known either from Bangladesh or from Myanmar, the most possible course of dispersal (Diag. 5). Indeed, *Didea fasciata* Macquart exhibits its existence in Assam in addition to Meghalaya (Diag. 1) and again far away in Taiwan in the east and in the Palaearctic region in the north to the exurb (Diag. 5). Whereas, two of 3 species under *Dideoides* are still restricted to Meghalaya (as already stated above), *ovatus* Brunetti occurring in Meghalaya, West Bengal and Sikkim, bounded over the intervening eastern-most edge of India, and Myanmar and Thailand to Laos, evidently with disjunct records (Diags. 1 & 5). Although *Dideopsis aegrotus* is not represented well in India where it is known only from Meghalaya, Assam, West Bengal and Kerala (Diag. 1), it has successfully colonized almost the entire south-east Asia as far beyond Nepal northward and as far beyond the Moluccas southward across the Weber's Line till the Australian region (Diag. 5). The range of distribution shown by *E. balteatus* and *M. confrater* are almost alike outside India in that they are not only widespread in the Orient but also dispersed both in the Palaearctic and Australian regions (Diags. 1 & 5).

Whereas *I. scutellaris* has invaded far beyond in the Hawaiian Islands through the Micronesia, *M. corollae* has done so in the Ethiopian region westward in lieu of the Australian region southward (Diag. 5). Indeed, none of them so far as known are well-represented in India (Diag. 1). *M. corollae* has been recorded only in Meghalaya and West Bengal, and *scutellaris* in Orissa, Tamil Nadu, Karnataka and, Jammu and Kashmir in addition. The preceding two species, *viz.*, *E. balteatus* and *M. confrater* are known from Meghalaya, Assam, Arunachal Pradesh and West Bengal. The former is also known from Sikkim, Orissa, Kerala, and Jammu and Kashmir wherein the latter is unknown but it is on the other hand reported from Bihar, Uttar Pradesh and Himachal Pradesh (Diag. 1). While *Epistrophe griseocincta* is confined to India (as stated above), *E. horishana*, though known only in Meghalaya and West Bengal in the Indian sub-region, has its distributional range as far east as Philippines in the Orient and as far north as Japan in the Palaearctic region across Laos and Taiwan but our knowledge on its occurrence in the intervening territories through which it might have dispersed in either of two ways to Japan or to Philippines, is lacking. *Meliscaeva cinctella* (Zetterstedt), *Scaeva selenitica* (Meigen) and *Sphaerophoria indiana* Bigot are of common occurrence in Meghalaya and Himachal Pradesh, and moreover, *cinctella* is known in Sikkim and West Bengal where *selenitica* is unknown but it is known in Uttar Pradesh (Diags. 1 & 2). Indeed, *indiana* exhibits a long range of distributional pattern in that it is recorded not only in Arunachal Pradesh, Sikkim, Bihar, Maharashtra, Karnataka and Kerala in addition to the states of occurrence of the other two species but also in the northern part of the Palaearctic region across China and Korea (Diags. 2 & 6). Its southward distribution in Sri Lanka is, however, doubtful but *cinctella* certainly exists there. The latter species extends its range eastward as far as Taiwan and northward as far as Europe across Nepal with a discontinuity of records in the intermediate countries (Diag. 5). *S. selenitica* is also known from Europe across China and the eastern limit of the species marks off to Vietnam through Laos and Cambodia implying a possibility of being dispersed through China in both ways, if not subsequently known from Myanmar and Thailand supposed to be the general course of migration.

The Bacchini are represented in Meghalaya by 6 species, of which *plumbicincta* Brunetti so far remains restricted to the state (as mentioned above) but *nigricosta* Brunetti is known from Meghalaya, Bihar and Uttar Pradesh in India and extends its range westward to Pakistan (Diags. 2 & 6). The other species except *amphithoe* Walker that occurs in Assam, Sikkim and West Bengal in addition to Meghalaya in India and does not occur beyond the Orient, are widespread as far north as in the Palaearctic region. However, *amphithoe* exhibits the distributional range as far east as Taiwan and Philippines turning southward up to Java through E Malaysia, Kalimantan and Sulawesi. The range encompasses Sri Lanka too but the species is neither known from Myanmar, Thailand, Malaya and Andalas nor from the eastern border states of India as well as China (Diags. 2 & 6), regarded here as the most probable route of migration. *Baccha nubilipennis* Austen is known only in Meghalaya in the east and Tamil Nadu, Karnataka and Kerala in the south of India, and extends its range southward up to Sri Lanka and eastward up to Taiwan turning northward up to Nepal and Japan in either direction but the records of distribution in the intervening territories are lacking (Diags. 2 & 6). Although *maculata*

Walker and *apicalis* Loew are not well-represented as any other species in India, they are widespread in the rest of the Orient (Diags. 2 & 6). In the Indian sub-region they are of common occurrence in Uttar Pradesh, West Bengal and Meghalaya only. The former species is known also from Himachal Pradesh and the latter from Bihar and Goa. Indeed, both of them exhibit their distributional range as far east as Taiwan and Philippines and as far south as Java. The northern limit of *maculata* is Nepal unlike *apicalis* which is instead present in Sri Lanka in the opposite. Although *maculata* is also known to occur in the entire Malaysia and the northern Indonesia (Andalas and Kalimantan), *apicalis* is known from Malaya. It is, therefore, speculated that the dispersal at least of *maculata* might have occurred through China even if it is unrecorded, because our knowledge on the distribution all along through Myanmar, Thailand, etc. that are supposed to be the alternative course of radiation, is wanting.

The Melanostomatini comprise 2 species of *Melanostoma* Schiner and 1 species of *Platycheirus* Lep. & Serv. The only species of the latter genus occurs in the Himalayan belt (Himachal Pradesh and West Bengal) in India and extends further northward to the Holarctic region, possibly across Nepal and China (unrecorded), and still it might have spread eastward to Philippines through China (Diags. 2 & 6). Both the species of *Melanostoma* are widely distributed not only in India (certain eastern, northern and southern states) but also in other parts of the Orient (Diags. 2 & 6). However, both of them do occur in the Palaearctic region but it is not known whether they extend their range southward also to the Australian region.

The Chrysotoxini are known by 2 species, of which *baphyrus* Walker mainly shows a Himalayan bias in India, colonizing Arunachal Pradesh, West Bengal, Uttar Pradesh, Himachal Pradesh, and Jammu and Kashmir despite its occurrence in Tamil Nadu in the south (Diag. 2). The species unlike *quadrifasciatum* Brunetti (already stated above) extends its range as far north as Nepal, as far south as Sri Lanka and up to Vietnam through Laos and Cambodia in the east but its record in the far Java remains dubious till its discovery from Myanmar, Thailand and Malaysia happens to be (Diag. 6).

The Paragini in Meghalaya also comprise 2 species, *viz.*, *serratus* (F.) and *tibialis* (Fallén). The latter is much more widespread in the Oriental region than the former that extends its range both in the Australian and Ethiopian regions but is unknown from the Palaearctic region where *tibialis* is widely distributed. However, *serratus* is known to occur nearly throughout India, and Pakistan in the west, Nepal in the north and Sri Lanka in the south, even exhibiting its range of distribution as far south as in Java across Sarawak but is unknown from the intervening territories where it most possibly occurs (Diags. 2 & 6). Indeed, *tibialis* is not well-represented in India and so far known only from Meghalaya, West Bengal, Bihar, Uttar Pradesh, Himachal Pradesh, Jammu and Kashmir, and Kerala (Diag. 2) despite its wide occurrence in other parts of the Orient.

Each of the 4 tribes: Cheilosini, Spheginobacchini, Eumerini and Cerioidini is known to contain a single species in Meghalaya and all of them are scarcely represented in India (Diags. 2 & 3) in that *Rhingia cincta* de Meijere, *Spheginobaccha macropoda* (Bigot) and *Merodon varicolor* Walker are all known only from West Bengal (except *macropoda*

in Sikkim too) and *Monoceromyia tredecimpunctata* (Brunetti) only from Assam beyond Meghalaya. Indeed, all these species are confined to the Oriental region and *macropoda* is the most widely known species occurring in China northward, extending eastward up to the Hainan Island across Myanmar, Thailand, Laos and Vietnam, and southward as far as in the central Indonesia through Malaysia (Diag. 7). While *varicolor* is a known inhabitant of Sarawak, and *cincta* of Taiwan and Java only with a long bound over the intervening territories, *tredecimpunctata* shows almost a continuous distribution up to Vietnam through Myanmar and Laos (Diag. 7).

The Volucellini comprise 5 species of the genera *Graptomyza* Wiedemann and *Volucella* Geoffroy in Meghalaya. Of the 3 species of the former genus, *angustimarginata* Brunetti is hitherto known only in this state and *sexnotata* Brunetti in Sikkim too (already mentioned above) but *nigripes* Brunetti mainly shows a Himalayan bias occurring in Arunachal Pradesh, West Bengal, Sikkim and Himachal Pradesh apart from Assam (Diag. 3). Outside India, it is known from the peninsular Malaya but neither known from Myanmar nor from Thailand, the most probable course of migration. Of the 2 species of *Volucella, trifasciata* Wiedemann is much more widespread in the Orient than *peleterii* Macquart (as already cited above) in that the former species is recorded from China in the north, and Taiwan and Philippines in the east across Myanmar, Thailand, Cambodia and Vietnam, turning southward as far as the central Indonesia up to the Weber's Line through Malaysia despite its only occurrence in Meghalaya and Sikkim within India (Diags. 3 & 7).

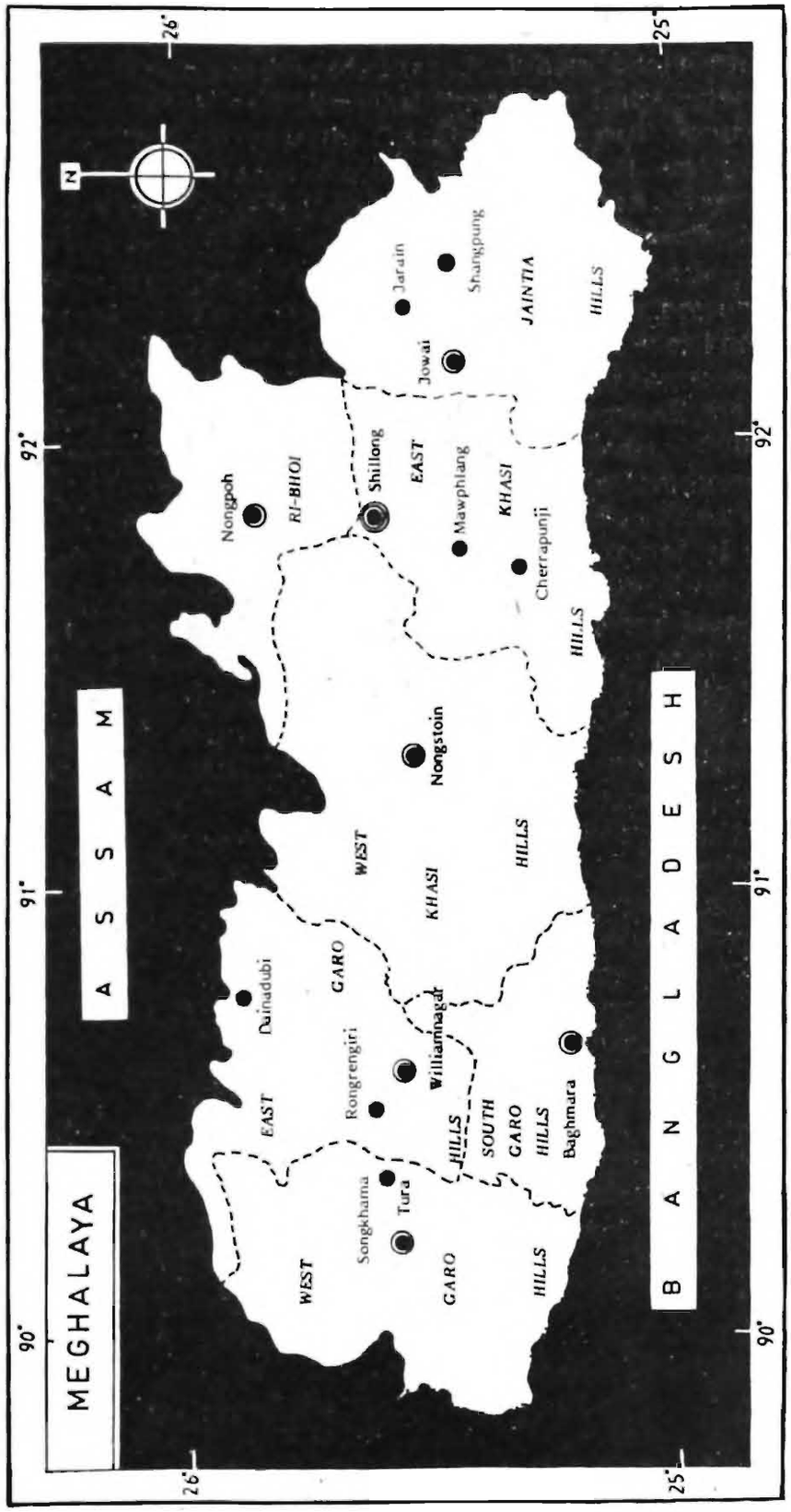
The tribe Eristalini is represented by 16 species under 5 genera, *viz., Catacores* Hull, *Eristalinus* Rondani, *Eristalis* Latreille, *Mallota* Meigen and *Phytomia* Guérin-Méneville. The genera *Catacores* and *Mallota* each contains a single species. While *C. cyanea* (Brunetti) is restricted to India occurring in Arunachal Pradesh, West Bengal and Sikkim apart from Meghalaya (Diag. 3), *M. orientalis* (Wiedemann) is dispersed as far east as in Taiwan across Laos and as far south as in Java across Malaya despite its poor representation only in West Bengal and Sikkim beyond the state but it is neither known from China nor from Myanmar nor from Thailand nor from North Indonesia supposed to be the possible course of radiation (Diags. 4 & 8). Of the 6 species of *Eristalinus, laetus* (Wiedemann) and *multifarius* (Walker) are unknown outside the Orient, and in India both of them are known from the eastern, western and southern parts, and the former from the northern part too (Diag. 3). In the rest of the Orient the former species exhibits its range of distribution northward up to China through Nepal, turning eastward up to Philippines through Taiwan and southward to Sri Lanka, whereas the latter to Nepal northward, to Vietnam eastward and to Sri Lanka and the far Java across Malaya on either way towards the south with disjunct records of its occurrence all along (Diag. 7). Although both *arvorum* (F.) and *quinquestriatus* (F.) occur abundantly almost everywhere in the Orient, extending their range as far as Japan (Palaearctic region) and the former species is also extremely dispersed throughout Australia with an encroachment in the far Hawaiian Islands across Micronesia (Diag. 7), they remain unrecorded from many states in India where they are most likely to exist (Diag. 3). Indeed, *paria* (Bigot) and *taeniops* (Wied.) are not known to occur everywhere in the Orient but the former species like *arvorum* exhibits north-south distribution from the Palaearctic to the

Australian region across the Orient and the latter to the Ethiopian region westward in lieu of the Australian region southward (Diag. 7). Whereas *taeniops* is hitherto known from Meghalaya, West Bengal and Himachal Pradesh in India (Diag. 3), and Nepal in the north and Pakistan in the west in the Oriental region, *paria* occurs more extensively in the Himalayan belt apart from the south India (Diag. 3), and in the remainder of the Orient it is spread out towards the east as far as Taiwan across Laos, towards the north in Nepal and as far south as in Java through the peninsular Malaya besides Sri Lanka in either direction (Diag. 7). Evidently, these two species lack continuity of existing records through a vast stretch of land-masses and are presumed to be intruded from the neighbouring regions as cited before. Indeed, the ever-known as well as the cosmopolitan species (Diags. 3 and 7) is *Eristalis tenax* (L.) that occasionally cause myiasis in humans who have some role in its influx in other areas. All the other 4 species of *Eristalis* have, however, limited range of distribution in India. While *suturalis* Brunetti and *angustimarginalis* Brunetti are not known anywhere in India except Meghalaya (as already discussed), *arbustorum* (L.) and *cerealis* F. mainly show a Himalayan bias occurring in the north-end of the country (Diag. 4) despite scanty record of the former species. Although *arbustorum* is essentially Holarctic, *cerealis* occurs throughout the Oriental region extending its range as far as Sakhalin across Korea and Japan in the Palaearctic region (Diags. 7 & 8). The genus *Phytomia* is known by 3 species, of which *crassa* (F.) is colonized well in India (Diag. 4), with northward migration to Nepal, eastward to Vietnam across Laos and southward to Sri Lanka on one side and to the far-off Sulawesi (Indonesia) on the other across Malaya despite lack of knowledge on its distribution in Myanmar, Thailand and the rest of Malaysia and Indonesia (Diag. 8) regarded as the probable route of radiation. Although *zonata* (F.) is known only in the eastern and southern parts of India (Diag. 4), it is much more known for its widespread distribution in the remainder of the south-east Asia extending its range as far as Manchuria through Korea and Japan in the Palaearctic region (Diag. 8). However, *chrysopyga* (Wiedemann) being represented only in Assam, Meghalaya and Sikkim in India (Diag. 4), crosses over the east-end of the country to Myanmar and thence to Thailand and Laos, and takes a turn southward as far as Java across Andalas (Diag. 8).

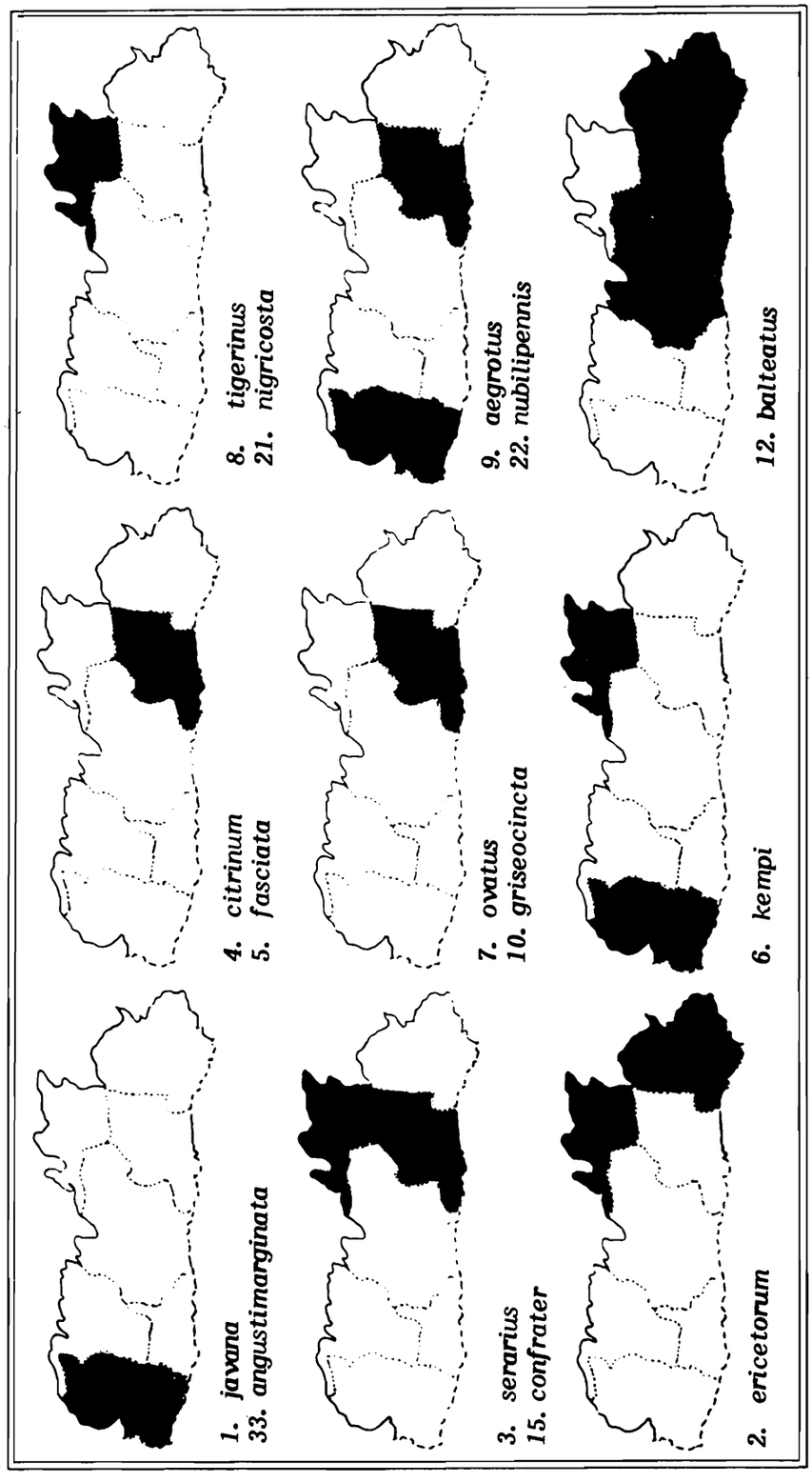
The Milesini comprise 4 genera, *viz.*, *Brachypalpus* Macquart and *Criorhina* Meigen each with a single species, *Milesia* Latreille with 7 species and *Xylota* Meigen with 2 species. One of *Xylota*, *viz.*, *penicillata* Brunetti and *C. bomboides* Hull are known only from the state (as already mentioned) but *B. dives* Brunetti goes ahead eastward to Nagaland without any record in Assam (Diag. 4). However, *annulata* Brunetti, the other species of *Xylota*, is known from West Bengal in India, and Laos and Malaya only in the other part of the Orient (Diags. 4 & 8). It is, therefore, likely to occur not only in the eastern fringe of this country but also in Myanmar and Thailand, if not even it advances furthermore. Of the *Milesia* species (Diags. 4 & 8) excepting *verticalis* Brunetti and *cretosa* Hippa already dealt with above, all but *semifulva* de Meijere that is unknown in Sikkim but known from the far south as Tamil Nadu, occur in Assam, West Bengal and Sikkim within India and all but *illustris* Hippa are known from Myanmar. The four species, *viz.*, *balteata* Kertész, *ferruginosa* Brunetti, *semifulva* de Meijere and *variegata* Brunetti extend their distributional range eastward to Laos through Thailand. However,

illustris Hippa is neither known from Myanmar nor from Thailand, and it is recorded only from Laos outside India. The intrusion of *balteata* in the Hainan Island might have brought about northward through China (unrecorded) because its occurrence eastward beyond Laos is unknown, but its southward migration to the peninsular Malaya through Thailand is clearly perceptible. The most widespread species of the genus so far known despite its disjunct records is *semifulva* that exhibits its range of distribution as far south as Andalas and Java through the peninsular Malaya.

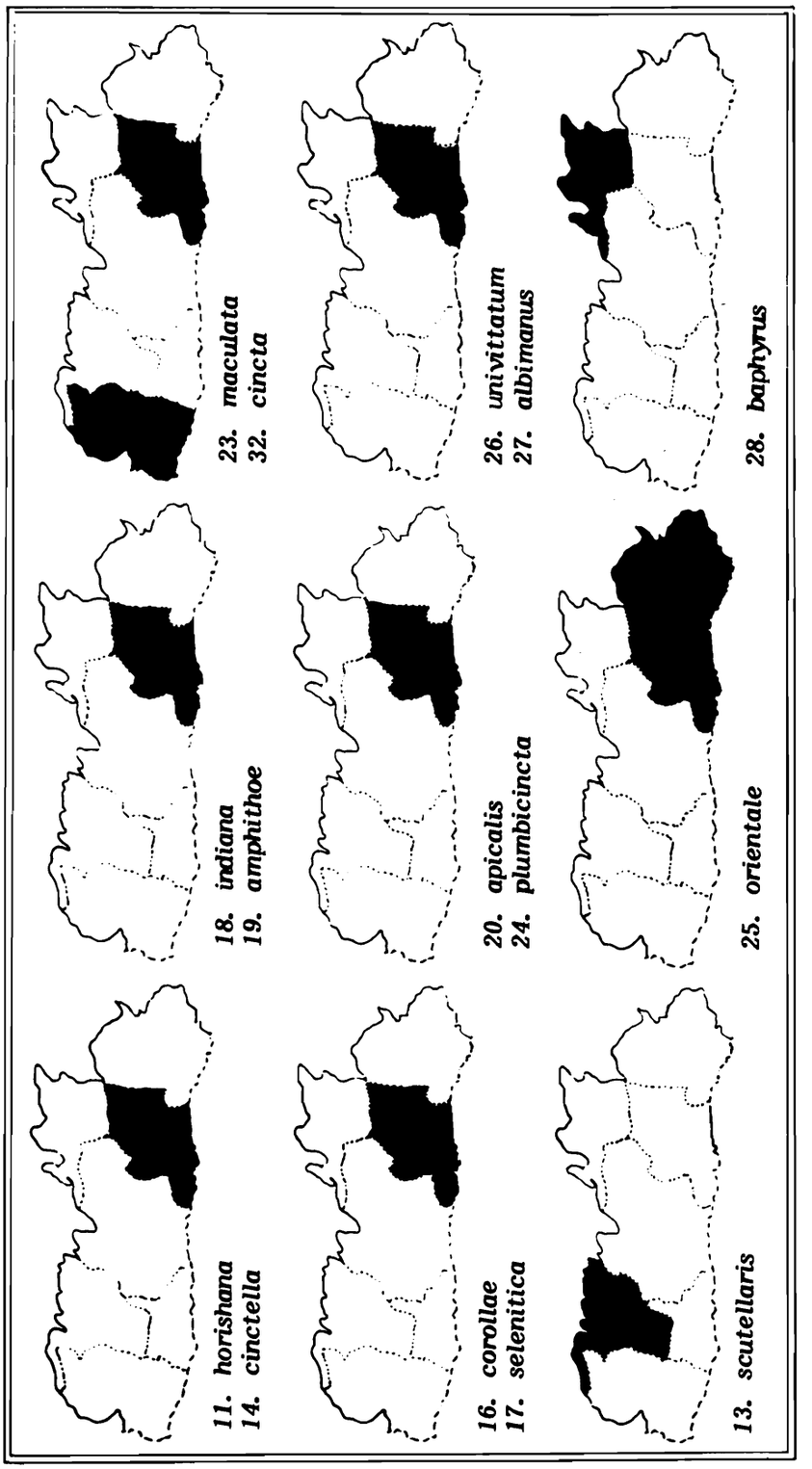
To conclude, Meghalaya harbours 67 species under 34 genera, of which 7 species are hitherto known only from the state and 11 species, inclusive of these 7, are confined to India (till March, 1992). The majority comprising 56 species are spread over other parts of the Oriental region, and of them, 28 species excluding 1 that remains doubtful, extend their range of distribution beyond the Orient.



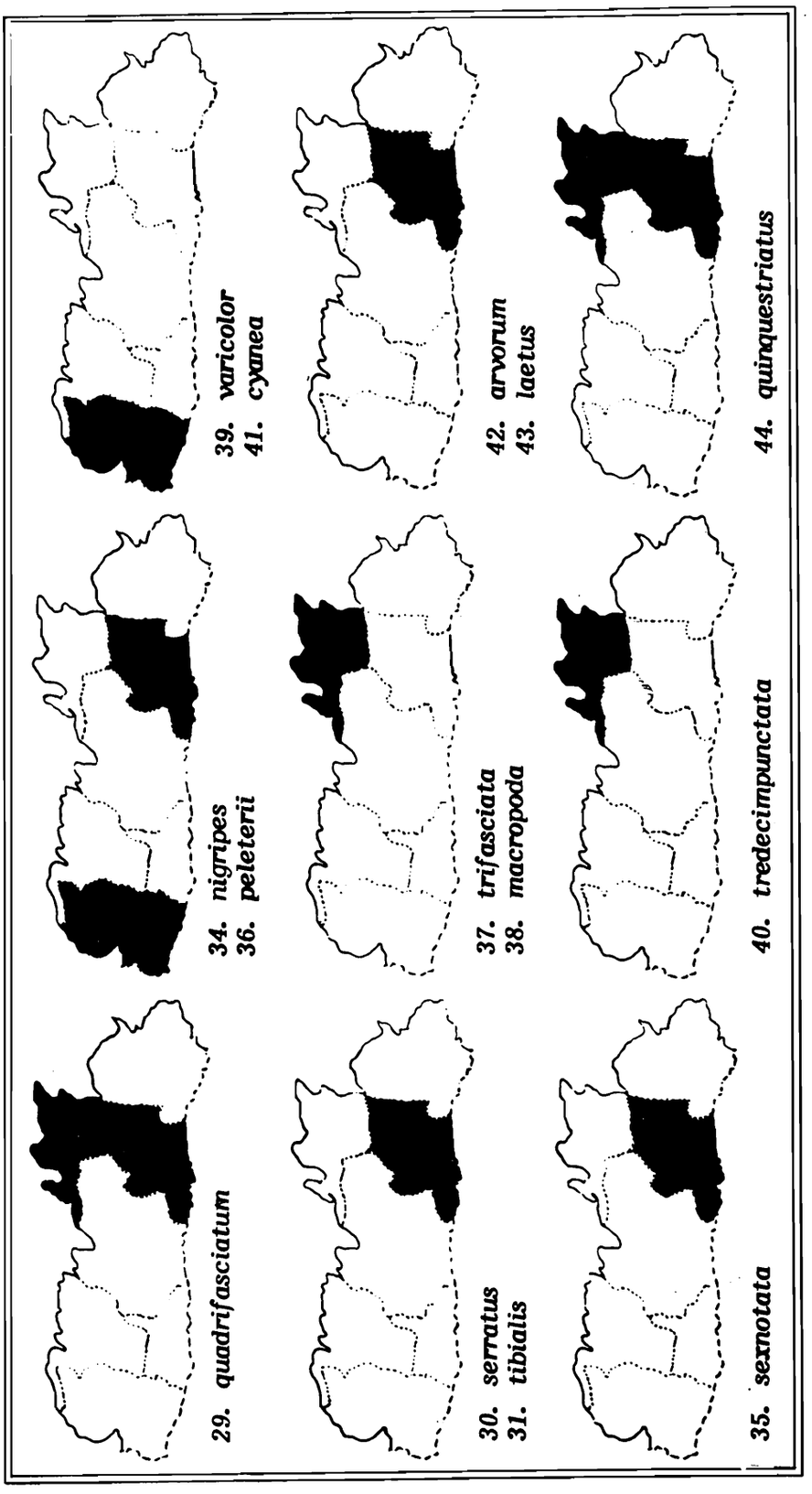
Map 1. Meghalaya showing its location, districts, district headquarters and recorded places of occurrence of the Syrphidae dealt with.



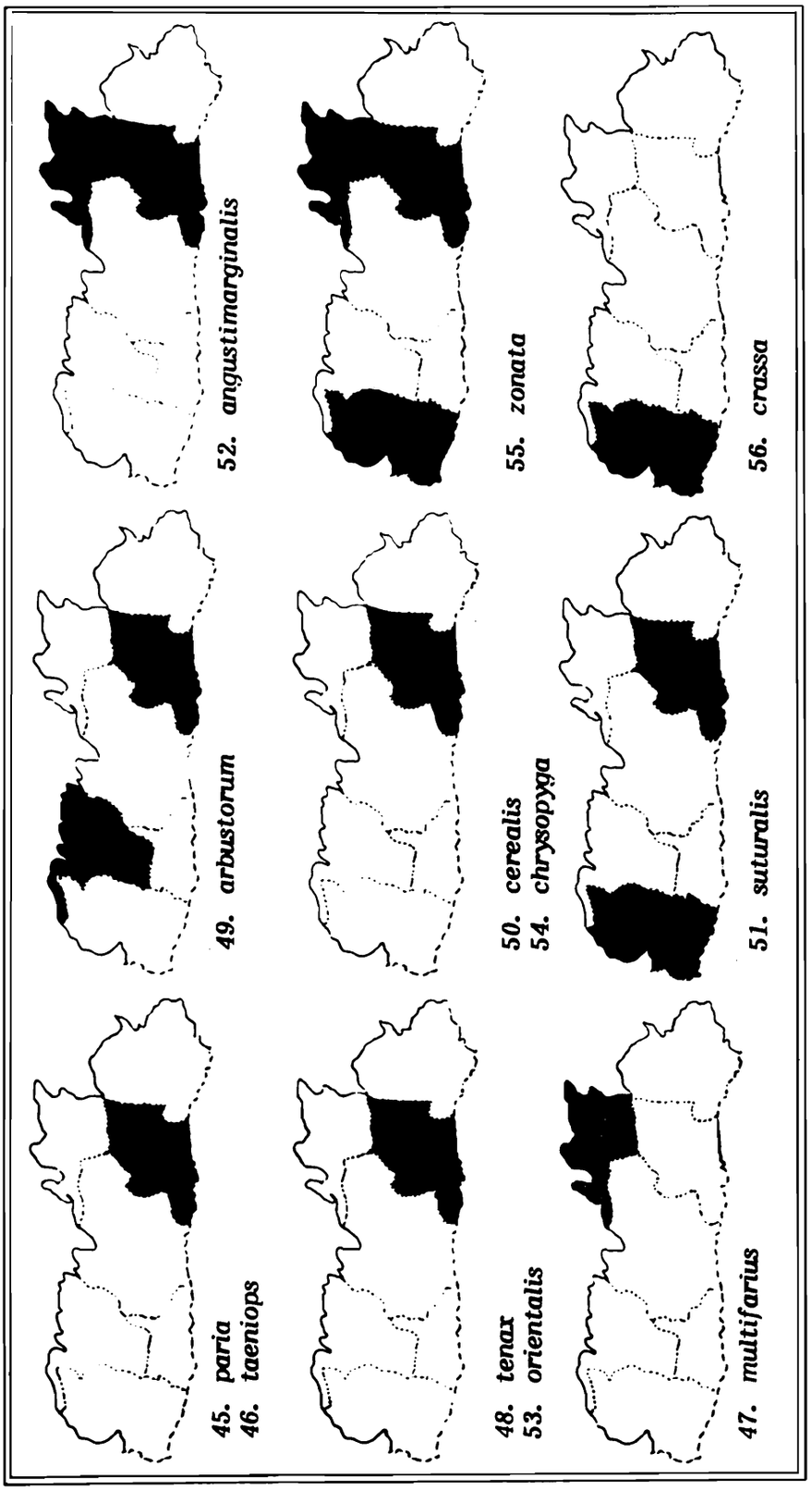
Map 2. Recorded districts of occurrence of *Allograpta, Asarkina, Betasyrphus, Citrogramma, Didea, Dideoides, Dideopsis, Epistrophe, Episyrphus, Metasyrphus, Baccha* and *Graptomyza* in Meghalaya



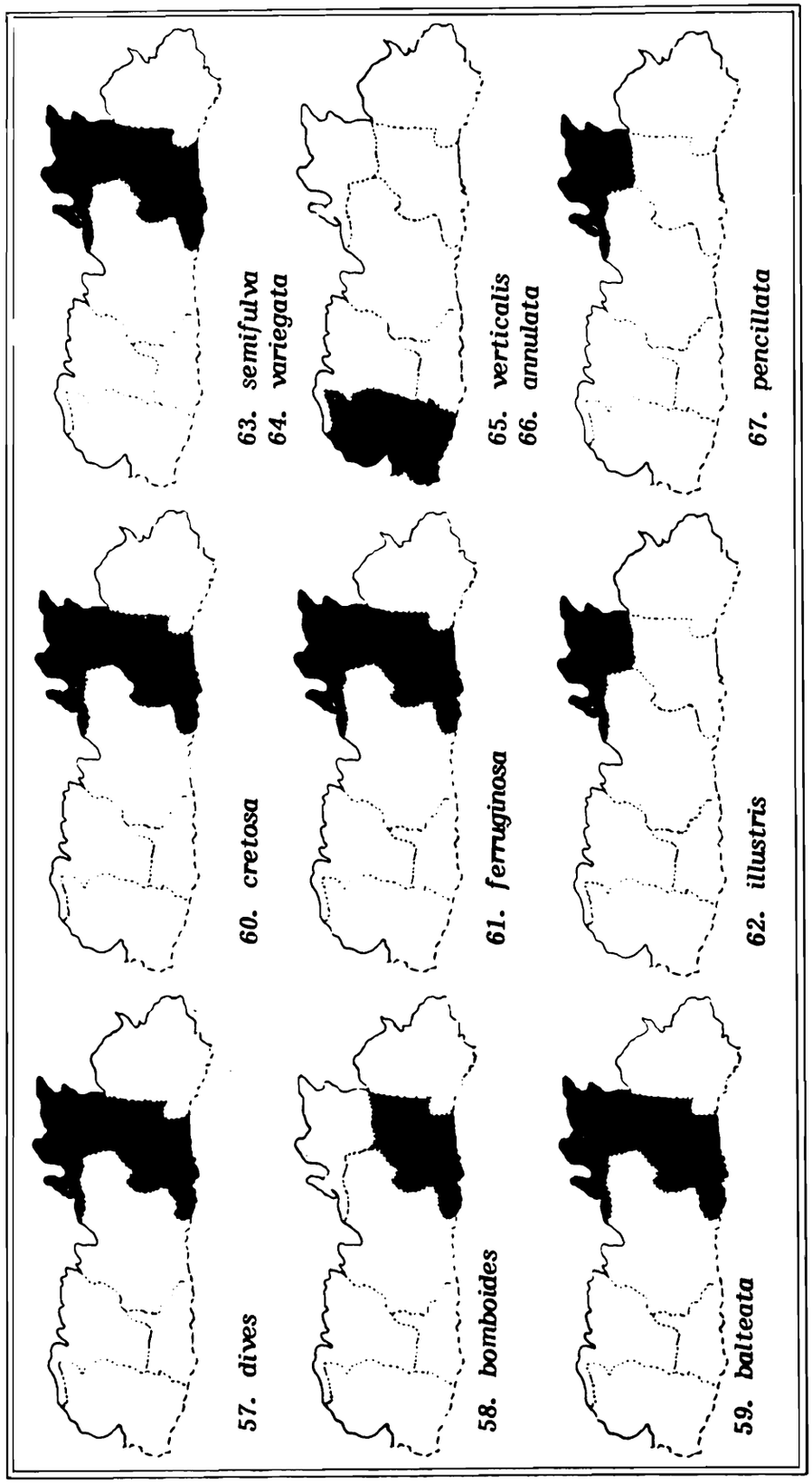
Map 3. Recorded districts of occurrence of *Epistrophe, Ischiodon, Meliscaeva, Metasyrphus, Scaeva, Sphaerophoria, Baccha, Melanostoma, Platycheirus, Chrysotoxum* and *Rhingia* in Meghalaya.



Map 4. Recorded districts of occurrence of *Chrysotoxum, Paragus, Graptomyza, Volucella, Spheginobaccha, Merodon, Monoceromyia, Catacores* and *Eristalinus* in Meghalaya.



Map 5. Recorded districts of occurrence of *Eristalinus, Eristalis, Mallota* and *Phytomia* in Meghalaya.



Map 6. Recorded districts of occurrence of *Brachypalpus, Chiorhina, Milesia* and *Xylota* in Meghalaya.

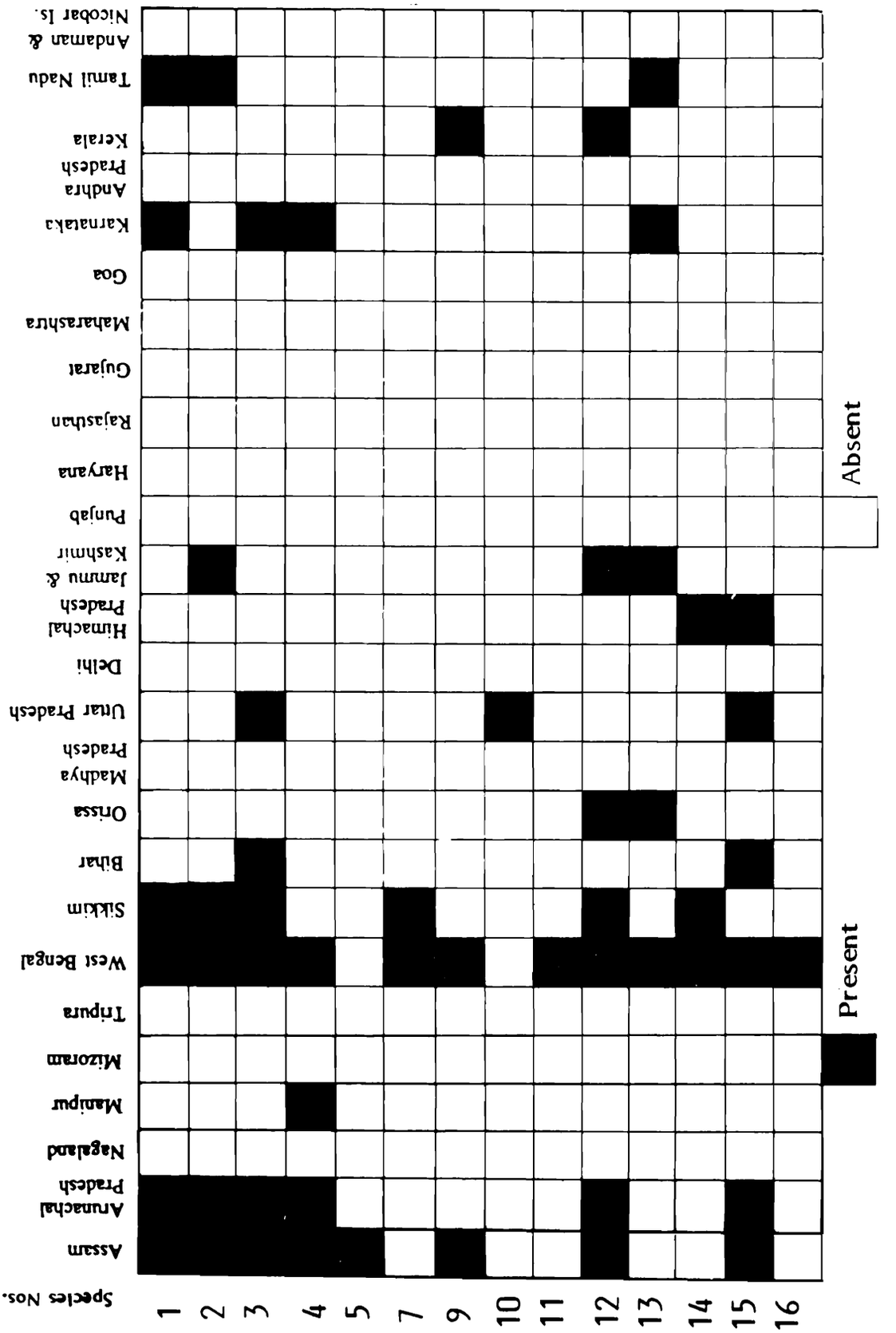


Diagram 1. Distribution of species (as per serial number) of *Allograpta, Asarkina, Betasyrphus, Citrogramma, Didea, Dideoides, Dideopsis, Epistrophe, Episyrphus, Ischiodon, Meliscaeva* and *Metasyrphus* in other parts of India.

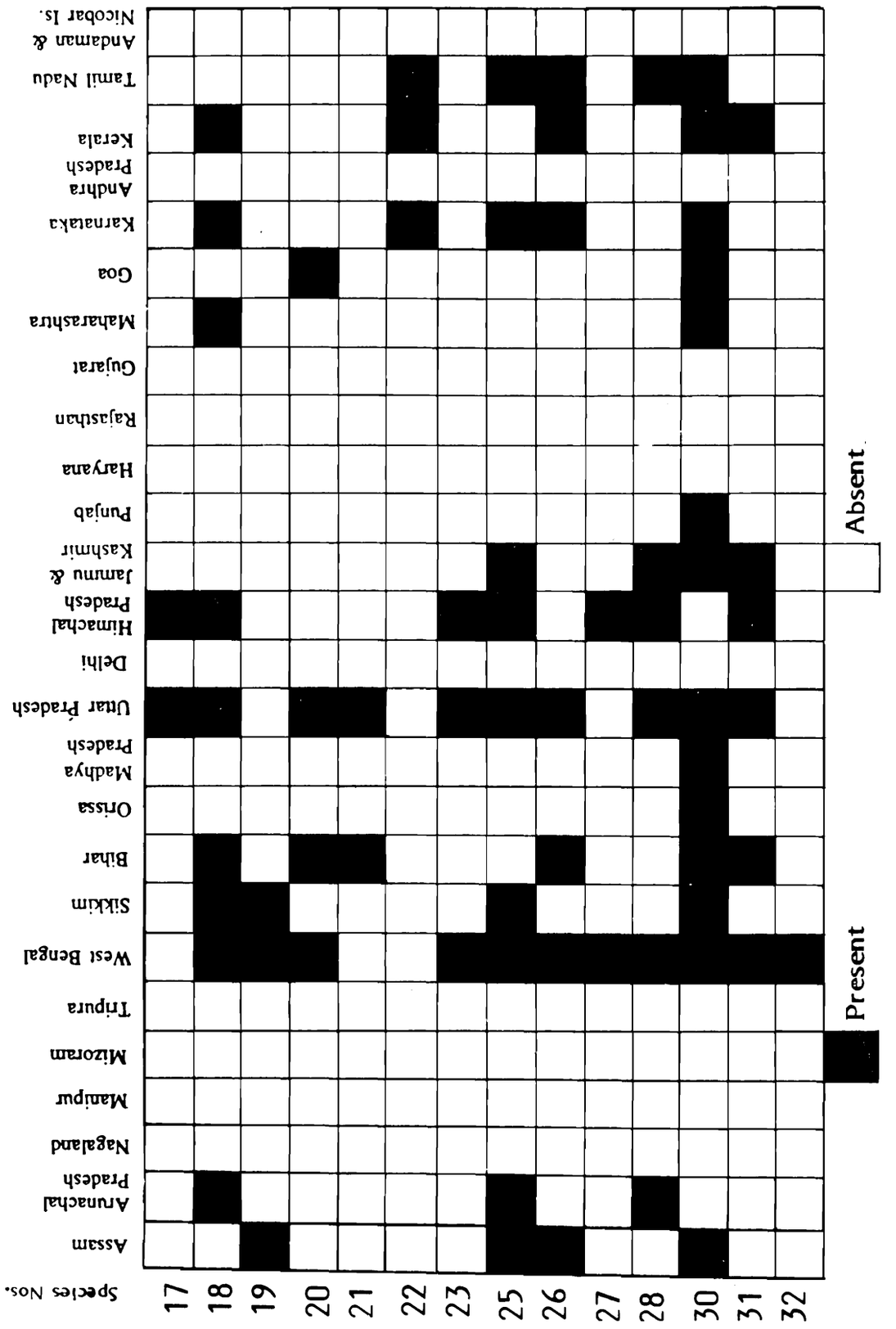


Diagram 2. Distribution of species (as per serial number) of *Scaeva, Sphaerophoria, Baccha, Melanostoma, Platycheirus, Chrysotoxum, Paragus* and *Rhingia* in other parts of India.

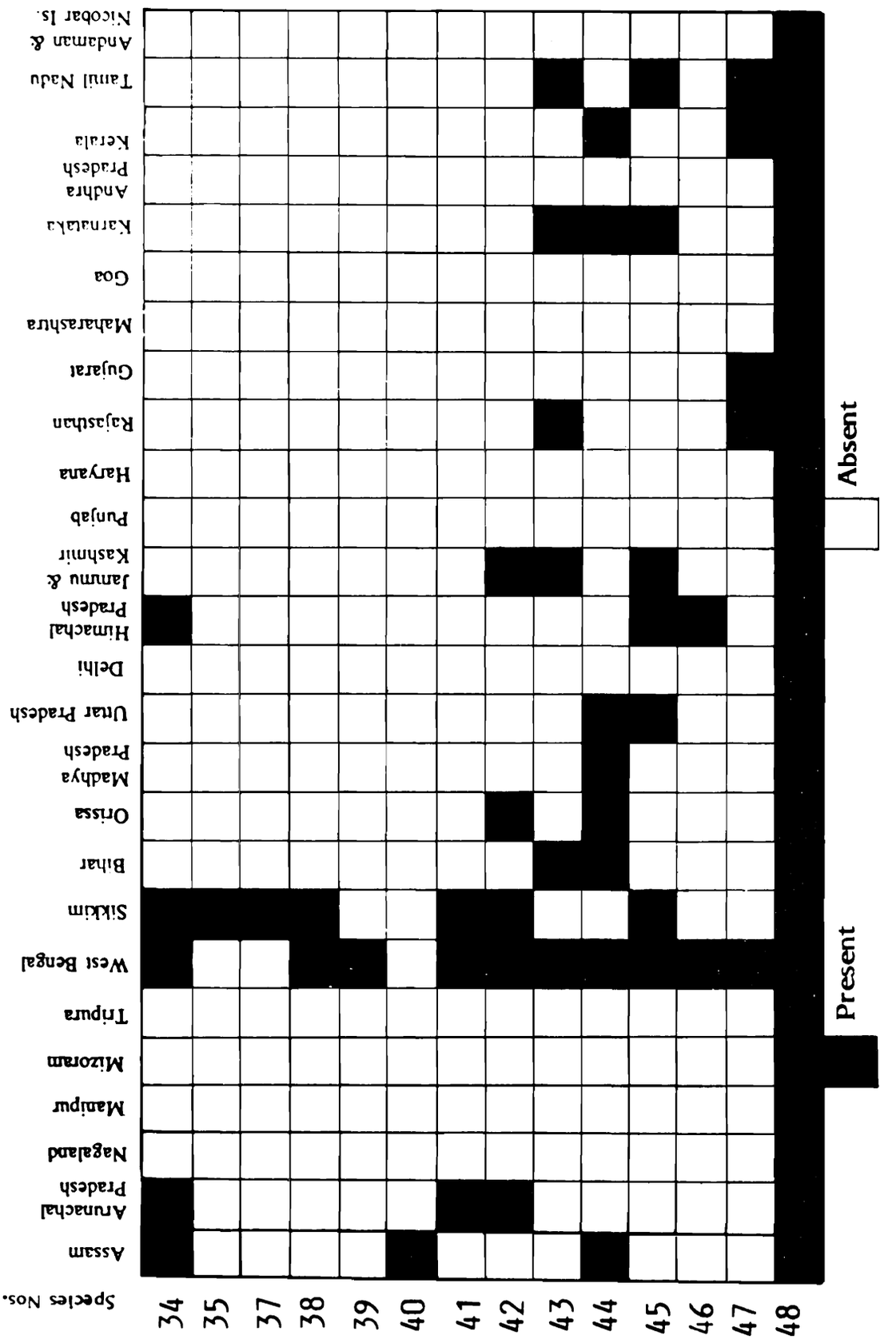


Diagram 3. Distribution of species (as per serial number) of *Graptomyza, Volucella, Spheginobaccha, Merodon, Monoceromyia, Catacores, Eristalinus* and *Eristalis* in other parts of India.

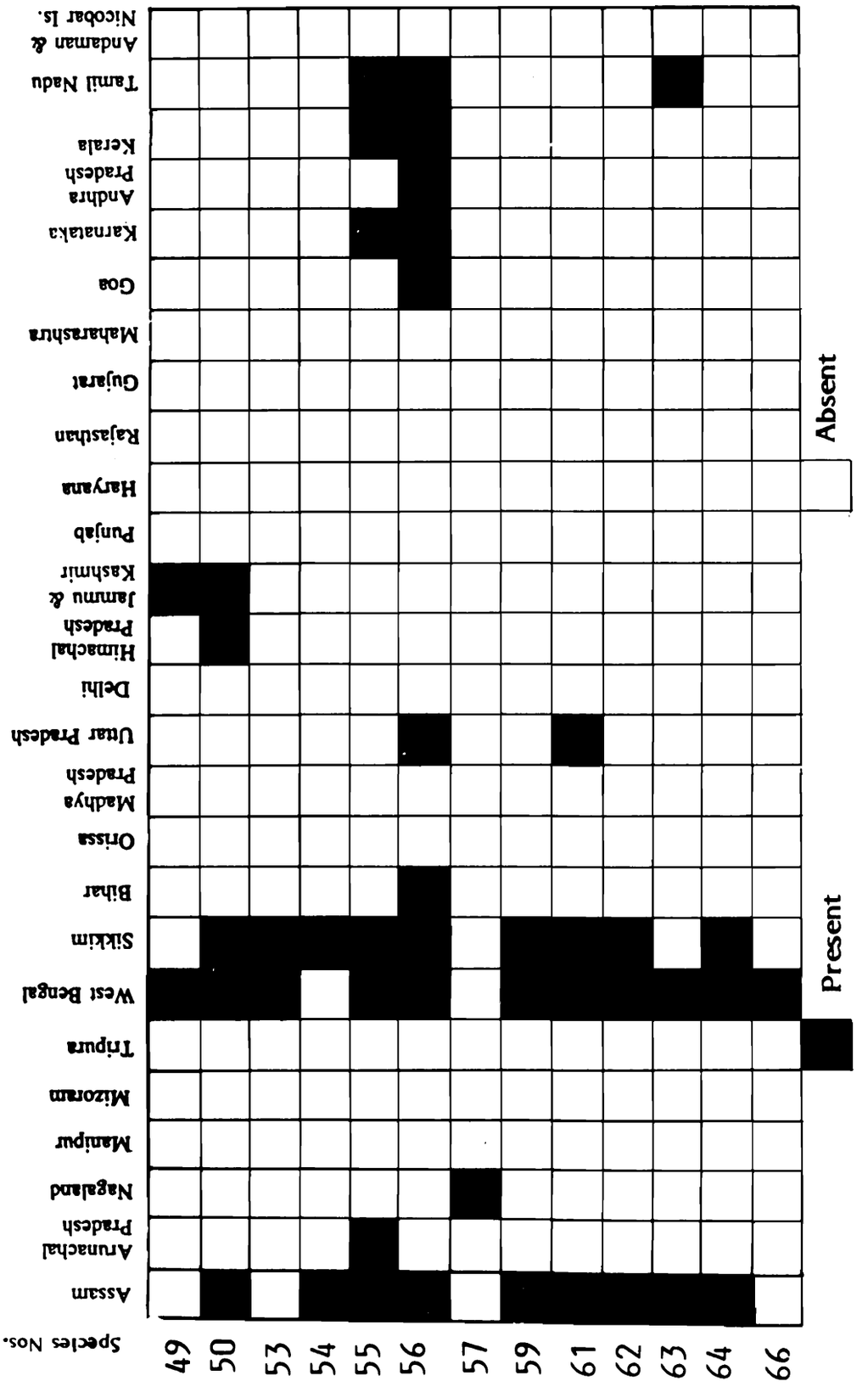


Diagram 4. Distribution of species (as per serial number) of *Eristalis, Mallota, Brachypalpus, Milesia* and *Xylota* in other parts of India.

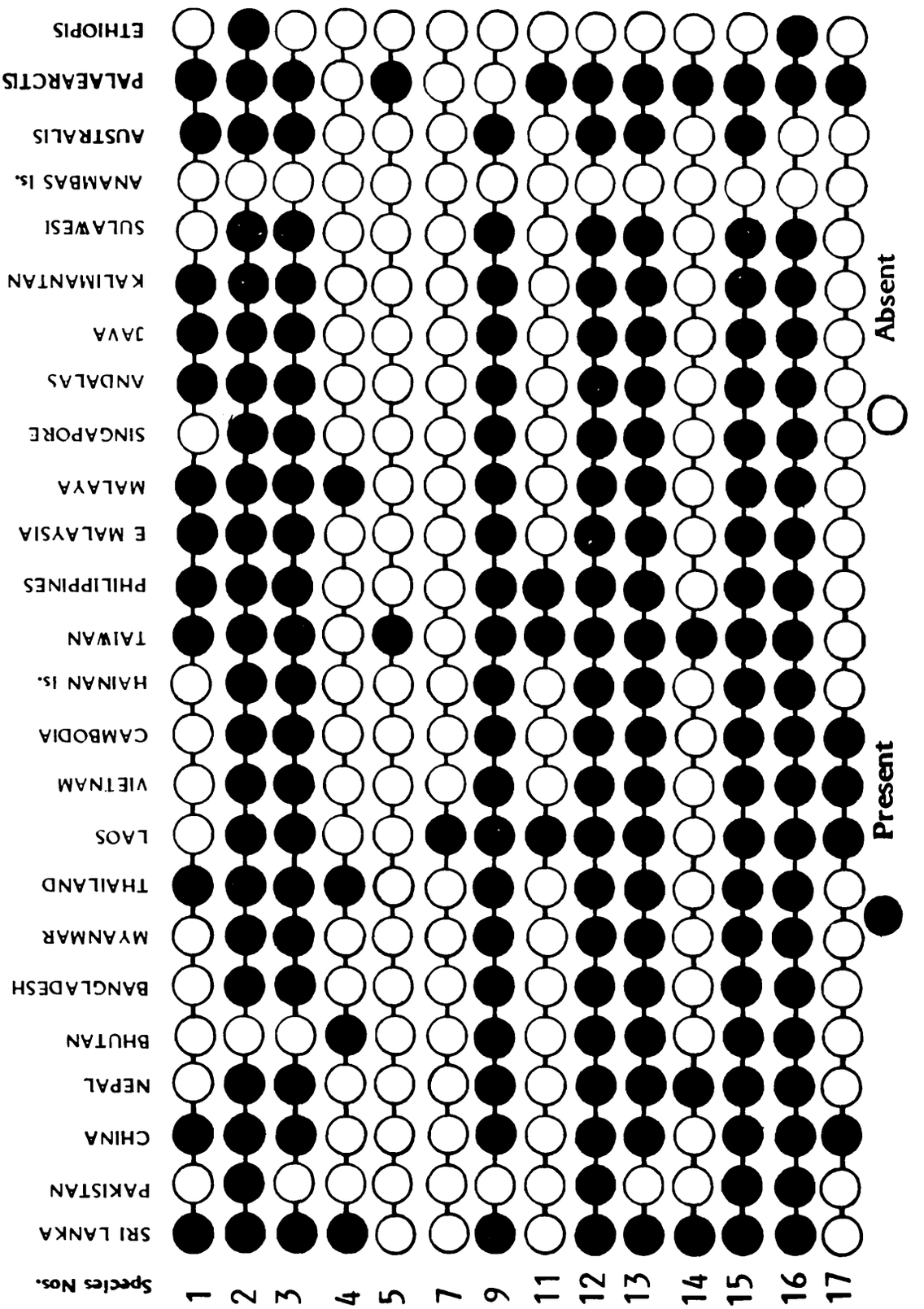


Diagram 5. Distribution of species (as per serial number) of *Allograpta, Asarkina, Betasyrphus, Citrogramma, Didea, Dideoides, Dideopsis, Epistrophe, Episyrphus, Ischiodon, Meliscaeva, Metasyrphus* and *Scaeva* in and around the Oriental region (excepting India).

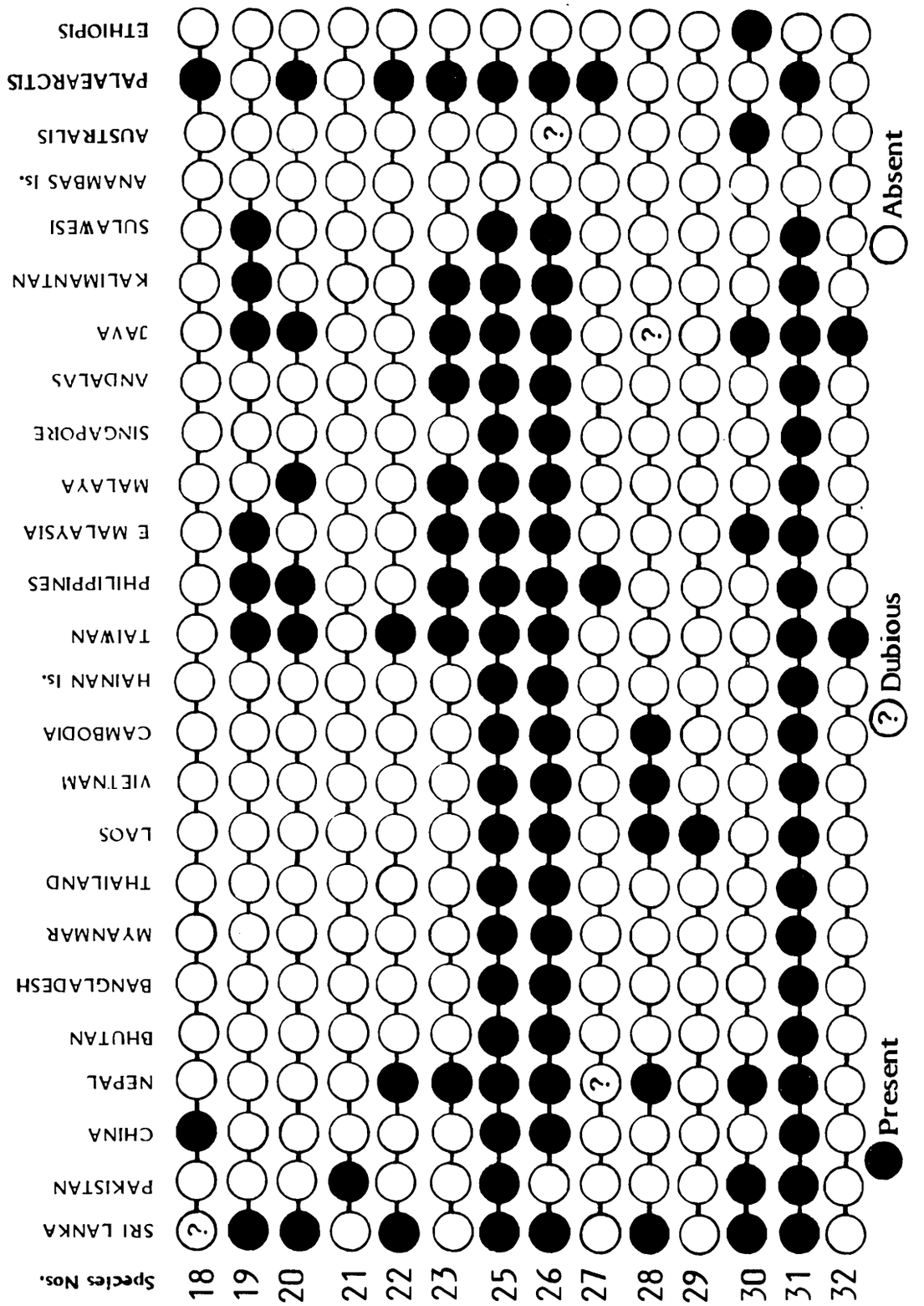


Diagram 6. Distribution of species (as per serial number) of *Sphaerophoria, Baccha, Melanostoma, Chrysotoxum, Paragus* and *Rhingia* in and around the Oriental region (excepting India).

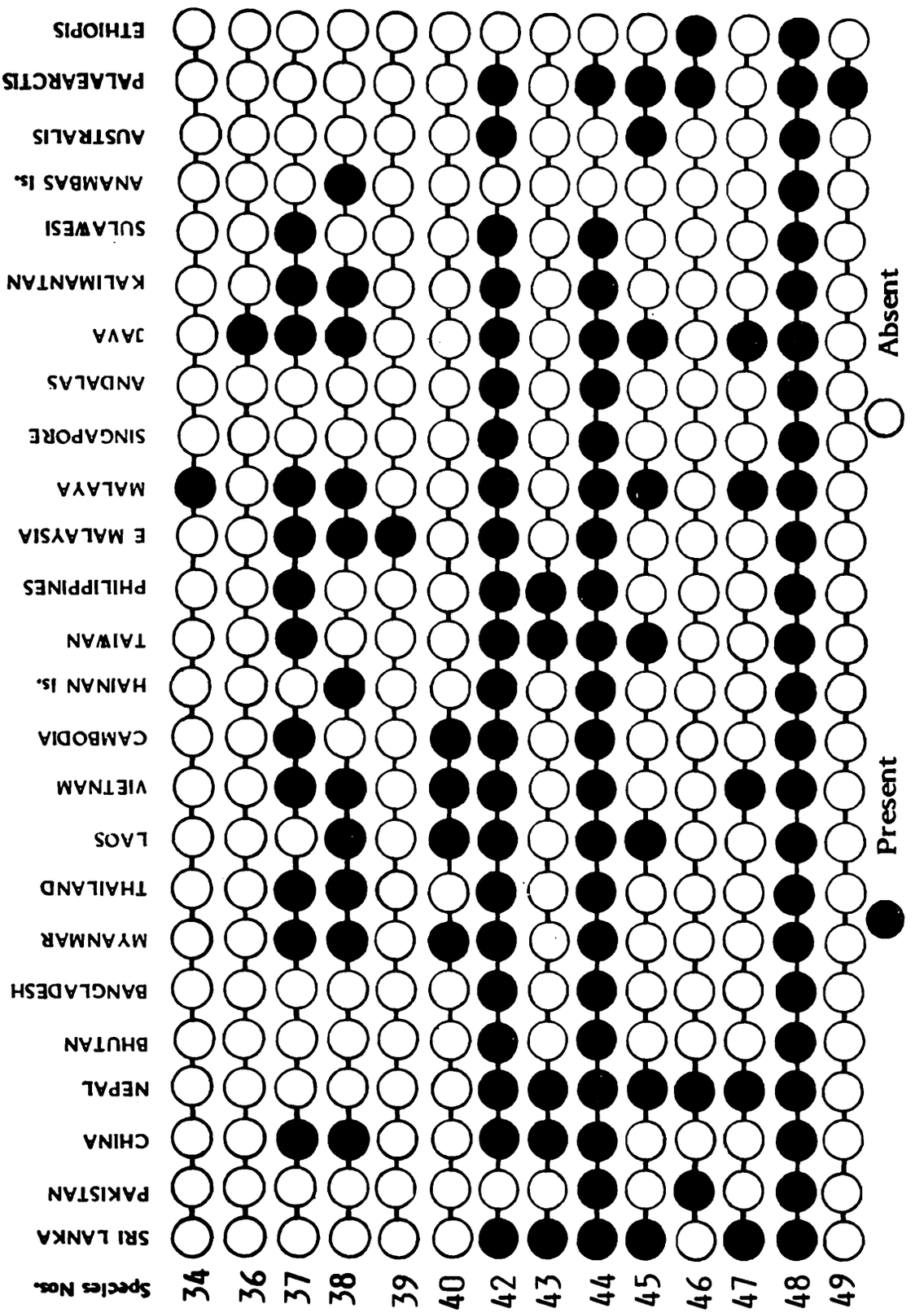


Diagram 7. Distribution of species (as per serial number) of *Graptomyza, Volucella, Spheginobaccha, Merodon, Monoceromyia, Eristalinus* and *Eristalis* in and around the Oriental region (excepting India).

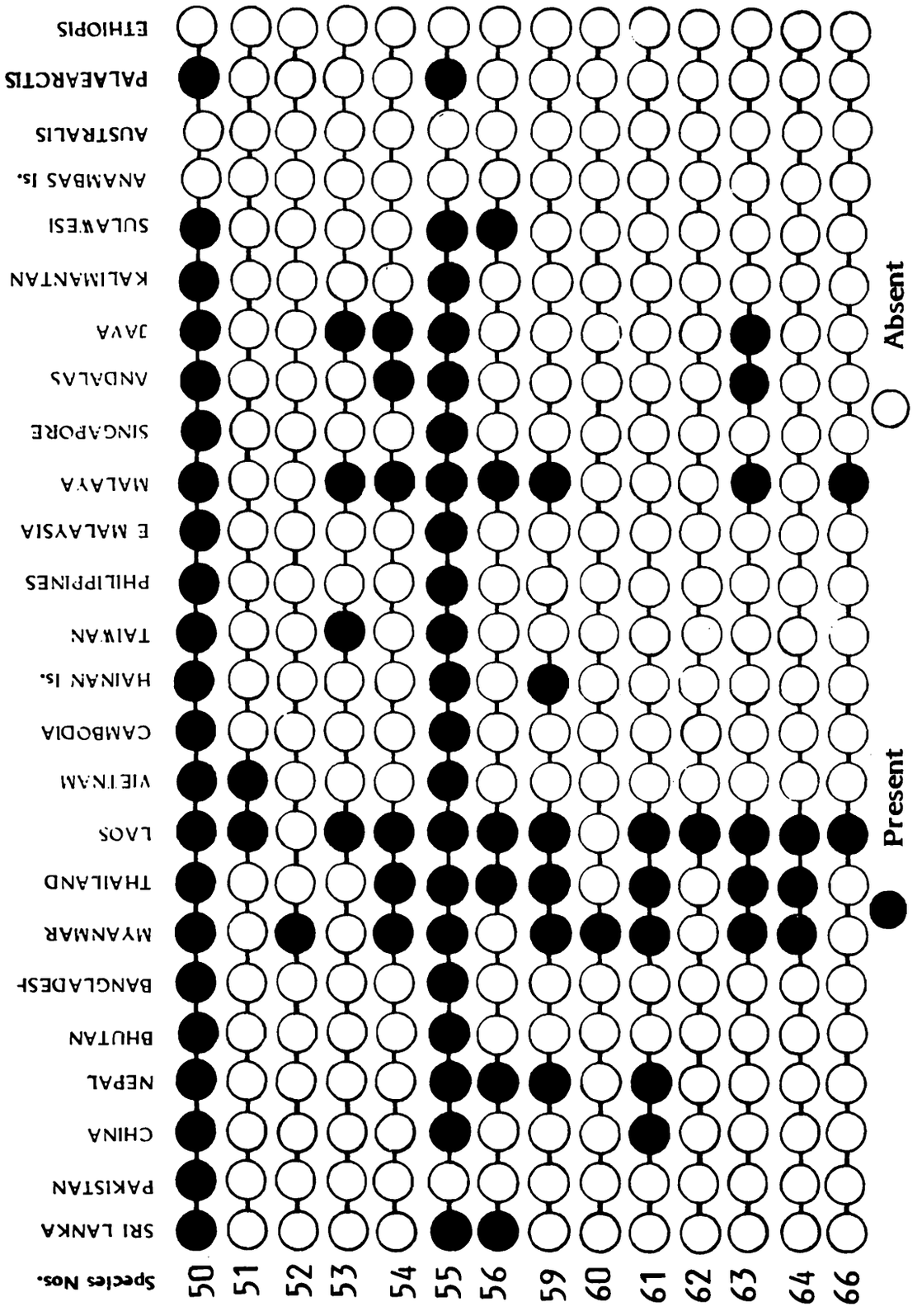


Diagram 8. Distribution of species (as per serial number) of *Eristalis, Mallota, Phytomia, Milesia* and *Xylota* in and around the Oriental region (excepting India).

SUMMARY

The paper accounts for 67 species under 34 genera occurring in Meghalaya, of which 3 genera with their lone species and 4 species under 3 known genera are recorded for the first time from the state. The species are systematically keyed and characterized, and are discussed in the light of their zoogeographical distribution.

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State Fauna Series 4 : Fauna of Meghalaya Part 6 : 177–221, 1998

DIPTERA : CULUCIDAE

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INTRODUCTION

The first anopheline survey was undertaken at Shillong during the malaria season by Shortt (1924). A total of 8 species and a variety of *Anopheles* were encountered. In early thirties, monographs of Indian anophelines and culicines were published by Christophers (1933) and Barraud (1934) respectively, based on prior surveys. Later, in 1976, while working on malaria transmission in Burnihat (Meghalaya), Rajagopal reported the presence of 14 species of of *Anopheles* with preponderance of *An. philippinensis.*

A detailed mosquito survey was carried out during April-May, 1980 at 6 places in Khasi & Jaintia Hills, by Das *et al.* (1984). The mosquito fauna comprised of 44 species (including 2 varieties) belonging to 6 genera. Further, mosquito collections were made at 3 localities of Meghalaya during Sept., 1986 and a total of 41 species of 6 genera, viz. *Aedes* (5 species), *Anopheles* (20), *Armigeres* (2), *Culex* (11), *Mansonia* (2) and *Toxorhynchites* (1) were reported (Nagpal & Sharma, 1987).

The recent checklist of mosquitos of northeast India recorded the presence of 60 species (of 7 genera) from Meghalaya (Malhotra & Mahanta, 1994). The latest monograph of Indian anophelines also confirms the presence of 28 species of *Anopheles* from Meghalaya (Nagpal & Sharma, 1994).

However, no comprehensive information regarding faunistic details of mosquitoes of Meghalaya has been published. The present update information is an attempt in this direction.

DESCRIPTION OF THE STUDY AREA

Meghalaya is situated between 25°07'N to 26°10'N latitude and 89°45'E to 92°47'E longitude. It has an area of 22, 489 sq. km, population nearly 13 lakhs. The stae is adjacent to Assam on the north & east and to Bangladesh on the south & west. The populace consists of Garo, Khasi & Jaintia tribes.

The climate of Meghalaya is moderately hot (not exceedig 28°C) and very humid (annual rainfall approx. 2150mm). Rainfall in the foot-hills is extremely heavy and humidity very high althrough the year. Mewsynram and Cherrapunji have an annual rainfall of over 17,500mm and are the wettest places of the world. The maximum precipitation occurs during June-Sept. The temperature is largely influenced by other biotic and abiotic factors of the hilly terrain.

SYSTEMATIC ACCOUNT

Table-1 : Systematic list of the mosquitoes of Meghalaya

Anopheles Meigen, 1818

Subgenus ***Anopheles*** Meigen, 1818

aitkenii James, 1903

baileyi Edwards, 1929

barbirostris Van der Wulp, 1884

gigas Giles, 1901

interruptus Puri, 1929

lindesayi Giles, 1900

nigerrimus Giles, 1900

sinensis Weidmann, 1828

Subgenus ***Cellia*** Theobald, 1902

aconitus Doenitz, 1902

annularis Van der Wulp, 1884

balabacensis Baisas, 1936

culicifacies Giles, 1901

dirus Peyton & Harrison, 1979

fluviatilis James, 1902

jamesii Theobald, 1901

jeyporiensis James, 1902

karwari (James), 1902

kochi Doenitz, 1901

maculatus Theobald, 1901

majidi Young & Majid, 1928

minimus Theobald, 1901
nivipes (Theobald), 1903
pallidus Theobald, 1901
philippinensis Ludlow, 1902
pseudojamesi Strickland & Chowdhury, 1931
splendidus Koidzumi, 1920
stephensi Liston, 1901
subpictus Grassi, 1899
tessellatus Theobald, 1901
vagus Doenitz, 1902
varuna Iyengar, 1924
willmori (James), 1903

Aedes Meigen, 1818

Subgenus ***aedes*** Meigen, 1818
atrius Barraud, 1928

Subgenus ***Aedimorphus*** Theobald, 1903
nummatus Edwards, 1923
vittatus (Bigot), 1861

Subgenus ***Finlaya*** Theobald, 1903
albolaterialis (Theobald), 1908
albotaeniatus (Leicester), 1904
cacharanus Barraud, 1923
chrysolineatus (Theobald), 1907
dissimillis (Leicester), 1908
elsiae Barraud, 1923
formosensis Yamada, 1921
novoniveus Barraud, 1934
prominens Barruad, 1923
pseudotaeniatus (Giles), 1901
pulchriventer (Giles), 1901
shortti Barraud, 1923

Subgenus *Neomelaniconion* Newstead, 1907

lineatopennis (Ludlow), 1905

Subgenus *Stegomyia* Theobald, 1901

aegypti (Linnaeus), 1762

albopictus (Skuse), 1894

craggi Barraud, 1923

flavopictus Yamada, 1921

mediopunctatus Theobald, 1905

Armigeres Theobald, 1901

Armigeres Theobald, 1901

Subgenus *Armigeres* Theobald, 1901

kuchingensis Edwards, 1915

subalbatus (Coquillett), 1898

theobaldi Barraud, 1933

Subgenus *Leicesteria* Theobald, 1904

annulitarsis Leicester, 1908

dentatus Barraud, 1927

longipalpis (Leicester), 1904

Coquillettidia Dyar, 1905

Coquillettidia Dyar, 1905

Subgenus *Coquillettidia* Dyar, 1905

crassipes (Van der Wulp), 1881

novochracea (Barraud), 1927

ochracea (Theobald), 1903

Culex Linnaeus, 1758

Subgenus *Culex* Linnaeus, 1758

bitaeniorhynchus Giles, 1901

cornutus Edwards, 1922

edwardsi Barraud, 1923

eipdesmus (Theobald), 1910

gelidus Theobald, 1901

hutchinsoni Barraud, 1924

mimeticus Noe, 1899

mimulus Edwards, 1915
quinquefasciatus Say, 1823
sinensis Theobald, 1903
tritaeniorhynchus Giles, 1901
vishnui Theobald, 1901
whitei Barraud, 1923
whitmorei (Giles), 1904

Subgenus ***Culiciomiya*** Theobald, 1907
fragilis Ludlow, 1903
nigropunctatus Edwards, 1926
pallidothorax Theobald, 1905

Subgenus ***Eumelanomyia*** Theobald, 1909
malayi (Leicester), 1908

Subgenus *Lophoceraomyia* Theobald, 1905
bengalensis Barraud, 1934
minor Leicester, 1908

Subgenus ***Lutzia*** Theobald, 1903
fuscanus Wiedemann, 1820
halifaxi Theobald, 1903
vorax Edwards, 1921

Heizmannia Ludlow, 1905

Subgenus ***Heizmannia*** Ludlow, 1905
complex (Theobald), 1910
Mansonia Blanchard, 1901

Subgenus ***Mansonioides*** Theobald, 1907
annulifera (Theobald), 1901
indiana Edwards, 1930
longipalpis (Van der Wulp), 1892
uniformis (Theobald), 1901

Toxorhychites Theobald, 1901

Subgenus ***Toxorhynchites*** Theobald, 1901
gravelyi Edwards, 1921

splendens (Wiedmann), 1819

Tripteriodes Giles, 1904

Subgenus *Rachionotomyia* Theobald, 1905

aranoides (Theobald), 1901

indicus (Barraud), 1929

Uranotaenia Lynch Arribalzaga, 1891

hebes Barraud, 1931

naxima Leicester, 1908

testacea Theobald, 1905

1. *Anopheles aitkenni* James

syn. *fragilis* Theobald, 1903
pallidus Ludlow, 1905
treacherii Leicester, 1908

var. *bengalensis* Puri, 1930

Harrison & Scanlon (1975) recognised 12 species in the *aitkenii* group. Among them only *aitkenii, bengalensis, pinjaurensis* and *insulaeflorum* occur in India.

An. aitekenii recorded from Shillong (Shortt. 1924). During recent surveys at Meghalaya, no specimen of *aitkenii, bengalensis* or *insulaeflorum* was encountered (Rajagopal, 1976; Das *et al.*, 1984; Nagpal & Sharma, 1987).

Small size brown mosquito with completely dart wings (Wattal & Kalra, 1961).

The species is prevalent at higher altitudes (upto 2000 m). It is a jungle species, rarely enter houses.

Larvae occur in small stagnant and semi-stagnant pools and seepages in the forest, tea-garden drains, shaded pools-close to hill streams (Ramachandra Rao, (1984).

No role in transmision of human disease.

2. *Anopheles baileyi* Edwards

Anopheles gigas var. *baileyi* Edwards, 1929

The variety *baileyi* was raised to species level by Ward (1984), Nagpal & Sharma (1994).

Collected from Shillong and Dumpep (Khasi & Jaintia Hills) (Christophers, 1933). Trapped at Barapani, Cherrapunji, Happy Valley, Jowai, Shillong (Das *et al.*, 1984).

Continuous dark fringe at vein 3 and onwards except for a pale area between veins 5-2 & 6 (Ramachandra Rao, 1984).

At Shillong, the species is prevalent from Oct. to Mar. An outdoor rester, but adults collected in human dwellings as well as in cattle sheds.

Breeding in deep/rocky pools, springs and immatures can be collected throughout the year.

Not considered as a vector of any human disease.

3. *Anopheles barbirostris* Van der Wulp

Reid (1962) considered it as a species group consisting of 2 subgroups, viz.,

(a) Barbirostris subgroup having 6 species i.e. *barbirostris, campestris, donaldi, franciscoi, hodgkini, pollicaris.*

(b) Vanus subgroup of 5 species i.e. *ahomi, vanus, barbumbrosus, manalangi* and *reidi.*

Of these, *barbirostris, ahomi* and *barbumbrosus* are reported from India.

An. barbirostris was collected from Burnihat (Rajagopal, 1976), Barapani, Burnihat, Cherrapunji, Happly Valley, Jowai, Shillong (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

An. barbirostris is comparatively a large mosquito with chaggy appearance, having a tuft of black-scales on 7th sternite.

Common in cattle-sheds and human-dwellings, but mainly zoophilic.

Susceptibility data not available. Resistant to DDT/Dieldrin in Assam (Das *et. al.*, 1987).

Larvae occur in ponds, pools, rice-fields, running streams, shallow wells etc.

No role in human malaria transmission in India. Minor role as vector of filariasis. Found infected in nature with Japanese encephalites (J.E.) virus in adjacent West Bengal (Chakravarty *et. al.*, 1975; NIV, Pune, 1979).

4. *Anopheles gigas* Giles

var. *formosus* Ludlow, 1909
simlensis James, 1911
refutans Alcock, 1913
baileyi Edwards, 1929

Knight and Stone (1977) recognised 4 more varities and a subspecies but none occurs in India.

Recorded from Shillong (Shortt, 1924), Barapani, Cherrapunji, Jowai, Shillong (Das *et al.*, 1984).

Very large species. Wing length 5-6mm. Inner quarter of costa with white interruption (Wattal & Kalra, 1961).

Wild species occurring in forets or woodland areas, mainly zoophilic.

Larvae occur in freshwater ponds, rain pools, springs, seepages, rock-pools, etc.

No relation to human disease.

5. *Anopheles interruptus* Puri

Anopheles annandalei var. *interruptus* Puri, 1929

The variety was raised to subspecies status (Puri, 1949) and then to species level (Reid, 1968).

Recorded from Nongpoh, in Khasi and Jaintia Hills (Puri, 1929). No specimen of *An. interruptus* was encountered in recent surveys in Meghalaya.

A small sized mosquito with a clear cut tuft of scales on the apical part of the hind femur. Wing has a subcostal pale spot on the costa (Das *et al.*, 1990a).

Comparatively a rare species, occurring in deep forests.

Larvae are tree-hole breeders, very dark in colour and not easily seen in dark water of tree-holes (Ramachandra Rao, 1984).

Not involved in any human disease transmission.

6. *Anopheles lindesayi* Giles

syn. *maculata* Theobald, 1910

var. *japonicus* Yamada, 1918
nilgiricus Christophers, 1924
pleccau koidzumi, 1924
cameronensia Edwards, 1929
benguetensis King, 1929

All the five varieties were upgraded to subspecies level by Knigh & Stone (1977). Of these, only *nilgiricus* occurs in India.

Collected at Shillong (Shortt, 1924), Khasi and Jaintia Hills (Christophers, 1933), Happy Valley (Das *et al.*, 1984).

Hind femur with a broad white band. Costa with only apical pale spot (Das *et al.*, 1990a).

Prefers forest habitats. The specimens do enter the houses for feeding. Shortt (1924) noted its feeding throughout the day in a small woodland near Shillong.

Breeding in ground and rocky pools in mountain streams, stream bed-pools, etc.

Though one gut infection was recorded in India, but not likely to be playing any role in malaria transmission (Ramachandra Rao, 1984).

7. *Anopheles nigerrimus* Giles

Anopheles hyrcanus var. *nigerrimus* Giles, 1990

An. "hyrcanus" Pallas, 1771, is a group having 10 recognised species alog with 4 forms. Of these, *argyropus, nigerrimus, nitidus, sinensis, peditaeniatus* and *crawfordi* recorded in India (Ramachandra Rao, 1984).

Specimens of *An. "hyrcanus"* group were recorded from Burnihat (Rajagopal, 1976). *An. nigerrinus* collected from Barapni, Burnihat, Cherrapunji, Happy Valley, Jowai, Shillong (Das *et al.*, 1984 : Nagpal & Sharma, 1987). The species was found to be very prevalent.

Inner quarter of costa mainly dark, palpi with distinct pale markings, long dark mark on base of wing vein 5, fringe spot also on vein 5 (Ramachandra Rao, 1984).

Predominantly a rice-field breeder.

Found infected with J.E. virus in West Bengal (Chakravarty *et al.*, 1975; NIV, Pune, 1979).

8. *Anopheles sinensis* Weidmann

Anopheles hyrcanus var. *sinesis* Wiedmann, 1828.

syn. *plumiger* Doenitz, 1901
jesoensis Tsuzuki, 1901

Upgraded as species by Reid (1953).

Collected from Shillong (Shortt. 1924). Found absent in the recent mosquito collections at Meghalaya.

Basal dark area on vein 5, usually a fringe spot at vein 5.2. Some pale scales on vein 1. Tip of vein 1 dark scaled (Ramachandra Rao, 1984; Das *et al.*, 1990a).

Breeding in marshes, streams, seepages, ground pools, rice- fields, etc.

Vectorial status is quite doubtful.

9. *Anopheles aconitus* Doenitz

syn. *albirostris* Theobald, 1903
brahmacharii Christophers, 1912

Collected from Burnihat (Rajagopal 1976), Barapani Burnihat (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

A fringe spot at vein 6. Palpi with apical white band equal to sub-apical white band (Wattal & Kalra, 1961).

Larvae occur in clean water tanks with grassy edges, in paddy- fields, in still water having algal growth and aquatic plants.

Secondary vector of malaria (Anderson & Viswanathan, 1941, Viswanathan *et al.*, 1941). Recently incriminated in Bangladesh (Maheswary *et al.*, 1992).

10. *Anopheles annularis* Van der Wulp

syn. *fuliginosus* Giles, 1900
jamesi Doenitz, 1901
nagpori James & Liston, 1904
lineata Ludlow, 1908
adiei James & Liston, 1911

Common mosquito species of Meghalaya (Shortt, 1924; Rajagopal, 1976; Das *et al.*, 1984; Nagpal & Sharma, 1987).

Wing vein 5 mainly dark, with a dark spot at the point of bifurcation (Wattal & Kalra, 1961).

Mainly zoophilic, also collected in human and mixed dwellings (Shortt. 1924). Occurs throughout the year with great abundance in May/June.

Susceptibility data not available. Resistant to DDT/Dieldrin in nearby states (Sundaram *et al.*, 1980; Das et al., 1987).

Breeding in ponds, pools, tanks, borrow pits, rice-fields, etc. with abundance vegetation, green algae, aquatic weeds, etc.

Secondary vector of malaria. Many gut/gland positive mosquitoes were observed in Assam and Shillong (Viswanathan *et al.*, 1941: Anderson & Viswanathan, 19410.

The author feels that more studies on *An. annularis* are warranted in Meghalaya.

11. *Anopheles balabacensis* Baisas

syn. *elegans* James, 1903
var. *hackeri* Edwards, 1921

An. balabacensis has 2 subspecies, none found in India.

Collected in Burnihat (Anon. 1970: Rajagopal 1976).

Hind leg with broad white tibio-tarsal joint (Wattal & Kalra, 1961). Commonly called "mosquito with white stockings".

Highly anthropophilic, rarely in cattle-sheds.

No susceptibility data available. Highly susceptible to DDT elsewhere (Sen *et al.*, 1982).

Breeds deep in the jungles. Larvae occur in pools by side of rocky streams, in disused wells, in rain-water pits/nullaha, etc.

Most efficient vector of human malaria. Not incriminated as malaria vector in Meghalaya so far, but its role in disease transmission in northeast is well documented (Sen *et al.*, 1973; Das & Baruah, 1985; Das *et al.*, 1990b).

Extensive studies should be taken up on this vector species, keeping persistent malaria transmission in Meghalaya in view.

12. *Anopheles culicifacies* Giles

syn. *listoni* Giles, 1901
indica Theobald, 1901
punjabensis James, 1911

var. *adenensis* Christophers, 1924

Recent studies have shown that *An. culicifacies* is a complex having 4 sibling species, viz. A,B,C & D. In Meghalaya and other north eastern states, species B occurs which is a very poor vector of malaria (Subbarao *et al.*, 1988).

Recorded from Khasi & Jaintia Hills (Christophers, 1933) Barapani, Burnihat (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

During resting, it maintains *Culex* like posture, hence the name. Wing vein 3 mainly dark (Das *et al.*, 1990a).

Highly zoophilic species.

Resistant to chlorinated hydrocarbons and organophosphates in many parts of India. Susceptibility status in Meghalaya still unknown.

Breeding in irrigation channels/wells, swmaps, river bed-pools, tanks, ponds, hoof-marks, cart-tracks, etc.

Recognised rural malaria vector of India. Extensive dissections made earlier by Anderson & Viswanathan (1941) in Assam (including present day Meghalaya) have shown very low infection rate.

13. *Anopheles dirus* Peyton & Harrison

In India, the species was known as *An. b. balabacensis* Baisas, till Peyton & Harrison (1979) described *An. (Cellia) dirus*, among the *leucosphyrus* group in Thailand. They advocated that species which was hitherto being described as *balabacensis* was infact *dirus*. The specimens of *balabacensis*, collected from Mizoram (Malhotra *et al.*, 1984) were re-examined by the present author and found to be *An. dirus*, which was further confrimed by Bhat (1988). The typical *balabacensis* is believed to be restricted to Balabac and Palawan Islands of the Philippines (Yang, 1983).

Presector dark mark on vein 1 with 1 or more pale interruptions, proboscis as long as

or slightly shorter than forefemur, apical pale band on hind tibia without a ventral dark stripe (Peyton & Harrison, 1979; Das *et al.*, 1990a).

Adult behaviour, feeding habits, larval ecology, etc. are all described previously in *balabacensis* heading.

Most efficient vector of human malaria. *An. dirus* has not been incirminated in Meghalaya, but its role in disease transmission in northeast has already been established (Das & Baruah, 1985; Dutta *et al.*, 1989 a&b; Das *et al.*, 1990b; Nandi *et al.*, 1993).

14. *Anopheles fluviatilis* James

syn. *listonii* Liston, 1901
leptomeres Theobald, 1903
arabica Christophers & Khazan Chand, 1915

Collected from Barapani, Burnihat, Shillong (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

Small to medium size mosquito. Inner quarter of costa without white interruption (Wattal & Kalra, 1961).

It is suspected that there are 2 biological races, one present in hills/foot-holls (highly anthropophilic) and another in plains (highly zoophilic). No morphological differences are noted (Ramchandra Rao, 1984). *An. fluviatilis* occurs throughout the year in Meghalaya.

Larval habitats include freshwater streams, field channels, ditches, swamps, rice-fields, etc. with abundant vegetation and good shade.

Very efficient vector of malaria in India. Not incriminated in Meghalaya. Recently positive specimens found in Assam (Nandi *et al.*, 1993).

15. *Anopheles jamesii* Theobald

Very uncommon species. Collected in Burnihat and other places of Meghalaya (Rajagopal, 1976; Nagpal & Sharma, 1987).

Golden yellow scales on the apical portion of dorsum of 7th and 8th abdominal segments (Wattal & Kalra, 1961).

Adults found in human dwellings, cattle-sheds and stables.

Larvae occur in tanks, rain-polls, ponds with grass, springs, surface-wells, growing rice-fields, etc.

No malaria infection recorded so far.

16. *Anopheles jeyporiensis* James

var. *candidiensis* Koidzumi, 1924

Harrison (1980) synonymized the variety with its type-from *jeyporiensis*.

Reported from Khasi & Jaintia Hills (Christophers, 1933), Burnihat (Rajagopal, 1976).

Basal 3rd of costa with one or more white interruptions. Tarsi with narrow and very distinct pale bands (Das *et al.*, 1990a).

Occurs all through the year. During day time, large numbers available in cattle-sheds and lesser inside the houses. No preference for cattle or man, biting them equally, depending upon availability.

Breeding in grassy slow moving streams, channels, fallow, rice-fields, swampy land, grass grown edges of lakes (Christophers, 1933).

Not considered as a vector of any human disease.

17. *Anopheles karwari* (James)

syn. *nigrans* Stanton, 1912

Comparatively an uncommon species. Recorded from Meghalaya (Rajagopal, 1976; Das *et al.*, 1984).

Medium size mosquito, wing length 2.5-4.3mm. Female palpi with 4 white bands.

Found in houses and cattle-sheds during day-time. Prefers human blood.

Breeding in ponds, weedy tanks, springs, seepages and slow running streams.

Not regarded as a vector anywhere.

18. *Anopheles kochi* Doenitz

syn. *halli* James, 1901
ocellatus Theobald, 1901
flava Ludlow, 1908

A common species in the jungle areas of Assam and neighbouring Khasi & Jaintia Hills of Meghalaya (Christophers, 1933; Rajagopal, 1976; Das *et al.*, 1984; Nagpal & Sharma, 1987).

Presence of conspicuous abdominal hair tuft on the ventral side of segments II-VI. Female palpi with 4 pale bands. Vein 6 has maximum of 3 dark spots (Ramachandra Rao, 1984).

Mainly zoophilic.

Preferential breeding places are shallow muddy collections of water, ground-pools, buffalo-wallows, fallow rice-fields (Christophers, 1933; Ramachandra Rao, 1984).

Species not regarded as a vector of human malaria, however infected specimens were found in Assam.

19. *Anopheles maculatus* Theobald

syn. *pseudowillmorei* Theobald, 1910
dravidicus Christophers, 1924
hanabusai Yamada, 1925

var. *villmori* James, 1903

Recorded from all the places of survey in Meghalaya (Shortt, 1924; Christophers, 1933; Das *et al.* 1984; Nagpal & Sharma, 1987).

Speckled legs, hind tarsi 5 and part of 4 white.

Mainly exophilic. The species bites outdoor as well as indoor. Anthropophilic.

it is primarily a stream breeder but also occur in ponds, water tanks, pools (formed in river-beds), rarely in rice-fields (Ramachandra Rao, 1984). Immatures were observed in ditch, rocky- pool and nalah (Das *et al., loc. cit.*).

The earlier dissections confirmed the presence of gut/gland positive *An. maculatus* (Anderson & Viswanathan, 1941; Viswanathan *et al.*, 1941). However no recent incrimination is reported.

Susceptibility status unknown. Resistant to DDT in Arunachal Pradesh (Sundaram *et al.*, 1980).

More studies on this suspected malaria vector are warranted in Meghalaya keeping its high density in view.

20. *Anopheles majidi* Young & Majid

An. karwai var. majidi Mc Combie Young & Majid, 1928

Revalidated as species by Puri (1928).

A very rare species, having no continuous distribution within India. Only 3 adult females collected recently from Meghalaya by Nagpal & Sharma (1987).

Female palpi has only 3 bands— two white broad apical bands and one narrow basal band (Ramachandra Rao., 19840.

Adults collected in houses as well as in cattle-sheds.

Breeding in slow running streams, open drains in tea-garden and fallow rice-fields.

No relation to malaria.

21. *Anopheles minimus* Theobald

syn. *christophersi* Theobald, 1902
formosaensis Tsuzuky, 1902
cohesa Doenitz, 1903
alboapicalis Theoblad, 1910
flavirostris Ludlow, 1914
merak (cohoesa) Mangkoewinoto, 1919

An. minimus has a wide distribution in the Oriental region. Recorded from Shillong (Shortt. 1924), Nongpoh in particular, Khasi & Jaintia Hills in general (Christophers, 1933), Burnihat (Rajagopal, 1976) and various localities of Meghalaya (Nagpal & Sharma, 1987).

Inner quarter of costa with a white interruption at least on one wing. No fringe spot on vein 6. Female palpi with 2 broad apical pale bands separated by a short dark area.

An. minimus is characteristically a species of the hills and foot-hills. It can be easily collected in houses and cow- sheds during day time. Mainly anthropophilic.

No susceptibility tests in Meghalaya. Highly susceptible to DDT in Mizoram (Das *et al.*, 1990b).

Recognised and proven vector of human malaria in India. Not incrimnated in Meghalaya. It's roll in malaria transmission in northeast is well recognised (Bhatnagar *et al.*, 1982; Das & Baruah, 1985; Dutta & Baruah, 1987; Nandi *et al.*, 1993; Dutta *et al.*, 1994).

22. *Anopheles nivipes* Theobald

An. philippinensis var. *nivipes* Theobald, 1903
An. fuliginosus var. *nivipes* Stanton, 1915

There is no previous record of its existence in India, but recently 227 adult specimens of *An. nivipes* were collected from Meghalaya during Sept., 1986 (Nagpal & Sharma, 1987).

An. nivipes is very much similar to *An. philippinensis* but can be distinguished on the basis of presector dark mark of vein 1 extending basally beyond the distal end of the humeral dark mark on the costa.

Adult bionomics and larval ecology very similar to *An. philippinensis.*

The species has vectorial potentiality in transmission of malaria in Meghalaya.

23. *Anopheles pallidus* Theobald

syn. *fowleri* Christophers, 1911

Recorded from Khasi & Jaintia Hills (Christophers, 1933) and recently from Barapani (Das *et al.*, 1984).

Brownish mosquito with lightly coloured wings. Vein 5 mainly pale except at base and apex, and having no dark spot in its middle portion. Scattered pale scales present over most of the venter. Distal end of hind tarsus 1 all dark.

May be collected in human dwellings as well as in cow-sheds.

Breeding in ditches, ponds, shallow pools, tanks, field, channels, just planted rice-fields, etc.

Secondary malaria vector, only having local importance.

24. *Anopheles philippinensis* Ludlow

syn. *nivipes* Theobald, 1903
freeroe Banks, 1906
fuliginosus Stanton, 1915
pampangensis Brunetti, 1920
hainanensis Takei, 1941

The species is in abundance in Meghalaya. Reported from Shillong (Shortt, 1924). Rajagopal (1976) found *An. philippinensis* as most predominant species. Specimens trapped at Barapani, Burnihat, Jowai, Shillong (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

Wing vein 5 mainly white with no dark spot at the point of bifurcation. Distal end of hind tarsus 1 is almost white.

An. philippinensis found to rest both in houses and cattle-sheds during day time. At Burnihat, Rajagopal (1976) noted almost equal number of adults biting man as well as on cattle. Further, it was noticed that the species maintains high densities, but never rested indoor during day time. Mainly zoophilic but its anthropophilic index is also very high.

Susceptible to DDT in Meghalaya (Anon, 1972; Rajagopal, 1976; Nawab Sing & Chakrabarti, 1979) and elsewhere also (Dutta Choudhury & Malhotra, 1982).

Breeds in swamps, water tanks, ponds, ditches and rice-fields. Good growth of vegetation with stangnant water are the preferential breeding places.

Established malaria vector of Meghalaya (Rajagopal, 1976). Vector was found to maintain high densities as well as man mosquito contact. Exophillic habits of the vector, asympotmatic parasitaemia, failure to detect fever cases during regular surveillance and movement of local populace are the various factors responsible for persistance transmission of malaria.

25. *Anopheles pseudojamesi* Strickland & Chowdhury

syn. *ramsayi* Covell, 1927

Nural Huda & Harrison (1985) elevated *An. psuedojamesi* to species rank and *An. ramsayi* is regarded as its junior synonym.

An uncommon species. Only 8 adult specimens collected from Meghalaya by Nagpal & Sharma (1987).

Darker wings, base of costa mainly dark, a dark area on vein 5 (in middle). Female palpi unspeckled, apical and sub-apical white bands unequal. Dorsum of 7th and 8th abdominal segments with dark scales only (Wattal & Kalra, 1961).

Adults are found in houses and cattle-sheds.

Breeding in rain water pools, tanks and swamps with growth of heavy vegetation.

An insignificant vector of malaria.

26. *Anopheles splendidus* Koidzumi

syn. *indiensis* Theobald, 1903
maculipalpis James & Liston, 1904

Species of hilly terrain with wide prevalance. Collected from Barapani, Burnihat, Shillong *(Das et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

Identified due to presence of (i) 2 broad apical pale bands on female palpi and (ii) black and white scales on last abdominal segment. No golden hairs/scales (Ramachandra Rao, 1984).

Primarily, a cattle-feeder but sometimes bite man.

Breeding in pools (with algae), beds in hill streams, river beds (with vegetation), marshy lake margins, etc.

No role in malaria transmission.

27. *Anopheles stephensi*, Liston

syn. *metaboles* Theobald, 1902
intermedia Rothwell, 1907
folquei de Mello, 1918

var. *mysorensis* Sweet & Rao, 1937

Though very common in mainland zones of India, rather very scarce in Meghalaya. Only 3 specimens collected at Barapani (Das *et al.*, 1984).

Two broad apical pale bands on the speckled palpi. Broad scaling on thorax (Ramachandra Rao, 1984).

Adults may be collected in human dwellings, barracks, cattle-sheds, but it bites cattle predominantly.

Resistant to DDT/HCH in most parts of the country.

Immature stages occur in clean water. Breeding in small pools, drains, well, cisterns, fountains, ornamental tanks, barrels, buckets, etc. (Ramachandra Rao, *loc. cit.*).

Major vector of urban malaria, but no role in disease transmission in Meghalaya.

28. *Anopheles subpictus* Grassi

syn. *rossi* Giles, 1899
error Theobald, 1903

var. *indefinitus* Ludlow, 1904
malayensis Hacker, 1921
vadakadiensis Doraisamy, 1963

Recorded from Shillong, Barapani, Burnihat, Khasi & Jaintia Hills and other palces in Meghalaya (Shortt, 1924; Christophers, 1933; Das *et at.*, 1984; Nagpal & Sharma, 1987).

Female palpi has the dark pre-apical area almost equal to the apical white band. Tarsi of forelegs have broad pale bands.

Feeding on cattle and domestic animals, but in their absence, it may bite man in large numbers.

Breeding occurs in ground pools, ponds, tanks, lake-margins, wells, borrow-pits, channels, rice-fields, etc.

No role in disease transmissin in Meghalaya.

29. *Anopheles tessellatus* Theobald

Anopheles punctualatus Doenitz

Several synonyms and 2 subspecies, but none occurs in India.

Wide distribution in the Oriental region, scanty in Meghalaya. Recorded from Burnihat (Rajagopal, 1976). The species has been reported from all the northeastern states, except Mizoram (Malhotra & Mahanta, 1994).

The female palp has 3 broad and 1 short pale band. Apical half of the proboscis is also pale. Femur and tibia speckled but without any white tibio-tarsal joint (Wattal & Kalra, 1961).

Adults collected in houses, mixed-dwellings and cow-sheds. However, the species prefer to bite cattle than man.

Breeding in small pools, swamps, rice-fields, irrigation/seepage channels with preference for dirty stagnant water.

Suspected vector of malaria elsewhere but not in Meghalaya.

30. *Anopheles vagus* Doenitz

Anopheles rossi var. *vagus*

subsp. *limosus* King.1932
subsp. *albino* Stocker & Waktoedi, 1949

Species was found to be very common and trapped at all the places (Das *et al.*, 1984; Nagpal & Sharma, 1987).

Female palp has a long apical pale band followed by a narrow pale band, interrupted by a short dark area. Tarsal segments of forelegs with broad white bands (Ramchandra Rao, 1984).

Zoophilic but sufficient number of specimens can be collected from human dwellings also, biting man.

Susceptibility data not available. Resistant to DDT/Dieldrin in Assam (Das *et. al.*, 1987).

Breeding habitats are hoof marks, rain water pools, ditches, rice-fields, borrow pits, spring pools, canals, wells, irrigation channels etc. (Ramachandra Rao, 1984).

Not considered as a malaria vector but biting nuisance. Recently incriminated as malaria vector in neighbouring Bangladesh (Maheshwary *et al.*, 1994).

31. *Anopheles varuna* Iyengar

Anopheles minimus var. *varuna*

No specimen collected in the earlier surveys. Only a single specimen found in Meghalaya recently (Nagpal & Sharma, 1987).

A medium size mosquito with fairly dark appearance, dark wings, no fringe spot on vein 6. Female palp with 2 broad apical bands separated by a narrow dark area.

Found in plains, foot-hills as well as at high altitudes. Adult may be collected in houses and cattle-sheds, but regarded as anthropophilic.

Breeding in stagnant freshwater in ponds and ditches, small streams, rice-fields, well, etc.

Suspected vector of malaria in India.

32. *Anopheles willmori* James

Anopheles maculatus var. *willmorei* James, 1903

Raised to species level by Rattanarithikul & Green (1986).

Recorded from Khasi & Jaintia Hills (Christophers, 1933). Trapped at Cherrapunji, Jowai and Shillong (Das *et al.*, 1984). Nagpal & Sharma (1987) also confirmed its presence in Meghalaya.

Resembles with *An. maculatus* in most of the characters except that the scaling of the tergites is much more profuse. Scales are broader. Full area of tergites III-IV having a covering of broad scales (Christophers, 1933).

Predominantly anthropophilic. May be collected from cow-sheds also. Exophillic.

Not a malaria vector in Meghalaya but incriminated in Nepal at an higher altitude area (Pradhan *et al.*, 1970).

33. *Aedes atrius* Barraud

Recorded from Nongpoh, Khasi Hills, Jul. 1922 by Barraud (1928). Found absent in the recent mosquito surveys. Known only from its type-locality.

Head of female mosquito mainly covered with flat dark scales. Some pale scales on vertex along the eye margins. Dark brown scales on mesonotum.

Larval habitats unknown.

No vector potentiality.

34. *Aedes nummatus* Edwards

Reported from Nongpoh, Jul., 1922 (Barraud, 1934). Complete absence in the recent mosquito collections.

Female scutellar scales dark brown, narrow on lateral lobes, borad or mid-lobe. In male, scales on mid-lobe of scutellum are light brown (Barraud, 19340.

Breeding in tree-holes, cut-bamboos, discarded glass containers.

Role in disease transmission not known.

35. *Aedes vittatus* (Bigot)

Collected from Burnihat (Das *et al.*, 1984).

The species has a very distinct ornamentation. On mesonotum, there are small white spots, usually 6 in number, arranged in 2 vertical rows.

Breeding in plant-axils, tree-holes, cut-bamboos, used tin-containers, discarded tyres, rain-water collections, rocky-pools, etc.

Suspected vector of dengue and dengue haemorrhagic fever.

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36. *Aedes albolateralis* (Theobald)

syn. *Aedes niveus* (Ludlow), 1903
Stegomyia pseudonivea Theobald, 1910

Collected from Nongpoh (Barraud, 1934), Burnihat, Jowai (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

Flat scales on head and scutellum, large silvery patch on front of mesonotum, often divided in females (Barraud, 1934).

Aquatic stages found in cut-bamboos and tree-holes.

No role in disease transmission. Biting nuisance when in abundance.

37. *Aedes albotaeniatus* (Leicester)

syn. *Finlaya lepchana* Barraud, 1923

var. *mikiranus* Edwards, 1922

Type-form and variety, both collected at Nongpoh, (Barraud, 1934). No recent record.

Presence of large anterior median white patch is the characteristic feature of the type-form. The varieity closely resembles, except that the mesonotum is brown above.

Breeding in cut bamboos.

Vectorial capabilities not known.

38. *Aedes cacharanus* Barraud

syn. *Finlaya cacharana* Barraud, 1923

Collected from Nongpoh, Jul., 1922 by Barraud (1923b).

Head possesses a narrow median white line, with a round white patch on front of mesonotum. In male specimens, mesonotum is entirely covered with white scales and upper surface of the head is mainly white (Barraud, 1934).

Larvae occur in tree-holes.

Role in disease transmission not known.

39. *Aedes chrysolineatus* (Theobald)

syn. *Hulecoeteomyia trilineata* Leicester, 1904

Larvae collected from tree-holes in Meghalaya (Nagpal & Sharma, 1987).

Golden lines on mesonotum and broad basal white rings on first 3 segments of hind tarsi.

Breed in tree-holes, cut-bamboos, rocky-pools, roof-gutters, etc.

40. *Aedes dissimillis* (Leicester)

var. *karwari* Barraud, 1924

Immatures found in tree-holes (Nagpal & Sharma, 1987).

Dark tarsi and silvery flat scales on posterior pronotal lobe (proepimeron). The verietal forms differ from type-from due to presence of golden scales, fully covering the mesonotum.

Tree-holes are the most preferential breeding habitats.

41. *Aedes elsiae* Barraud

syn. *Finlaya elsiae* Barraud, 1923
Aedes (Finlaya) simlatus Barraud, 1931

Recorded from Shillong, Jul., 1922 by Barraud (1923b). No specimen encountered in the recent surveys.

Adult specimens have striped legs. Thorax possesses double median yellowish line. Dorsal surface of the head mainly dark, a pale border to eyes. Proboscis dark brown or black on upper surface. Mesonotum deep brown, marked with narrow lines of yellowish scales.

Breeding in rocky-pools.

Role in human/animal disease transmission unknown.

42. *Aedes formosensis* Yamada

syn. *Finlaya khasiana* Barraud, 1923

Collected from Nongpoh and Shillong (Barraud, 1934). No recent record.

Golden lines on mesonotum not very sharply marked. Broad basal white rings on first three segments of hind tarsi (Barraud, 1934).

Breeding in cut-bamboos, leaf axils of *Colocasia/Alocasia/Musa* spp.

43. *Aedes novoniveus* Barraud

Collected from Nongpoh, Jul. 1922 (Barraud, 1934). Absent in recent collections.

Mesonotum has a complete white area. In females, scutellar scales all black where as in males, scales of head and scutellum all creamy.

Cut-bamboos and tree-holes are recognised breeding habitats.

44. *Aedes prominens* Barruad

syn. *Finlaya prominens* Barraud, 1923

Recorded from Nongpoh, Jul., 1922 by Barraud, (1923c). Absent in recent collections at Meghalaya.

A black and white species of moderate size. Tufts of very long outstanding scales on venter of abdomen and rough scales on dorsum. White scales on lateral lobes of scutellum.

Immatures occur in tree-holes and bamboo-holes.

45. *Aedes pseudotaeiatus* (Giles)

Commonest species. Trapped in CDC light traps at Barapani, Cherrapunji, Jowai, Shillong (Das *et al.*, 1984). Later, Nagpal & Sharma (1987) also recorded this species in Meghalaya.

The species is well recognised by ornamentation of mesonotum, dark proboscis, striped femora and apical & basal white rings on hind tarsi (Barraud, 1934).

Breed in cement sinks, drains, cisterns, rock-pools, tyres, drums, cut-bamboos and tree holes (Barraud, *loc. cit.*; Das *et al. loc. cit.*; Nagpal & Sharma *loc. cit.*).

No role in disease transmission but biting nuisance due to its abundance.

46. *Aedes pulchriventer* (Giles)

syn. *Howardina himalayana* Giles, 1904

Recorded from Cherrapunji (Barraud, 1934). Not reported from Meghalaya or northeast in the recent past (Malhotra & Mahanta, 1994).

Dark tarsi and prominent orange patches on abdominal sternites.

Breeding in small pools, pot-holes, in stream-beds, tree-holes, etc.

47. *Aedes shortti* Barraud

syn. *Finlaya shortti* Barraud, 1923

Collected from the type locality-Shillong, by Barraud, Jun, 1922 (Barraud, 1923b). Again caught in CDC traps at Burnihat. Cheerapunji, Shillong (Das *et al.*, 1984).

Presence of double median yellowish line on thorax and striped legs are the characteristic features of this species. Hind femur with clear and prominent white markeing near knee. Dark coloured tiblia, pale at base and apex (Barraud, 1934).

Breeding in rock-pools.

48. *Aedes lineatopennis* (Ludlow)

syn. *Culex luteolateralis* Theobald, 1901

Found in Burnihat and Happy Valley (Das *et al.*, 1984).

Dark brown specimens. Sides of mesonotum yellow scaled. Dark brown legs with no bands. Abdomen with pale yellow basal bands (Barraud, 1934).

Breeding occurs in open natural pools.

No vectorial capabilities.

49. *Aedes aegypti* (Linnaeus)

syn: *Culex argenteus* Poiret, 1787
Culex fasciatus Fabricius, 1805
Culex calopus Meigen, 1818

var. *atritarsis* Edwards, 1920
luciensis Theobald, 1901
queens landensis Theobald, 1901

Ae. aegypti has 2 sub-species, viz. *Aedes (aegypti) aegypti* (the type form) and *Aedes (aegypti) formosus* (the sylvan form).

Immatures collected from discarded tyres (Das *et al.*, 1984).

White scales on mesonotum, forming a girdle shaped structure. Rubbed specimens identified due to presence of silvery-white flat scales in middle of vertex in female mosquitoes.

Breeding occurs in artificial receptacles.

Ae. aegypti transmits dengue (DEN) and Chikungunya (Chik) viruses in India (Ramachandra Rao, 1975).

50. *Aedes albopictus* (Skuse)

The most common species throughout the northeast. Trapped at Barapani, Burniht, Cherrapunji, Jowai (Das *et al.*, 1984). Meghalaya (Nagpal & Sharma, 1987).

The male and female specimens bear a narrow silvery-white median line running almost the whole length of mesonotum. Broad white rings on all segments of hind tarsi. Scutellar scales flat and snow white on all lobes.

Collected from drums, cut-bamboos, tree-holes, artificial receptacles (Das *et al., loc. cit.*, Nagpal & Sharma *loc. cit.*). Susceptibility data not available. Larvae susceptible to synthetic insecticides in Assam (Chakraborty *et. al.*, 1981).

Recognised vector of dengue and dengue haemorrhagic fever. No dengue epidemic

has so far been reported from Meghalaya, but its nuisance as day biter is very well known among tribals and tropps (Malhotra, 1985, 1988).

51. *Aedes craggi* Barraud

syn. *Stegomyia craggi* Barraud, 1923
Aedes (Stegomyia) purii Barraud, 1931

Recorded from Nongpoh, Khasi Hills during Jul., 1922 by Barraud (1923c). Found absent in the recent mosquito surveys.

White patch on head and thorax. 3-5 segments of hind tarsi entirely dark. 4th hind tarsal segment mainly white, having a narrow black apical ring (Barraud, 1934).

Larval habitats and disease relationship unknown.

52. *Aedes flavopictus* Yamada

Collected from Shillong (Barraud, 1934). Not re-reported from Meghalaya nor from any other north eastern state (Malhotra & Mahanta, 1994).

Very similar to *Ae. albopictus*. Markings on mesonotum are of yellowish colour, except for the median silvery line. In some specimens the yellowish tinge is faint or all together absent.

Breeding in tree-holes.

53. *Aedes mediopunctatus* Theobald

syn. *Stegomyia mediopunctata* Theobald

var. *perplexus* Leicester, 1908
submediopunctatus Barraud, 1923
sureilensis Barraud, 1922

Recorded from Nongpoh and Shillong by Barraud (1923a). No specimen was encountered during recent surveys.

White area on the front of mesonotum is oblique and continued back towards the scutellum. Scutellar scales white on mid-lobe, dark brown on lateral lobes (Barraud, 1934).

Breeding in bamboo-stumps.

No role in disease transmission.

54. *Armigeres kuchingensis* Edwards

var. *durhami* Edwards, 1917
shillongensis Barraud, 1927
nongpohensis Barraud, 1927
dibrugarhensis Barraud, 1927

Collected from Nongpoh, Shilling (Barraud, 1927), Barapani (Das *et al.*, 1984), Meghalaya (Nagpal & Sharma, 1987).

Yellowish brown scales on mesonotum, without any distinct pale margin. Abdominal sternites II-VI white scaled, without any apical black bands.

Type-form found in the cold season or more or less dry season, whereas the varieties are prevalent during rains.

Breeding in bamboo-stumps, plant-axils of *Alocasia indicum, Colocasia,* etc.

The species not involved in any disease transmission but create biting nuisance when in high density.

55. *Armigeres subalbatus* (Coquillett)

syn. *Armigeres obturbans* Walker, 1860
Culex ventralis Walker, 1861
Culex subalbatus Coquillett, 1898
Armigeres panalectoros Giles, 1902

Common mosquito species in urban and rural areas. Recorded from all over the state (Das *et al.*, 1984, Nagpal & Sharma, 1987).

A large size mosquito, Eyes bordered with creamy or white flat scales. A patch of broad white scales in middle of vertex. Scutellar scales flat and broad. Abdomen brownish-black dorsally having white markings on tergites, laterally (Barraud, 1934).

Specimens can be collected in cattle sheds followed by human dwellings and pigsties.

Breeding in cesspits, cesspools, drains, septic tanks and all types of containers having foul/polluted water.

A prime nuisance mosquito due to its vicious diurnal manbiting activity.

Ar. subalbatus is an efficient vector of JE and filariasis, both under ambient and experimental conditions (Puspita Das *et al.*, 1983.

56. *Armigeres theobaldi* Barraud

syn. *Stegomyia crassipes* Theobald, 1901
Desvoidea apicalis Theobald, 1910

Collected from Cherrapunji (Barraud, 1934). Found absent in recent surveys.

A large yellowish mosquito with median apical yellow markings on abdominal tergites. White scales on venter. Short palpi and unbanded tarsi.

Breeding in bamboo stumps.

57. *Armigeres annulitarsis* Leicester.

Recorded from Nongpoh and Shillong (Barraud, 1934). Absent in recent mosquito surveys.

Small mosquito with compressed throax, yellow lateral markings on abdomen and ringed tarsi. Female head elongated, covered with flat black scales. Thorax narrow and laterally compressed. Scutellar scales flat. Brownish-black legs (Barraud, 1934)

Immature stages occur in cut-bamboos.

58. *Armigeres dentatus* Barraud

Collected from Nongpoh during No. 1921 (Barraud, 1934). No specimen encountered during the recent surveys.

Compressed thorax, yellow lateral markings on abdomen and dark tarsi. Head covered with black scales with a pale patch in middle of vertex. Palpi and proboscis brownish-black. Mesonotum covered with dark brown scales. Dark brown legs (Barraud, 1934).

Breeding in bamboo-stumps.

59. *Armigeres longipalpis* (Leicester)

Recorded from Nongpoh in Jul. 1922 (Barraud, 1934). No recent record from Meghalaya.

Apical bands on abdominal tergites all complete. Female head almost black with scales, but a narrow pale border towards eyes. Dark scales wings. Tibiae and tarsi fully dark (Barraud, 1934).

Larvae occur in bamboo-holes.

60. *Coquillettidia crassipes* (Van der Wulp)

Mansonia (Coquillettidia) crassipes (Van der Wulp). 1892

syn. *Taeniorhynchus brevicellulus* Theobald, 1901
Chrysoconops pygmeus Theobald, 1908
Chrysoconops fuscopteron Theobald, 1911

Specimens captured from cattle-sheds in Burnihat (Das *et al.*, 1984).

Zoophilic. Adult specimens can be collected in cow-sheds and sties.

Characterised by its yellowish-brown thorax, dark wings and legs. Female head covered by upright forked yellow scales.

61. *Coquillelttidia novochracea* (Barraud)

Mansonia (Coquillettidia) novochracea (Barraud), 1927.

Collected from Nongpoh by Barraud (1934). No specimen collected in the recent surveys. Reported from Assam (Malhotra *et al.*, 1983; Malhotra, 1985).

A medium sized bright yellow mosquito with dark markings on thoracic integument. Scutellar scales and bristles also yellow. Yellow legs with blackish-brown markings at tips of femora.

62. *Coquillettidia ochracea* (Theobald)

Mansonia (Coquillettidia) ochracea (Theobald), 1903

syn. *Mansonia chrysogona* Knab, 1909

Collected from Cherrapunji during Oct. 1920 (Barraud, 1934). Found absent in the recent surveys. Reported from neighbouring country—Bangladesh (Ahmed, 1987).

A medium sized bright yellow mosquito, without any dark markings on mesonotum. Fore and mid-tarsi yellow or brown without any distinct banding. Female palp dark at tips.

63. *Culex bitaeniorhynchus* Giles

syn. *Taeniorhynchus* ager Giles, 1901
Taenioprihynchus tenax Theobald, 1901
Culex infula Theobald, 1901
Grabhamia ambiguus Theobald, 1903
Grabhamia taeniarostris Theobald, 1907
Taeniorhynchus tenax var. *ocellata* Theobald, 1907
Oculeomyia sarawaki Theobald, 1907

var. tenax Theobald, 190
ambiguus Theobald, 1903

Common mosquito species, collected from all the places of Meghalaya (Das *et al.*, 1984; Nagpal & Sharma, 1987).

Large sized mosquito. Speckled wings, banded proboscis and apical yellow bands on abdominal tergites.

Zoophilic. It's avidity to cattle is well documented (Mahadev *et al.*, 1978; Kay *et al.*, 1979; Rahman, 1988).

Breeding in open weedy pools (having abundance of green algae), ditches, paddy-fields, etc. Larva is recognised due to its triangular pointed mentum, furnished with a large number of minute teetch.

Vector of Japanese encephalitis (J.E.).

64. *Culex cornutes* Edwards

Recorded from Meghalaya by Nagpal & Sharma (1987). However, there is no previous record of its presence in the state.

Female head clothed dorsally with brown narrow curved scales. Palp brownish-black. Mesonotum covered with dark brown narrow scales. Legs dark brown. Femora and tibiae sprinkled with pale scales.

Breeding in jungle/ground pools, paddy-fields, etc.

No vectorial status.

65. *Culex edwardsi* Barraud

Reported from Shillong during Jun. 1922 (Barraud, 1934). No recent record.

Medium sized mosquito with brownish-black colour. Head with upright black scales on vertex and nape. Mesonotum covered with dark brown narrow scales. Femora and tibiae of mid and hind legs marked with longitudinal pale stripes.

66. *Culex epidesmus* (Theobald)

syn. *Grabhamia ochracea* Theobald, 1905
Taeniorhynchus epidesmus Theobald, 1910
Taeniorhynchus luteoabdominalis Theobald, 1910

Collected from Cherrapunji (Das *et al.*, 1984).

Predominantly a yellow coloured mosquito. Dorsal surface of the head covered with narrow, yellow and brown scales. Proboscis has a yellow band/ring in the middle. Mesonotum covered with yellow, brown and white scales. Femora and tibiae yellowish, with numerous scattered brown scales. Legs also yellow.

Zoophilic. May be collected from cattle-sheds, pigsties and human dwellings.

JE virus was once isolated from this species in Bankura, West Bengal (Dhanda & Kaul, 1980).

67. *Culex gelidus* Theobald, 1907

var. *cuneatus* Theobald, 1901
bipunctatus Theobald, 1907

Widely distributed mosquito species of Meghalaya. 1305 adult specimens collected in survey, undertaken at 6 places in Meghalaya. The highest density (114.71 mosquitoes ptn) was noticed at Barapani (Das *et al.*, 1984). The specimens of *Cx. gelidus* were also encounted during Sept. 1986 (Nagpal & Sharma, 1987).

Small sized mosquito with white scaling on mesonotum. Anterior white area of mesonotum is not produced in lines to scutellum, otherwise the species is very similar to *Cx-whitmorei*. Pale band on proboscis of female mosquito is usually narrower. Femur and tibia uniformly dark in front and above.

Zoophilic. Prefers bovine blood. Rarely on pigs, man and birds (Rahman, 1988).

Breeding in ponds, pools, marshy tracks etc. Presence of weed in the breeding habitats is always preferred by this species.

Suspected vector of JE.

68. *Culex hutchinsoni* Barraud

Recorded from Nongpoh in Jul. 1922 by barraud (1924). No specimen was encountered during the recent surveys. Recently reported from Manipur (Rajput & Singh, 1992).

A very small dark mosquito. Proboscis may or may not be banded. Female head covered by golden brown and pale narrow-curved scales on vertex. Mesonotum and scutellum clothed with narrow brown scales of deep golden tint. Dark brown legs. Tarsi entirely dark.

Breeding in road-side pools.

69. *Culex mimeticus* Noe

var. *mimuloides* Barraud, 1924

Recorded from Shillong, Cherrapunji (Barraud, 1934). Jowai, Shillong (Das *et al.*, 1984). It is a hill species, occasionally found in plains.

It is the only Culex species (except *Cx. mimulus*) with spotted wings. Resembles with Indian anophelines. Mesonotum mottled with yellowish and brownish scales, tending to form 3 spots on anterior half, one near front margin and a pair in the middle (Barraud, 1934).

Larvae occur in ditches, ponds, rocky pools, pool-margins, cement tanks, nalah, paddy-fields, etc. (Das *et al.*, Loc. cit.).

No role in human disease transmission.

70. *Culex mimulus* Edwards.

Common in hilly region of Assam including some parts of present day Meghalaya (Barraud, 1934). Recently collected from some places in Mehalaya (Das *et al.*, 1984; Nagpal & Sharma, 1987).

Spotted wings. Very similar but smaller than *Cx-mimeticus.* Distinguished due to presence of pale spot at middle of costa involving vein 1. Usually vein 3 entirely dark scaled.

Breeding in paddy-fields, rainy pools in forests.

No relation to human disease.

71. *Culex quinquefasciatus* Say

Culex (Culex) fatigans Wiedemann. 1828

syn. *Cx. cingulatus* Doleschall, 1856
Cx. doleschallii Giles, 1900
Cx. quasipipiens Theobald, 1901
Cx. fouchowensis Theobald, 1901
Cx. reesii Theobald, 1901
Cx. sericeus Theobald, 1901
Cx. albolineatus Giles, 1901
Cx. christophersi Theobald, 1901
Cx. minor Theobald, 1908

Commonest mosquito species of Meghalaya. Recorded from Shillong (Barraud. 1934) and from all the places of recent surveys (Das *et al.*, 1984; Nagpal & Sharma, 1987).

Large found mosquito with narrow golden brown scales on the vertex. Dark scaling on mesonotum, with dark brown/nearly black legs. Dark tarsi.

Highly anthropophilic. Occur in mixed dwellings and cattle-sheds also.

Larvae occur in ditches, ponds, rocky pools, cement tanks, nalahs, discarded tyres/drums, etc.

Recognised vector of Bancroftian filariasis.

72. *Culex sinensis* Theobald

Culex gelidus var. *sinensis*

syn. *Culex sepositus* Leicester, 1908
taeniorhynchus tenax Leicester, 1908

Collected from Nongpoh (Barraud, 1934), Barapani, Burnihat, Happy Valley, Jowai, Shillong (Das *et al.*, 1984; Nagpal Sharma, 1987).

Resembles *Cx. bitaeniorhynchus* in general appearance. Differentiated by the presence of entirely dark scaled wings.

Zoophilia. May be collected from human dwellings also.

Immatures are found in ditches, ponds, nalaha, puddles, road-side drains, paddy-fields, large sized pools having abundance of weed.

Not involved in any human disease transmission.

73. *Culex tritaeniorhynchus* Giles

syn. *Culex vishnui* Theobald, 1901
Culex annulus Theobald, 1901
Culex sitiens Theobald, 1901
Culex biroi Theobald, 1905

Cx. tritaeniorhynchus was considered as one of the species under *Cx. vishnui* group, till it was redescribed by Reuben (1969).

Very common mosquito species of Meghalaya. The specimens were collected from all the places of survey (Das *et al.*, 1984; Nagpal & Sharma, 1987).

Small mosquito with dark brown scales, uniformly covering whole of the mesonotum. Femore and tibiae dark brown.

Zoophilic. Mainly cattle (97%), others i.e. goat, sheep, bird, man (3%) (Rahman, 1988).

This mosquito generaly breeds in rural situations and immatures are prevalent in ground pools, ponds, puddles, paddy-fields, ditches, rocky-pools, nalahs, etc. (Das *et al.*, 1984; Rahman, 1988). Its breeding is restricted to water with abundant filamentous green algae.

Recognised vector of Japanese encephalitis in India. It may be mentioned that JE outbreaks generally coincides with high density of vector population. As Meghalaya has very high density of *Cx. tritaeniorhynchus*, vector control measures should be taken up as a routine.

74. *Culex vishnui* Theobald

syn. *Culex impellens* Theobald, 1901

var. *Culex perplexus* Leicester, 1908

Reuben (1969) redescribed *Cx. vishnui* group and distinguished it from other closely related species namely *Cx. pseudovishnui* and *Cx. tritaeniorhynchus.*

A very common mosquito species of Meghalaya. Recorded from all the places of survey (except in Happy Valley) (Das *et al.*, 1984; Negpal & Sharma, 1987).

Small brown mosquito with a pale band on proboscis. Distinguished by scaling of mesonotum and of male palpi and structure of male hypopygium.

Zoophilic. Cattle (87%), birds (5.1%), man (3.2%), amphibians (2.5%), pigs (0.2%), dogs (0.2%) (Rahman, 1988).

Breeding in rural situations. Aquatic stages found in ground pools, ponds, puddles, rice-fields, etc. where aquatic vegetation such as grass, paddy crops, water hyacinth, lemna, etc. are abundant (Srivankaran, 1976; Rahman, 1988).

Recognised vector of JE in India. In Meghalaya, no out-break of JE has been reported so far, but it is recommended that vector control measures should be taken up. Further studies on JE vectors, specially peak vector density period must be determined.

75. *Culex whitei* Barraud

Collected from Shillong and Nongpoh, Jun., 1922 (Barraud, 1934). Found absent in recent collections.

Resembles very closely with *Cx. vishnui* and *Cx. barraudi*, but can be differentiated on the structure of male hypopygium and larval characters.

Breeding in ground-pools, ponds, paddy-fields, etc.

Vectorial potentiality unknown.

76. *Culex whitmorei* (Giles)

syn. *Taeniorhynchus argenteus* Ludlow, 1905
Leucomyia plegipennis Theobald, 1907
Culex albus Leicester, 1908
Culex loricatus Leicester, 1908

Recorded from Meghalaya (Nagpal & Sharma, 1987).

Anterior white area of mesonotum produced in lines to scutellum. Pale band on proboscis of female mosquito usually broader.

Zoophilic, mainly cattle.

Breeding in pools, ponds, puddles, paddy-fields, etc. Usually with aquatic vegetation.

Recognised vector of JE in India.

77. *Culex fragilis* Ludlow

syn. *Trichorhynchus fuscus* Theobald, 1905
Culiciomyia inornata Theobald, 1907
Culiciomyia ceylonica Theobald, 1907
Culex graminis Leicester, 1908

Recorded from Nongpoh (Barraud, 1934). No recent record in Meghalaya or in north-east (Malhotra & Mahanta, 1994).

No pale bands on abdomen, nor any dark markings on pleurae.

Breeding in tree-holes.

78. *Culex nigropunctatus* Edwards

syn. *Culiciomyia annulata* Theobald, 1907.

Recorded from Nongpoh (Barraud, 1934). Absent in recent collections. Reported from Manipur (Rajpur & Singh, 1992).

A small brown mosquito. Very distinct velvety-black spot present on mesepimeron. The most distinguished character of larva is the presence of false-jointed siphon-tube.

Breeding in pools, ponds, paddy-fields, etc.

Nothing is known regarding its role in disease transmission, if any.

79. *Culex pallidothorax* Theobald

syn. *Culex albopleura* Theobald, 1907
Culiciomyia annuloabdominalis Theobald, 1910

Occurs in plains and hills of Assam/Meghalaya (Barraud, 1934). Recently recorded from Meghalaya (Nagpal & Sharma, 1987).

A moderate size mosquito. Head scales all dark. Narrow scales brown rather than creamy. Scales covering the mesonotum are dark fawn-brown.

Breeding in tree-holes, cut-bamboos, shallw wells, streams, rocky/ground pools, discarded tyres, tar barrels, etc.

No role in disease transmission.

80. *Culex malayi* (Leicester)

syn. *Aedes nigrescens* Theobald, 1907
Aioretomyia aedes Leicester, 1908

One of the most common mosquito species in Meghalaya. *Cx. malayi* was the largest single species encountered during the survey (Das *et al.*, 1984). The species was encountered at all the places, in high density.

It differs from allied species in head scaling and colouration of pleurae. In the middle of the vertex, there is a small area of narrow scales. In some specimens, there are narrow basal pale bands on abdomen (Barraud, 1934).

Zoophilic. Cattle-biter.

Immatures occur in ponds, rocky-pools, discarded tyres, drums, cut-bamboos, rice-fields, etc. (Das *et al.*, *loc cit*).

Not involved in disease transmission, but creates big biting nuisance due to its very high density and small size.

81. *Culex bengalensis* Barraud

Culex (Lophoceratomyia) minor var. *bengalensis* (Barraud), 1934

Collected from Shillong and Nongpoh by Barraud (1934). No recent record.

Identified due to presence of all very long specialised hairs on segment 6 of antenna. Basal part of antenna quite thick.

Larvae occur in rock-pools, cut-bamboos, tree-holes, etc.

Not considered as a vector.

82. *Culex minor* Leicester

var. *bengalensis* (Barraud), 1934

Specimens collected from Meghalaya recently (Nagpal & Sharma, 1987).

Male palpi slightly longer than proboscis. Antennae with few short hair-like scales on segment 6, all of the same length.

Breeding in bamboo stumps, rock-pools, tree holes, etc.

No vectorial potentiality.

83. *Culex fuscanus* Wiedemann,

syn. *Culex setulusus* Doleschall, 1857
Culex luridus Doleschall, 1857
Culex concolor Theobla.d, 1901

Specimens trapped in a cattle-shed at Barapani (Das *et. al.*, 1984).

Large sized mosquito. Head covered with narrow pale scales and numerous upright scales, which appear almost dark from all the sides.

Zoophilic. Females seldom attack man.

Larvae occur in water pits, pools, shallow wells, discarded tyres, domestic containers, etc. Larvae are predaceous in nature.

No role in disease transmission.

84. *Culex halifaxi* Theobald

syn. *Culex multimaculosus* Leicester, 1908
Culex aureopunctis Ludlow, 1910

Collected from Nongpoh (Barraud, 1934). Found absent in recent collections. Reported from Arunachal Pradesh (Malhotra *et al.*1987).

Large size dark mosquito. Abdominal tergites entirely dark. Mesonotum covered with brownish-black scales.

Zoophilic. Females never attack man.

Larval habitats include small ponds, road-side drains/ditches, jungle-pools, rice-fields, water barrels, tyres etc. Larvae predeceous in nature, always occur with larvae of *Cx. quinquefasciatus,* on which they prey upon.

No role in disease transmission.

85. *Culex vorax* Edwards

Occurs in hilly terrains only. Recorded from Cherrapunji and Shillong (Barraud, 1934). Not encountered during the recent surveys.

Zoophilic. Seldom bite man.

Large size mosquito. Abdominal tergites with pale apical bands of about the same width.

Larval haibitats, predaceous nature of larvae, role in disease transmission is similar to *Cx. fuscanus* and *Cx. halifaxi.*

86. *Heizmannia complex* (Theobald)

Recorded at Nongpoh, Jul 1922 & Mar. 1927 (Barraud, 1934). No recent record.

Dark coloured mosquito. Mesonotal and scutellar scales dull greyish-brown, with some metallic lustre. Deep brown abdomen with lateral pale markings.

Larvae occur in tree-holes, bamboo-stumps.

No relation with disease transmission.

87. *Mansonia annulifera* (Theobald)

syn. *Panoplites seguini* Laveran, 1901
Mansonioides septemguttata Theobald, 1907

Recorded from Meghalaya (Das *et al.*, 1984; Nagal & Sharma, 1987).

Small yellowish-brown mosquito. Female head with some white scales along eye-margins and at sides. Vertex and nape with narrow yellow and pale upright scales. Moesnotum with narrow yellow or golden scales.

Anthropophilic.

Breeds profusely in tanks, ponds, open drainage, marshy, water-logged, areas, paddy-

1861 ZSI/99—15B

fields infested with aquatic weeds. Immatures always found attached to the roots of aquatic plantsfor respiration-an inherited behaviour in *Masonia.*

Chief vector of Brugian filariasis. JE virus isolated from *M. annulifera* at Dibrugarh (Assam) (Chakraborty *et al.*, 1980).

88. *Mansonia indiana* Edwards

Widely distributed mosquito species of Meghalaya. Collected from Nongpoh, Jul. 1922 (Barraud, 1934). Recently trapped at Barapani, Burnihat, Jowai, Shillong (Das *et al.* 1984).

Brownish mosquito with complete absence of greenish stripes on the mesonotum.

Breeding in water tanks, ponds, paddy-fields, etc. infested with aquatic weeds. Immatures always found attached with roots (for respiration) of hydro-plants.

Recognised vector of Brugian filariasis. A prime nuisance mosquito, when in high densities, due to its vicious biting habits.

89. *Mansonia longipalpis* (Van der Wulp)

syn. *Culex annulipes* Walker, 1857

Recorded from Nongpoh, Sept. 1926 (Barraud, 1934). Recently collected at Burnihat (Das *et al,* 1984).

Large sized yellow-brown mosquito with dark colouration. Mesonotum marked with 2 or 3 round white spots.

Mainly zoophilic, occasionally bites man when in high densities.

Breeding in water-rich in decaying organic matters. Larvae are found attached to aquatic plants.

Principal vector of Brugian filariasis.

90. *Mansonia uniformis* (Theobald)

Collected at Burnihat, Barapani, Jowai, Shillong (Das *et al.*, 1984). Common mosquito in most parts of Meghalaya (Nagpal & Sharma, 1987).

Large sized brownish mosquto with less defined rings on femora. Mesonotum marked with a pair of sublateral greenish stripes.

Zoophilic. Prevalent in sites, cattle-sheds and stables. M. uniformis has a great affinity to pigs/piglets.

Breeding in swams and pools, with thick vegetation. Larvae found attached to the roots of aquatic plants i.e. *Eichhornia specios, Pistia sp., Salvania sp.,* etc.

Recognised vector of Brugian filariasis.

91. *Toxorhychites gravelyi* Edwards

syn. *Megarhinus gravelyi* Edwards, 1921.

Recorded at Nongpoh, Jul.1922 (Barraud, 1934). Absent in the recent collections.

Very large sized mosquito (wing length 6.5 - 7 mm). Lateral tufts on terminal segments of abdomen, not very prominent. Leg markings and colouration of abdomen, very distinctive.

Breeding in tree-holes, bamboo-stumps, etc.

92. *Toxorhychites splenders* (Wiedmann)

syn. *Megarhinus splendens* (Wiedmann), 1819
Culex spendens Wiedmann, 1819
Culex regius Thwaites, 1859
Megarhina immisericors Giles, 1901
Megarhina sikkimensis Giles, 1901
Megarhinus immisericors Theobald, 1901
Negarhinus gilessi Theobald, 1901
Worcesteria grata Banks, 1906
Toxorhynchites argenteotarsis Ludlow, 1906

Nagpal & Sharma (1987) collected 15 immatures from tree-holes of bamboo and kathal. The species is abundant in rainy season.

Large sized mosquito (wing length 8.5 - 9 mm). Presence of well developed lateral tufts of yellow, black and orange hairs on terminal abdominal segments. Dull bronzy or greenish-brown scales on mesonotum.

A non-biter species. Adults visit flowers for sucking honey, during day time.

Breeding in tree-holes, bamboos, discarded GI tins/jars, domestic containers, etc. These larvae (usually one in number) occur with larvae of other mosquito species on which they prey.

Larvae may be used in biological control.

93. *Tripteroides aranoides* (Theobald)

syn. *Myeomyia aranoides* Theobald, 1899
Rachinotomyia ceylonensis Theobald, 1905
Skeiromyia fusca Leicester, 1908
Squamomyia inornata, Theobald, 1910
Ficalbia tenax de Meijere, 1910

var. *serrata* Barraud, 1929

Recorded from Shillong during Jun & Aug. 1922 (Barraud, 1934). Found absent in the recent collections. Reported from north-east (Malhotra & Mahanta, 1994).

Small mosquitoes with dark brown slender legs, devoid of any band. White scales on posterior pronotal lobe (proepimeron) and pleurae. Light scales forming a lateral straight border to tergites for length of abdomen (Barraud, 1934).

Breeding in bamboo-stumps, occasionally in tree-holes.

No vector potentiality.

94. *Tripteroides indicus* (Barraud)

Triptroides powelli (Ludlow), 1909, var. *indicus* (Barraud), 1929
Rachionotomyia powelli (Ludlow), 1909 var. *indicus* (Barraud), 1929

Recorded from Nongpoh, Jul.1922 (Barraud, 1934). Two female paratypes (reared from larvae in bamboos) are present in the collections of NICD (Kaur,1992). Absent in the recent mosquito surveys. Reported from north-east (Malhotra & Mahanta, 1994).

Dark brown scales on anterior pronotal lobe. Femora marked with 2 silvery spots. Presence of several pairs of dorso-central bristles on mesonotum.

Breeding in cut-bamboos.

95. *Uranotaenia hebes* Barraud

Collected from its type locality-Nongpoh, Mar. 1927 (Barraud, 1934). Not encountered during recent surveys.

A brown coloured mosquito of moderate size. Only 1 small dark area on pleurae. Short palpi. Less expanded upright scales on head (Barraud, *loc cit*).

Jungle species.

Breeding in tree-holes, bamboos.

96. *Uranotaenia maxima* Leicester

Recorded from Shillong, Sept.1917 & Sept.1918 (Barraud, 1934). No recent record.

A large brown mosquito with dark areas on pleurae. Narrow bands on some abdominal segments.

Breeding in rocky-pools at the edge of a stream.

97. *Uranotaenia testacea* Theobald

syn. *Uranotaenia falcipes* Banks, 1906
Uranotaenia unilineata Leicester, 1908.

Reported from Nongpoh, Nov. 1921 (Barraud, 1934). Found absent in the recent collections in north-east (Malhotra & Mahanta, 1994).

Dark mosquito (wing length 2.4 - 2.7 mm) with bright blue or bluish-silvery flat scales on head.

Larvae occur in bamboo-stumps.

Nothing is known regarding its role in disease transmission, if any.

SUMMARY

The various mosquito surveys conducted in the state of Meghalaya, till date, show the presence of 97 species under 10 genera, viz. *Anopheles (32 species)*, *Aedes* (21), *Armigeres* (6), *Coquillettidia* (3), *Culex* (23), *Hiezmannia* (1), *Mansonia* (4), *Toxorhychites* (2), *Tripteroides* (2) and *Uranotaenia* (3). All the documented species are furnished with synonymy, salient taxonomic characters, distribution, biology and their role in disease transmission.

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LEPIDOPTERA : PAPILIONOIDEA : PAPILIONIDAE AND DANAINE NYMPHALIDAE

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INTRODUCTION

The Papilionidae and danaine Nymphalidae belong to the well-known butterfly group of the highly specialised insect Order Lepidoptera. The Papilionidae is represented by 561 species in 31 genera from the world (*vide* Hancock, 1983), 94 species in 12 genera from India, and 50 species in 10 genera from the state of Meghalaya. The danaines, on the other hands comprise 157 species in 11 genera from the world (*vide* Ackery & Vane-Wright, 1984), 38 species in 6 genera from India, and 15 species in 4 genera from the state.

Fresh material, apart from quite a few lying in the old collections, have been brought from different districts of the hilly state during the last decade by various parties from the zoological Survey of India. The collected material, comprising about eighty specimens of both the families taken together, represent about 35% of the known state fauna. Quite a many were earlier stated to be rich in status and abundance by Evans (1932), Talbot (1939, 1949) and Wynter-Blyth (1957); but now these are apparently of poorer status. The paucity of these natural resources, particularly the papilionids of great aesthetic value, is obviously attributed to the ruthless denudaton of their forest habitats through human interferences. Such elements, therefore, badly need substantial measures of their conservation within the apt distributional range in the state and elsewhere in India.

The pioneering work on the lepidopteran faunistics including those of the concerned families from Meghalaya dates back to Swinhoe (1893); he worked on the collections from the Khasi and Jaintia Hills. This was subsequently followed by other workers, *viz.*, Parsons and Cantlie (1948), Varshney and Chanda (1971) and a few more as cited by Varshney (1977). Rynth (1977) published a list of butterflies from the Garo Hills. Very recently Radhakrishnan, *et al* (1989) contributed an illustrated account of the fauna.

The superfamily Papilionoidea with the components under report is cosmopolitan and best recognised by the antennae clavate and basally approximated, penultimate radials of fore wing stalked and hind-wing jugate. The papilionids represent the largest and most magnificient of all the Indian butterflies. These are mostly tailed-a feature from which the family gets its name as the "Swallowtails" Their ways of flight are varied, for example, the Bird wings (*Troides*) soar slowly and majestically around tree-tops; the Jays (*Graphium*) skip from flower to flower, while others like the Red Helen (*Princeps helenus*) have a lazy

flight; still others like the Lime Butterfly (*P. demoleus*) fly fast and straight. In any case, all are capable of rapid flight if danger threatens. All feed at flowers, while hovering around and barely touching them with legs, through long uncurled proboscis thrust deep into the blossoms. Foodplants belong to Aristolochiaceae, Rutaceae, Lauraceae, Anonaceae, etc. A few like the Common Rose (*Atrophaneura aristolochiae*) are mimicked by females of the Common Mormon (*Princeps polytes*). The elements are chiefly encountered in forest and hilly jungle. The danaines are tough, leathery and unpleasantly tasted insects with slow flight and best equipped for survival. Confident in their security, these are always fearless insects which show no seasonal variation. They are chiefly found in tropical and subtropical plains and feed on Asclepiadaceae - type of foodplants from which they get the subfamily name, the "Milkweed butterflies"; their other foodplants are known to belong to Apocynaceae and Urticaceae.

The present paper deals with the systematic account of state fauna covering both the papilionids and the danaines. Amongst the species examined, the former comprises 13 including *Princeps polymnestor* (Cr.) and *P. crino* (Fabr.) as new records for the state, and the latter, 12 including the only newly recorded element, *Euploea midamus rogenhoferi* Feld. & Feld. The remaining 37 papilionid and 3 danaine species, which are not available in the collections from the state, are appended after a comprehensive literature review. Distribution of certain interesting species is shown by map-plotting their serial number as under the Systematic list of taxa. The system of Papilionidae and that of danaine Nymphalidae have been followed after Hancock (1983) and Ackery & Vane-Wright (1984) respectively.

SYSTEMATIC ACCOUNT

The general morphology along with illustrations of this well familiar group of butterflies under report has been substantiated by Talbot (1939, 1949) and Wynter-Blyth (1957). Brief account of collection and preservation methods together with keys to the concerned families, subfamilies and other taxa up to most of the species has already been provided in the authors' earlier work (*vide* Mondal & Maulik, *in* press).

LIST OF TAXA

	Order	Lepidoptera
	Superfamily	Papilionoidea
I.	Family	Papilionidae
	Subfamily	Papilioninae
	Tribe	Troidini
	Subtribe	Troiditi
	Genus	***Atrophaneura*** Reakirt
	Subgenus	Atrophaneura Reakirt

nox – group

1. *varuna* (White)

ssp. astorion (Westwood)

polydorus-group

2. *aristolochiae* (Fabricius)

ssp. aristolochiae (Fabricius)

Genus *Troides* Hübner
Subgenus *Troides* Hübner

helena-group

3. *helena* (Linn.)

ssp. *cerberus* (C. & R. Felder)

Tribe Papilionini
Genus ***Chilasa*** Moore
Subgenus *Chilasa* Moore

clytia-group

4. *clytia* (Linn.)

ssp. *clytia* (Linn.)

agestor-group

5. *agestor* (Gray)

ssp. agestor (Gray)

Genus ***Princeps*** Hübner
Subgenus ***Menelaides*** Hübner

protenor-group

6. protenor (Cramer)

ssp. *euprotenor* (Fruhstorfer)

memnon-group

7. *polymnestor* (Cramer)

ssp. *polymnestor* (Cramer)

8. *memnon* (Linn.)

ssp. *agenor* (Linn.)

helenus-group

9. *helenus* (Linn.)

ssp. *helenus* (Linn.)

polytes-group

10. *polytes* (Linn.)

ssp. *romulus* (Cramer)

nephelus-group

11. *nephelus* (Boisduval)

ssp. *chaon* (Westwood)

Subgenus *Princeps* Hübner

demoleus-group

12. *demoleus* (Linn.)

ssp. *demoleus* (Linn.)

palinurus-group

13. *crino* (Fabricius)

II. Family Nymphalidae

Subfamily Danainae

Tribe Danaini

Subtribe Amaurina

Genus ***Parantica*** Moore

14. *aglea* (Stoll)

ssp. *melanoides* Moore

15. *melaneus* (Cramer)

ssp. *plataniston* (Fruhstorfer)

16. *sita* (Kollar)

ssp. *sita* (Kollar)

Subtribe Danaina

Genus ***Tirumala*** Moore

17. *limniace* (Cramer)

ssp. *leopardus* (Butler)

18. *septentrionis* (Butler)

ssp. *septentrionis* (Butler)

Genus *Danaus* Kluk

Subgenus *Salatura* Moore

19. *genutia* (Cramer)

ssp. *genutia* (Cramer)

Subgenus *Anosia* Hübner

20. *chrysippus* (Linn.)

ssp. *chrysippus* (Linn.)

Tribe Euploeini

Subtribe Euploeina

Genus *Euploea* Fabricius

21. *mulciber* (Cramer)

ssp. *mulciber* (Cramer)

22. *midamus* (Linn.)

ssp. *rogenhoferi* C. & R. Felder

23. *radamanthus* (Fabricius)

ssp. *ramsayi* (Moore)

24. *algea* (Godart)

ssp. *deione* Westwood

25. *core* (Cramer)

ssp. *core* (Cramer)

Family I. Papilionidae

Subfamily Papilioninae

Tribe Troidini

Genus (A). ***Atrophaneura*** Reakirt, 1865

1833. *Polydorus* Swainson, *Zool. Illustr.*, ii : **2**, pl. 101.

1983. *Atrophaneura*, Hancock, *Smithersia*, **2** : 27.

1. *Atrophaneurs (Atrophaneura) varuna* (White, 1842)

1842. *Papilio varuna* White, *Ent.*, 1 : No. 17, P. 280.

ssp. *astorion* (Westwood, 1842)

In press : *Atrophaneura (Atrophaneura) varuna astorian*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Chandmari, Tura, West Garo Hills district, 16.x.1988, *R.K. Ghosh* & party Coll. *Wing expanse*: 125mm.

Distribution : India : Meghalaya (West Garo; East Khasi Hills). West Bengal; Arunachal Pradesh; Assam; Sikkim; Uttar Pradesh. Elsewhere : Burma.

Remarks : Parsons and Cantlie (1948) recorded the butterfly from Cherrapunji.

2. *Atrophaneura (Atrophaneura) aristolochiae (Fabricius, 1775)*

1775. *Papilio aristolochiae* Fabricius, *Syst. Ent.*, p. 443.

ssp. *aristolochiae* (Fabricius, 1775)

In press. *Atrophaneura (Atrophaneura) aristolochiae aristolochiae*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., on way to Tura Peak, West Garo Hills district, 2. v. 1979, J.K. Jonathon & party coll. *Wing expanse* : 95 mm.

Distribution : India : Meghalaya (West Garo : Tura, Wagaesi, Kobal, Rongrengiri and Songsak; Khasi Hills : Umsning, Mawroh and Cantonment area, Shillong). Elsewhere : Weedy in the Indian subregion, but unknown in Burma. Also extends to Java.

Remarks : Varshney and Chanda (1971) and Radhakrishnan, *et, al* (1989) reported the butterfly from the Khasi Hills, while Rynth (1977) reported it from the Garo Hills.

Genus (B). *Troides* Hübner, 1819

1819. *Troides* Hübner, *Verz. bek. Schmett.*, p. 88.

1983. *Troides*, Hancock, *Smithersia*, **2** : 28.

3. *Troides (Troides) helena* (Linn., 1758)

1758. *Papilio helena* Linnaeus, *Syst. Nat.*, ed. **10** : 461.

ssp *cerberus* (C. & R. Felder, 1864)

In press. *Troides (Troides) helena cerberus*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : one ex., Nongpo, Khasi Hills, 29. ix. 1988, A.R. Lahiri & party coll. *Wing expanse* : 150 mm.

Distribution : India : Meghalaya (East Khasi Hills : Dawki). Elsewhere : Rest of the East Himalaya and also eastern and southern Peninsula of India. Further known from Bangladesh, Bhutan, Burma, Indonesia, Nepal, Malaysia and Vietnam.

Remarks : The butterfly, which is the largest of all in India, was reported from Dawki by parsons and Cantlie (1948).

Tribe Papilionini

Genus (C). *Chilasa* Moore (1881)

1881. *Chilasa* Moore, *Lep. Ceylon*, **1** : 153.

1983. *Chilasa*, Hancock, *Smithersia*, **2** : 33.

4. *Chilasa (Chilasa) clytia* (Linn., 1758)

1758. *Papilio clytia* Linnaeus, *Syst. Nat.*, ed. **10** : 479.

ssp. *clytia* (Linn., 1758)

In press. *Chilasa (Chilasa) clytia clytia*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 3 exs., Kherapara, West Garo Hills district, 21. vii. 1988, R K Ghosh & party coll.; Serengma, 11. v. 1979, B. Ray and party coll.; along road from Mousumai to Shella, Khasi Hills, 26. v. 1979, G. K. Srivastava & party coll. *Wing expanse* : 105 - 110 mm.

Distribution : India : Meghalaya (West Garo; Khasi Hills). Elsewhere : Throughout the rest of the Indian mainland; also Burma.

Remarks : Cantlie (1952) reported the very rare form, *commixtus* (Rothschild) from the Khasi Hills; Varshney and Chanda (1971) mentioned both ff. *dissimillima* Evans and *dissimillis* (Linn.) of this butterfly also from the Khasi Hills.

5. *Chilasa (Chilasa) agestor* (Gray, 1832)

1832. *Papilio agestor* (Gray, in Griffith's ed. Cuvier, *Animal Kingdom*, **15** : 32.

ssp. *agestor* (Gray, 1832)

1983. *Chilasa (Chilasa) agestor*, Hancock, *Smithersia*, 2 : 48 (ssp. *agestor*, Talbot, 1939, *Fauna Brit. India*, *1* : 107).

Material examined : One ex., William Nagar, East Garo Hills, 12.iii.1991, B. C. Das & party coll. *Wing expanse* : 110 mm.

Diagnosis : Fore wing ground colour black with bluish grey markings. Hind wing ground colour chestnut red with bluish grey markings; postdiscal series of spots incomplete; submarginal series of dots obsolescent.

Distribution : India : Meghalaya (East Garo Hills; East Khasi Hills). Elsewhere : Sikkim to upper Burma, Vietnam and Malaya.

Remarks : This locally common butterfly frequents shrubby woods during spring. It feeds on *Machilus oderatissima* (Lauraceae) as reported by Wynter-Blyth (1957). The element was earlier known from Cherrapunji (*cf.* Parson & Cantlie, 1948).

Genus (D). ***Princeps*** Hübner, 1807

1758. *Papilio* Linnaeus, *Syst. Nat.*, ed. 10 (1) : 458.

1983. *Princeps*, Hancock, *Smithersia*, 2 : 35.

6. ***Princeps (Menelaides) protenor*** (Cramer, 1775)

1775. *Papilio protenor* Cramer, *Pap. Exot.*, **1** : 77.

ssp. *euprotenor* (Fruhstorfer, 1908)

1908. *Papilio protenor euprotenor* Fruhstorfer, *Ent. Zeit. Stutt.*, **22** (11) : 46.

1983. *Princeps protenor*, Hancock, *Smithersia*, 2 : 48 (ssp. *euprotenor* Talbot, 1939, *Fauna Brit. India*, **1** : 142).

Material examined : One ex., William Nagar, East Garo Hills, 12.iii.1991, B.C.Das & party coll. *Wing expanse* : 110 mm.

Diagnosis : Fore wing underside whitish. Hind wing distal area broadly blue-scaled, subcostal white stripe in male; tailess. Both wings with blue sheen; underside without red basal marking.

Distribution : India : Meghalaya (East Garo Hills; East Khasi hills : Shillong); Sikkim. Elsewhere : North Burma; Vietnam.

Remarks : The butterfly, that belongs to the *protenor* species - group, is a mimetic of *Atrophaneura* (cf. Hancock, 1983). It is locally common and often seen on moist sand along river banks, showing a slow and tumbling flight. It is very much attracted to thistles and feeds on *Zanthaxylum alatum* (Rutaceae). The element was earlier reported from the Khasi and Garo Hills by Parsons & Cantlie (1948), Varshney & Chanda (1971), Rynth (1977) and Radhakrishnan, *et al* (1989).

7. ***Princeps (Menelaides) polymnestor*** (Cramer, 1775)

1775. *Papilio polymnestor* Cramer, *Pap. Exot.*, **1** : 83.

ssp. *polymnestor* (Cramer, 1775)

In press. *Princeps (Menelaides) polymnestor polymnestor,* Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Cherrapunji, East Khasi Hills, alt. c 900 m, - x.1956. S. K. Sarkar & party coll. *Wing expanse* : 125 mm.

Diagnosis : ♂–Head and abdomen not marked red. Fore wing without pale blue submarginal band. ♀ Not available in colln.

Distribution : India : Meghalaya (E. Khasi Hills); Sikkim; Peninsular areas including the Nilgiris.

Remarks : This butterfly constitutes new locality record for the state of Meghalaya. For habits, *vide* Mondal & Maulik (*in* press). Unlike in West Bengal, the element occurs during wet month in Meghalaya. Though locally common in the plains, it seems to be endangered in a hilly state like Meghalaya where it needs legal conservation measures along with its forest habitats.

8. ***Princeps (Menelaides) memnon*** (Linn., 1758)

1758. *Papilio memnon* Linnaeus, *Syst. Nat.*, ed. 10 : 460.

ssp. *agenor* (Linn., 1758)

In press. *Princeps (Menelaides) memnon agenor,* Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 7 exs.; Tura, 15.x.1974, Chandmari, West Garo Hills, 16.x.1974, S.K. Gupta & party coll.; Songsak, 18.ix.1975, N. Muruleedharan & party coll.; Tasek, 2.vii. 1988, Darugiri, alt. *c* 400m, 1.vii.1988, R.K. Ghosh & party coll.; William Nagar, E. Garo Hills, 12.iii.1991, B.C.Das & party coll. *Wing expanse* : 115-160 mm.

Distribution : India : Meghalaya (East and West Garo Hills; Khasi Hills); West Bengal; Arunachal Pradesh; Assam; Nagaland; Sikkim; Andaman and Nicobar Islands. Elsewhere : Burma.

Remarks : The butterfly was earlier reported from the Khasi Hills by Parsons & Cantlie (1948).

9. ***Princeps (Menelaides) helenus*** (Linn. 1758)

1758. *Papilio helenus* Linnaeus, *Syst. Nat.*, ed. 10 : 459.

ssp. *helenus* (Linn., 1758)

In Press : *Princeps (Menelaides) helenus helenus,* Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Degrangiri, alt. c 400 m, East Garo Hills, 1. vii. 1988, R. K. Ghosh & party coll. *Wing expanse* : 115 mm.

Distribution : India : Meghalaya (East Garo Hills; Khasi Hills); rest of East Himalaya; West Bengal; Uttar Pradesh. Elsewhere Burma; Malay Peninsula; Thailand.

Remarks : The butterfly, which is bivoltine in habit, was earlier recorded from different districts of the state by Parsons & Cantlie (1948), Varshney & Chanda (1971), Rynth (1977) and Radhakrishnan, *et al* (1989).

10. ***Princeps (Menelaides) polytes*** (Linn., 1758)

1758. *Papilio polytes* Linnaeus, *Syst. Nat.*, ed. 10 : 460.

ssp. *romulus* (Cramer, 1775)

In press. *Princeps (Menelaides) polytes romulus*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 9 exs.; Songsak, 22.ix.1975, Rongram, 24.ix.1975, N. Muraleedharan & party coll.; Darugiri, 30.vi.1988, R K Ghosh & party coll.; Nangwal, 20.v.1990, M. S. Shishodia & party coll.; William Nagar, East Garo Hills district, 12.iii.1991, B. C. Das & party coll.; Jowai, Narling, Jaintia Hills, 20.ix.1988, V.D. Srivastava & party coll. *Wing expanse* : 88-96 mm.

Distribution : India : Meghalaya (East Garo Hills; Jaintia Hills). Elsewhere : East to North-west Himalaya; Eastern (including West Bengal) and southern Peninsula of India. Also, Sri Lanka, Burma and Malayan.

Remarks : The butterfly was earlier reported from different districts of the state of Meghalaya by Parsons & Cantlie (1948), Varshney & Chanda (1971), Rynth (1977) and Radhakrishnan, *et al* (1989).

11. ***Princeps (Menelaides) nephelus*** (Boisduval, 1836)

1836. *papilio nephelus* Boisduval, Spec. Gén. Lép., 1 : 210
ssp. *chaon* (Westwood, 1845)

In press. *Princeps (Menelaides) nephelus chaon*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Mateiral examined : 8 exs. : Darugiri, c 425 m, East Garo Hills, 1. vii. 1988; Kherapara, West Garo Hills, 20. vii. 1988, R.K.Ghosh & party coll.; Khasi Hills, -x.1956, S. K. Sarkar & party coll. *Wing expanse* : 90-120 mm.

Distribution : India : Meghalaya (East and West Garo Hills; Khasi Hills); Arunachal Pradesh; Assam; Sikkim; West Bengal; Orissa. Elsewhere : Nepal, Burma, Vietnam and Thailand.

Remarks : The butterfly was earlier known from Meghalaya (*vide Parsons & Cantlie, 1948; Radhakrishnan, et al*, 1989).

12. *Princeps (Princeps) demoleus* (Linn., 1758)

1758. *Papilio demoleus* Linnaeus, *Syst. Nat.*, ed. 10 : 464.
ssp. *demoleus* (Linn., 1758)

In press. *Princeps (Princeps) demoleus demoleus*, Mondal & Maulin, *in State Fauna Series, West Bengal.*

Material examined : 2 exs. : Kherapara, 20.vi.1988, Sibbari, West Garo Hills, 15.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 90-95 mm.

Distribution : India : Meghalaya (West Garo Hills; Khasi Hills). Elsewhere : Rest of East Himalaya to North-west Himalaya and also peninsular belts including West Bengal. Also, East Palaearctic, North Burma and Sri Lanka.

Remarks : The butterfly was earlier reported from the Khasi Hills by Varshney & Chanda (1971) and Radhakrishnan, *et al* (1989).

13. *Princeps (Princeps) crino* (Fabricius, 1793)

In press. *Princeps (Princeps) crino*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Jawai, Tirkhela, 23.ix.1988, V.D. Srivastava & party coll. *Wing expanse* : 130 mm.

Distribution : India : Meghalaya (Jaintia Hills). Elsewhere : Eastern (including West Bengal), northern and southern Peninsula of India. Also, Sri Lanka.

Diagnosis : Body black, with metallic green scales. Fore wing green band not entering cell. Hind wing with red and blue spots; tail green-tipped.

Remarks : The species constitutes new locality record for Meghalaya. For habits, *vide* Mondal & Maulik (*in* press). The specimen examined is appreciably larger in expanse than that mentioned by Bingham (1907), Talbot (1939) and Wynter-Blyth (1957).

Family II.	Nymphalidae
Subfamily	Danainae
Tribe	Danaini
Genus (E)	***Parantica*** Moore, 1880

*1802. *Danaus* Kluk, *Zwierzat. Hist. nat. Pocz. gospod.*, **4** : 84.

1984. *Parantica*, Ackery & Vane-Wright, *Milkweed butterflies*, P. 174.

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*cf. Cowan (1970) for discussion concerning date of publication, which may be 1780.

14. *Parantica aglea* (Stoll, 1782)

1782. *Papilio aglea* Stoll, *in* Cramer, *Pap. Exot.*, 4 : 173.

ssp. *melanoides* Moore, 1883

In press. *Parantica aglea melanoides*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 6 exs. : Khasi Hills, 25-27.v.1979, G.K. Srivastava & S. B. Roy parties coll.; Tasek, Songsak, E. Garo Hills, 4.vii.1988, R.K. Ghosh & party coll.; Garampani, Luchook, Jaintia Hills, 2.x.1988, V.D. Srivastava & party coll. Also, one ex., Shillong, xi.1879 (Old colln.). *Wing expanse* : 75-90 mm.

Distribution : India : Meghalaya (East Garo Hills; Jaintia Hills; Khasi Hills); Arunachal Pradesh; Assam; Sikkim; West Bengal; Himachal Pradesh; Jammu and Kashmir. Elsewhere : Bangladesh; Burma; Malaya; Hainan; Nepal; Thailand; Vietnam.

Remarks : The butterfly was earlier known from Meghalaya.

15. *Parantica melaneus* (Cramer, 1775)

1775. *Papilio melanea* Cramer, *Pap. Exot.*, 1 : 48.

ssp. *plataniston* (Fruhstorfer, 1910)

In press. *Parantica melaneus plataniston*, Mondal & Maulik *in State Fauna Series, West Bengal.*

Material examined : One ex., Cherrapunjee, East Khasi Hills, 17.ix.1988, A.R. Lahiri & party coll. Also, 2 exs., Shillong, - .xi.1879, Mus. Coll. (Old colln.). *Wing expanse* : 90-95 mm.

Distribution : India : Meghalaya (East Khasi Hills; Garo Hills). Elsewhere : Rest of East Himalaya; Uttar Pradesh of India. Also Burma, China, Indo-China and Thailand.

Remarks : The butterfly, earlier known from the Khasi Hills, was also reported from the Garo Hills by Rynth (1977).

16. *Parantica sita* (Kollar, 1844)

1844. *Danais sita* Kollar, in Hügel, Kasch. Reich. Siek, 4 : 424, pl. 6.

ssp. *sita* (Kollar, 1844)

1984. *Parantica sita sita, Ackery & Vane-Wright, Milkweed butterflies*, p. 178.

Material examined : 4 exs. : Shillong, -.vi.1880, Mus. Coll. (Old colln.). *Wing expanse* : 85-110 mm.

Diagnosis : Fore wing cell not entirely dark. Hind wing with some double elements in submarginal series; in male cubital patch prominent, chestnut border wider than that in female, cell-streak well defined and *underside* with a distinct patch of scent scales.

Distribution : India : Meghalaya (East Khasi Hills); Sikkim; Assam; Arunachal Pradesh; Uttar Pradesh; Jammu & Kashmir. Elsewhere : Bhutan, N. Burma, South-east Tibet, Yunan, China, Hainan, Vietnam and Thailand.

Remarks : The butterfly, which was earlier known from Shillong and Cherrapunji, is locally common. It has a strong soaring flight over tree-tops and inhabits glades amidst upland forest. It is fond of flowers of Asteraceae, Meliaceae, Scrophulariaceae, and also dried bait of *Heliotropium indicum* (Boraginaceae). Larva feeds on plants of Asclepiadaceae. According to Talbot (1949), this butterfly is polymorphic, but excluding the f. *pedonga* (Talbot) which has recently been considered as a distinct species by Ackery & Vane-Wright (1984). All the specimens, presently examined, belong to the f. *tytia* (Gray) with fore wing discal patches in cubital area not united, and in male hind wing cell-streak dark.

Genus(F). *Tirumala* Moore, 1880

1802. *Danaus* Kluk, *Zwierzat Hist. nat. pocz. gospod.*, **4** : *84.*

1984. *Tirumala*, Ackery & Vane-Wright, *Milkweed Butterflies*, p. 196.

17. *Tirumala limniace* (Cramer, 1775)

1775. *Papilio limniace* Cramer, *Pap. Exot.*, *1* : 92.

ssp. *leopardus* (Butler, 1866)

In press. *Tirumala limniace leopardus*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Degrangiri, E. Garo Hills, 18.v.1979, S. B. Roy and party coll. *Wing expanse* : 88mm.

Distribution : India : Meghalaya (East Garo Hills; E. Khasi Hills). Elsewhere : Throughout the rest of mainland and Andaman and Nicobar Islands of India. Also Burma, China, Indo-China, Pakistan, Sri Lanka, Thailand, Vietnam and Western Malaysia.

Remarks : The butterfly was earlier reported from the Khasi Hills by Parsons and Cantlie (1948).

18. *Tirumala septentrionis* (Butler, 1874)

1874. *Danais septentrionis* Butler, *Ent. month. Mag., London, 11 : 163.*

ssp. *septentrionis* (Butler, 1874)

In press. *Tirumala septentrionis septentrionis*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Garampani, Luchook, Jaintia Hills, 2.x.1988, V. D. Srivastava & party coll. Also, 2 exs., Shillong, -.xi.1880, Mus. coll. (Old colln.). *Wing expanse* : 105-110 mm.

Distribution : India : Meghalaya (Jaintia Hills; East Khasi Hills); Arunachal Pradesh; Assam; Nagaland; Sikkim; West Bengal; Orissa; Himachal Pradesh; Jammu & Kashmir. Elsewhere : Bhutan, Burma, China, Malay, Nepal, Vietnam, Sumatra and Thailand.

Remarks : The butterfly was earlier known from Meghalaya (*vide* Parsons & Cantlie, 1948). Talbot (1939) treated the subspecies under the species, *Danaus hamata* (Mc Leay); the latter was subsequently considered as a distinct species (not known from India) under the genus *Tirumala* by Ackery & Vane-Wright (1984).

Genus (G) *Danaus* Kluk, 1802

1802. *Danaus* Kluk, *Zwierzat Hist. nat. pocz. gospod., 4* : 84.

1984. *Danaus*, Ackery & Vane-Wright, *Milkweed Butterflies*, p. 201.

19. *Danaus (Salatura) genutia* (Cramer, 1779)

1779. *Papilio genutia* Cramer, Pap. Exot., 3 : 23.

ssp. *genutia* (Cramer, 1779)

In press. *Danaus (Salatura) genutia genutia*, Monda & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 3 exs., Chandmari, Tura, West Garo Hills, 16.x.1974, S.K. Gupta & party coll; Serengma, 11.v.1979, S.B. Roy & party coll.; Darugiri, Songsak, 3.vii.1988, R.K. Ghosh & party coll. Also, One ex., Shillong, -.-.-, Mus. Coll. (Old colln.). *Wing expanse* : 80-90 mm.

Distribution : India : Meghalaya (West Garo Hills; East Khasi Hills); rest of East Himalaya to North-west Himalaya; peninsular belts and also Andaman and Nicobar Islands. Elsewhere : China, Taiwan, Philippines and southward to Indo-China, Malaysia, Indonesia and north-western Australia.

Remarks : The butterfly was earlier known from Meghalaya.

20. *Danaus (Anosia) chrysippus* (Linn., 1758)

1758. *Papilio chrysippus* Linnaeus, *Syst. Nat.*, ed. **10** : 471.

ssp. *chrysippus* (Linn., 1758)

In press. *Danaus (Anosia) chrysippus chrysippus*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 3 exs., William Nagar, East Garo Hills, 12.iii.1991, B.C. Das & party coll. *Wing expanse* : 75-80 mm.

Distribution : India : Meghalaya (East Garo Hills; East Khasi Hills). Elsewhere : Throughout the rest of the Indian mainland. Also, different belts of the Oriental Region, extending to Japan and Asia Minor.

Remarks : This is a very common species already known from Meghalaya.

Tribe Euploeini

Genus (H.) *Euploea* Fabricius, 1807

1807. *Euploea* Fabricius, *Illiger Mag.*, 6 : 280.

1984. *Euploea*, Ackery & Vane-Wright, Milkweed Butterflies, P. 212.

21. *Euploea mulciber* (Cramer, 1777)

1777. *Papilio mulciber* Cramer, *Pap. Exot.*, 2 : 45.

ssp. *mulciber* (Cramer, 1777)

In press. *Euploea mulciber mulciber*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 9 exs., Tura, West Garo Hills, 15-16.x.1974, S.K. Gupta & party coll.; Jowai, 8-mile village, Jaintia Hills, 24.ix.1988, V.D. Srivastava & party coll.; Mausumai, Khasi Hills, 26.v.1979, *G.K. Srivastava & party coll. Wing expanse* : 85-90 mm.

Distribution : India : Meghalaya (West Garo Hills; Jaintia Hills; Khasi Hills); Arunachal Pradesh; Assam; Nagaland; Sikkim; West Bengal; Himachal Pradesh; Andaman and Nicobar Islands. Elsewhere : Burma, China, Malaya, Nepal and Vietnam.

Remarks : The butterfly was earlier known from Meghalaya.

22. *Euploea midamus* (Linn., 1758)

1758. *Papilio midamus* Linnaeus, *Syst. Nat.*, ed. 10 : 470.

ssp. *rogenhoferi* C. & R. Felder, 1865

In press. *Euploea midamus rogenhoferi*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examind : One ex., Tura, West Garo Hills, 3.xi.1974, S.K. Gupta & party coll. ***Wing expanse*** : 85 mm.

Distribution : India : Meghalaya (West Garo Hills); Assam; Nagaland; Sikkim; up to eastern border of West Himalaya; West Bengal. Elsewhere : Burma and Nepal.

Remarks : This rare butterfly, the expanse of which is quite smaller than that mentioned by Talbot (1949) and Wynter-Blyth (1957), constitutes new locality record for the state of Meghalaya.

23. *Euploea radamanthus* (Fabricius, 1793)

1793. *Papilio radamanthus* Fabricius, *Ent. Syst.*, 3 (1) : 42.

ssp. *ramsayi* (Moore, 1890)

In press. *Euploea radamanthus ramsayi*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 2 exs., Along road from Mausumai to Shella, Khasi Hills, 26.v.1979, G.K. Srivastava & party coll.; Wafa village, near Tasok, East Garo Hills, 3.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 75-80 mm.

Diagnosis : Fore wing discal cell with a large white spot; in female with a blue gloss over the apical area; in male cell Culb with an androconial band; *underside* with a white basal spot in cell R1. Hind wing lower median and upper cubital areas streaked; submarginal series of spots complete.

Distribution : India : Meghalaya (East Garo Hills; Khasi Hills); Assam; Arunachal Pradesh; Sikkim; West Bengal. Elsewhere : Nepal.

Remarks : The butterfly was earluer known from Meghalaya by a different subspecies, i.e., ssp. *diocletianus* (Fabr.) which was reported from Cherrapunji by Parsons & Cantlie (1948).

24. *Euploea algea* (Godart, 1819)

1819. *Danais algea* Godart, *in* Latreille & Godart, Enc. meth., Hist. Nat. (Zool.), 9 : 178.

ssp. *deione* Westwood, 1848

In press. *Euploea algea deione*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ex., Shillong, .-.-.-, Mus. Coll. (Old colln.). *Wing expanse* : 100 mm.

Distribution : India : Meghalaya (East Khasi Hills); Assam; Manipur; Nagaland; Sikkim; West Bengal. Elsewhere : Burma and Tibet.

Remarks : The butterfly was earlier known from East Khasi Hills. It seems to be rare in the state.

25. *Euploea core* (Cramer, 1780)

1780. *Papilio core* Cramer, *Pap. Exot.*, 3 : 133.

ssp. *core* (Cramer, 1780)

In press. *Euploea core core*, Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 3 exs. : Mausumai, 26.v.1979, G.K. Srivastava & party coll.; Cherrapunjee, East Khasi Hills, 12.x.1988, A.R. Lahiri & party coll.; Sibbari, West Garo Hills, 15.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 80-85 mm.

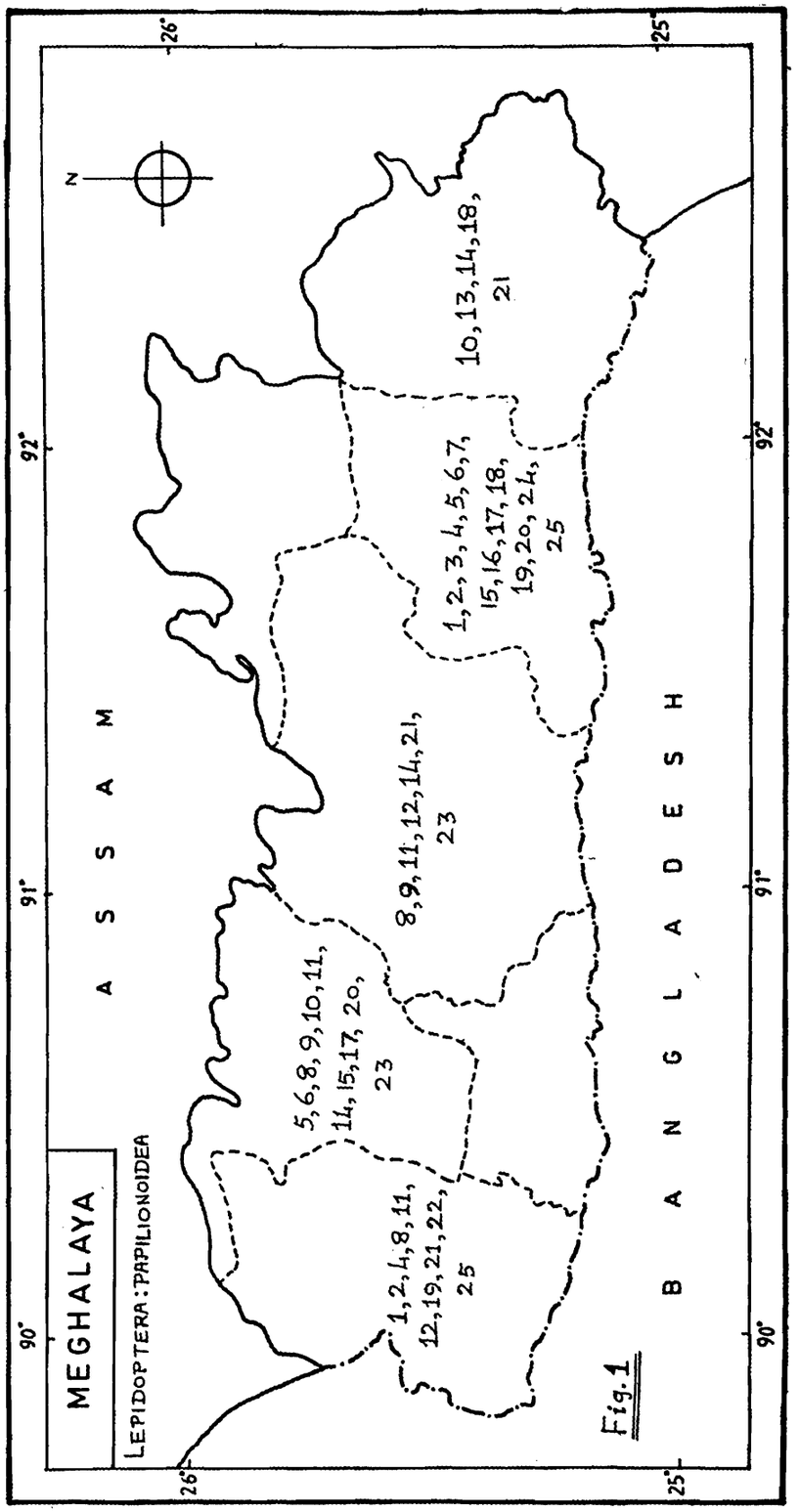
Distribution : India : Meghalaya (East Khasi Hills; West Garo Hills); throughout the rest of mainland. Elsewhere : Burma, Nepal & Pakistan.

Remarks : The montane f. *vermiculata* Butler of this subspecies was earlier reported from East Khasi Hills by Parson & Cantlie (1948).

TABLE SHOWING DISTRIBUTION OF PAPILIONOID SPECIES EXAMINED FROM DIFFERENT DISTRICTS OF MEGHALAYA

[+, known distribution; N, new record for the state. For distribution of other species in the state, *vide* appendix]

Name of spp./subspp.	HILL DISTRICTS OF THE STATE OF MEGHALAYA						
	West Garo	East Garo	South Garo	West Khasi	East Khasi	Ri-Bhoi	Jaintia
1. *Atrophaneura varuna astorion*	+				+		
2. *A. aristolochiae aristolochiae*	+				+		
3. *Troides helena cerberus*					+		
4. *Chilasa clytia clytia*	+				+		
5. *C. agestor agestor*		+			+		
6. *Princeps protenor euprotenor*		+			+		
7. *P. polymnestor polymnestor*					N		
8. *P. memnon agenor*	+	+		+			
9. *P. helenus helenus*		+		+			
10. *P. polytes romulus*		+					+
11. *P. nephelus chaon*	+	+		+			
12. *P demoleus demoleus*	+			+			
13. *P. crino*							N
14. *Parantica aglea melanoides*		+		+			+
15. *P. melaneus plataniston*		+			+		
16. *P. sita sita*					+		
17. *Tirumala limniace leopardus*		+			+		
18. *T. septentrionis septentrionis*					+		+
19. Danaus genutia genutia	+				+		
20. *D. chrysippus chrysippus*		+			+		
21. *Euploea mulciber mulciber*	+			+			+
22. *E. midamus rogenhoferi*	N						
23. *E. radamanthus ramsayi*		+		+			
24. *E. algea deione*					+		
25. *E. core core*	+				+		



Map showing distribution of papilionoid spp. in different districts of Meghalaya. (Tabulated numerals indicate the serial no. of spp. examined from the state).

APPENDIX

The following species, which are not represented in the collection under study, are all known from Meghalaya, as cross-referred to Parsons & Cantile (1948) and others cited in this paper :–

PAPILIONIDAE

1.	*Bhutanitis lidderdalii* Atkinson	Khasi Hills
2.	*Teinopalpus imperialis imperialis* Hope	Cherrapunji
3.	*Meandrusa sciron gyas* (Westwood)	Tirasy
4.	*Meandrusa payeni evan* (Doubleday)	Cherrapunji
5.	*Lamproptera curius* (Fabricius)	Shillong
6.	*Graphium eurous sikkimica* (Heron)	Umtynger; Shillong
7.	*Graphium aristeus anticrates* Doubleday	Cherrapunji
8.	*Graphium antiphates pompilius* (Fabricius)	Cherrapunji; Shillong
9.	*Graphium eurypylus cheromus* Fruhstorfer	Dawki
10.	*Graphium doson axion* Felder	Umsaw
11.	*Graphium agamemnon agamemnon* (Linn.)	Dawki
12.	*Graphium agetes agetes* (Westwood)	"
13.	*Graphium xenocles xenocles* (Doubleday)	"
14.	*Graphium macareus lioneli* (Fruhstorfer)	"
15.	*Graphium megarus megarus* (Westwood)	"
16.	*Graphium chiron* (Wallace)	"
17.	*Graphium cloanthus cloanthüs* (Westwood)	Shillong
18.	*Graphium sarpedon luctatius* Fruhstorfer	Shillong; Garo Hills
19.	*Atrophaneura latreillei kabrua* Tytler	Khasi Hills
20.	*Atrophaneura crassipes* (Oberthür)	Jowai
21.	*Atrophaneura nevilli* (Wood-Mason)	Cherrapunji
22.	*Atrophaneura dasarada* (Moore)	Shillong; Mawpat
23.	*Atrophaneura polyeuctes philoxenus* (Gray)	Barapani; Shillong; Garo Hills
24.	*Atrophaneura aidoneus* (Doubleday)	Umran; Shillong
25.	*Troides aeacus aeacus* (Felder & Felder)	Dawki, Umran
26.	*Chilasa paradoxa telearchus* Hewitson	"
27.	*Chilasa epicydes* (Hewitson)	Cherrapunji
28.	*Chilasa slateri slateri* (Hewitson)	Dawki
29.	*Papilio machaon verityi* Fruhstorfer	Khasi Hills
30.	*Princeps bootes bootes (Westwood)*	Cherrapunji
31.	*Princeps alcmenor rhetenor* (Westwood)	Dawki
32.	*Princeps castor castor* (Westwood)	"
33.	*Princeps polyctor ganesa* (Doubleday)	Shillong
34.	*Princeps elephenor elephenor* (Doubleday)	Cherrapunji
35.	*Princeps paris paris* (Linn.)	Dawki
36.	*Princeps arcturus arcturus* (Westwood)	Cherrapunji

37. *Princeps krishna* (Moore) Khasi Hills

Danaine Nymphalidae

38. *Euploea sylvester hopei* Felder & Felder Cherrapunji
39. *Euploea klugii macclellandi* Moore "
40. Euploea doubledayi doubledayi Felder & Felder Dawki

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INSECTA : LEPIDOPTERA : PIERIDAE

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INTRODUCTION

The butterflies of the family, popularly known as "The whites or yellows", are cosmopolitan in distribution. They are found in every conceivable environs from plains, forest valleys of hills and mountains. The term butterfly is derived from the butter yellow colour of the male of the species namely, *Gonepteryx rhamni* (Linnaeus), popularly called as "The common brimstone" of the family Pieridae.

Amongst a total of about 1300 species of butterflies from the whole world and 1000 species from India, only 105 species from India and 34 species from Meghalaya are known. The species from Meghalaya may be grouped into two subfamilies - the whites belonging to subfamilies Pierinae and the yellows to Coliadinae as classified by Talbot (1939). Out of a total of 34 species in 14 genera from the state, 3 species (marked *) constitute new records from Meghalaya.

Swinhoe (1893), Parsons & Cantlie (1947), Cantlie (1952) and Varshney & Chanda (1971), Radhakrishnan, Alfred & Rynth (1989) made valuable contributions on the pierid fauna of Meghalaya. Evans (1932) Talbot (1939), Sevastopulo (1956), Wynter - Blyth (1957) and Rynth (1977) also recorded several species of the family from time to time from the state. A number of survey parties from Zoological Survey of India have undertaken several faunistic surveys in all the districts of Meghalaya in different seasons of the year.

In the paper a brief account of the collection, preservation and diagnostic characters has been provided.

Keys to taxa of the material examined, literature review of the species (marked **) not studied, distribution and status of the species along with generic and species references have been included. Besides, the summary and bibliography have been given at the end.

Collection and Preservation

The pierid butterflies are found to be on flight, settled on damp ground or near puddles either singly or congregating and sometimes on flowers. The collection may be made with the help of a collecting net. When the specimen is trapped inside the net, it must be held at thorax between the thumb and index finger to stop fluttering of wings. Light pressure

1861 ZSI/99—17A

is applied simultaneously to kill the specimen. The freshly collected specimens are kept in paper envelops and the permanent storage is done in large insect cabinets after pinning the insects.

Diagnostic characters

Medium sized butterflies; white or orange or yellow coloured with black markings; legs alike and normal in both sexes; forewings with R_3, R_4 and R_5 stalked or coincident, M_1 usually stalked with them, M_2 usually from above middle of cell; hindwings with or without humeral veinlet and with two anal veins.

Subfamily A. Pierinae

Genus	1.	***Delias*** Hübner
	1.	*Delias agostina* (Hewitson)
Sub species	1a.	*Delias agostina agostina* (Hewitson)
	2.	*Delias belladona* (Fabricius)
	2a.	*Delias belladona lugens* Jordan
	3.	*Delias descombesi* (Boisduval)
	3a.	*Delias descombesi descombesi* (Boisduval)
	*4.	*Delias eucharis* (Drury)
	**5.	*Delias acalis* (Godart)
	**5a	*Delias acalis pyramus* (Wallace)
	**6.	*Delias pasithoe* (Linnaeus)
	**7.	*Delias berinda* (Moore)
	**7a.	*Delias berinda berinda* (Moore)
	**8.	*Delias hyparete* (Linnaeus)
Genus	2.	***Aporia*** Hübner
	9.	*Aporia agathon* (Gray)
	9a.	*Aporia agathon caphusa* (Moore)
Genus	3.	***Pieris*** Schrank
	10.	*Pieris napi* (Linnaeus)
	*10a.	*Pieris napi ajaka* Moore
	10b.	*Pieris napi montana* Verity
	11.	*Pieris canidia* (Sparrman)
	11a.	*Pieris canidia canis* Evans

12. *Pieris brassicae* (Linnaeus)

12a. *Pieris brassicae nepalensis* Doubleday

Genus 4. ***Appias*** Hübner

13. *Appias lyncida* (Cramer)

13a. *Appias lyncida eleonora* (Boisduval)

14. *Appias libythea* (Fabricius)

*14a. *Appias libythea olferna* Swinhoe

**15. *Appias albina* (Boisduval)

**16. *Appias pandione* (Geyer)

Genus 5. ***Cepora*** Billberg

17. *Cepora nerissa* (Fabricius)

17a. *Cepora nerissa nerissa* (Fabricius)

**18. *Cepora nadina* (Lucas)

**18a. *Cepora nadina nadina* (Lucas)

Genus 6. ***Leptosia*** Hübner

**19. *Leptosia nina* (Fabricius)

Genus 7. ***Prioneris*** Wallace

**20. *Prioneris clemanthe* (Doubleday)

**21. *Prioneris thestylis* (Doubleday)

Genus 8. ***Ixias*** Hübner

**22. *Ixias pyrene* (Linnaeus)

Genus 9. ***Valeria*** Horsefield

**23. *Valeria valeria* (Cramer)

**23a. *Valeria valeria anais* (Lesson)

Subfamily B. Coliadinae

Genus 10. ***Catopsilia*** Hübner

24. *Catopsilia crocale* (Cramer)

25. *Catopsilia pyranthe* (Linnaeus)

25a. *Catopsilia pyranthe pyranthe* (Linnaeus)

**26. *Catopsilia florella* (Fabricius)

Genus 11. ***Colias*** Fabricius

27. *Colias electo* (Linnaeus)

27a. *Colias electo fieldi* Menétriés

Genus 12. ***Eurema*** Hübner

28. *Eurema hecabe* (Linnaeus)

28a. *Eurema hecabe contubernalis* (Moore)

29. *Eurema laeta* (Boisduval)

29a. *Eurema laeta laeta* (Boisduval)

30. *Eurema brigitta* (Stoll)

30a. *Eurema brigitta rubella* (Wallace)

**31. *Eurema blanda* (Boisduval)

**31a. *Eurema blanda silhetena* (Wallace)

Genus 13. ***Dercas*** Doubleday

**32. *Dercas lycorias (Doubleday)*

**33. *Dercas verhuelli* (Hoeven)

Genus 14. ***Gonepteryx Leach***

**34. *Gonepteryx rhamni* (Linnaeus)

Key to subfamilies

Palpi always with hair; hindwing with well developed precostal vein curved distal .....Pierinae

Palpi without hair; hindwing without precostal vein or very short directed basal.....Coliadinae

Key to genera of the subfamily Pierinae

1. Forewing with vein R_2 2
   Forewing without vein R_2 ..... ***Delias***
2. Forewing vein M_1 arising from above midway between fork of R_3 and R_{4+5} ..... ***Aporia***
   Forewing vein M_1 arising nearer to cell than to fork of R_3 and R_{4+5} 3
3. Forewing vein R_3 emitting from R_4 + R_5 which is very close to apex with long stalk ..... ***Pieris***
   Forewing vein R_3 emitting from R_4+R_5 which is very close to apex, with short stalk 4
4. Male with a tuft of hairs arising between 7th and 8th abdominal segment ..... ***Appias***

Male without tuft of hair ..... *Cepora*

Genus *Delias* Hübner

1819. *Delias* Hübner, *Verz. Bek. Schmett.*, : 91.

1917. *Delias*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 45.

Key to species of the genus Delias Hübner

1. Hindwing underside without red markings 2
— Hindwing underside with red markings 3
2. Hindwing underside entirely yellow except outer margin ..... *agostina*
— Hindwing underside not entirely yellow but with scattered yellow spots ..... *belladona*
3. Hindwing underside with a broad red sub-costal stripe in area R_5 ..... *descombesi*
— Hindwing underside with a row of six red spots in marginal area ..... *eucharis*

1. *Delias agostina* (Hewitson)

1852–55 *Pieris agostina* Hewitson, *Exot. Butt.*, pl. 1, figs. 1, 2.

1971. *Delias agostina*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 46.

1a. *Delias agostina agostina* (Hewitson)

1852-55. *Pieries agostina* Hewitson, *Exot. Butt., pl. 1, figs. 1, 2.*

1939. *Delias agostina agostina*, Talbot, *Fauna Brit. India*, Butterflies 1 : 351 – 352.

Diagnostic characters : Females: forewing: upperside blackish brown, veins broadly black, row of spots in submarginal area; hind-wing: deep yellow, inner area paler, veins dusted with black especially vein M_1, submarginal row of five white dots present which are connected by short dash on the fold, underside with five black bordered white spots.

Material examined : 2 exs. (♀ ♀): Meghalaya, East Khasi Hills, Shillong Museum, date & coll. Nil.

Distribution : India: Meghalaya (East Khasi Hills). Elsewhere: Nepal to Lower Burma (Dawna Range), also in Thailand and Tongking.

Status : Not rare but common in parts of Burma and Khasi Hills.

2. *Delias belladona* (Fabricius)

1773. *Papilo belladona* Fabricius, *Ent. Syst.*, **3** : 180.

1971. *Delias belladona*, Varshney & Chanda, *Indian Mus. Bull.*, 6(1):46.

2a. *Delias belladona lugens* Jordan

1925. *Delias belladona lugens* Jordan, *Nov. Zool.*, **32** : 286.

1939. *Delias belladona lugens*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 341.

Diagnostic characters : Wings : upperside blackish brown with white spots; hindwing: a creamish yellow spot present in basal costal area, underside with a yellow patch in discocellular.

Material examined : 3 exs (♀ ♀) : Meghalaya, East Khasi Hills, Elephant Falls, 6.ix. 1975, Tripura castle Road, 8.ix. 1975 (Coll. *N. Muraleedharan*).

Distribution : India: Meghalaya (East Khasi Hills), Assam, Sikkim, Nagaland (Naga Hills). Elsewhere: Upper shan states, Northern Burma and Bhutan.

Status : Not rare.

3. *Delias descombesi* (Boisduval)

1836. *Pieris descombesi* Boisduval, *Spec. Gen. Lep.*, **1** : 465.

1971. *Delias descombesi*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1):46.

3a. *Delias descombesi descombesi* (Boisduval)

1836. *Pieris descombesi* Boisduval, *Spec. Gen. Lep.*, **1** : 465.

1939. *Delias descombesi descombesi*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 348 – 350.

Diagnostic characters : Male: forewing: upperside white, costal narrowly black, a small black apical area extending from margin to vein M_3, underside with black veins streaked with white, narrow discocellular white bar, three subapical stripes and submarginal spots in area M_3 and Cu_{1a} smaller than others; hind wing : upperside white with black marginal area, underside yellow with a broad subcostal red stripe in area Rs, extending from basal area to middle of costa and six submarginal whitish yellow spots of different sizes.

Material examined : 1 ex (♂) : Meghalaya, West Garo Hills, Garobodha, West of Tura, 11.x. 1988 (Coll. K. K. Roy & party).

Distribution : India : Meghalaya (Khasi Hills and West Garo Hills), West Bengal.

Elsewhere: Nepal to Burma, also in Thailand, Annam, Saigon and Cochinchina.

Status : Not rare.

*4. *Delias eucharis* (Drury)

1773. *Papilio eucharis* Drury, *Illustr. Nat. Hist.*, Pl. x, figs. 5,6.

1939. *Delias eucharis*, Talbot, *Fauna Brit. India*, Butterlies, **1** : 352 - 356.

Diagnostic characters : (*Vide* Key).

Material examined : 1 ex. (♂) : Meghalaya, West Garo Hills, Tura, Walbakgri, 220 m., 5.x. 1991 (Coll. R. K. Varshney, I. J. Gupta & S. Ghosh).

Distribution : India : Meghalaya (West Garo Hills), Peninsular India as far as the lower slopes of the Himalayas. Sri Lanka.

Status : Common.

**5. *Delias acalis* (Godart)

1819. *Pieris acalis* Godart, *Encyc. Meth.*, : 113, 148, t.9.

1971. *Delias acalis*, Varshney & Chanda, *Indian Mus. Bull.*, 6(1) : 45.

**5a. *Delias acalis pyramus* (Wallace)

1867. *Thyca pyramus* Wallace, *Trans. ent. Soc. Lond.*, **4** (3), Ser. 3:347.

1971. *Delias acalis pyramus*, Varshney & Chanda, *Indian Mus.Bull.*, **6** (1) : 45.

Distribution : India: Meghalaya (Khasi Hills), Assam, West Bengal. Nepal to Bhutan, Burma, Western Yunnan and Western Thailand.

Status : Not rare.

**6. *Delias pasithoe* (Lennaeus)

1758. *Papilio aglaia* Linnaeus, *Syst. Nat.*, ed x. : 465.

1971. *Delias aglaia*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 46.

1984. *Delias pasithoe*, Varshney, *Journ. Bombay nat. Hist. Soc.*, **81** (2) : 495 496.

Distribution : India: Meghalaya (Khasi and Jaintia Hills). South West and South East China, Formosa, Hainan to Himalayas and Burma, South and East to Malaya Peninsula, the Phillippines and Java.

Status : Not rare.

**7. *Delias berinda* (Moore)

1872. *Thyca berinda* Moore, *Proc. zool. Soc. Lond.*, : 566.

1971. *Delias berinda*, Varshney & Chanda, *Indian Mus. Bull.*, 6(1):46.

**7a. *Delias berinda berinda* (Moore)

1872. *Thyca berinda* Moore, *Proc. zool. Soc. Lond.*, : 566.

1939. *Delias berinda berinda*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 337 - 338.

Distribution : India : Meghalaya (Khasi Hills), Nagaland (Naga Hills). Elsewhere: Abor country and Northern Burma.

Status : Not common.

**8. *Delias hyparete* (Linnaeus)

1764. *Thyca hyparete* Linnaeus, *Mus. Ludov. ulricae*, : 247.

1971. *Delia hyparte*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1):46.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere: Indo-Malayan Region from the Philippines, Borneo, Java and Sumatra to South China.

Status : Common. Rare from Bengal to Madras.

Genus *Aporia* Hübner

1819. *Aporia* Hübner, *Verz. Bek, Schmett.*, : 90.

1971. *Aporia*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 44.

9. *Aporia agathon* (Gray)

1831. *Pieris agathon* Gray, *Zool. Misc.*, 1 : 33.

1917. *Aporia agathon*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1):44.

9a. *Aporia agathon caphusa* (Moore)

1872. *Metaporia caphusa* Moore, *Proc. zool. Soc. Lond.*, : 564.

1939. *Aporia agathon caphusa*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 318.

Diagnostic characters : Forewing : Upperside black with white stripes, anterior white stripes on both wings are not continuous underside with subapical spot and those of hind wing faintly yellow.

Material examined : 3 exs. (♀ ♀), Meghalaya, East Khasi Hills, Cherrapunji, 1300 m, 24, 25.iv.1979 (Coll. *J. K. Jonathan & party).*

Distribution : India: Meghalaya (East Khasi Hills), Uttar Pradesh (Garhwal and Mussorie).

Status : Not rare, sometimes abundant.

Genus *Pieris* Schrank

1801. *Pieris* Schrank, *Fauna Boica.*, : 152.

1971. *Pieris*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 48.

Key to species of the genus *Pieris* Schrank

1. Hindwing underside with well defined black veins ..... *napi*
— Hindwing underside with veins not defined with black 2
2. Forewing upperside with black area dentate at inner edge.....*canidia*
— Forewing upperside with black area not dentate at inner edge ..... *brassicae*

10. *Pieris napi* (Linnaeus)

1758. *Papilio napi* Linnaeus, *Syst. Nat., ed x,* : 468.

1971. *Pieris napi*, Varshney & Chanda, *Indian Mus. Bull.*, 6(1):48.

Key to the subspecies of the species *Pieris napi* (Linnaeus)

Forewing with a spot in area Cu_{1a} and prominent
spot in 1b forming a bar to inner margin, upperside marking black but not conspicuous in male ..... *Pieris napi ajaka*
Forewing with spot in area Cu_{1a} much longer than above and spot in 1b continued in a broad streak along inner margin to base, upperside markings conspicuously black in male ..... *Pieris napi montana*

*10a. *Pieris napi ajaka* Moore

1865. *Pieris ajaka* Moore, *Proc. zool. Soc. Lond.*, : 490,pl.31, fig. 16.

1939. *Pieris napi ajaka*, Talbot, *Fauna Brit. India*, Butterflies, **1**: 420.

Diagnostic character : (*Vide* Key).

Material examined : 3 exs. (♀ ♀) : Meghalaya, East Khasi Hills, Pynursila, 21.iii. 1959 (Coll. A.P. Kapur); Shillong, 17.iii.1991 (Coll. B.C. Das & party).

Distribution : India: Meghalaya (East Khasi Hills), Punjab, Uttar Pradesh (Kumaon). Elsewhere: Pakistan (Murree).

Status : Common.

10b. *Pieris napi montana* Verity

1908. *Pieris melete* var. *montana* Verity, *Rhopalocera Palaearctica*, : 141, pl. 31, figs. 20 21.

1939. *Pieris napi montana*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 420 - 421.

Diagnostic characters : (*Vide* Key).

Material examined : 42 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, Shillong, Kenchis Tr., 29.iii.1959 (Coll. *A.P. Kapur*); Nongpoh, 18.v.1990 (Coll. M.S. Shishodia & party); Shillong, 16,17.iii. 1991, Pologround, 18.iii.1991 (Coll. B.C.Das & party); Mandwan Village, 23.iii. 1991 (Coll. S.K. Saha & party); Shillong Botanical Garden, 1400 m., Ward Lake, in and around Elephant Falls, upper Shillong, 29.iii. 1991 (Coll. S.K. Ghosh & party); Social Forestry, 30.iii. 1991 (Coll. A.K. Hazra & party); In and around Happy valley, 1560 m., Moujrang, *ca* 20 km. from Shillong, 4.iv. 1991, Risa colony, 8.iv. 1991, Charfarlong, 1450m. 9.iv. 1991, nr. Mouza, Polo Hills Forest, 1500 M., Moulai, 1500 m., 11.iv. 1991 (Coll. S.K. Ghosh & party); Jaintia Hills, Jalang, 9.iii. 1991, Jarain, 10.iii. 1991, Raliang, 12.iii. 1991 (Coll. K. K. Roy & party).

Distribution : India : Meghalaya (East Khasi and Jaintia Hills), Sikkim. Elsewhere: Southern Shan States, Perak.

Status : Not rare.

11. *Pieris canidia* (Sparrman)

1768. *Papilio canidia* Sparrman, *Amoen. Acad.*, **7** : 504.

1971. *Pieris canidia*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 48.

11a. *Pieris canidia canis* Evans

1912. *Pieris canidia canis* Evans, *J. Bombay nat. Hist. Soc.*, : 559, 976.

1939. *Pieris canidia canis*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 425 - 426.

Diagnostic characters : Forewing : uppeside white, apical black patches entering in area M_2 as a short spur, inner edge of marginal black border dentate and a prominent black spot in area Cu_{1a}; hindwing : upperside with marginal black spots, and a costal spot.

Material examined : 4 exs. (♂ ♂) : Meghalaya, East Khasi Hills, Shillong 10, 18.iii. 1959, Pynurisla, 21, 30.x. 1974 (Coll. *S. K. Gupta* and party).

Distribution : India: Meghalaya (East Khasi Hills), West Bengal, South India, Nilgiri Hills.

Status : Common.

12. *Pieris brassicae* (Linnaeus)

1758. *Papilio brassicae* Linnaeus, *Syst. Nat. ed.x.* : 467.

1971. *Pieris brassicae*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 48.

12a. *Pieris brassicae nepalensis* Doubleday

1864. *Pieris brassicae* var. *nepalensis* Doubleday, Westwood and and Hewitson, *Genera of Diurnal Lepidoptera*, **1** : 9.pl.vi.

1939. *Pieris brassicae nepalensis*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 427-428.

Diagnostic characters : Forewing: upperside creamy white, dusted with black at base and costa for a short distance, apex and outer margin black, underside slightly dusted with black at base and along costa, apex light ochreous brown, a black spot at outer-half of area 1A and a quadrate spot at base of area Cu_{1a} hindwing : a large subapical black costal spot, underside light ochreous brown, dusted with black.

Material examined : 70 exa (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, Shillong, Laban, 18.xii. 1958, 18.iii. 1959, Shirniketan, 8.iii. 1959, Shillong, 10,18.iii. 1959, 6,9.v. 1959, Kenchis Trace 14.17.iii.1959, Pynursila, 21.iii. 1959 (Coll. A.P. Kapur), Kenchis Trace, 19,21.iv. 1959 (Coll. H.L. Paul); Botanical Garden, 19.x. 1974 (Coll. S.K. Gupta & party); upper Shillong, 3.iii. 1991, Maupat, 4.iii. 1991. Raliang, 12.iii. 1991, Shagpung, 13.iii. 1991 (Coll. K. K. .Roy & party); Social Forestry, 30.iii. 1991 (Coll. A. K. Hazra & party); Polo Hill Forest, 1500 m., Mawlai, 1500 m., 11.iv, 1991 Coll. S.K. Ghosh & party).

Distribution : India ; Meghalaya (East Khasi Hills), West Bengal, Plains adjoining the Himalayas, Sikkim, Assam. Elsewhere: Tibet, Yunnan, Baluchistan and Chitral.

Status : Very Common.

Genus *Appias* Hübner

1819. *Appias* Hübner, *Verz. bek, Schmeit.*, : 91.

1971. *Appias*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 44.

Key to species of the genus *Appias* Hubner

1. Hindwing underside yellow ..... *lyncida*
— Hindwing underside not yellow 2
2. Forewing underside with veins in apical and outer marginal area black ..... *libythea*
— Forewing underside with veins in apical and outer marginal area not black ..... *albina*

13. *Appias lyncida* (Cramer)

1777. *Papilio lyncida* Cramer, *In Cramer, Uitl. Kapellen* 2 (11) : 52.

1971. *Appias lyncida*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 45.

13a. *Appias lyncida eleonora* (Boisduval)

1836. *Pieris eleonora* Boisduval, *Spec. Gen. Lep.*, **1** : 481.

1939. *Appias lyncida eleonora*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 398-490.

Diagnostic characters : Forewing : Male : upperside white, costal area dusted with black, marginal black border dentate, underside with broad apical black area, a subapical yellow oval spot in area m_1; hindwing : white with marginal area black, under side yellow except marginal area; Female : upperside blackish brown, forewing : with short white streaks; hindwing : basal half and inner area broadly white.

Material examined : 9 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, around Dawki Road, from Pynursila to pomshulita, 27. v. 1979 (Coll. G.K. Srivastava & party); Burnihat, 30.ix. 1988. (Coll. A.R. Lahiri & party); East Garo Hills, Langolbibra, 17.i. 1991, Williamnagar, 17.i. 1991 (Coll. B.N. nandy & party); West Garo Hills, Tura, Walbakgri, 220 m., 5.x. 1991 (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh).

Distribution : India : Meghalaya (Khasi Hills and Garo Hills), West Bengal, Sikkim. Elsewhere : Burma, Hainan, Tongking, Thailand and Annam.

Status : Common.

14. *Appias libythea* (Fabricius)

1775. *Papilio libythea* Fabricius. *Syst. Ent.*, : 471.

1939. *Appias libythea*, Talbot. *Fauna Brit. India*, Butterflies, 1 : 393-394.

*14a. *Appias libythea olferna* Swinhoe

1890. *Appias olferna* Swinnoe, *Ann. Mag. nat. Hist. Soc.*, (6) **5** : 358.

1982. *Appias libythea olferna*, Arora & Nandi, *Rec. zool. Surv. India*, **80** : 5.

Diagnostic characters : Forewing : upperside white, costa apex and outermargin black, the marginal black area finely produced along the veins for a short distance, underside pale yellow, vein Sc + R_1, median vein, vein beyond cell darkened.

Material examined : 5 exs. (♂ ♂) ; Meghalaya, West Garo Hills, Rajabala, West of Phulbari, 28.x. 1988 (Coll. K.K. Roy & party).

Distribution : India : Meghalaya (West Garo Hills), West Bengal, Assam, Car Nicobar. Elsewhere : Burma, Hainan and Malaya Peninsula.

Status : Not Common.

**15. *Appias albina* (Boisduval)

1836. *Pieris albina* Boisduval, *sp. Gen. Lep.*, 1 : 480.

1986. *Appias albina*, Ghosh & Chaudhury, Rec. Zool. Surv. India, 84 (1-4) : 116.

Distribution : India : Meghalaya (Khasi Hills), China, South and east to Australia and the papuan Region.

Status : Common in Sri Lanka and the hills of South India. Generally not common elsewhere.

**16. *Appias pandione* (Geyer)

1832. *Hiposcritia pandione* Geyer, *in* Hübner, *zutr. z. Samml. exot. schmett.*, **4** : 16.

1971. *Appias pandione*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 45.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh, (Mussooree) Elsewhere : Southern Burma, Tongking, Hainan, the Malaya peninsula and Thailand.

Status : Not rare.

Genus *Cepora* Billberg

1820. *Cepora* Billberg, *Enumeratio Insecta Orum in Musco Billberg* : 36.

1971. *Cepora*, Varshney & Chanda, *Indian Mus. Bull.*, 6 (1) : 45.

17. *Cepora nerissa* (Fabricius)

1775. *Papilio nerissa*, Fabricius, *Syst. Ent.*, : 471.

1939. *Cepora nerissa*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 362.

17a. *Cepora nerissa nerissa* (Fabricius)

1775. *Papilio nerissa* Fabricius, *Syst. Ent.*, : 471

1939. *Cepora nerissa nerissa*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 364-365.

Diagnostic characters : Forewing : upperside white, veins black, apical area broadly black, underside white tinged with yellow in costal and apical area, black submarginal spots in area 1b, Cu_{1b} and M_2; hindwing : marginal black spot varying in size, underside yellow, veins diffusely bordered with black.

Material examined : 2exs. (♂ ♀) : Meghalaya East Khasi Hills, in and around Happy valley, 1500 m., 30.iii. 1991 (Coll. S.K. Ghosh & party).

Distribution : India : Meghalaya (East Khasi Hills), Assam to Sikkim.

Status : Common.

.8. *Cepora nadina* (Lucas)

1852. *Pieris nadina* Lucas, *Rev. Mag. zool. Ser.* 2, **4** : 333.

1971. *Cepora nadina*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 367.

*18a. *Cepora nadina nadina* (Lucas)

1852. *Pieris nadina* Lucas, *Rev. Mag. zool. Ser.* 2, **4** :333.

1939. *Cepora nadina nadina*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 369-371.

Distribution : India; Meghalaya (Khasi Hills), Sikkim. Elsewhere : Burma.

Status : Not rare.

Genus *Leptosia* Hübner

1818. *Leptosia* Hübner, *Samml. Exot. Schmett.*, **1** : 13.

1939. *Leptosia*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 305.

**19. *Leptosia nina* (Fabricius)

1793. *Papilio nina* Fabricius, *Ent. Syst.*, 3 (1) : 194.

1982. *Leptosia nina*, Arora & Nandi, *Rec. zool, Surv. India*, 80 : 2

Distribution : India : Meghalaya, West Bengal, Peninsular India to Uttar Pradesh (Mussooree), Andaman Islands. Elsewhere : Burma, Indochina, Thailand, Hainan and South China.

Status : Common.

Genus *Prioneris* Wallace

1867. *Prioneris* Wallace, *Trans. ent. Soc. Lon.*, 4 (3), pt. 3 : 383.

1939. *Prioneris*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 372.

**20. *Prioneris clemanthe* (Doubleday)

1864. *Pieris clemanthe* Doubleday, *Ann. Mag. nat. Hist.*, 18 : 23.

1939. *Prioneris clemanthe*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 377-378.

Distribution : India : Meghalaya, Sikkim, Elsewhere : Burma, also extending to South China, Tongking and Thailand.

Status : Rare in Sikkim, not rare in Assam.

**21. *Prioneris thestylis* (Doubleday)

1842. *Pieris thestylis* Doubleday, *in Grays zool. Muscell.*, : 76.

1939. *Prioneris thestylis*, Talbot, *Fauna Brit. India*, Butterflies, **1** ; 373-375.

Distribution : India : Meghalaya (Khasi Hills), West Bengal, Uttar Pradesh. Elsewhere : Burma, Hainan, South China.

Status : Not rare.

Genus *Ixias* Hübner

1819. *Ixias* Hübner, *Verz. bek. Schmett.*, : 95.

1939. *Ixias*, Talbot, *Fauna Brit. India, Butterflies*, **1** : 439-440.

**22. *Ixias pyrene* (Linnaeus)

1764. *Papilio pyrene* Linnaeus, *Mus. Ulr.*, : 241.

1939. *Ixias pyrene*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 443-444.

Distribution : India : Meghalaya (Khasi Hills), Andaman Islands. Elsewhere : Sri Lanka, Japan, Formosa to China, South to Malaya Peninsula.

Status : Common.

Genus *Valeria* Horsefield

1829. *Valeria* Horsefield, *Cat. Lep. Ins. Mus. E.I.C.*, 2 ; 139.

1939. *Valeria*, Talbot. *Fauna Brit. India*, Butterflies, 1 : 479-480.

**23. *Valeria valeria* (Cramer)

1776. *Papilio valeria* Cramer, *In* Cramer *Uitl; Kapellen*, **1** : (8) : 133.

1971. *Valeria valeria*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 53.

**23a. *Valeria valeria anais* (Lesson)

1837. *Danais anais* Lesson, In Bougainvilla *"Journal de la Navigation autour du Globe de la Fregate la Thetis et de la corvette 1 Esperance"*, pl. 64, figs. **2**, 2bis.

1947. *Valeria valeria anais*, Talbot, *Fauna Brit. India*, Butterflies, **2** : 493.

Distribution : India : Meghalaya (Garo Hills), Elsewhere : Burma and Thailand.

Status : Common.

Subfamily Coliadinae

Key to genera of the subfamily Coliadinae

1. Hindwing with precostal vein short, male with oval sex patch on upperside of hindwing ..... ***Catopsilia***

— Hindwing either with precostal vein or obsolete, male without sex patch..... 2
2. Forewing with vein R_2 arising from stalk of R_4+R_5 and R_3 ..... ***Colias***

— Forewing with vein R_2 arising from cell ..... ***Eurema***

Genus *Catopsilia* Hübner

1819. *Catopsilia* Hübner, *Verz. bek Schmett.*, : 98.

1971. *Catopsilia*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 45.

Key to species of the genus *Catopsilia* Hübner

Wings underside without reddish brown strigae ..... *crocale*
Wings underside marked with transverse brown strigae..... *pyranthe*

24. *Catopsilia crocale* (Cramer)

1775. *Papilio crocale* Cramer, *Pap. Exot.*, **1** : 87, pl. 55, fig. C.D.

1917. *Catopsilia crocale*, Varshney & Chanda, *Indian Mus. Bull.*, **6** (1) : 45.

24a. *Catopsilia crocale crocale* (Cramer)

1775. *Papilio crocale* Cramer, *Pap. Exot.*, **1** : 87, pl. 55, fig. C.D.

1982. *Catopsilia crocale crocale*, Arora & Nandi, *Rec. Zool. Surv. India*, **80** : 9.

Diagnostic characters : Forewing : upperside white, costa narrowly black upto base, outer margin narrowly black; hindwing : unmarked, rarely with marginal black vein.

Material examined : 11exs. (♂♂, ♀♀) : Meghalaya, East Garo Hills, Darugiri F.R.H., 30.vi. 1988 (Coll. S.B. Roy & Party); East Garo Hills, Songsok, East of 1.B., 18, 20. ix. 1975 (Coll. N. Muraleedharan and party), Rongrengiri Reserve Forest, 1 Km. South of F.R.H., 9. vii. 1988, Shibbari, P.W.D. 1.B., 15.vii. 1988, Kherapara, P.W.D. 1.B., 20 vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (Khasi and Garo Hills), West Bengal, Andaman Islands. Elsewhere : South China, Burma, Borneo, Sumatra, Java and Sri Lanka.

Status : Common, but rare in Andaman Is.

25. *Catopsilia pyranthe* (Linnaeus)

1758. *Papilio pyranthe* Linnaeus, *Syst. Nat., ed.x,* : 469.

1971. *Catopsilia pyranthe,* Varshney & Chanda, *Indian Mus. Bull.,* **6** (1) : 45.

25a. *Catopsilia pyranthe pyranthe* (Linnaeus)

1758. *Papilio pyranthe* Linnaeus, *Syst. Nat., ed.x,* : 469.

1982. *Catopsilia pyranthe pyranthe,* Arora & Nandi, *Rec. zool. Surv. India,* **80** : 9.

Diagnostic characters : Forewing : upperside white, slightly tinged with green, discocellular black spot, costa finely black, outer margin black, wide at apex and narrowing at tornus, underside greenish, with reddish brown strigae and small discocellular spot; hindwing : with marginal black vein dots, sometimes it becomes a narrow border.

Material examined : lex. (♀) : Meghalaya, West Garo Hills, Chaipani, South of Kherapara, 14.x. 1988 (Coll. K.K. Roy & party).

Distribution : India : Meghalaya (Khasi and West Garo Hills), West Bengal, Andaman Islands. Elsewhere : Hainan, Taiwan, South China, Burma, South and east to Borneo, Java, Sulawesi, the Phillippines and Sri Lanka.

Status : Common, rare in Andaman Islands.

**26. *Catopsilia florella* (Fabricius)

1775. *Papilio florella* Fabricius, *Syst. Nat.,* : 479.

1971. *Catopsilia florella, Varshney & Chanda, Indian Mus. Bull.,* **6** (1) : 53

Distribution : India : Meghalaya, West Bengal, Andaman Island. Elsewhere : Burma to Indo-China, Hainan to South China, Africa to Arabia, Persia and Sri Lanka.

Status : Very common.

Genus *Colias* Fabricius

1807. *Colias* Fabricius, *Illigers Mag.,* **6** : 284.

1971. *Colias,* Varshney & Chanda, *Indian Mus. Bull.,* **6** (1) : 45.

27. *Colias electo* (Linnaeus)

1763. *Papilio electo* Linnaeus, *Amoen. Acad.,* **4** : 405.

1971. *Colias electo,* Varshney & Chanda, *Indian Mus. Bull.* 6 (1) : 45.

27a. *Colias electo fieldi* Menétriés

1855. *Colias fieldi* Menétriés, *Enum. Corp. Anim. Mus. Petr.,* : 79.

1939. *Colias electo fieldi,* Talbot, *Fauna Brit. India,* Butterflies, **1** : 562-563.

Diagnostic characters : Forewing : male : upperside orange yellow, a greenish black basal patch, a black pear shaped spot on discocellular, a broad black outer border, underside orange yellow, costa, outer and inner margin cilia salmon pink, discocellular spot black but centred with white, a post discal series of black spots; hindwing : basal portion covering with long soft hairs, inner margin orange yellow, outer margin black, its inner edge crenulate, underside with double silvery white discocellular spots circled by diffuse salmon pink ring; female : forewing with sub-marginal bright bellow spots.

Material examined : 18 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, Smit, 5.iii. 1991 (Coll. K.K. Roy & part); Shillong, Ward Lake, 1400 m., 14. iii. 1991; Shillong, 16. iii. 1991 (Coll. B.C. Das & party). Shillong, Ward Lake 1400 m., 29. iii. 1991 (Coll. S.K. Ghosh & party); upper Shillong, in and around Elephant Falls, 1700 m., 30.iii. 1991, Mawfran, *Ca.* 20 Km. from Shillong. 4. iv. 1991, Mawra, Polo Hill Forest, 1500 m., 10, 11. iv. 1991; East Garo Hills. William nagar, Samphalamgiri, 10. iii. 1991 (Coll. B.C. Das & Party).

Distribution : India : Meghalaya (East Khasi Hills and East Garo Hills), West Bengal, N.W. Himalayas, Uttar Pradesh and Maharashtra. Elsewhere : Burma, Nepal and Tibet.

Status : Common.

Genus *Eurema* Hübner

1819. *Eurema* Hübner, *Verz. bek. Schmett.,* : 96.

1971. *Eurema,* Varshney & Chanda, *Indian Mus. Bull.,* 6(1) : 47.

Key to species of the genus *Eurema* Hübner

1. Upperside of forewing with black border not extending to vein 1A ..... *hecabe*
— upperside of forewing with black border extending to vein 1A.....2
2. Underside of forewing with one discocellular spot ..... *laeta*
Underside of forewing with two discocellular spots ..... *brigitta*

28. *Eurema hecabe* (Linnaeus)

1758. *Papilo hecabe* Linnaeus, *Syst. Nat., ed.x,* : 470.

1986. *Eurema hecabe*, Ghosh & Chaudhury, *Rec. Zool. Surv. India*, 84(1-4) : 117.

28a. *Eurema hecabe contubernalis* (Moore)

1886. *Terias contubernalis* Moore, *Journ. Linn,. Soc. Lond. Zool.*, p.46.

1939. *Eurema hecabe contubernalis*, Talbot, *Fauna Brit. India*, 1 : 527 - 530.

Diagnostic characters : Forewing : upperside deep yellow, with costal black, narrow, outer black border broad at apex and excavated between vein Cu_{1a} to M_3, black spot below vein Cu_{1b} dilated into a square spot which occupies the whole tornal angle, underside paler, two small reddish brown specks in basal half of cell, a reniform discocellular spot, hindwing : deep yellow with black narrow outer margin, underside with slightly curved three small spots on subbasal area, a spot on discocellular, a post discal series of highly irregular curved streaks.

Material examined : 29 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Garo Hills, Nufa Hills nr. Tasek F.R.H. 1.B., Songsok, 7.vii. 1988 (Coll. R.K. Ghosh & party); West Garo Hills, Chaipani, South of Kherapra, 14.x. 1988, Bonkangiri, North of Phulbari, 23.x. 1988 (Coll. K.K. Roy & party); Rongva, 12.i. 1991, Siju Cave, 14,15. i. 1991, Williamnagar, 19.i. 1991 (Coll. B.N. Nandi & party); Dalai, 50 m., 3.x. 1991, Kherapara, 200 m., 4.x. 1991, Tura, Walbakgri, 220 m. 5.x. 1991, (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh); East Khasi Hills, Sejbieh, 21.iii. 1991, Shillong, Hills Top nr. Elephant Falls, 27.iii. 1991 (Coll. A.K. Hazra & party); Old Barapani Road, 1050 ., 18.ix. 1991. Ward Lake, 1500 m., 20.ix. 1991, Umlong, on way to Shilla, 500 m., 22.ix. 1991, (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh); Pynurshila, 11.xi. 1991, Nongkran, 13.xi. 1991 (Coll. R.C. Basu & party); Jaintia Hills, Dymtring, nr. Jowai, 1350 m., 26.ix, 1991 (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh);

Distribution : India : Meghalaya: (East Khasi Hills. Garo Hills and Jaintia Hills), West Bengal, Assam, Sikkim, Gujarat. Elsewhere: Burma, Malaya Peninsula and Singapore.

Status : Very common.

29. *Eurema laeta* (Boisduval)

1836. *Terias laeta* Boisduval, *Spec. Gen. Lep.*, 1 : 674.

2987. *Eurema laeta*, Ghosh & Chaudhury, *Rec. zool. Surv. India*, 84(1-4) : 117.

29a. *Eurema laeta laeta* (Boisduval)

1836. *Terias laeta* Boisduval, *Spec. Gen. Lep.*, 1 : 674.

1939. *Eurema laeta laeta*, Talbot, *Fauna Brit. India*, Butterflies, 1 : 517 – 520.

Diagnostic characters : Forewing : upperside yellow, apical portion black upto vein Cu_{1b}, basal portion dusted with black, underside colour pale, a spot in discocelular cell; hindwing:

upperside with outer margin black, underside with black patch on area Sc + R_1.

Material examined : 10 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, upper Shillong, 20.x. 1974, Elephant Falls, 28.x. 1974 (Coll. S.K. Gupta & party); In and around Elephant Falls, 1700 m., 30.iii. 1991 (Coll. S.K. Ghosh & party); Elephant Falls, Upper Shillong, 17.ix. 1991. Old Barapani Road, 1050 m., 18.ix. 1991; Jaintia Hills, Dymtring nr. Jowai, 1350 m., 26.ix. 1991, Thadalaskein Lake, Jowai, 1300m., 27.ix. 1991 (Coll. R.K. Varshney, I.J. Gupta & S.Ghosh).

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), West Bengal, Peninsular to Western Himalayas. Elsewhere: Sri Lanka.

Status : Very common.

30. *Eurema brigitta* Stoll

1780. *Papilio brigitta* Stoll, *In.* Cramer, *Uitl. Kapellen*, **4** (28) : 82.

1972. *Eureman brigitta*, Varshney & Chanda, *Indian Mus. Bull.* **6** (1) : 47.

30a. *Eurema brigitta rubella* (Wallace)

1867. *Terias rubella* Wallace, *Trans. ent. Soc. Lond.*, **4** (3) : 323.

1982. *Eurema brigitta rubella*, Arora & Nandi, *Rec. zool. Surv. India*, **80** : 11.

Diagnostic characters : Forewing : Upperside yellow, apical third black in outer margin, basal area dusted with black, underside yellow ground colour, costa narrowly edged with pinks, two well marked discocellular spots, hindwing : yellow, with outer black border, underside with black spots.

Material examined : 6 exs. (♂ ♂, ♀ ♀) : Meghalaya, East Khasi Hills, Upper Shillong, 20.x. 1974 (Coll. S.K. Gupta & party); Barapani, 7.ix. 1975 (Coll. Muraleedharan); West Khasi Hills, Poultry Farm Forest, Nongstom, 21. iii.1991. (Coll. A.K. Hazra & party), Umlan Shillong, 1000 m., 19.ix.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India: Meghalaya (East and West Khasi Hills), West Bengal, Punjab, N.W. Himalayas (Kumaon), Uttar Pradesh, (Mussooree, Dehradun), Maharashtra (Poona, Bombay), Karnataka (Kanara, Coorg), Nicobar Island. Elsewhere: Sri Lanka, Burma, South China.

**31. *Eurema blanda* (Boisduval)

1836. *Terias blanda* Boisduval, *Spec. Gen. Lep.*, **1** : 672.

1939. *Eurema blanda*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 522 523.

**31a. *Eurema blanda silhetana* (Wallace)

1867. *Terias silhetana* Wallace, *Trans. ent. Soc. Lond.*, **4** (3) : 324.

1982. *Eurema blanda silhetana*, Arora & Nandi, *Rec. zool. Surv. India*, **80** : 12.

Distribution : India : Meghalaya (Khasi Hills), West Bengal, Peninsular India to Sikkim, Assam, Andaman Islands. Elsewhere: Burma and Sri Lanka

Status : Common.

Genus *Dercas* Doubleday

1847. *Dercas* Doubleday, *Genera of Diurnal Lepidoptera*, **1** : 70.

1939. *Dercas*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 501.

**32. *Dercas lycorias* (Doubleday)

1842. *Rhodocera lycorias* Doubleday, *Zool. Miscell.*, : 77.

1939. *Dercas lycorias* Talbot, *Fuana Brit. India*, Butterflies, **1** : 504.

Distribution : India: Meghalaya, Sikkim to Assam. Elsewhere: South East Tibet, Tongking and Annam.

Status : Generally rare.

**33. *Dercas verhuelli* (Hoeven)

1839. *Colias verhuelli* Hoeven, *Tijdsch. voor. Nat. Ges.*, **5** : 341, pl. 8, figs. 3, 4.

1939. *Dercas verhuelli*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 502.

Distribution : India : Meghalaya (Khasi Hills), Sikkim. Elsewhere: Burma, Malay Peninsula, South China to Tongking, Annam, Thailand.

Status : Not rare.

Genus *Gonepteryx* Leach

1815. *Gonepteryx* Leach, *Edinburgh. Encycl.*, 9 : 128.

1939. *Gonepteryx*, Talbot, *Fauna Brit. India*, Butterflies, 1:505-506.

**34. *Gonepteryx rhamni* (Linnaeus)

1758. *Papilio rhamni* Linnaeus, *Syst. Nat. ed.x*, : 470.

1939. *Gonepteryx rhamni*, Talbot, *Fauna Brit. India*, Butterflies, **1** : 507.

Distribution : India: Meghalaya, Himalayas. Elsewhere: The whole Palaearctic Region, extending to Japan, South to Burma, Baluchistan.

Status : Common.

Name of the species	East Garo Hills	West Garo Hills	East Khasi Hills	West Khasi Hills	Jaintia Hills	Khasi Hills	Megha laya*	Garo Hills*
1. *Delias agostina agostina* (Hewitson)			+					
2. *Delias belladona lugens* Jordan			+					
3. *Delias descombesi descombesi* (Boisduval)		+						
4. *Delias eucharis* (Drury)		+						
5. *Delias acalis pyramus* (Wallace)						+		
6. *Delias pasithoe* (Linnaeus)					+	+		
7. *Delias berinda berinda* (Moore)						+		
8. *Delias hyparete* (Linnaeus)						+		
9. *Aporia agathon caphusa* (Moore)			+					
10a. *Pieris napi ajaka* Moore			+					
10b. *Pieris napi montana* Verity			+		+	+		
11. *Pieris canidia canis* Evans			+					
12. *Pieris brassicae nepalensis* Doubleday			+					
13. *Appias lyncida eleonora* (Boisduval)	+	+	+					
14. *Appias libythea olferna* Swinhoe		+						
15. *Appias albina* (Boisduval)						+		
16. *Appias pandione* (Geyer)			+					
17. *Cepora nerissa* (Fabricius)			+					
18. *Cepora nadina nadina* (Lucas)						+		
19. *Leptosia nina* (Fabricius)						+	+	
20. *Prioneris clemanthe* (Doubleday)						+	+	
21. *Prioneris thestylis* (Doubleday)					+			
22. *Ixias pyrene* (Linnaeus)					+			

Name of the species	East Garo Hills	West Garo Hills	East Khasi Hills	West Khasi Hills	Jaintia Hills	Khasi Hills*	Megha laya*	Garo Hills*
23. *Valeria valeria anais* (Lesson)								+
24. *Catopsilia crocale crocale* (Cramer)	+	+						
25. *Catopsilia pyranthe pyranthe* (Linn.)		+				+		
26. *Catopsilia florella* (Fabricius)							+	
27. *Colias electo fieldi* Menetries	+		+					
28. *Eurema hecabe contubernalis* (Moore)	+	+	+		+			
29. *Eurema laeta laeta* (Boisduval)			+		+			
30. *Eurema brigitta rubella* (Wallace)			+	+				
31. *Eurema blanda silhetena* (Wallace)						+		
32. *Dercas lycorias* (*Doubleday*)							+	
33. *Dercas verhuelli* (Hoeven)						+		
34. *Gonepteryx rhamni* (Linnaeus)							+	

Note: Asterick (*) denoting the species recorded from the area as the name of the District is not known.

SUMMARY

The paper incorporates collection and preservation, diagnostic characters of the family, the taxonomic account of the species and geographical distribution of the species belonging to the family Pieridae from Meghalaya. Keys to taxa of the examined material, literature review of the species not studied, the table showing the districts of Meghalaya, and relevant references have been provided. Thus an account of 34 species in 14 genera and two subfamilies has been furnished in the paper of which 3 species constitute new locality records for Meghalaya.

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INSECTA : LEPIDOPTERA : HESPERIIDAE

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INTRODUCTION

The butterflies of the family are popularly known as "Skippers" due to their short jerky flight. They are found in different environs, namely, plains, forests, hills and mountains.

Evans (1949) laid down a fair basis of classification which contained quite a large number of species from the Oriental region. Therefore, the authors, in the paper, have followed the arrangement of taxonomic categories as based by Evans (*loc. cit.*).

The present study has been made to provide the taxonomic account of the hesperiid fauna of Meghalaya. The study is based on the collections at the repository of Zoological Survey of India either in the Headquarters or at the Eastern Regional Station, Shillong and also on the collections brought by the various survey parties of Zoological Survey of India recently.

A total of about 1064 species are known from the whole world of which 750 species are reported from Europe, Asia and Australia by Evans (1949). Amongst a total of about 310 species hitherto recorded from India, 115 species in 60 genera and 3 subfamilies are dealt with from Meghalaya. It is interesting to note that out of a total of 115 species from the state, 70 species constitute new locality records, of which 2 species are recorded for the first time from India. Of the remaining 45 species, 28 species (marked *) were recorded earlier and 17 species have been reviewed from literature (marked **) due to the paucity of the material for examination.

This group of butterflies is known from India through the valuable works of Watson (1891), Swinhoe (1893), Seitz (1927), Evans (1932 & 1949), Parsons and Cantlie (1947), Cantlie (1952), Sevastopulo (1956) and Wynter-Blyth (1957). In the later part of this century, Varshney and Chanda (1971), Rynth (1977), Radhakrishnan, Alfred and Rynth (1989) also reported several species from the area. In the paper, a brief account of the diagnostic characters, list of taxa, keys to taxa of the examined material, generic and species references have been incorporated. Besides, the distribution of each species along with new locality records and the literature review of those species, not examined by the authors, have also been included. Summary and bibiliography alongwith district-wise list of species have been incorporated at the end.

DIAGNOSTIC CHARACTERS

Head broad with bases of antennae widely separate. Antenna with a terminal club which may be straight, hooked or angled; barred portion of club is nudum. Forewing : with or without 2A; all branches of Rs arising separately from cell. Hindwing : Sc and R enclosing a small subcostal cell near base and then fusing together; with 2A and 3A. Legs : hind tibiae usually with middle spurs.

LIST OF SPECIES/SUBSPECIES

Subfamily HESPERIINAE

Group A. Heteropterus

Genus 1. ***Apostictopterus*** Leech

1. *Apostictopterus fuliginosus* Leech

Group B. Astictopterus Felder

Genus 2. ***Astictopterus*** Felder

2. *Astictopterus jama* Felder

2a *Astictopterus jama olivascens* Moore

Genus 3. ***Arnetta*** Watson

*3. *Arnetta atkinsoni* (Moore)

Genus 4. ***Aeromachus*** de Nicéville

4. *Aeromachus stigmata* Moore

*4a *Aeromachus stigmata obsoleta* (Moore)

5. *Aeromachus jhora* (de Nicéville)

**5a *Aeromachus jhora creta* Evans

Genus 5. ***Ochus*** de Niceville

6. *Ochus subvittatus* (Moore)

*6a *Ochus subvittatus subradiatus* (Moore)

Genus 6. ***Baracus*** Moore

7. *Baracus vittatus* (Felder)

7a *Baracus vittatus septentrionum* Wood Mason & deN

Genus 7. ***Sebastonyma*** Watson

8. *Sebastonyma dolopia* (Hewitson)

Genus 8. ***Sovia*** Evans

9. ***Sovia lucasii*** (Mabille)

9a *Sovia lucasii magna* Evans

**10 *Sovia grahami* (Evans)

Genus 9. ***Pithauria*** Moore

11 *Pithauria marsena* Hewitson

Genus 10. ***Thoressa*** Swinhoe

12. *Thoressa gupta* (de Nicéville)

12a. *Thoressa gupta gupta* (de Nicéville)

13. *Thoressa cerata* (Hewitson)

14. *Thoressa fusca* (Elwes)

** 14a. *Thoressa fusca debilis* (Elwes & Edward)

Genus 11. ***Halpe*** Moore

15. *Halpe zema* (Hewitson)

15a. *Halpe zema zema* (Hewitson)

* 16. *Halpe knyvetii* Elwes & Edwards

* 17. *Halpe sikkima* Moore

18. *Halpe porus* (Mabille)

19. *Halpe homolea* Hewitson

* 19a. *Halpe homolea aucma* Swinhoe

** 20. *Halpe wantona* Swinhoe

** 21. *Halpe kumara* de Nicéville

Group C. Ancistroides

Genus 12. ***Iambrix*** Watson

22. *Iambrix salsala* (Moore)

* 22a. *Iambrix salsala salsala* (Moore)

Genus 13. ***Stimula*** de Niceville

23. *Stimula swinhoei* (Elwes & Edwards)

* 23a. *Stimula swinhoei swinhoei* (Elwes & Edwards)

Genus 14. ***Ancistroides*** Butler

24. *Ancistroides nigrita* (Latreille)

24a. *Ancistroides nigrita diocles* (Moore)

Genus 15. ***Notocrypta*** de Nicéville

25. *Notocrypta curvifascia* (Felder)

* 25a. *Notocrypta curvifascia curvifascia* (Felder)

Genus 16. ***Udaspes*** Moore

* 26. *Udaspes folus* (Cramer)

Genus 17. ***Koruthaialos*** Watson

27. *Koruthaialos rubecula* Plotz

** 27a. *Koruthaialos rubecula cachara* Evans

Group D. Plastingia

Genus 18. ***Cupitha*** Moore

28. *Cupitha purrea* (Moore)

Genus 19. ***Scobura*** Elwes & Edwards

29. *Scobura cephala* (Hewitson)

** 30. *Scobura isota (Swinhoe)*

Genus 20. ***Suastus*** Moore

31. *Suastus gremius* (Fabricius)

31a. *Suastus gremius gremius* (Fabricius)

Genus 21. ***Zographetus*** Watson

32. *Zographetus satwa* (de Nicéville)

Genus 22. ***Plastingia*** Butler

33. *Plastingia noemi* (de Nicéville)

Genus 23. ***Lotongus*** Distant

34. *Lotongus sarala* (de Nicéville)

* 34a. *Lotongus sarala sarala* (de Nicéville)

Genus 24. ***Matapa*** Moore

*35. *Matapa aria* (Moore)

36. *Matapa druna* (Moore)

37. *Matapa sasivarana* (Moore)

** 38. *Matapa purpurascens* Elwes & Edwards

Genus 25. ***Pudicita*** de Nicéville

39. *Pudicita pholus* (de Nicéville)

Genus 26. ***Pirdana*** Distant

40. *Pirdana hyela* (Hewitson)

40a. *Pirdana hya rudolphii* Elwes & de Nicéville

Genus 27. ***Cyrina*** Hemming

41. *Cyrina cyrina* (Hewitson)

41a. *Cyrina cyrina cyrina* (Hewitson)

Genus 28. ***Zela*** de Nicéville

42. *Zela zeus* de Nicéville

42a. *Zela zeus optimus* (Fruhstorfer)

Group E Gegenes

Genus 29. ***Parnara*** Moore

* 43. *Parnara guttatus* (Bremer & Gray)

** 44. *Parnara ganga* Evans

Genus 30. ***Borbo*** Evans

45. *Borbo bevani* (Moore)

Genus 31. ***Pelopidas*** Walker

46. *Pelopidas sinensis* (Mabille)

* 47. *Pelopidas mathias* (Fabricius)

48. *Pelopidas assamensis* (Wood Mason & de Nicéville)

49. *Pelopidas conjuncta* (Herrich-Schaffer)

49a. *Pelopidas conjuncta conjuncta* (Herrich-Schaffer)

Genus 32. ***Polytremis*** Mabille

50. *Polytremis lubricans* (Herrich-Schaffer)

50a. *Polytremis lubricans lubricans* (Herrich-Schaffer)

51. *Polytremis discreta* (Elwes & Edwards)

51a. *Polytremis discreta discreta* (Elwes & Edwards)

52. *Polytremis eltola* (Hewitson)

52a. *Polytremis eltola eltola* (Hewitson)

Genus 33. ***Caltoris*** Swinhoe

53. *Caltoris auriciliata* (Elwes & Edwards)

54. *Caltoris cahira* (Moore)

* 54a *Caltoris cahira austeni* (Moore)
55. *Caltoris cormasa* (Hewitson)
56. *Caltoris plebia* (de Nicéville)
57. *Calotris kumara* (Moore)
57a. *Caltoris kumara moorei* (Evans)
58. *Caltoris tulsi* (de Nicéville)
58a. *Caltoris tulsi tulsi* (de Nicéville)
Genus 34. ***Baoris*** Moore
59. Baoris farri (Moore)
Genus 35. ***Iton*** de Nicéville
60. *Iton semamora* (Moore)
60a. *Iton semamora semamora* (Moore)
Group F. Taractocera
Genus 36. *Taractocera* Butler
61. *Taractocera maevius* (Fabricius)
61a. *Taractocera maevius sagara* (Moore)
Genus 37. ***Oriens*** *Evans*
* 62. *Oriens gola* (Moore)
Genus 38. ***Potanthus*** Scudder
63. *Potanthus confucius* (Felder)
63a. *Potanthus confucius dushta* (Frushtorfer)
64. *Potanthus pseudomaesa* (Moore)
64a. *Potanthus pseudomaesa clio* (Evans)
65. *Potanthus sita* (Evans)
Genus 39. ***Telicota*** Moore
* 66. *Telicota augias* (Linnaeus)
Genus 40. ***Cephrenes*** Waterhouse & Lyell
67. *Cephrenes chrysozona* (Plotz)
67a. *Cephrenes chrysozona oceanica* (Mabille)
Group G. *Hesperia*
Genus 41. *Ochlodes* Scudder

68. *Ochlodes subhyalina* Bremer & Gray
* 68a *Ochlodes subhyalina pasca* Evans
69. *Ochlodes siva* (Moore)
69a. *Ochlode siva siva* (Moore)

Subfamily Coeliadinae

Genus 42. ***Bibasis*** Moore
70. *Bibasis sena* (Moore)
70a. *Bibasis sena sena* (Moore)
71. *Bibasis harisa* (Moore)
71a. *Bibasis harisa harisa* (Moore)
72. *Bibasis anadi* (de Nicéville)
73. *Bibasis oedipodea* (Swainson)
73a. *Bibasis oedipodea belesis* (Mabille)
74. *Bibasis jaina* (Moore)
74a. *Bibasis jaina jaina* (Moore)
75. *Bibasis vasutana* (Moore)
76. *Bibasis amara* (Moore)
77. *Bibasis gomata* (Moore)
77a. *Bibasis gomata gomata* (Moore)
Genus 43. ***Hasora*** Moore
78. *Hasora anura* de Nicéville
* 78a. *Hasora anura anura* de Nicéville
79. *Hasora khoda* (Mabille)
79a. *Hasora khoda* Coulteri Wood Mason & de Nicéville
80. *Hasora badra* (Moore)
80a. *Hasora badra badra* (Moore)
81. *Hasora vitta* Butler
81a. *Hasora vitta indica* Evans
Genus 44. ***Choaspes*** Moore
82. *Choaspes plateni* (Staudinger)

82a. *Choaspes plateni stigmata* Evans
83. *Choaspes benjaminii* (Guérin)
84. *Choaspes zanthopogon* (Kollar)
85. *Choaspes hemixanthus* Rothschild
85a. *Choaspes hemixanthus furcata* Evans

Genus 45. ***Badamia*** Moore

* 86. *Badamia exclamationis* (Fabricius)

Subfamily Pyrginae

Group H. *Celaenorrhinus*

Genus 46. ***Capila*** Moore
87. *Capila phanaeus* (Hewitson)
87a. *Capila phanaeus lalita* (Doherty)
** 87b. *Capila phanaeus fudicia* Evans
88. *Capila pennicillatum* (de Nicéville)
* 88a. *Capila pennicillatum pennicillatum* (de Nicéville)
89. *Capila pieridoides* (Moore)
* 89a. *Capila pieridoides pieridoides* (Moore)
90. *Capila jayadeva* (Moore)

Genus 47. ***Lobocla*** Moore
91. *Lobocla liliana* (Atkinson)
91a. *Lobocla liliana liliana* (Atkinson)

Genus 48. ***Celaenorrhinus*** Hübner
92. *Celaenorrhinus dhanada* (Moore)
92a. *Celaenorrhinus dhanada affinis* Elwes & Edwards
93. *Celaenorrhinus pyrrha* de Nicéville
* 94. *Celaenorrhinus leucocera* (Kollar)
95. *Celaenorrhinus nigricans* (de Nicéville)
96. *Celaenorrhinus badia* (Hewitson)
97. *Celaenorrhinus asmara* (Butler)
* 97a. *Celaenorrhinus asmara consertus* de Nicéville

1861 ZSI/99—19B

98. *Celaenorrhinus munda* (Moore)
** 98a. *Celaenorrhinus munda maculicornis* (Elwes & Edwards)
** 99. *Celaenorrhinus zea* Swinhoe

Group I. Tagiades

Genus 49. ***Odontoptilum*** de Nicéville
100. *Odontoptilum angulata* Felder
100a. *Odontoptilu angulata angulata* Felder

Genus 50. ***Satarupa*** Moore
101. *Satarupa gopala* Moore

Genus 51. ***Sesaria*** Matsumara
102. *Sesaria sambara* (Moore)
102a. *Sesaria sambara sambraa* (Moore)

Genus 52. ***Darpa*** Moore
103. *Darpa hanria* Moore

Genus 53. ***Odina*** Mabille
104. *Odina decoratus* (Hewitson)

Genus 54. ***Chamunda*** Evans
105. *Chamunda chamunda* (Moore)

Genus 55. ***Mooreana*** Evans
106. *Mooreana trichoneura* (Felder)
106a. *Moorena trichoneura pralaya* (Moore)

Genus 56. ***Tagiades*** Hübner
107. *Tagiades japetus* (Stoll)
* 107a. *Tagiades japetus ravi* (Moore)
108. *Tagiades litigiosa* Möschler
108a. *Tagiades litigiosa litigiosa* Möschler

Genus 57. ***Daimio*** Murray
109. *Daimio sinica* Felder
109a. *Daimio sinica narada* (Moore)
110. *Daimio phisara* (Moore)
* 110a. *Daimio phisara phisara* (Moore)

Genus 58. ***Coladenia*** Moore

111. *Coladenia agni* (de Nicéville)

112. *Coladenia dan* (Fabricius)

112a. *Coladenia dan fatih* (Kollar)

** 112b. *Coladenia dan festa* Evans

** 112c. *Coladenia dan fatua* Evans

Genus 59. ***Sarangessa*** Moore

113. *Sarangessa dasahara* (Moore)

113a. *Sarangessa dasahara dasahara* (Moore)

114. *Sarangessa purendra* Moore

**114a. *Sarangessa purendra purendra* Moore

Genus 60. ***Caprona*** Wallengren

115. *Caprona agama* (Moore)

** 115a. *Caprona agama agama* (Moore)

Key to the subfamily of the family Hesperiidae

1. Forewing vein M_2 nearer to M_1 than M_3 at origin of cell; abdomen shorter than anal margin of hindwing 2
— Forewing vein M_2 nearer to M_3 than M_1 at origin of cell; abdomen generally equal to anal margin of hindwing ..... Hesperiinae
2. Labial palpi with second joint upturned and third joint porrect, long and owl-shaped ..... Coeliadinae
— Labial palpi with these joints showing variable orientation, third joint may be long but never owl-shaped ..... Pyrginae

Key to groups of the subfamily Hesperiinae

1. Forewing vein M_2 straight at its origin; hindwing lower end cell usually not upturned; vein M_2 well marked 2
— Forewing vein M_2 generally decurved at origin; hindwing lower end cell usually upturned; vein M_2 usually untraceble 5
2. Second segment of labial palpi porrect 3
— Second segment of labial palpi errect 4
3. Hindwing cell usually longer than half of the wing ..... Heteropterus group
— Hindwing cell not longer than half of the wing ..... Astictopterous group

4. Hindwing vein M_2 decurved at origin ..... Ancistroides group
   Hindwing vein M_2 not decurved at origin ..... Plastingia group
5. Without antennal apiculus 6
— With antennal apiculus ..... Gegenes group
6. Mid tibiae smooth ..... Taractocera group
— Mid tibiae spined ..... Hesperia group

Group Heteropterus

Genus *Apostictopterus* Leech

1893. *Apostictopterus* Leech, *Butterfl. Chin. Japan Cor.* : 630.

1949. *Apostictopterus*, Evans *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.), : 24.*

Diagnostic characters - Antenna : club not flattened, apiculus obtuse; legs : fore tibiae epiphysis fully developed, mid tibiae smooth, hind tibiae with two pairs of short spurs; forewing : vein M_3 before vein R_2, vein R_1 and Sc apart.

*1. *Apostictopterus fuliginosus* Leech

1893. *Apostictopterus fuliginosus* Leech, *Butterfl. Chin Japan Cor.* : 631, pl.38.

1949. *Apostictopterous fuliginosus*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist), : 233.

Diagnostic characters : Colour : pale brown, unmarked.

Material examined : 1 ex. : Meghalaya, East Garo Hills, Sonsok, 16.xi.1973 (Coll. S. Biswas).

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : China (W. Szechwan, Ta Tsien Lou).

Remarks : It is for the first time recorded from India.

Group Astictopterus

Key to genera of the group Astictopterus

1. Forewing vein M_2 well before vein R_1 and far away from vein Cu1a 2
— Forewing vein M_2 after or opposite vein R_1 and never far away from vein Cu1a 3
2. Wings broad, costa of forewing arched and vein R_1 and Sc approximate ..... *Astictopterus*
— Wings narrower, costa of forewing straight and vein R_1 and Sc apart ..... *Arnetta*
3. Wings broad, costa of forewing always arched 4
   Wings produced at apex of forewing, costa of forewing straight 6

4. Hindwing cell equal to half of the wing ..... ***Aeromachus***
   Hindwing cell shorter than half of the wing 5
5. Forewing vein M_1 abnormal, arising well below end cell and place mid vein M_2 and R_5 ..... ***Ochus***
   Forewing vein M_1 normal, with vein M_2 and R_5 at cell apex ..... ***Baracus***
6. Forewing upper end cell not produced, vein M_2 straight ..... ***Sevastonyma***
   Forewing upper end cel produced, vein M_2 decurved at origin 7
7. Uncus undivided ..... ***Sovia***
   Uncus divided 8
8. Antennal apiculus hooked 9
   Antennal apiculus long and thin ..... ***Pithauria***
9. Labial palpi porrect, gnathos strongly developed ..... ***Thoressa***
   Labial palpi erect, gnathos absent or undeveloped ..... ***Halpe***

Genus *Astictopterus* Felder

1860. *Astictopterus* Felder, *Wien. ent. Monatsb.*, **4** : 401.

1949. *Astictopterus*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.) : 25.

2. *Astictopterus jama* Felder

1860. *Astictopterus jama* Felder, *Wien. ent. Monatsb.*, 4 : 401.

1949. *Astictopterus jama*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Austalia in Brit. Mus. (nat. Hist.) : 233.

2a. *Astictopterus jama olivascens* Moore

1878. *Astictopterus olivascens* Moore, *Proc. zoo. Soc. Lond.*, : 692.

1949. *Astictopterus jama olivascens*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.) : 234.

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 cell, R_4, R_5 and M_1.

Material examined : 2 exs. : Meghalaya, Khasi Hills, date and coll. nil; 3 exs : Shillong, no other data.

Distribution : India including Meghalaya (Khasi Hills), Assam, Sikkim, Nagaland and Andamans; Elsewhere : Bhutan, Thailand, Indo China.

Genus *Arnetta* Watson

1893. *Arnetta* Watson, *Proc. zool. Soc. London*, : 72.

1949. *Arnetta*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.), : 25.

* 3. *Arneta atkinsoni* (Moore)

1878. *Isoteinon atkinsoni* Moore, *Proc. zool. Soc. Lond.*, : 693, pl. 16, fig. 10.

1949. *Arnetta atkinsoni*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in *Brit. Mus. (nat. Hist.)* : 236.

Diagnostic characters : Wings : forewing upperside with tuft of black hairs on mid dorsum, cell spot conspicuous, no spot in space 1B; hindwing : underside sandy to ferruginous with spots.

Material examined : 1 ex. : Khasi Hills, date and coll. nil.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim; Elsewhere : Burma, Thailand.

Genus *Aeromachus* de Nicéville

1890. *Aeromachus* de Nicéville, *Journ. Bombay nat. Hist. Soc.*, 5 : 214.

1949. *Aeromachus*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in *Brit. Mus. (nat. Hist.)*, : 26.

4. *Aeromachus stigmata* Moore

1878. *Aeromachus stigmata* Moore, *Proc. zool. Soc. Lond.*, : 694.

1949. *Aeromachus stigmata*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in *Brit. Mus. (nat.Hist.)* : 242.

* 4a. *Aeromachus stigmata obsoleta* (Moore)

1878. *Thanaos obsoleta* Moore, *Proc.zool.Soc.Lond.*, : 694.

1949. *Aeromachus stigmata obsoleta*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in *Brit. Mus. (nat. Hist.)* : 242.

Diagnostic characters : Wings : forewing upperside with a discal stigma and white dots usually continued to vein 1A, hindwing : underside whitish or grey, inner spot in space between R_4 and R_5 absent or faint.

Material examined : 3 exs. : Khasi Hills, Shillong, date and coll. nil.

Distribution : India : Meghalaya (East Khashi Hills), Assam, Manipur and Nagaland; Elsewhere : Burma to Bhamo.

5. *Aeromachus jhora* (de Nicéville)

1885. *Thanaos johra* de Nicéville, *Journ.Asiat.Soc.Bengal* : 122, pl.2, fig. 12.

1949. *Aeromachus jhora*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 243.

** 5a. *Aeromachus jhora creta* Evans

1949. *Aeromachus jhora creta* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 243.

Distribution : India : Meghalaya (Khasi Hills), and Assam; Elsewhere : Burma, Malaya.

Genus *Ochus* de Nicéville

1894. *Ochus* de Nicéville, *Journ.Asiat.Soc.Bengal* (N.S.), 63 (2) : 51.

1949. *Ochus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 26.

6. *Ochus subvittatus* (Moore)

1878. *Cyclopides subvittatus* Moore, *Proc.zool.Soc.Lond.*, : 692.

1949. Ochus subvittatus, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.) : 236.

* 6a. *Ochus subvittatus subradiatus* (Moore)

1878. *Cyclopides subradiatus* Moore, *Proc.zool.Soc.Lond.*, : 693.

1949. *Ochus subvittatus subradiatus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.HIst.)* : 236.

Diagnostic characters : Wings : Upperside nearly black with a yellow spot at apex of forewing, underside with apex, costa of forewing and hindwing bright yellow with numerous black markings.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

Genus *Baracus* Moore

1881. *Baracus* Moore, *Lep.Ceylon*, **1** : 162.

1949. *Baracus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 26.

7. *Baracus vittatus* (Felder)

1862. *Isoteinon vittatus* Felder, *Verz.zool.bot.Ges.Wien.*, **12** : 480.

1949. *Baracus vittatus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 237.

7a. *Baracus vittatus septentrionum* Wood Mason & de Nicéville

1886. *Bararcus septentrionum* Wood-Mason & de Nicéville, *Journ. Asiat. Soc. Bengal*, **15** : 379, pl.18, figs. 4, 4a.

1949. *Baracus vittatus septentrionum*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 255.

Diagnostic characters : Wings : forewing upperside with prominent apical spots, discal spot faint, no spot in space 1B; hindwing : underside rather faint, radial streaks from base and shorter streak on disc.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Kasi Hills), Assam, Sikkim. Elsewhere : Bhutan and Burma.

Genus *Sebastonyma* Watson

1893. *Sebastonyma* Watson, *Proc.zool.soc.London* : 81.

1949. *Sebastonyma* Evans. *A Catalogue of Hesperidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 26.

8. *Sebastonyma dolopia* (Hewitson)

1868. *Hesperia dolopia* Hewitson, *Descrip. Hesperiid.*, : 27.

1949. *Sevastonyma dolopia*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 246.

Diagnostic characters : Antennae : club brown above; forewing : with three apical spots, hindwing : underside chocolate, a long white streaks at base of space between R_4 and R_5.

Material examined - 2 exs. : Khasi Hills, date and coll. nil.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim. Elsewhere : N. Burma.

Genus *Sovia* Evans

1949. *Sovia* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat. Hist.)* : 27.

9. *Sovia lucasii* (Mabille)

1876. *Hesperilla lucasii* Mabille, *Bull.Soc.Ent.Fr.*, (5) **4** : Cl. iii.

1949. *Sovia lucasii*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.) : 247.

9a. *Sovia lucasii magna* Evans

1932. *Halpe separata magna* Evans, Identification of Indian Butterfly, p. 389.

1949. *Sovia lucasii magna*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 247.

Diagnostic characters : Palpi : clothed with ochreous or black hairs; forewing : upperside spot in space Cu1a and Cu1b nearer to cell spot than to spot in space Cu1a and M_3, cell spot narrowly rectangular, underside, apex and costa ferruginous, hindwing : underside olive; cilia : both wings conspicuously white and black.

Material examined : 1 ex. : Khasi Hills, other data nil.

Distribution : India : Meghalaya (Khasi Hills), Nagaland (Naga Hills) and Manipur; Elsewhere : W. China.

** 10. *Sovia grahami* (Evans)

1926. *Halpe grahami* Evans, *Journ.Bombay nat.Hist.Soc.*, **31** : 618.

1949. *Sovia grahami*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 246.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim and Uttar Pradesh (Kumaon).

Genus *Pithauria* Moore

1878. *Pithauria* Moore, *Proc.zool.Soc.Lond.* : 689.

1949. *Pithauria*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 28

11. *Pithauria marsena* Hewitson

1866. *Pitahuria marsena* Hewitson, *Exot.Butt.*, : 5.

1949. *Pithauria marsena*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 269.

Diagnostic characters : Forewing : upperside greenish ochreous with a stigma, hindwing : R_5 and M_1 hair pinned, underside ferruginous without any super scaling but with variable pale spots.

Material examined : 1 ex. : Khasi Hills, without date and collector.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Manipur; Elsewhere : Malayan subregion.

Genus *Thoressa* Swinhoe

1913. *Thoressa Swinhoe, Lep. Indica,* **10** : 284.

1949. *Thoressa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat.Hist.)* : 28.

Key to the species of the Genus *Thoressa* Swinhoe

Antennal club not ringed with pale yellow before apiculus, upperside of hindwing without white spot and underside of hindwing with olive scaling sparser ..... *gupta*

Antennal club ringed with pale yellow before apiculus, upperside of hindwing with white spots and underside of hindwing without olive scale ..... *cerata*

12. *Thoressa gupta* (de Nicéville)

1886. *Halpe gupta* de Niceville, *Journ.Asiat.Soc.Bengal* : 255.

1949. *Thoressa gupta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 255.

12a. *Thoressa gupta gupta* (de Nicéville)

1886. *Halpe qupta* de Nicéville, *Journ. Aésiat. Soc. Bengal* : 255.

1949. *Thoressa gupta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 255.

Material examined : 1 ex. : Khasi Hills, no other data.

Disribution : India : Meghalaya (Khasi Hills), Sikkim and Uttar Pradesh (Garhwal).

13. *Thoressa cerata* (Hewitson)

1876. *Halpe cerata* Hewitson, *Ent. Month. Mag.* : 152.

1949. *Thoressa cerata*, Evans, *A Catalogue of Heperiidae from Eurpope, Asia and Australia in Brit. Mus.* (nat. Hist.) : 253.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution - India : Meghalaya (Khasi Hills), Assam and Sikkim; Elsewhere : Burma, Thailand, Indo-china.

14. *Thoressa fusca* (Elwes)

1892. *Halpe fusca* Elwes, *Proc. zool. Soc. Lond,* : 653.

1949. *Thoressa fusca*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 256.

** 14a. *Thoressa fusca debilis* (Elwes & Edwards)

1897. *Halpe debilis* Elwes & Edwards, *Trans. zool. Soc. Lond.*, **14** (4) : 266.

1949. *Thoressa fusca debilis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 256.

Distribution : India : Meghalaya (Khasi HIlls).

Genus *Halpe* Moore

1878. *Halpe* Moore, *Proc. zool. Soc. Lond.* : 689.

1949. *Halpe*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 28.

key to species of the genus *Halpe* Moore

1. Antennal club white or pale yelow ringed before apiculus 2
— Antennal club not ringed before apiculus 4
2. Underside of hindwing with a continuous broad white band ..... *zema*
— Underside of hindwing without broad white band 3

3. Upperside of forewing with conspicuous cell spot as large as spot in space Cula ..... *knyvetti*
— Upperside of forewing cell spot absent or smaller than spot in space cula ..... *sikkima*
4. Upperside with two cell spots or single spot across cell ..... *porus*
— Upperside without two cell spots, sometimes upper cell spot present but never across cell ..... *homolea*

15. *Halpe zema* (Hewitson)

1877. *Hesperia zema* Hewitson, *Ann. Mag. nat. Hist.* (4) **19** : 77.

1949. *Halpe zema*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 257.

15a. *Halpe zema zema* (Hewitson)

1877. *Hesperia zema* Hewitson, *Ann. Mag. nat. Hist.*, (4) **19** : 77.

1949. *Halpe zema* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 258.

Diagnostic characters : Forewing : upperside with spots in spaces Cula and Culb over-lap, three apical spots present.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution: India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere ; N. Burma, Indochina.

* 16. *Halpe knyvetti* Elwes & Edwards

1897. *Halpe knyvetti* Elwes & Edwards, *Trans. zool. Soc. Lond.*, **14** (4) : 261.

1949. Halpe knyvetti, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 259.

Diagnostic characters : Wing : produced with cilia grey; genitalia : claspers broader and cuiller teeth more pronounced.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi and Jaintia Hills), Sikkim and Nagaland (Naga Hills); Elsewhere : Karen HIlls.

* 17. *Halpe sikkim*a Moore

1882 *Halpe sikkima* Moore, *Proc. zool. Soc. Lond.*; 407.

1949. *Halpe sikkima*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 260.

Material examined : 3 exs. : Khasi Hills, no date, no coll.

Distribution: India : Meghalaya (Khasi Hills), Sikkim and Manipur; Elsewhere : Burma, Thailand, Indo-china, Malayan subregion.

18. *Halpe porus* (Mabille)

1876. *Hesperilla porus* Mabille, *Bull. Soc. Ent. Fr.*, (5) **6** : 199.

1949. *Halpe porus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 260.

* 19a. *Halpe homelea aucma* Swinhoe

1893. *Halpe aucma* Swinhoe, *Trans. ent. Soc. Lond.*, : 325.

1949. *Halpe homolea aucma*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 262.

Diagnostic characters : Forewing : discal spots overlapping, cell spot conspicuous, two apical spots, cilia white, hindwing : upperside darker and more uniform, underside marking not well defined.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution — India : Meghalaya (East Khasi Hills), Manipur and Nagaland (Naga Hills). Elsewhere : S.E. Tibet, N. Burma.

**20. *Halpe wantona* Swinhoe

1893. *Halpe wantona* Swinhoe, *Trans. ent. Soc. London* : 325.

1949. *Halpe wantona*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 267.

Distribution : India : Meghalaya (East Khasi Hills : Shillong); Assam and Manipur; Elsewhere : Burma, Malaya.

** 21. Halpe kumara de Nicéville

1885. *Halpe kumara* de Nicévile, *Journ. Asiat. Soc. Bengal* : 121. pl. 2, fig. 10.

1949. *Halpe kumara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 259.

Distribution : India : Meghalaya (Khasi Hills), Manipur and Nagaland (Naga Hills).

Group Ancistroides

Key to genera of the group Ancistroides

1. Forewing vein M_2 straight 2
— Forwing vein M_2 more or less decurved at its origin 3
2. Forewing vein Sc and R_1 separate ..... ***Iambrix***
— Forewing vein Sc and R_1 almost touching ..... ***Stimula***
3. Forewing vein Cula opposite to vein R_2 at their origin and M_3 not nearer to vein Cula than to M_2 ..... ***Ancistroides***
— Forewing vein Cula opposite to vein R_3, vein M_3 much nearer to vein Cula than to M_2 4
4. Hindwing cell equal to half of wing, antennae greater than costa, forewing with hyaline white band dorsally ..... ***Notocrypta***
— Hindwing cell shorter than half of wing, antennae shorter than half of costa, forewing with large hyaline spot dorsally ..... ***Udaspes***

Genus *Iambrix* Watson

1893. *Iambrix* Watson, *Proc. zool. Soc. Lond.*, : 76, pl. 3, fig. 25.

1949. *Iambrix*, Evans, 1949. *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 30.

22. *Iambrix salsala* (Moore)

1865. *Nisionides salsala* Moore, *Proc. zool. Soc. Lond.* : 786.

1949. *Iambrix salsala*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 272.

* 22a. *Iambrix salsala salsala* (Moore)

1865. *Nisionides salsala* Moore, *Proc. zool. Soc. Lond.* : 786.

1949. *Iambrix salsala salsala*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 272.

Diagnostic characters : Forewing : male upperside with smaller and duller ochreous spots which may be numerous or absent, costa not ochreous; female with less numerous white dots or absent but when present reaching upt space 2A.

Material examined : 1 ex. : West Garo Hills, Kherapara, 200 m., 4-x-1991 (coll. *R.K. Varshney*, I.J. Gupta & S. Ghosh).

Distribution : Oriental region including India : Meghalaya (West Garo Hills), Sikkim, Assam, West Bengal and Himachal Pradesh; Elsewhere : Indonesia, Taiwan, Hongkong, Philippines.

Genus *Stimula* de Nicéville

1898. *Stimula* de Nicéville, *Journ. Bombay nat. Hist. Soc.*, **12** : 159.

1949. *Stimula*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 30.

23. *Stimula swinhoei* (Elwes & Edwards)

1897. *Kerana swinhoei* Elwes & Edwards, *Trans. zool. Soc. Lond.* **14** (4) : 220.

1949. *Stimula swinhoei*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 279.

* 263a. *Stimula swinhoei swinhoei* (Elwes & Edwards)

1897. *Kerana swinhoei* Elwes & Edwards, *Trans. zool. Soc. Lond.*, **14** (4) : 220.

1949. *Stimula swinhoei swinhoei*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 279.

Diagnostic characters : Forewing : upperside uniform brown, underside outer half rather paler and dorsum below vein Culb pale yellowish brown.

Material examined : 1 ex. : Khasi Hills, no other data.

Disribution : India ; Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere: Burma.

Genus *Ancistroides* Butler

1874. *Ancistroides* Butler, *Trans. ent. Soc. London* : 436.

1949. *Ancistroides*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 31.

24. *Ancistroides nigritta* (Latreille)

1824. *Hesperia nigrita* Latreille, *Enc. Meth.* **9** (2) : 788.

1949. *Ancistroides nigritta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 280.

24a. *Ancistroides nigritta diocles* (Moore)

1865. *Kerana diocles* Moore, *Trans. ent. Soc. Lond.*, **14** (4) : 255.

1949. *Ancistroides nigritta diocles*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 280.

Diagnostic characters : Forewing : upperside brown, unmarked; underside : apex of forewing and termen of hindwing broadly paler.

Material examined : 1 ex : East Garo Hills, Songsok, 17. xi. 1973 (Coll. S. Biswas).

Distribution : India : Meghalaya (East Garo Hills), Sikkim and Assam; Elsewhere : Bhutan, Burma.

Genus *Notocrypta* de Nicéville

1889. *Notocrypta* de Nicéville, J. Bombay nat. Hist. Soc. : 188.

1949. *Notocrypta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 31.

25. *Notocrypta curvifascia* (Felder)

1862. *Plesioneura curvifascia* Felder, *Wien. ent. Mon.*, **6** : 29.

1949. *Notocrypta curvifascia*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) ; 286.

25a. *Notocrypta curvifascia curvifasica* (Felder)

1862. *Plesioneura curvifascia* Felder, *Wien. ent. Mon.*, **6** : 29.

1949. *Notocrypta curvifascia curvifascia*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 286.

Diagnostic characters : Antennae : usually ringed with white or yellow at base of culb, forewing : band not entering or just entering base of space Cula and usually not extended above radius to costa dorsally, upperside of apical area fully spotted, a dot in space Cula.

Material examined : 1 ex. : Garo Hills, Songkhoma, 15.xi. 1973, Coll. nil; 1 ex. : West Garo Hills, Chaipani, S. of Kherapara, 14.x.1988 (Coll. K.K. Roy & Party); 1 ex. : Khasi Hills, Lawsoptum, 5.ix.1968 (Coll. R.K. Varshney), 5 exs. : Shillong, no other data. 1 ex : East Khasi Hills, Cherrapunji, 1250 m., 21.ix. 1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : Palaearctic and Oriental region including India : Meghalaya (East Khasi and West Garo Hills), Assam, West Bengal, South India and Andamans.

Genus *Udaspes* Moore

1881. *Udaspes* Moore, *Lep. Ceyl.*, 1 ; 177.

1949. *Udaspes*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Ausralia in Brit. Mus.* (nat. Hist.) : 31.

26. *Udaspes folus* (Cramer)

1775. *Papilio folus* Cramer, Pap.Exot., 1 : 118, pl.74, fig.F.

1949. *Udaspes folus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 292.

Diagnostic characters : Wings : upperside with marginal white spots; forewing : upperside with large white markings; hindwing : upperside with large white area and underside with variegated white patches, brown patches between Cu1b and M_3, another small spot present between Rs and Sc + R_1.

Material examined : 2 exs. : Shillong, March, no other data, 1 ex. : East Khasi Hills, old Barapani Road, Shillong, 18.ix.1991 (Coll. *R.K. Varshney, I.J. Gupta* and *S. Ghosh*).

Distribution : Palaearctic and Oriental Region including India : Meghalaya (East Khasi Hills), Sikkim, Assam, West Bengal, Orissa, South India and North West Himalayas.

Genus *Koruthaialos* Watson

1893. *Koruthaialos* Watson, *Proc.zool.Soc.London* : 76.

1949. *Koruthaialos* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)*, : 30.

27. *Koruthaialos rubecula* Plotz

1882. *Koruthaialos rubecula* Plotz, *Berl.Ent.Ztschr.* : 264.

1949. *Koruthaialos rubecula*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 274.

** 27a. *Koruthaialos rubecula cachara* Evans

1949. *Koruthialos rubecula cachara* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 274.

Distribution : India : Meghalaya (Khasi Hills), Assam, Manipur and Nagaland (Naga Hills); Elsewhere : Bangladesh (Silhet).

Group Plastingia

Key to genera of the group Plastingia

1. Antennal apiculus not longer than twice width of club, shortly or moderately hooked; palpi generally with second segment slender, third pointed and protruding more or less 2
— Antennal apiculus longer than twice width of club; palpi generally with second segment stout and quadrantic, third segment short and stout, bluntly conical, not protruding 7
2. Hindwing dorsum not longer than costa 3
— Hingwing dorsum longer than costa 5
3. Palpi third segment very long and thin, forewing vein M_2 straight 4
Palpi third segment very short, forewing vein M_2 decurved ..... ***Cupitha***
4. Forewing vein M_3 nearer to vein Cu1a than te vein M_2, vein Sc and R_1 close .... ***Scobura***
Forewing vein M_3 mid way between M_2 and Cu1a, vein Sc and R_1 apart ..... ***Suastus***
5. Forewing vein Cu1a opposite to vein R_3 rather than vein R_2 ..... ***Zographetus***
Forewing vein Cu1a opposite to vein R_2 rather than vein R_3 6
6. Hindwing cell not larger than half of wing, upperside of forewing with yellow marking ..... ***Plastingia***
Hindwing cell longer than half of wing, upperside of forewing with white marking ..... ***Lotongus***
7. Forewing cell as long as dorsum of hindwing which is not longer than dorsum of forewing 8
Forewing cell larger than dorsum of hindwing, which is generally longer than dorsum of forewing 9
8. Hindwing with lower angle of discocellular cell abnormally produced, vein M_1 opposite to vein Cu1b, eyes red, unmarked ..... ***Matapa***
Hindwing with lower angle of cell normally produced, vein M_1 opposite to vein Cu1a, eyes not red, marked with hyaline yellow spots ..... ***Pudicita***
9. Palpi normal, third segment short, hindwing cilia yellow, underside of hindwing green ..... ***Pirdana***
Palpi abnormal, third segment very long and stout, hindwing cilia orange, underside of hind wing not green ..... ***Cyrina***

Genus *Cupitha* Moore

1884. *Cupitha* Moore, *Journ.Asiat.Soc.Bengal* : 47.

1949. *Cupitha*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 32.

28. *Cupitha purrea* (Moore)

1877. *Pamphila purrea* Moore, *Proc.zool.Soc.Lond.* : 594.

1949. *Cupitha purrea*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 299.

Diagnostic characters : Body brown; forewing : upperside with yellow streak along costa and a broad central irregular yellow band from base below cell towards apex; hindwing: upperside with a broad central yellow band.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, South India and Andamans; Elsewhere : Indo-China, Thailand, Malayan subregion.

Genus *Scobura* Elwes & Edwards

1897. *Scobura* Elwes & Edwards, *Trans.zool.Soc.London*, **14** : 204.

1949. *Scobura*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.* : 32.

29. *Scobura cephala* (Hewitson)

1876. *Hesperia cephala* Hewitson, *Ent.Mon.Mag.* : 152.

1949. *Scobura cephala*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 293.

Diagnostic characters : Forewing : upperside with a spot in space M_2 and M_3, but no spot in space Cu1a and M_3, hindwing : upperside with two hyaline spots, underside with a conspicuous rectangular white spot in space 3A in continuation of the spot in space Cu1a and Cu1b, beyond the discal spot the yellow colour becomes ferruginous.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

** 30. *Scobura isota* (Swinhoe)

1893. *Ismene isota* Swinhoe, *Trans.ent.Soc.London*, p.320.

1949. *Scobura isota*, Evans, *A Catalogue of Hesperidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)*, : 294.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand, Tonkin, Malaya.

Genus *Suastus* Moore

1881. *Suastus* Moore, *Lep.Ceyln.*, 1 : 168.

1949. *Suastus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 32.

31. *Suastus gremius* (Fabricius)

1798. *Hesperia gremius* Fabricius, *Ent.Syst.Suppl.*, : 433.

1949. *Suastus gremius*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 296.

31a. *Suastus gremius gremius* (Fabricius)

1798. *Hesperia gremius* Fabricius, *Ent.Syst.Suppl.*, : 433.

1949. *Suastus gremius*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 296.

Diagnostic characters : Forewing : underside tornus dark beyond a central white in space 2A, which may be absent, upperside with a white spot, hindwing : underside with a conspicuous black cell spot, which is atleast as large as any discal spot.

Material examined : 1 ex. : Khasi Hills, no other data, 2 exs. : Garo Hills, Deoripathar, 21.xi.1973 (Coll.S. Biswas).

Distribution : Oriental region including India : Meghalaya (Khasi and Garo Hills), Sikkim, Assam, South India, Central India and North West Himalayas.

Genus *Zographetus* Watson

1893. *Zographetus* Watson, *Proc.zool.Soc.London* : 84.

1949. *Zographetus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 33.

32. *Zographetus satwa* (de Nicéville)

1883. *Isoteinon satwa* de Nicéville, *Journ.Asiat.Soc.Bengal* : 86.

1949. *Zographetus satwa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 299.

Diagnostic characters : Forewing : vein Cu1b nearer to base than to vein Cu1a, upperside with two subapical spots and a spot in space 2A, underside costa yellow to the subapical

spots, hindwing : underside basal half yellow with a few black spots, outer half dark brown with purple washed.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand, Malaya, Java.

Genus *Plastingia* Butler

1870. *Plastingia* Butler, *Ent.Mon.Mag.*, : 7.

1949. *Platingia*, Evans, *A Catalogue of Hesperidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 34.

33. *Platingia noemi* de Nicéville

1885. *Platingia noemi* de Nicéville, *Journ. Asiat.Soc.Bengal*, : 54 (2) : 120, p 12, fig.15.

1949. *Plastigina noemi*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 318.

Diagnostic characters : Forewing : with two cell spots, one above the other, upper cell spot centred well before origin of vein R_3, hindwing : upperside with conspicuous yellow discal area, underside with solid black spots.

Material examined : 3 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam.

Genus *Lotongus* Distant

1886. *Lotongus* Distant, *Rhopalocera Malayana* : 369, 371.

1949. *Lotongus*, Evans, *A Catalogue of Hesperiidae fro Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 34.

34. *Lotongus sarala* (de Nicéville)

1889. *Parnara sarala* de Nicéville, *Journ. Bombay nat.Hist.Soc.*, 4 : 173.

1949. *Lotongus sarala*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 322.

34a. *Lotongus sarala sarala* (de Nicéville)

1889. *Lotongus sarala* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, 4 : 173.

1949. *Lotongus sarala sarala*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus. (nat.Hist.) : 322.

Diagnostic characters : Forewing : Upperside with conjoined cell spot and a spot in space Cu1a and Cu1b overlap; hindwing : upperside with central yellow band, underside yellow band running from mid costa to mid dorsum.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Matapa* Moore

1881. *Matapa* Moore, *Lep.Ceylon*, 1 : 163.

1949. *Matapa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 35.

Key to species of the genus *Matapa* Moore

1. Hindwing cilia white or very pale yellow ..... *aria*
   Hindwing cilia orange 2
2. Upperside of forewing stigma broad and curved ..... *druna*
   Upperside of forewing stigma short and straight ..... *sasivarana*

35. *Matapa aria* (Moore)

1865. *Isémene aria* Moore, *Proc.zool.Soc.London* : 784.

1949. *Matapa aria*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 330.

Material examined : 1 ex. : West Garo Hills, Tura, Walbakgri, 220m., 5.x.1991 (Coll.R.K.Varshney, I.J.Gupta and S. Ghosh).

Distribution : Oriental region including India : Meghalaya (West Garo Hills), Sikkim, Assam, South India, Madhya Pradesh and Uttar Pradesh.

36. *Matapa druna* (Moore)

1865. *Ismene druna* Moore, *Proc.zool.Soc.Lond.*, 784.

1949. *Matapa druna*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 330.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam. Elsewhere : Burma, Indo-China, Malayan subregion.

37. *Matapa sasivarana* (Moore)

1865. *Ismene sasivarana* Moore, *Proc.zool.Soc.London* : 784.

1949. *Matapa sasivarana*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 331.

Material examined : 1 ex. : Shillong, nov. 1879.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Indo-China, Malaya, Sumatra.

38. *Matapa purpurascens* Elwes & Edwards

1897. *Matapa purpurascens* Elwes & Edwards, *Trans.zool.Soc.London*, **14** : 209, pl.20, fig.1.

1949. *Matapa purpurascens*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 331.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

Genus *Pudicita* de Nicéville

1895. *Pudicita* de Nicéville, *Journ. bombay nat.Hist.Soc.*, 9 : 379.

1949. *Pudicita*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 35.

39. *Pudicita pholus* (de Nicéville)

1889. *Parnara pholus* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, **4** : 172.

1949. *Pudicita pholus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 332.

Diagnostic characters : Brown; head and scapulae dark green iridescence; wings : yellow with hyaline spots.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam and Nagaland (Naga Hills).

Genus *Pirdana* Distant

1886. *Pirdana* Distant, *Rhopalocera Malayana* : 369; 376.

1949. *Pirdana*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 36.

40. *Pirdana hyela* (Hewitson)

1867. *Hesperia hyela* Hewitson, *Trans.ent.Soc.London*, : 24.

1949. *Pirdana hyela*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 338.

40a. *Pirdana hyela rudolphii* Elwes & de Nicéville

1886. *Pirdana rudolphii* Elwes & de Nicéville, *Journ.Asiat.Soc.Bengal*, : 438, pl.20, fig.6.

1949. *Pirdana hyela rudolphii*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 338.

Diagnostic characters : Forewing : upperside paler upto vein Cu1b; hindwing : upperside tornal area orange, underside veins edged with pale shining blue green colour.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills); Elsewhere : Burma, Thailand, Malaya.

Genus *Cyrina* Hemming

1939. *Cyrina* Hemming, *Proc.R.ent.Soc.London*, **8** : 39.

1949. *Cyrina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 36.

41. *Cyrina cyrina* (Hewitson)

1876. *Hesperia cyrina* Hewitson, *Ann.Mag.nat.Hist.Soc.*, (4) **18** : 450.

1939. *Cyrina cyrina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 339.

41a. *Cyrina cyrina cyrina* (Hewitson)

1876. *Hesperia cyrina* Hewitson, *Ann. Mag.nat.Hist.Soc..*, (4) **18** : 456.

1949. *Cyrina cyrina cyrina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus. (nat.Hist.)* : 339-340.

Diagnostic characters : Palpi : black; legs : densely fringed and yellow at ends; wings : with large and conspicuous hyaline spots; hind-wing : underside submarginal yellow border.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Bhutar

Genus *Zela* de Nicéville

1895. *Zela* de Nicéville, Journ. Bombay nat. Hist. Soc., **9** : 386.

1949. *Zela*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 34.

42. *Zela zeus* de Nicéville

1895. *Zela zeus* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, **9** : 388.

1949. *Zela zeus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 323.

42a. *Zela zeus optimus* (Fruhsterfer)

1911. *Lotongus optimus* Furhstorfer, *Iris*, p.18.

1949. *Zela zeus optimus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 323.

Distribution : India : Meghalaya (Khasi Hills) and Assam; Elsewhere : Burma, Thailand.

Group Gegenes

Key to genera of the group Gegenes

1. Antennae with more segments of nudum on club than on apiculus ..... ***Parnara***
   Antennae with at least as many as segment on apiculus as on club 2
2. Antennae not reaching to mid costa. Forewing vein Cu1b opposite to vein R_1..... 3
   Antennae equal to half costa. Forewing vein Cu1b before origin of vein R_1 4
3. Underside of hindwing without cell spot, mid tibiae unspined ..... ***Borbo***
   Underside of hindwing with cell spot, mid tibiae heavily spined ..... ***Pelopidas***
4. Antennal apiculus more obtuse and palpi less flattened ..... ***Polytremis***
   Antennal apiculus right angled, palpi much stouter 5
5. Mid tibiae unspined ..... ***Caltoris***
   Mid tibiae heavily spined ..... ***Baoris***

Genus *Parnara* Moore

1881. *Parnara* Moore, *Lep.Ceylon*, 1 : 166.

1949. *Parnara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 43.

43. *Parnara guttatus* (Bremer & Grey)

1853. *Eudamus guttatus* Bremer & Gray, *Schmett. N.China*, : 10.

1949. *Parnara guttatus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 433.

Diagnostic characters : Forewing : with a spot in space Cu1b with its edge under or after the origin of vein Cu1b; hindwing : always with a straight row of four discal spots.

Material examined : 3 exs. : East Garo Hills, Anogira, 7.xi.1973, Songsok, 18.xi.1973; Damra, 20.xi.1973 (Coll. S. Biswas).

Distribution : India : Meghalaya (East Garo Hills), Sikkim and N.W. Himalayas; Elsewhere : N. China, Japan, Korea, Linkin Island.

** 44. *Parnara ganga* Evans

1937. *Parnara ganga* Evans, *A Catalogue of the African Hesperiidae. Brit.Mus.(nat.Hist.)* : 83.

1949. *Parnara ganga*, Evans, *A Catalogue of the African Hesperiidae. Brit.Mus.(nat.Hist.)* : 83.

1949. *Parnara ganga*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus. (nat.Hist)* : 434.

Distribution : India : Meghalaya (Khasi Hills), Central India, West Bengal, Bihar, Nagaland, Manipur and Assam (Cachar); Elsewhere : Burma, China and Malaya.

Genus *Borbo* Evans

1949. *Borbo* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

45. *Borbo bevani* (Moore)

1878. *Hesperia bevani* Moore, *Proc.zool.Soc.London*, : 688.

1949. *Borbo bevani*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* 437.

Diagnostic characters : Wings : broad; forewing : with two discal, two apical and a upper cell spot; hindwing : underside greenish olive, spot variable.

Material examined : 3 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and Kashmir to Kumaon; Elsewhere : Bhutan, Indo-China, Malayan subregion, Burma, Thailand.

Genus *Pelopidas* Walker

1870. *Pelopidas* Walker, *Ent.*, 5 : 56.

1949. *Pelopidas*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

Key to species of the genus *Pelopidas* Walker

1. Upperside of forewing with discal stigma 2
   Upperside of forewing without discal stigma 3
2. Lower end of stigma not nearer to base more or less under origin of vein Cu1a ..... *sinensis*
   Lower end of stigma nearer to base and well before origin of vein Cu1a ..... *mathias*
3. Upperside of forewing spots white, cell spots usually conjoined; uncus arms divergent ..... *assamensis*
   Upperside of forewing spots pale yellow, cell spots separate; uncus arms connivent ..... *conjunctana*

46. *Pelopidas sinensis* (Mabille)

1877. *Gegenes sinensis* Mabille, *Bull.Soc.zool.Fr.* : 232.

1949. *Pelopidas sinensis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 438.

Material examined : 4 exs. : Khasi Hills, Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and N.W. Himalaya; Elsewhere : S.W. China, Burma.

* 47. *Pelopidas mathias* (Fabricius)

1798. *Hesperia mathias* Fabricius, *Ent.Syst.Symbol*, : 433.

1949. *Pelopidas mathias*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 441.

Material examined : 4 exs. : East Garo Hills, Sangsok giri, 13.xi. 1973; Sangsok, 17.xi.1973; Damru, 20.xi.1973 (Coll. S.Biswas), 1 ex. : East Khasi Hills, Shillong, Rissa Colony, 21.ix.1975 (Coll. K. Deb).

Distribution : Oriental including India : Meghalaya (East Khasi Hills & East Garo Hills), Sikkim, Assam, South India, Maharashtra, Central India, Rajasthan, Punjab, Uttar Pradesh, Jammu & Kashmir and Central Nicobars); Elsewhere : Papuan and Australian regions.

48. *Pelopidas assamensis* (Wood Mason & de Nicéville)

1882. *Parnara assamensis* Wood Mason & de Nicéville, *Journ.Asiat.Soc.* Bengal : 65.

1949. *Pelopidas assamensis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus. (nat.Hist.)* : 65.

Material examined : 5 exs. : Khasi Hills, Shillong, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand, Indo-China, Malaya.

49. *Pelopidas conjuncta* (Herrich-Schäffer)

1869. *Goniloba conjuncta* Herrich-Schäffer, *Corr.Blatt.zool.min.Ver.Regensb.* : 195.

1949. *Pelopidas conjuncta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 443.

49a. *Pelopidas conjuncta conjuncta* (Herrich-Schäffer)

1869. *Goniloba conjuncta* Herrich-Schäffer, *Corr.Blatt.zool.min.ver.Regensb* : 195.

1949. *Pelopidas conjuncta conjunctas*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 443.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Assam and Central Nicobar; Elsewhere : Burma, Taiwan, Malayan subregion.

Genus *Polytremis* Mabille

1904. *Polytremis* Mabille, *In Wytsmans, Genera Insectorum*, 17 (B) : 136.

1949. *Polytremis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

Key to species of the genus *Polytremis* Mabille

1. Palpi third segment slender, protruding, semi-errect; antennal club obtuse; upperside of hindwing with inconspicuous hyaline spots ..... *lubricans*

Palpi third segment short, stout and errect; antennal club angled; upperside of hindwing with conspicuous spots 2

2. Hindwing tornal cilia white; uncus and gnathos convergent.....*discreta*
Hindwing tornal cilia yellow; uncus and gnathos divergent.....eltola

50. *Polytremis lubricans* (Herrich-Schaffer)

1869. *Gonilba lubricans Herrich-Schaffer, Corr.Blatt.zool.min.ver.Regensb.* : 195.

1949. *Polytremis lubricans*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 446.

50a. *Polytremis lubricans lubricans* (Herrich-Schäffer)

1869. *Goniloba lubricans* Herrich-Schäffer, *Corr.Blatt.zool.min.ver.Regensb.* : 195.

1949. *Polytremis lubricans lubricans*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus. (nat. Hist.) : 446.

Material examined : 1 ex. : East Khasi Hills, old Barapani, 28.vi. 1970 (Coll. S. Khera); 2 exs. : East Khasi Hills, old Barapani, 28.vi. 1970; Hills, Lamgiri, 5.xi. 1973; 1 ex. : East Garo Hills, 17.xi.1973 (Coll. S. Biswas).

Distribution : India : Meghalaya (East Khasi Hills, East Garo Hills), South India, Bihar and Andaman; Elsewhere : Burma, Malayan subregion, China.

51. *Polytremis discreta* (Elwes & Edwards)

1897. *Parnara discreta* Elwes & Edwards, *Trans.zool.Soc.London*, **14** : 282, fig.16.

1949. *Polytremis discreta*, Evans, *A Catalogue of Hesperiidae from Europe Asia and Australia in Brit.Mus.(nat.Hist.)* : 447.

51a. *Polytremis discreta discreta* (Elwes & Edwards)

1897. *Parnara discreta*, Elwes & Edwards, *Trans.zool.Soc.London*, **14** : 282, fig. 16.

1949. *Polytremis discreta discreta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 447.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and N.W. Himalayas; Elsewhere : Burma, North Siam, Thailand, Malaya, China.

52. *Polytremis eltola* (Hewitson)

1869. *Hesperia eltola* Hewitson, *Exot.Butt.*, **4**, pl.4, fig.40.

1949. *Polytremis eltola*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 447.

52a. *Polytremis eltola eltola* (Hewitson)

1869. *Hesperia eltola* Hewitson, Exot.Butt., **4**, pl.4, fig.40.

1949. *Polytremis eltola eltola*, Evans, *A Catalogue of Hesperiidae Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 447.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, West Bengal and N.W. Himalayas; Elsewhere : Burma.

Genus *Caltoris* Swinhoe

1893. *Caltoris* Swinhoe, *Trans.ent.Soc.London*, : 323.

1949. *Caltoris*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

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 spot 4
2. Antennal club aberrant ..... *auriciliata*
— Antennal club normal 3
3. Underside of hindwing chocolate or scaled with ochreous brown, cuiller rounded, valva projecting ..... *cahira*
— Underside of hindwing densely overlaid with ochreous brown scales and often with purple flush, cuiller produced, valva not projecting ..... *cormasa*
4. Underside of forewing without tuft of hairs 5
Underside of forewing with an upturned tuft of dark hairs from dorsum near base ..... *plebia*
5. Underside of hindwing densely overlaid with ochreous brown scales ..... *kumara*
Underside of hindwing not overlaid with ochreous brown scales ..... *tulsi*

53. *Caltoris auriciliata* (Elwes & Edwards)

1897. *Parnara auriciliata* Elwes & Edwards, *Trans.zool.Socl.London.*, **14** : 278, fig.23.

1949. *Caltoris auriciliata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 451.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Manipur and Nagaland.

54. *Caltoris cahira* (Moore)

1877. *Hesperia cahira* Moore, *Proc.zool.Soc.London* : 593.

1949. *Caltoris cahira*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 452.

* 54a. *Caltoris cahira austeni* (Moore)

1883. *Baoris austeni* Moore, *Proc.zool.Soc.London* : 533.

1949. *Caltoris cahira austeni*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 452.

Diagnostic characters : Dark in colour and small in size. Upperside of forewing spots well marked.

Material examined : 3 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam and Manipur; Elsewhere : Taiwan, Burma, Thailand, Indo-China, Malaya.

55. *Caltoris cormasa* (Hewitson)

1876. *Hesperia cormasa* Hewitson, *Ann.N.H.*. (4) 18 : 457.

1949. *Caltoris cormasa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 454.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Burma, Thailand, Malayan subregion, China.

56. *Caltoris plebia* (de Nicéville)

1887. *Parnara plebia* de Nicéville, *Proc.zool.Soc.London*, : 466, pl.60, figs. 2

1949. *Caltoris plebia*, Evans, *A Catalogue of Hesperiidae from Europe Asia and Australia in Brit.Mus.(nat.Hist.)* : 456.

Distribution : India : Meghalaya (Khasi Hills), Sikkim; Elsewhere : Burma, Malayan subregion.

57. *Caltoris kumara* (Moore)

1878. *Hesperia kumara* Moore, *Proc.zool.Soc.London*, : 687.

1949. *Caltoris kumara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 454.

57a. *Caltoris kumara moorei* (Evans)

1926. *Baoris moorei* Evans, *Journ.Bombay nat.Hist.Soc.*, 31 : 634.

1949. *Caltoris kumara moorei*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 455.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

58. *Caltoris tulsi* (de Nicéville)

1883. *Parnara tulsi* de Nicéville, *Journ.Asiat.Soc.Bengal*, 52 (2) : 86, no.30, pl.X, fig.1.

1949. *Caltoris tulsi*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 455.

58a. *Caltoris tulsi tulsi* (de Nicéville)

1883. *Parnara tulsi* de Nicéville, *Journ.Asiat.Soc.Bengal*, 52 (2) : 86, no.30, pl.X, fig.1.

1949. *Caltoris tulsi tulsi*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 455.

Material examined : 3 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Bhutan, Burma, Thailand, Malaya.

Genus *Baoris* Moore

1881. *Baoris* Moore, *Lep.Ceylon*, 1 : 165.

1949. *Baoris*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

59. *Baoris farri* (Moore)

1878. *Hesperia farri* Moore, *Proc.zool.Soc.London* : 688.

1949. *Baoris farri*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 448.

Diagnostic characters : Forewing : upperside with white hyaline spots, cell spots conjoined, underside with polished grey dorsal area in the centre of which lying an oval brand in male and with pale super scaling; hindwing : upperside of male with a black recumbent paint brush overlying a scent pouch in cell.

Material examined : 1 ex. : Shillong Botanical Garden, 16.viii.1967 (Coll. R.K.Varshney); 1 ex. East Garo Hills, Songsok, 17.xi.1973 (Coll. S. Biswas); 1 ex. West Garo Hills, Tura, Walbakgri, 220 m., 5.x.1991 (Coll. R.K.Varshney, I.J. Gupta and S. Ghosh).

Distribution : Oriental region including India : Meghalaya (East Khasi Hills, East and West Garo Hills), Sikkim, Assam, South India, Central India, Uttar Pradesh, Andaman and Nicobar Islands.

Genus *Iton* de Nicéville

1895. *Iton* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, 9 : 399.

1949. *Iton*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 44.

60. *Iton semamora* (Moore)

1865. *Hesperia semamora* Moore, *Proc.zool.Soc.London* ; 791.

1949. *Iton semamora*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 457.

60a. *Iton semamora semamora* (Moore)

1865. *Hesperia semamora* Moore, *Proc.zool.Soc.London* : 791.

1949. *Iton semamora semamora*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 457.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and West Bengal; Elsewhere : Burma, Thailand, Malaya.

Group Taractocera

Key to genera of the group

1. Palpi third segment long, protruding and thin as antennal shaft 2
— Palpi third segment short and stout, never so thin as antennal shaft 4
2. Antennal club flattened and palpi needle-like ..... ***Taractocera***
— Antennal club not flattened, palpi not so thin 3
3. Forewing vein Cu1b nearer to base than to end cell, vein M_3 much nearer to Cu1a than to M_2, antennae longer than half of wing, upperside of forewing without brand .... ***Oriens***
— Forewing vein Cu1b nearer to cell than to base, vein M_3 not nearer to vein Cu1a than to vein M_2, antennae equal to half costa, upperside of forewing with a brand ..... ***Potanthus***
4. Forewing vein Cu1b nearer to end cell than to base, upperside of forewing always with an unbroken discal stigma in male, uncus divided ..... ***Telicota***
— Forewing vein Cu1b nearer to base than to end cell, upperside of forewing without brand, uncus undivided ..... ***Cephrenes***

Genus *Taractocera* Butler

1869. *Taractocera* Butler, *Cat.Lep.Fabr.* : 279.

1949. *Taractocera*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 40.

61. *Taractocera maevius* (Fabricius)

1793. *Hesperia maevius* Fabricius, *Ent.Syst.*, 3 : 352.

1949. *Taractocera maevius*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 357.

61a. *Taractocera maevius sagara* (Moore)

1865. *Pamphila sagara* Moore, *Proc.zool.Soc.London* : 792.

1949. *Taractocera maevius sagara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 358.

Diagnostic characters : Hindwing : underside grey, veins white.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : Oriental region including India : Meghalaya (Khasi Hills), Sikkim, Assam, South India, Madhya Pradesh and North West India.

Genus *Oriens* Evans

1932. *Oriens* Evans, *Identification of Indian, Butterflies* : 312, 400.

1949. *Oriens*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 40.

* 62. *Oriens gola* (Moore)

1877. *Padraona gola* Moore, Proc.zool.Soc.London, : pl.58, fig.9.

1949. *Oriens gola*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 40.

* 62. *Oriens gola* (Moore)

1877. *Padraona gola* Moore, Proc.zool.Soc.London, : pl.58, fig.9.

1949. *Oriens gola*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 372.

Diagnostic characters : Forewing : with an oblique discal irregular sinuous broader golden yellow band which is bent before apex and indented at end of cell; hindwing : with an median discal golden yellow band and with some hairs at base, cilia edged with golden yellow; underside of both wings with a blackish streak at end of cell.

Material examined : 1 ex. : Garo Hills, Songkhama, 5.xi.1973 **(Coll. S.Biswas).**

Distribution : India : Meghalaya (Garo Hills), Sikkim, Assam **(Cachar)**, Orissa, **Tamil-Nadu** (Nilgiris) and Andamans.

Genus *Potanthus* Scudder

1872. *Potanthus* Scudder, *4th Ann.Peabody Acad.Sci.*, : 75.

1949. *Potanthus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 40.

Key to species of the genus *Potanthus* Scudder

1. Uncus with end rounded or slightly scalloped ..... *confucius*
   Uncus with end tapered 2
2. Upperside of forewing marking narrower and tawny; underside of hindwing dull brownish; band defined by dark veins and outwardly edged by dark bars. ..... *.pseudomaesa*
   Upperside of forewing marking broad and pale, underside of hindwing yellow band defined by dull dark bars ..... *sita*

63. *Potanthus confucius* (Felder)

1862. *Pamphila confucius* Felder, *Wien.Ent.Mon.*, **6** : 62.

1949. *Potanthus confucius*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 382.

63a. *Potanthus confucius dushta* (Fruhstorfer)

1911. *Padraona dushta* Fruhstorfer, *Iris*, : 39.

1949. *Potanthus confucius dushta*, Evans, *A Catalogue of Hasperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 382.

Diagnostic characters : Small species with broad markings; forewing : spots in space M_3 and R_5 with discal band; hindwing; underside brown.

Material examined : 2 exs : East Khasi Hills, Shillong, Umiam, 1000m., 19.ix.1991; 1 ex. : West Garo Hills, Kherapara, 200m.,4.x.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh); 2 exs. : Jaintia Hills, Momenthu village, Jawai, 23.ix.1991 (Coll.A.K. Hazra & Party).

Distribution : Oriental region including India : Meghalaya (East Khasi Hills, West Garo Hills, Jaintia Hills), Sikkim and Assam.

64. *Potanthus pseudomaesa* (Moore)

1881. *Padraona pseudomaesa* Moore, *Lep.Ceylon.*, **1** : 170.

1949. *Potanthus pseudomaesa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 377.

64a. *Potanthus pseudomaesa clio* (Evans)

1932. *Padraona clio* Evans, *Identification of Indian Butterflies* : 402.

1949. *Potanthus pseudomaesa clio*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 377.

Diagnostic characters : Paler, upperside of hindwing with spots in spaces M_1 and R_2, underside with band more contrasting and defined by black spots.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, N.W. Himalayas (Kashmir to Simla); Elsewhere : Burma, Malaya, China.

65. *Potanthus sita* (Evans)

1932. *Padraona sita* Evans, *Identification of Indian Butterflies* : 403.

1949. *Potanthus sita*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 378.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Assam; Elsewhere : Burma

Genus *Telicota* Moore

1881. *Telicota* Moore, *Lep. Ceylon.*, **1** : 169.

1949. *Telicota*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 41.

* 66. *Telicota augius* (Linnaeus)

1767. *Papilio augius* Linnaeus, *Syst.Nat.*, **1** (2) : 794.

1949. *Telicota augius*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 394.

Diagnostic characters : Wings : produced; forewing upperiside with broad tawny area, base of wings unshaded, band joined to the apical spot; hind wing : underside more or less tawny, band broad but inconspicuous.

Material examined : 2 exs. : Garo Hills, Deoripthar, 21.xi.1973 (Coll. S. Biswas).

Distribution : India : Meghalaya (Garo Hills), Nagaland; Elsewhere : Malayan subregion, South Burma.

Genus *Cephrenes* Waterhouse & Lyell

1914. *Cephrenes* Waterhouse & Lyell, *Butterflies of Australia* : 206.

1949. *Cephrenes*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus. (nat.Hist.)* : 41.

67. *Cephrenes chrysozona* (Plotz)

1883. *Telicota chrysozona* Plotz, *Stett.Ent.Ztg.*, **44** : 288.

1949. *Cephrenes chrysozona*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 407.

Diagnostic characters : Forewing : upperside tawny colour with central dark band solid throughout in male tawny marking suffused with dark scaling in female hindwing : underside yellow to ochreous brown.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : Oriental region including India : Meghalaya (Khasi Hills), Sikkim, Assam, Andamans; Elsewhere : Burma, Indo-china.

Group Hesperia

Genus *Ochlodes* Scudder

1872. *Ochlodes* Scudder, *Ann.Rep.Transtees Peabody Acad.Sci.*, 4 : 78.

1949. *Ochlodes*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.* (nat.Hist.) : 38.

68. *Ochlodes subhyalina* Bremer & Gray

1949. *Ochlodes subhyalina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 354.

Diagnostic characters : Wings : rounded; forewing : underside with a small spot in space 1b and sharply defined; hindwing : underside veins not darkened.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills) and Sikkim.

Remarks. : Original reference could not be traced.

69. *Ochlodes siva* (Moore)

1878. *Pamphila siva* Moore, *Proc.zool.Soc.London*, : 672.

1949. *Ochlodes siva*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 355.

** 69a. *Ochlodes siva siva* (Moore)

1878. *Pamphila siva* Moore, *Proc.zool.Soc.London* : 672.

1949. *Ochlodes siva siva*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 356.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, Uttar Pradesh (Mussorie). Elsewhere : North Burma, Sudan.

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***
   Forewing vein 1A acutely bisinuate near base, often with hyaline spot dorsally .... ***Hasora***
3. Wings upperside more or less blue or green, without hyaline spot ..... ***Choaspes***
   Wings upperside not blue or green with hyaline spot ..... ***Badamia***

Genus ***Bibasis*** Moore

1881. *Bibasis* Moore, *Lep. Ceylon*, **1** : 160.

1949. *Bibasis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 8.

Key to species of the genus ***Bibasis*** Moore

1. Hindwing underside more or less striped, small black spot at base of space R_4 2
   Hindwing underside without stripe, no spot in space R_4 ..... ***sena***
2. Underside of forewing with discal striping not reaching termen at apex 3
   Underside of forewing with discal striping reaching upto termen at apex 6
3. Forewing vein Cu1a nearer to origin of vein Cu1b than to origin of vein M_3 4
   Forewing vein Cu1a nearer to origin of vein M_3 than to origin of vein Cu1b ..... *harisa*
4. Forewing dorsally with a conspicuous brand 5
   Forewing without brand ..... *anadi*
5. Brand situated in basal area covering origin of vein Cu1b ..... *oedipodea*
   Brand situated in central area rather than basal, origin of vein Cu1b clear ..... *jaina*
6. Hindwing cilia ochreous ..... *vasutana*
   Hindwing cilia white 7
7. Forewing vein Cu1a nearer to vein Cu1b than to M_3, hindwing underside brown with green veins and stripes ..... *amara*
   Forewing vein Cu1a nearer to vein M_3 than to vein Cu1b, hindwing underside greenish with broad pale green stripes between the veins ..... *gomata*

70. ***Bibasis sena*** (Moore)

1865. *Goniloba sena* Moore, *Proc.zool.Soc.London* : 778.

1949. *Bibasis sena*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 52.

70a. ***Bibasis sena sena*** (Moore)

1865. *Goniloba sena* Moore, *Proc.zool.Soc.London* : 778.

1949. *Bibasis sena sena*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 52.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, N.W. Himalayas, South India and Andamans; Elsewhere : Sri Lanka, Burma, Thailand, China.

71. *Bibasis harissa* (Moore)

1865. *Ismene harisa* Moore, *Proc.zool.Soc.London*, : 782.

1949. *Bibasis harisa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 48.

71a. *Bibasis harisa harisa* (Moore)

1865. *Ismene harisa* Moore, *Proc.zool.Soc.London*, : 782.

1949. *Bibasis harisa harisa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 48.

Material examined : 4 exs. : Khasi Hills, no other data.

Distribution : Oriental region including India : Meghalaya (Khasi Hills), Sikkim, Assam and Andamans.

72. *Bibasis anadi* (de Nicéville)

1883. *Choaspes anadi* de Nicéville, *Journ.Asiat.Soc.Bengal*, **52** (2) 83, pl. 10, fig.6.

1949. *Bibasis anadi*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 48.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand.

73. *Bibasis oedipodea* (Swainson)

1820-21. *Ismene oedipodea* Swainson, *Zool.Illust.*, **1** : pl.16.

1949. *Bibasis oedipodea*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 45.

73a. *Bibasis oedipodea belesis* (Mabille)

1876. *Ismene belesis* Mabille, *Bull.Ann.Soc.Ent.Fr.* (5) **4** : IX & 260.

1949. *Bibasis oedipodea belesis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 45.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and N.W. Himalayas (Kangra, Kumaon); Elsewhere : Bhutan, Burma, Thailand, China.

74. *Bibasis jaina* (Moore)

1865. *Ismene jaina* Moore, *Proc.zool.Soc.London*, : 782.

1949. *Bibasis jaina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist)* : 46.

74a. *Bibasis jaina jaina* (Moore)

1865. *Ismene jaina* Moore, *Proc.zool.Soc.London*, : 782.

1949. *Bibasis jaina jaina*, Evans, *A Catalgoue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 47.

Material examined : 9exs. : Khasi Hills, Shillong, no other data; 1 ex. : Shillong, Risa Colony, 6.viii.1973 (Coll.R.S. Giri).

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and N.W. Himalayas (Dehradun, Kumaon); Elsewhere : Burma.

75. *Bibasis vasutana* (Moore)

1865. *Ismene vasutnana* Moore, *Proc.zool.Soc.London* : 783.

1949. *Bibasis vasutnana*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 49.

Material examined : 6 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Nepal.

76. *Bibasis amara* (Moore)

1865. *Ismene amara* Moore, *Proc.zool.Soc.London*, : 783.

1949. *Bibasis amara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 50.

Material examined : 4 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, West Bengal and Andaman; Elsewhere : Burma, Thailand, China.

77. *Bibasis gomata* (Moore)

1865. *Ismene gomata* Moore, *Proc.zool.Soc.London* : 783.

1949. *Bioasis gomata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 50.

77a. *Bibasis gomata gomata* (Moore)

1865. *Ismene gomata* Moore, *Proc.zool.Soc.London*, : 783.

1949. *Bibasis gomata gomata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 50.

Material examined : 4 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam and West Bengal.

Genus *Hasora* Moore

1881. *Hasora* Moore, *Lep.Ceylon*, **1** : 159.

1949. *Hasora*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 8.

Key to species of the Genus *Hasora* Moore

1. Underside of hindwing without dark tornal lobe ..... *anura*
   Underside of hindwing with more or less dark tornal lobe 2
2. Style of claspers bifid 3
   Style of claspers trifid ..... *khoda*
3. Underside of hindwing with two pale spots ..... *badra*
   Underside of hindwing without spot ..... *vitta*

78. *Hasora anura* de Nicéville

1889. *Hasora anura* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, **6** : 170, pl.6, fig.5.

1949. *Hasora anura*, Evans, *A Catalogue of Hesperiidae from Europe Asia and Australia in Brit.Mus.(nat.Hist.)* : 57.

* 78a. *Hasora anura anura* de Nicéville

1889. *Hasora anura* de Nicéville, *Journ.Bombay nat.Hist.Soc.*, **6** : 170, pl.6, fig.5.

1949. *Hasora anura anura*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 57.

Material examined : 1 ex : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Nagaland and Manipur; Elsewhere : North Burma.

79. *Hasora khoda* (Mabille)

1876. *Ismene khoda* Mabille, *Bull.Royal Ass.Soc.Ent.Fr.*, (5) **6** : 25 & 262.

1949. *Hasora khoda*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 69.

79a. *Hasora khoda coulteri* Wood MAson & de Nicéville

1886. *Hasora coulteri* Wood Mason & de Nicéville, *Journ.Asiat.Soc.Bengal*, 55 (2) : 378.

1949. *Hasora khoda coulteri*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 70.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam and Andamans; Elsewhere: Burma.

80. *Hasora badra* (Moore)

1865. *Goniloba badra* Moore, *Proc.zool.Soc.London*, : 778.

1949. *Hasora badra badra*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 66.

80a. *Hasora badra badra* (Moore)

1865. *Goniloba badra* Moore, *Proc.zool.Soc.London* : 778.

1949. *Hasora badra badra*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.HIst.)* : 66.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, South India, Andaman and Nicobar Island; Elsewhere : Burma, Thailand, China, Taiwan, Malayan subregion.

81. *Hasora vitta* Butler

1870. *Hasora vitta* Butler, *Trans.ent.Soc.London* : 498.

1949. *Hasora vitta*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 68.

81a. *Hasora vitta indica* Evans

1932. *Hasora indica* Evans, *Identification of Indian Butterflies* : 315.

1949. *Hasora vitta indica*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 68.

Material examined : 1 ex. : Shillong, no other data.

Distribution : Oriental region including India : Meghalaya (East Khasi Hills), Sikkim, Assam and South India.

Genus *Choaspes* Moore

1881. *Choaspes* Moore, *Lep.Ceylon*, **1** : 158.

1949. *Choaspes* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 8.

Key to species of the genus *Choaspes* Moore

1. Upperside of forewing of male with a brand ..... *plateni*
   Male without brand 2
2. Cuiller of clasper with rounded tip and a beak ..... *benjaminii*
   Cuiller of clasper without beak on ventral side 3
3. Claspers ending in a rounded disc and without curved projection on outer side ... *xanthopogon*
   Claspers not ending in a rounded disc but broadening outwardly and with a large curved projection on outer side ..... *hemixanthus*

82. *Choaspes plateni* (Staudinger)

1888. *Rhopalocampa plateni* Staudinger, *Exot.Tagfalter*, p.293.

1949. *Choaspes plateni*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.) : 73.

82a. *Choaspes plateni stigmata* Evans

1932. *Choaspes stigmata* Evans, *Identification of Indian Butterflies : 320.*

1949. *Chaospes plateni stigmata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.) : 73.*

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim; Elsewhere : Tonkin, Taiwan.

83. *Choaspes benjamini* (Guerin)

1843. *Thymele benjamini* Guerin, *Delesserts Souv.voy.Ind.*, **2** : 79, pl.22, fig.2, 2a.

1949. *Choaspes benjaminii*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 74.

Material examined : 1 ex. : Khasi Hills, Shillong, Kenches Terrace, 24.viii.1967 (Coll. R.K. Varshney).

Distribution : India : Meghalaya (East Khasi Hills), South India; Elsewhere : Sri Lanka.

84. *Choaspes xanthopogon* (Kollar)

1844. *Hesperia xanthopogon* Kollar, *In Hugels Kaschmir und das Reich der sieck*, **4** : 453, pl.18, fig.1, 2.

1949. *Choaspes xanthopogon*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 76.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, N.W. Himalayas (Kashmir to Kumaon); Elsewhere : Nepal, Japan, W. China.

85. *Choaspes hemixanthus* Rothschild & Jordon

1903. *Choaspes hemixanthus* Rothschild & Jordon, *Mov.zool., pl.xi, fig.3.*

1949. *Choaspes hemixanthus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 76.

85a. *Choaspes hemixanthus furcata* Evans

1932. Choaspes *furcata* Evans, *Identification of Indian Butterflies* : 321.

1949. *Choaspes hemixanthus furcata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 77.

Diagnostic characters : Forewing : upperside pearly green upto middle, whence it is black with some indigo reflexation; hindwing : green colour extending to a black border along costa and termen.

Material examined : 2 exs. : Shillong, Khasi Hills, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Assam; Elsewhere : Bhutan, Peruk, Thailand, N. China.

Genus *Badamia* Moore

1881. *Badamia* Moore, *Lep. Ceylon*, **1** : 157.

1949. *Badamia*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 8.

* 86. *Badamia exclamationis* (Fabricius)

1775. *Papilio exclamationis* Fabricius, *Syst.Ent.*, : 530.

1949. *Badamia exclamationis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 72.

Diagnostic characters : Wings : dorsally dark brown, pale at base; forewing : upperside with large whitish hyaline spots in space M_3 and Cu1a, Cu1a and Cu1b and also in cell; hindwing; ventrally pale brown with dark brown tornus surmounted by whitish subtornal spot.

Material examined : 1 ex. : Shillong, Kenche's Terrace, 28.viii. 1968 (Coll. S. Biswas).

Distribution : Oriental region including india : Meghalaya (East Khasi Hills), Sikkim, Assam and Andamans; Elsewhere : Papuan, Australian and Hawaian regions.

Key to groups of the subfamily Pyrginae

Forewing cell generally long, palpi second segment errect ..... Celaenorrhinus Group
Forewing cell generally short, palpi second segment porrect ..... Tagiades Group

Group Celaenorrhinus

Key to genera of the group Calaenorrhinus

1. Hindwing vein M_2 tubular, hind tibiae with hair pencil..... ***Capila***
   Hindwing vein M_2 not tubular, hind tibiae without hair pencil 2
2. Antennae arcuate; legs without tibial hair pencil; uncus undivided ..... ***Lobocla***
   Antennae obtuse; legs with tibial hair pencil, uncus divided ..... ***Celaenorrhinus***

Genus *Capila* Moore

1865. *Capila* Moore, *Proc. zool. Soc. London*, : 785.

1949. *Capila*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 10.

Key to species of the genus *Capila* Moore

1. Upperside of forewing with conspicuously separated hyaline discal spots ..... *phanacus*
— Upperside of forewing without conspicuously separated hyaline discal spots 2
2. Upperside of forewing with hyaline apical spots ..... *pennicillatum*
— Upperside of forewing without apical spots 3
3. Male above head, thorax and base of wings mostly white ..... *pieridoides*
— Male above head, thorax and base of wings orange ..... *jayadeva*

87. *Capila phanaeus* (Hewitson)

1867. *Eudamus phanaeus* Hewitson Deser, Hesperiid : 114.

1949. *Capila phaneus*, Evans. *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 85.

87a. *Capila phanaeus lalita* (Doherty)

1886. *Erionota lalita* Doherty, *Journ. Asiat. Soc. Bengal* : 263.

1949. *Capila phanaeus lalita*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 85.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution India : Meghalaya (Khasi Hills) and Manipur; Elsewhere : N.W. Thailand.

87b. *Capila phanaeus pudicia* (Evans)

1949. *Capila phanaeus fudicia*, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in *Brit. Mus.* (nat. Hist.) : 86.

88. *Capila pennicillalum* (de Nicéville)

1892. *Crossiura penniciiiatum* de Nicéville, *Journ. Bombay nat. Hist. Soc.*, **6** : 351.

1949. *Capilla pennicillatum*, Evans, *A catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 86.

* 88a. *Capila pennicillatum pennicillatum* (de Nicéville)

1892. *Crossiura pennicillatum* de Nicéville, *Journ. Bombay nat. Hist. Soc.*, **6** : 351.

1949. *Capila pennicillatum pennicillatum*, Evans. *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 86.

Material examined : 4 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills).

89. *Capila pieridoides* (Moore)

1878. *Calliana pieridoides* Moore, *Proc. zool. Soc. London,* : 687. pl. 45, fig. 2.

1949. *Capila pieridoides,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 86.

* 89a. *Capila pieridoides pieridoides* (Moore)

1878. *Calliana pieridoides* Moore, *Proc. zoool. soc. London,* : 687, pl. 45, fig. 2.

1949. *Capila pieridoides pieridoides,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 86.

Material examined; 2 exs. : Khasi Hills, no other data.

Distribution — India : Meghalaya (Khasi Hills) and Manipur (Lushai Hills).

90. *Capila Jayadeva* (Moore)

1857. *Ismene jayadeva* Moore, *Cat. Lep. E.I.C.,* 1 : 248.

1949. *Capila jayadeva,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 87.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : Oriental region including India : Meghalaya (Khasi Hills), Sikkim and Assam.

Genus *Lobocla* Moore

1884. *Lobocla* Moore, *Journ. Asiat. Soc. Bengal,* 53 (2) : 51.

1949. *Lobocla,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 11.

91. *Lobocla liliana* (Atkinson)

1871. *Plesioneura liliana* Atkinson, *Proc. zool, Soc. London,* : 216, pl. 12, fig. 2.

1949. *Lobocla liliana,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 88.

91a. *Lobocla liliana liliana* (Atkinson)

1871. *Plesioneura liliana* Atkinson, *Proc. zool. Soc. London,* : 216, pl. 12, fig. 2.

1949. *Lobocla liliana liliana,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 88.

Diagnostic characters : Palpi : grey below; forewing : upperside dark fuliginous brown with three apical spots in spaces M_1, R_5 and R_4, band broad, hindwing : without marking.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand, Indo-China.

Genus *Celaenorrhinus* Hübner

1819. *Celaenorrhinus* Hübner, *Verz. bek. Schmet.*, 106.

1949. *Celanorrihinus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 11.

Key to species of the genus Celaenorrhinus Hübner

1. Upperside of forewing white with central band or spot 2
— Upperside of forewing yellow to orange with central band ..... *dhanada*
2. Upperside of forewing with a pale or dark spot in basal part of space 2A ..... *pyrrha*
— Upperside of forewing without spot in basal part of space 2A..... 3
3. Upperside of forewing with a cell spot placed midway between base and apex of wing ..... *leucocera*
— Upperside of forewing with a cell spot placed nearer to apex than to base 4
4. Upperside of forewing cell spot continued to costa ..... *nigricans*
— Upperside of forewing cell spot not continued above costa 5
5. Upperside of forewing with central white band narrow and continuous to vein 1A, hindwing cilia broadly yellow, unchequered ..... *badia*
— Upperside of forewing with central white band compact, not continued below vein Cu1b and spot in space Cu1a projecting, hindwing cilia brown ..... *asmara*

92. *Celaenorrhinus dhanada* (Moore)

1865. *Plesioneura dhanada* Moore, Proc. zool. Soc. London, : 789.

1949. *Celaenorrhinus dhanada*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 104.

92a. *Celaenorrhinus dhanada affinis* Elwes & Edwards

1897. *Celaenorrhinus affinis* Elwes & Edards, *Trans. zool. Soc. London*, **14** : 121, fig. 9.

1949. *Celaenorrhinus dhanada affinis*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 105.

Diagnostic characters : Forewing : Upperside and underside with a broad yellow tornal spot; genitalia : style of claspers broader and with a rounded end.

Material examined. 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Assam; Elsewhere : Burma.

93. *Celaenorrhinus pyrrha* de Nicéville

1889. *Celaenorrhinus pyrrha* de Nicéville, *Journ. Bombay nat. Hist. Soc.*, **4** : 181.

1949. *Celaenorrhinus pyrrha*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 95.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Bhutan, North Burma, Cochin-China.

* 94. *Celaenorrhinus leucocera* (Kollar)

1848. *Hesperia leucocera* Kollar, *In Hugels Kashmir and das Reich der siek*, **4** : 454, pl. 18, figs. 3, 4.

1949. *Celaenorrhinus leucocera*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Must.* (nat. Hist.) : 95.

Material examined : 1 ex. : Khasi Hills, Risa Colony, 18.x.1963 (Coll. A.K. Sen); 1 ex. Shillong, Malki, 26.v.1975 (Coll. K. Deb); 2 exs. : Khasi Hills, no other data; 1 ex. : East Khasi Hills, Shillong, Risa Colony, 8.iv.1991 (Coll. S.K. Ghosh and Party).

Distribution : Oriental region including India : Meghalaya (East Khasi Hills), Sikkim, Assam, Madhya Pradesh, South India, North West Himalayas and Andamans.

95. *Celaenorrhinus nigricans* (de Nicéville)

1885. *Plesioneura nigricans* de Nicéville, *Journ. Asiat. Soc. Bengal.* **59** (2) : 123, pl. 2, fig. 6.

1949. *Celaenorrhinus nigricans*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 101.

Material examined : 3 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam; Elsewhere : Bhutan, Burma, West Thailand.

96. *Celaenorrhinus badia* (Hewitson)

1877. *Pterygospidea badia* Hewitson, *Ann. Mag. nat. Hist.* (4) **20** : 322.

1949. *Celaenorrhinus badia,* Evans, *A Catalogue of Hesperiidae from Europe, Aisa and Australia in Brit. Mus.* (nat. Hist.) : 103.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Bhutan.

97. *Celaenorrhinus asmara* (Butler)

1877. *Plesioneura asmara* Butler, *Trans. Linn. Soc. zool.,* 92) **1** : 556.

1949. *Calaenorrhinus asmara,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 103.

* 97a. *Celaenorrhinus asmara consertus* de Nicéville

1890. *Celaenorrhinus consertus* de Nicéville, *Journ. Bombay nat. Hist. Soc.,* **5** : 222, pl. e., ifg. 12.

1949. *Celaenorrhinus asmara consertus,* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Ausralia in Brit. Mus.* (nat. Hist.) : 103.

Diagnostic characters : Wings : less produced, forewing : dorsum greater than tersum, upperside apical spots reduced.

Material examined : 3 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi HIlls); Elsewhere : Rangoon.

Remarks : It is for the first time recorded from India.

98. *Celaenorrhinus munda* (Moore)

1884. *Plesioneura munda* Moore, *Journ. Asiat. Soc. Bengal,* : 48.

1949. *Celaenorrhinus munda,* Evans, *A Catalogue of Hesperiidae from Europe, Aisa and Australia in Brit. Mus.* (nat. Hist.) : 100.

** 98a. *Celaenorrhinus munda maculicornis* (Elwes & Edwards)

1897. *Pedestes maculicornis* Elwes & Edwards. *Trans. zool. Soc. London,* **14** : 193, pl. 18, fig. 23.

1949. *Celaenorrhinus munda maculicornis,* Evans, *A Catalogue of Hesperiidae from Europe. Asia and Australia in Brit. Mus.* (nat. Hist.) : 100.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

99. *Celaenorrhinus zea* Swinhoe

1909. *Celaenorrhinus zea* Swinhoe, *Ann. Mag. nat. Hist. soc.,* **3** : 89.

1949. *Celaenorrhinus zea*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit. Mus.* (nat. Hist.) : 104.

Distribution — India : Meghalaya (Khasi Hills), Sikkim and Assam.

Group Tagiades

Key to genera of the group Tagiades

1. Apiculus tapered to a fine point, Sc in forewing usually ending over end cell 2
— Apiculus blunt, Sc in forewing usually ending before and cell ..... ***Odontoptilum***
2. Hindwing dorsum is greater than costa 3
— Hindwing dorsum not greater than costa 6
3. Hind tibia with a hair pencil ..... ***Satarupa***
Hind tibia without hair pencil 4
4. Antennal club angled or hooked to apiculus beyond thickest part of the club 5
— Antennal club arcuate or obtuse from thickest part of the club ..... ***Sesaria***
5. Hindwing cilia at tornus elongate ..... ***Darpa***
Hindwing cilia at tornus not elongate ..... ***Odina***
6. Upperside of hindwing with spot 7
Upperside of hindwing plain brown without spot ..... ***Chamunda***
7. Hindwing vein 1A much shorter than vein Sc + R_1 ..... ***Mooreana***
Hindwing vein 1A not shorter than vein Sc+R_1 8
8. Hind tibia with a recumbent hair pencil 9
Hind tibia without hair pencil ..... ***Tagiades***
9. Upperside of hindwing with dark spot 10
Upperside of hindwing with pale central area ..... ***Daimio***
10. Upperside of forewing with large hyaline spots ..... ***Coladenia***
Upperside of forewing with small hyaline spots ..... ***Sarangessa***

Genus *Odontoptilum* de Nicéville

1890. *Odontoptilum* de Nicéville, *Journ.Bombay.nat.Hist.Soc.*, **5** : 217.

1949. *Odontoptilum*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.*(nat.Hist.) : 15.

100. *Odontoptilum angulata* Felder

1862. *Odontoptilum angulata* Felder, *Verh.zool.bot.Ges.Wien*, **12** : 488.

1949. *Odontoptilum angulata*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 157.

100a. *Odontoptilum angulata angulata* Felder

1862. *Odontoptilum angulata* Felder, *Verh.zool.bot.ges.Wien*, **12** : 488.

1949. *Odontoptilum angulata angulata* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 158.

Diagnostic characters : Forewing : upperside without white lines, ground colour more or less variegated; hindwing : cilia pale, brown, never entirely white.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, N.W. Himalayas and South India; Elsewhere : Bhutan, Nepal, Sri Lanka, Burma, Thailand, Indo-China, Malayan subregion.

Genus *Satarupa* Moore

1865. *Satarupa* Moore, *Proc.zool.Soc.London.*, 780.

1949. *Satarupa, Evans, A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 13.

101. *Satarupa gopala* Moore

1865. *Satarupa gopala* Moore, *Proc.zool.Soc.London*, : 780, pl.42, fig.1.

1949. *Satarupa gopala*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 121.

Diagnostic characters : Forewing : cell spot absent or small, not larger than spot in space Cu1a, spot in space 2A narrower than spots in space Cu1a and Cu1b; hindwing : underside with black discal spots reduced and separated by white veins which penetrate to termen and a prominent spot present in area R_5.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, China, Malaya, Sumatra.

Genus *Sesaria* Matsumara

1919. *Sesaria*, Matsumara, *Thous.Ins.Japan Addit.*, **3** : 683.

1949. *Sesaria*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 14.

102. *Sesaria sambara* (Moore)

1857. *Goniloba sambara* Moore, *Cat.Lep.Mus.E.I.C.*, **1** : 246.

1949. *Sesaria sambara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 124.

102a. *Sesaria sambara sambara* (Moore)

1857. *Goniloba sambara* Moore, *Cat.Lep.Mus.E.I.C.*, **1** : 246.

1949. *Sesaria sambara sambara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 124.

Diagnostic characters : Forewing : with narrow dorsal white spots between Cu1a and Cu1b which is outwardly excavated; connecting white bar to dorsum obscure in wet season form; abdomen : centrally white.

Material examined : 1 ex. : Shillong, Khasi Hills, no other data; 1 ex. : West Garo Hills, Kherapara, 200 mm 4.x.1991 Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : Oriental region including India : Meghalaya (East Khasi Hills and West Garo Hills) Sikkim, Assam and Manipur.

Genus *Darpa* Moore

1865. *Darpa* Moore, *Proc.zool.Soc.London.* : 781.

1949. *Darpa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 13.

103. *Darpa hanria* Moore

1865. *Darpa hanria* Moore, *Proc.zool.Soc.London*, : 781, pl.42, fig.2.

1949. *Darpa haria*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 110.

Diagnostic characters : Wings : termen of both wings highly crenulate; forewing : cell spot peculiar, continued upwards above vein Sc and downwards branched to two spots in space Cu1b; hindwing : with submarginal black dots in spaces Cu1a and Cu1b.

Material examined : 2 exs. ; Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

Genus *Odina* Mabille

1891. *Odina* Mabille, *Ann.Soc.ent.Beligique* : 35.

1949. *Odina*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 13.

104. *Odina decoratus* (Hewitson)

1867. *Eudamus decoratus* Hewitson, *Descr.Hesperiid*, 17.

1949. *Odina decoratus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 111.

Diagnostic characters : Wings : upperside orange, with black spots except an outer third which is black trasversed throughout by a narrow zigzag pale line, two spots near base, a series of three spots before middle; hindwing : a spot at base, two spots before middle.

Material examined : 1 ex. : Garo Hills, March, no other data.

Distribution : India : Meghalaya (Garo Hills), Sikkim and Assam; Elsewhere : Burma, Thailand.

Genus *Chamunda* Evans

1949. *Chamunda* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 14.

105. *Chamunda chamunda* (Moore)

1865. *Plesioneura chamunda* Moore, *Proc.zool.Soc.London*, : 788.

1949. *Chamunda chamunda*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 127.

Diagnostic characters : Wings : upperside dark brown, base of forewing and whole of hind wing except exterior margin dark olive brown; cilia brown.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma, Thailand.

Genus *Mooreana* Evans

1926. *Mooreana* Evans, *Journ.Bombay nat.Hist.Soc.*, **31** : 51.

1949. *Mooreana*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 15.

106. *Mooreana trichoneura* (Felder)

1860. *Pterygospidea trichoneura* Felder, *Wien.Ent.Mon.*, **4** : 402.

1949. *Mooreana trichoneura*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 154.

106a. *Mooreana trichoneura pralaya* (Moore)

1857. *Goniloba pralaya* Moore, *Cat.Lep.E.I.C.*, **1** : 246.

1949. *Mooreana trichoneura pralaya*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 154.

Diagnostic characters : Forewing : upperside dark brown with numerous small hyaline white spots; hindwing : upperside and underside tornal third orange, underside with dark brown costa which extends along termen to space M_2, basal brown area to beyond mid wing and mid dorsum and is cut into streaks by pale veins.

Material examined : 4 exs. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam and Uttar Pradesh (Kumaon); Elsewhere : Burma, Thailand, Indo-China.

Genus *Tagiades* Hübner

1816. *Tagiades* Hübner, *Verz.bek.Schmett.* : 108.

1949. *Tagiades* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 14.

Key to species of the genus *Tagiades* Hübner

Forewing without hyaline spots in space R_1 and over cell spot; hind tibiae without hair pencil in male, end of uncus bilobate ..... *japetus*

Forewing with hyaline spots in space R_1 and over cell spot; hind tibiae with short recumbent hair pencil on innerside, end of uncus undivided ..... *litigiosa*

107. *Tagiades japetus* (Stoll)

1870. *Papilio japetus* Stoll, *Ent.Mon.Mag.*, 7 : 99.

1949. *Tagiades japetus*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 135.

* 107a. *Tagiades japetus ravi* (Moore)

1865. *Pterygospidia ravi* Moore, *Proc.zool.Soc.London*, : 779.

1949. *Tagiades japetus ravi*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 135.

Material examined : 2 exs. : Khasi Hills, no other data.

Distribution : Oriental region including India : Meghalaya (Khasi Hills), Sikkim, Assam, Orissa and Uttar Pradesh.

108. *Tagiades litigiosa* Moschler

1878. *Tagiades litigiosa* Moschler, *Verh.zool.bot.Ges.Wien*, 68 : 230.

1940. *Tagiades litigiosa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 146.

108a. *Tagiades litigiosa litigiosa* Moschler

1878. *Tagiades litigiosa* Moschler, *Verh.zool.bot.Ges.Wien.*, 68 : 230.

1949. *Tagiades litigiosa litigiosa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 146.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, N.W. Himalayas and South India; Elsewhere : Burma, Thailand, Indo-China.

Genus *Daimio* Murray

1875. *Daimio* Murray, *Ent.Mon.Mag.*, **11** : 17.

1949. *Daimio*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 14.

Key to the species of the genus *Daimio* Murray

Abdomen above white centrally, brown at end, uncus with bulbous end ..... *sinica*
Abdomen above narrowly striped with uncus tapered to a point at the end ..... *phisara*

109. *Daimio sinica* Felder

1949. *Daimio sinica*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 130.

Remark: Original reference could not be traced.

109a. *Daimio sinica narada* (Moore)

1884. *Satarupa narada* Moore, *Journ.Asiat.Soc.Bengal*, : 51.

1949. *Daimio sincia narada*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 130.

Diagnostic characters : Wings : upperside violet brown; forewing : with a small errect oval spot at lower end of cell, a quadrate spot present in median area, a broad band present in posterior margin; hindwing : with a broad white medial band, cilia edged with white.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam; Elsewhere : Burma.

110. *Daimio phisara* (Moore)

1884. *Satarupa phisara* Moore, *Journ.Asiat.Soc.Bengal*, : 50.

1949. *Daimio phisara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 131.

110a. *Daimio phisara phisara* (Moore)

1884. *Satarupa phisara* Moore, *Journ.Asiat, Soc.Bengal*, : 50.

1949. *Daimio phisara phisara*, Evans, *A Catalogue of Hesperiidae from Europe Asia and Australia in Brit.Mus.(nat.Hist.)* : 131.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and Manipur (Lushai Hills); Elsewhere : Burma, Thailand.

Genus *Coladenia* Moore

1881. *Coladenia* Moore, *Lep. Ceylon*, **1** : 180.

1949. *Coladenia*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 13.

Key to species of the genus *Coladenia* Moore

Underside of hindwing not dark brown with tawny spots, hind tibiae with recumbent hair pencil, uncus undivided ..... *agni*

— Underside of hindwing dark brown more or less suffused with tawny spots, hind tibiae fringed, uncus widely divided ..... *dan*

111. *Coladenia agni* (de Nicéville)

1883. *Plesioneura agni* de Nicéville, *Journ.Asiat.Soc.Bengal*, **52** (2) : 87, pl.10, fig.4.

1949. *Coladenia agni*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 116.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam; Elsewhere : Burma, Thailand, China.

112. *Colaenia dan* (Fabricius)

1787. *Papilio dan* Fabricius, *Mant. Ins.*, **2** : 88.

1949. *Coladenia dan*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 112.

112a. *Coladenia dan fatih* (Kollar)

1848. *Hesperia fatih* Kollar, *In Hugel's kashmir und das Reich der Siek*, **4** (1) : 454, pl.18, figs. 5, 6.

1949. *Coladenia dan fatih*, Evans, *A Catalogue of Hesperiidae from Eurpoe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 112.

Diagnostic characters : Forewing : ground colour dull tawny, upperside spots white, contiguous, not conjoined, spot in space Cu1b extending to before origin of vein Cu1a but spot in Cu1a not reaching that point.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills) and N.W. Himalayas.

** 112b. *Celadenia dan festa* Evans

1949. *Coladenia dan festa* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 113.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Manipur and Nagaland; Elsewhere : Bhutan, Burma, China.

** 112c. *Coladenia dan fatua* Evans

1949. *Coladenia dan fatua* Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 113.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Manipur and Nagaland; Elsewhere : Bhutan, Burma, Bangladesh.

Genus *Sarangessa* Moore

1881. *Sarangessa* Moore, *Lep,Ceylon*, **1** : 176.

1949. *Sarangessa*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 13.

113. *Sarangess dasahara* (Moore)

1865. *Nisioniades dasahara* Moore, Proc.zool.Soc.London, : 787.

1949. *Sarangessa dasahara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 120.

113a. *Sarangessa dasahara dasahara* (Moore)

1865. *Nisionides dasahara* Moore, *Proc.zool.Soc.London*, : 787.

1949. *Sarangessa dashara dasahara*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 120.

Diagnostic characters : Forewing : upperside with two separate cell spot; hindwing : underside dark brown suffused with ochreous grey, cilia dusky.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi HIlls), Sikkim, Assam, N.W. Himalayas and Bihar; Elsewhere : Burma, Indo-China.

114. *Sarangessa purendra* Moore

1882. *Sarangessa purendra* Moore, *Proc.zool.Soc.London* : 262.

1949. *Sarangessa purendra*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 119.

114a. *Sarangess purendra purendra* Moore

1882. *Sarangess purendra* Moore, *Proc.zool.Soc.London*, : 262.

1949. *Sarangessa purendra purendra*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 119.

Distribution : India : Meghalaya (Khasi Hills) and Uttar Pradesh (Kangra, Kulu, Simla, Dun to Garhwal, Kumaon).

Genus *Caprona* Wallengren

1857. *Caprona* Wallengren, *K. svenska vetensk Akad Handl.*, **2** (4) : 51.

1949. *Caprona*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 16.

115. *Caprona agama* (Moore)

1857. *Pyrgus agama* Moore, *Cat.Lep.Mus.E.I.C.*, **1** : 249, pl.7, fig.1.

1949. *Caprona agama*, Evans, *A Catalogue of Hesperidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 161.

** 115a. *Caprona agama agama* (Moore)

1857. *Pyrgus agama* Moore, *Cat.Lep.Mus.E.T.C.*, **1** : 249, pl.7, fig.1.

1949. *Caprona agama agama*, Evans, *A Catalogue of Hesperiidae from Europe, Asia and Australia in Brit.Mus.(nat.Hist.)* : 161.

Distribution : India : Meghalaya (Khasi Hills), Manipur, West Punjab; Elsewhere : Nepal, Thailand, Sulawesi, Burma, Indo-China.

No.	Name of the species/subspecies	East Khasi Hills	West Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Garo Hills*	Jaintia Hills
1.	*Apostictopterus fuliginosus* Leech			+				
2.	*Astictopterus jama olivascens* Moore					+		
3.	Arnetta atkinsoni (Moore)					+		
4.	*Aeromachus stigmata obsoleta* (Moore)					+		
5.	*Aeromachus jhora creta* Evans					+		
6.	*Ochus subvittatus subradiatus* (Moore)					+		
7.	*Baracus vittatus septentrionum* Wood Mason & de Nicéville	+						
8.	*Sebastonyma dolopia* (Hewitson)					+		
9.	*Sovia lucasii magna* Evans					+		
10.	*Sovia grahami* (Evans)					+		
11.	*Pithauria marsena* Hewitson					+		
12.	*Thoressa gupta gupta* (de Nicéville)					+		
13.	*Thoressa cerata* (Hewitson)					+		
14.	*Thoressa fusca debilis* (Elwes & Edward)					+		
15.	*Halpe zema zema* (Hewitson)					+		

No.	Name of the species/subspecies	East Khasi Hills	West Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Garo Hills*	Jaintia Hills
16.	*Halpe knyvetii* Elwes & Edwards					+		
17.	*Halpe sikkima* Moore					+		
18.	*Halpe porus* (Mabille)	+						
19.	*Halpe homolea aucma* Swinhoe	+						
20.	*Halpe wantona* Swinhoe	+						
21.	Halpe kumara de Nicéville					+		
22.	*Iambrix salsala salsala* (Moore)				+			
23.	*Stimula swinhoei swinhoei* (Elwes & Edwards)					+		
24.	*Ancistroides nigrita diocles* (Moore)			+				
25.	*Notocrypta curvifascia curvifascia* (Felder)	+			+			
26.	Udaspes folus (Cramer)	+						
27.	*Koruthaialos rubecula cachara* Evans					+		
28.	*Cupitha purrea* (Moore)					+		
29.	*Scobura cephala* (Hewitson)					+		
30.	*Scobura isota* (Swinhoe)					+		
31.	*Suastus gremius gremius* (Fabricius)					+	+	
32.	*Zographetus satwa* (de Nicéville)					+		
33.	*Plastingia noemi* (de Nicéville)					+		
34.	*Lotongus sarala sarala* (de Nicéville)					+		
35.	*Matapa aria* (Moore)				+			
36.	Matapa druna (Moore)					+		
37.	*Matapa sasivarana* (Moore)	+						
38.	*Matapa purpurascens* Elwes & Edwards					+		
39.	*Pudicita pholus* (de Nicéville)					+		
40.	*Pirdana hyaelarudolphii* Elwes & de Nicéville					+		
41.	*Cyrina cyrina cyrina* (Hewitson)					+		
42.	*Zela zeus optimus* (Fruhstorfer)					+		
43.	*Parnara guttatus* (Bremer & Gray)			+				

No.	Name of the species/subspecies	East Khasi Hills	West Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Garo Hills*	Jaintia Hills
44.	*Parnara ganga* Evans					+		
45.	*Borbo bevani* (Moore)	+						
46.	*Pelopidas sinensis* (Mabille)	+						
47.	*Pelopidas mathia* (Fabricius)	+		+				
48.	*Pelopidas assamensis* (Wood Mason & de Nicéville)					+		
49.	*Pelopidas conjuncta conjuncta* (Herrich-Schaffer)					+		
50.	*Polytremis lubricans lubricans* (Herrich-Schaffer)	+		+				
51.	*Polytremis discreta discreta* (Elwes & Edwards)	+						
52.	Polytremis eltola eltola (Hewitson)	+						
53.	*Caltoris auriciliata* (Elwes & Edwards)	+						
54.	*Caltoris cahira austeni* (Moore)					+		
55.	*Caltoris cormasa* (Hewitson)					+		
56.	*Caltoris plebia* (de Nicéville)					+		
57.	*Caltoris kumara moorei* (Evans)					+		
58.	*Caltoris tulsi tulsi* (de Nicéville)					+		
59.	*Baoris farri* (Moore)	+		+	+			
60.	*Iton semamora semamora* (Moore)					+		
61.	*Taractocera maevius sagara* (Moore)					+		
62.	*Oriens gola* (Moore)						+	
63.	*Potanthus confucius dushta* (Fruhstorfer)	+			+			+
64.	*Potanthus pseudomaesa clio* (Evans)	+						
65.	*Potanthus sita* (Evans)	+						
66.	*Telicota augias* (Linnaeus)						+	
67.	*Cephrenes chrysozona oceanica* (Mabille)					+		
68.	*Ochlodes subhyalina pasca* Evans	+						
69.	*Ochlodes siva siva* (Moore)					+		

No. Name of the species/subspecies	East Khasi Hills	West Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Garo Hills*	Jaintia Hills
70. *Bibasis sena sena* (Moore)					+		
71. *Bibasis harisa harisa* (Moore)					+		
72. *Bibasis anadi* (de Nicéville)					+		
73. *Bibasis oedipodea belesis* (Mabille)	+						
74. *Bibasis jaina jaina* (Moore)	+						
75. *Bibasis vasutana* (Moore)					+		
76. *Bibasis amara* (Moore)					+		
77. *Bibasis gomata gomata* (Moore)					+		
78. *Hasora anura anura* de Nicéville	+						
79. *Hasora khoda Coulteri Wood-Mason & de Nicéville*	+						
80. *Hasora badra badra* (Moore)	+						
81. *Hasora vitta indica* Evans	+						
82. *Choaspes plateni stigmata* Evans					+		
83. *Choaspes benjaminii* (Guerin)	+						
84. *Choaspes zanthopogon* (Kollar)	+						
85. *Choaspes hemixanthus furata* Evans	+						
86. *Badamia exclamationis* (Fabricius)							
87a. *Capila phanaeus lalita* (Doherty)					+		
87b. *Capila phanaeus fudicia* Evans					+		
88. *Capila pennicillatum pennicillatum* (de Nicéville)					+		
89. *Capila pieridoides pieridoides* (Moore)					+		
90. *Capila jayadeva* (Moore)					+		
91. *Lobocla liliana liliana* (Atkinson)					+		
92. *Celaenorrhinus dhanada affinis* Elwes & Edwards					+		
93. *Celaenorrhinus pyrrha* de Nicéville					+		
94. *Celaenorrhinus leucocera* (Kollar)	+						

No.	Name of the species/subspecies	East Khasi Hills	West Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Garo Hills*	Jaintia Hills
95.	*Celaenorrhinus nigricans* (de Nicéville)					+		
96.	*Celaenorrhinus badia* (Hewitson)					+		
97.	*Celaenorrhinus asmara concertus* de Nicéville					+		
98.	*Celaenorrhinus munda maculicornis* (Elwes & Edwards)					+		
99.	*Celaenorrhinus zea* Swinhoe					+		
100.	*Odontoptilum amulata angulata* Felder	+						
101.	*Satarupa gopala* Moore					+		
102.	*Sesaria sambara sambara* (Moore)	+			+			
103.	*Darpa hanria* Moore					+		
104.	*Odina decoratus* (Hewitson)							
105.	*Chamunda chamunda* (Moore)						+	
106.	*Mooreana trichoneura pralaya* (Moore)						+	
107.	*Tagiades japetus ravi* (Moore)						+	
108.	*Tagiades litigiosa litigiosa* Moschler	+						
109.	*Daimio sinica narada* (Moore)						+	
110.	*Daimio phisara phisara* (Moore)	+						
111.	*Coladenia agni* (de Nicéville)					+		
112a.	*Coladenia dan fatih* (Kollar)	+						
112b.	*Coladenia dan festa* Evans					+		
112c.	*Coladenia dan fatua* Evans					+		
113.	*Sarangessa dasahara dasahara* (Moore)	+						
114.	*Sarangessa purendra purendra* Moore					+		
115.	*Caprona agama agama* (Moore)					+		

Asterisk (*) denoting the species recorded from the area as the name of the district is not known.

SUMMARY

The paper incorporates diagnostic characters of the family Hesperiidae alongwith the taxonomic account and geographical distribution of the species from Meghalaya. Keys to taxa of the examined material, literature review of the species not studied, the table showing the distribution of species in the districts of Meghalaya and also relevant references have been provided. Thus an account of 115 species in 60 genera and three subfamilies has been furnished in the paper, of which 70 species constitute new localities records for Meghalaya.

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INSECTA : LEPIDOPTERA : ARCTIIDAE

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INTRODUCTION

The present work is an attempt to provide a comprehensive account of Arctiidae from Meghalaya. The study is based on the decades collections made by different party members of Zoological Survey of India.

This family includes "Tiger moths", "Ermine moths", "Footmen" etc. Usually the moths are stout bodied with long, narrow to moderately broad, prominently spotted and brightly coloured wings. They are mostly nocturnal and found predominantly in tropics. As per estimate, about 3500 species are known from the world. Amongst a total of 450 Indian species, 117 species are hitherto reported from Meghalaya. Of these, the latest references of the dagger marked (ψ) Species as mentioned under Systematic account, could not, however, be seen.

Cotes and Swinhoe (1887-89) prepared a Catalogue of Moths of India and listed all the species in the National Zoological collections of Zoological Survey of India. Hampson (1894-95, 1900 and 1901) dealt with the Indian fauna of Arcttidae including Meghalaya, Assam and adjoining areas of north-east India. Seitz (1913), Draudt (1914) and Rothschild (1914) reported the Indo- Australian fauna of Arctiidae, Swinhoe (1891), Seitz (1910 1913), Strand (1919), Bryk (1937), Roepke (1944), Daniel (1943 - 1954), Roesler and Kupper (1976), Arora and Chaudhury (1982) and Arora (1983) made some valuable contributions on the family from India and also from concerned state.

The account deals with the taxonomical study of 117 species distributed over 46 genera and 7 subfamilies. Of these, 28 species constitute new locality records (marked *). The literature review (marked **) of 66 speices has been incorporated in the paper. Besides, the keys to taxa of the examined material and distribution of species have been given. The table showing the distribution of species in different districts of Meghalaya and bibliography have been provided.

Subfamily A. Arctiinae

Genus 1. ***Diacrisia*** Hübner

*1. *Diacrisia mona* (Swinhoe)

2. *Diacrisia gopara* (Moore)
*3. *Diacrisia multiguttata* (Walker)
**4. *Diacrisia impleta* (Walker)
**5. *Diacrisia sikkimensis* (Moore)

Genus 2. ***Baroa*** Moore
**6. *Baroa vatala* Swinhoe

Genus 3. ***Amsacta*** Walker
*7. *Amsacta lineola* (Fabricius)
**8. *Amsacta negrita* (Hampson)

Genus 4. ***Alphaea*** Walker
**9. *Alphaea quadriramosa* (Kollar)

Genus 5. ***Arctia*** Schrank
**10. *Arctia caja* (Linnaeus)

Subfamily B. Nyctemeriinae

Genus 6. ***Dilemera*** Hübner
11. *Dilemera arctata* (Walker)

Genus 7. ***Nyctemera*** Hübner
12. *Nyctemera varians* Walker
13. *Nyctemera cenis* (Cramer)
14. *Nyctemera adversata* (Schäller)

Subfamily C. Callimorphinae

Genus 8. ***Callimorpha*** Latreille
15. *Callimorpha plagiata* (Walker)
16. *Callimorpha equitalis* (Kollar)

Submfamily D. Spilosominae

Genus 9. ***Creatonotos*** Hübner
17. *Creatonotos gangis* (Linnaeus)

Genus 10. ***Phissama*** Moore

**18. *Phissama transiens* (Walker)

Genus 11. ***Aloa*** Walker

*19. *Aloa lactinea* (Cramer)

Genus 12. ***Spilarctia*** Butler

*20. *Spilarctia casigneta* (Kollar)

21. *Spilarctia obliqua* (Walker)

**22. *Spilarctia flavens* (Moore)

**23. *Spilarctia melanosoma* (Hampson)

**24. *Spilarctia rubilinea* (Moore)

**25. *Spilarctia nigrifrons* (Walker)

Genus 13. ***Areas*** Walker

26. *Areas galactina* (Hoeven)

Subfamily E. Lithosiinae

Genus 14. ***Chrysorabdia*** Butler

*27. *Chrysorabdia viridata* (Walker)

**28. *Chrysorabdia bivitta* (Walker)

**29. *Chrysorabdia aurantiaca* Hampson

Genus 15. ***Zadadra*** Moore

30. *Zadadra distorta* (Moore)

Genus 16. ***Strysopha*** Arora and Chaudhury

*31. *Strysopha tortricoides* (Walker)

Genus 17. ***Eilema*** Hübner

*32. *Eilema tetragona* (Walker)

33. *Eilema vagesa* (Moore)

34. *Eilema vicaria* (Walker)

*35. *Eilema griseola* (Hübner)

**36. *Eilema cucullata* (Moore)

**37. *Eilema fuscistriga* (Hampson)

**38. *Eilema cana* (Hampson)

**39. *Eilema nigripes* (Hampson)

Genus 18. ***Agylla*** Walker

40. *Agylla ramelana* (Moore)

**41. *Agylla semirufa* (Hampson)

Genus 19. ***Cyana*** Walker

42. *Cyana signa* (Walker)

43. *Cyana puer* (Elwes)

44. *Cyana dudgeoni* Hampson

45. *Cyana catorhoda* Hampson

*46. *Cyana coccinea* (Moore)

*47. *Cyana bianca* (Walker)

**48. *Cyana molleri* (Elwes)

**49. *Cyana khasiana* Hampson

**50. *Cyana arama* (Moore)

**51. *Cyana dohertyi* (Elwes)

**52. *Cyana detrita* Walker

**53. *Cyana alborosea* Walker

**54. *Cyana gelida* (Walker)

Genus 20. ***Asura*** Walker

*55. *Asura undulosa* (Walker)

*56. *Asura obsoleta* (Moore)

*57. *Asura frigida* (Walker)

58. *Asura strigipennis* (Herrich-Schäffer)

*59. *Asura euprepiodes* (Walker)

60. *Asura conjunctana* (Walker)

*61. *Asura nebulosa* (Moore)

**62. *Asura discisigna* (Moore)

**63. *Asura dasara* (Moore)

**64. *Asura pudibunda* (Snellen)

**65. *Asura umbrosa* (Hampson)

Genus 21. ***Asuridia*** Hampson

*66. *Asuridia metaphaea* Hampson

Genus 22. ***Stigmatophora*** Staudinger

*67. *Stigmatophora palmata* (Moore)

Genus 23. ***Miltochrista*** Hübner

*68. *Miltochrista strigivenata* Hampson

*69. *Miltochrista cuneonotata* (Walker)

*70. *Miltochrista cruciata* (Walker)

*71. *Miltochrista multistriata* Hampson

*72. *Miltochrista magna* Hampson

*73. *Miltochrista eccentropis* Meyrick

*74. *Miltochrista radians* (Moore)

**75. *Miltochrista prominens* (Moore)

**76. *Miltochrista spilosomoides* (Moore)

**77. *Miltochrista phaeoxanthia* Hampson

**78. *Miltochrista gratiosa* (Guérin-Méneville)

**79. *Miltochrista delicia* (Swinhoe)

**80. *Miltochrista mesortha* Hampson

**81. *Miltochrista inflexa* (Moore)

**82. *Miltochrista cardinalis* Hampson

**83. *Miltochrista dentifascia* Hampson

Genus 24. ***Siccia*** Walker

**84. *Siccia taprobanis* (Walker)

*85. *Sicia seriata* Hampson

Genus 25. ***Oeonistis*** Hübner

*86. *Oeonistis entella* (Cramer)

Genus 26. ***Prabhasa*** Moore

**87. *Prabhasa costalis* Moore

**88. *Prabhasa flavicosta* Moore

Genus 27. ***Hyposiccia*** Hampson

**89. *Hyposiccia amnaea* (Swinhoe)

**90. *Hyposiccia mesozonata* (Hampson)

Genus 28. ***Parasiccia*** Hampson

**91. *Parasiccia nocturna* Hampson

Genus 29. ***Macaduma*** Walker

**92. *Macaduma tortricella* Walker

Genus 30. ***Halone*** Wālker

**93. *Halone flavescens* (Hampson)

**94. *Halone diffusifascia* (Swinhoe)

Genus 31. ***Scaptesyle*** Walker

**95. *Scaptesyle bicolor* Walker

Genus 32. ***Siculifer*** Hamspon

**96. *Siculifer bilineatus* Hampson

Genus 33. ***Meteugoa*** Hampson

**97. *Meteugoa ochrivena* (Hampson)

Genus 34. ***Pareugoa*** Hampson

**98. *Pareugoa multistrigata* (Hampson)

Genus 35. ***Poliosia*** Hampson

**99. *Poliosia muricolor parva* (Moore)

**100. *Poliosia brunnea* Moore

Genus 36. ***Nudaria*** Hawarth

**101. *Nudaria suffusa* Hampson

**102. *Nudaria fumidisca* Hampson

**103. *Nudaria discipuncta* Hampson

Genus 37. ***Gymnochroma*** Hampson

**104. *Gymnochroma fulvipicta* (Hampson)

Genus 38. ***Diduga*** Moore

**105. *Diduga rufidisca* Hampson

Genus 39. ***Tropacme*** Hampson

**106. *Tropacme cupreimargo* Hampson

Genus 40. ***Macrobrochis*** Herrich-Schäffer

107. *Macrobrochis gigas* (Walker)

Subfamily F. Micrarctiinae

Genus 41. ***Argina*** Hübner
108. *Argina astrea* (Drury)
109. *Argina argus* (Kollar)
Genus 42. ***Utetheisa*** Hübner
110. *Utetheisa pulchella* (Linnaeus)

Subfamily G. Nolinae

Genus 43. ***Celama*** Walker
**111. *Celama tesselata* (Hampson)
Genus 44. ***Nola*** Leach
**112. *Nola melanota* Hampson
**113. *Nola tristicta* Hampson
**114. *Nola microphasma* Butler
Genus 45. ***Roesalia*** Hübner
115. *Roesalia triangularis* (Leech)
116. *Roesalia argyria* (Hampson)
Genus 46. ***Zia*** Walker
**117. *Zia lunisigna* (Hampson)

Key to subfamilies of the family Arctiinae

1. Body stoutly built in one or both sexes 2
   Body slender in one or both sexes 5
2. Proboscis not always functional ..... Arctiinae
   Proboscis always functional 3
3. Wings usually white, antennae always bipectinate in male ..... Nyctemerinae
   Wings usually blackish, antenna of variable texture in male 4
4. Forewing markings usually in form of bands ..... Callimorphinae
   Forewing markings reduced to dots ..... Spilosominae
5. Head usually broad, forewing very long and hindwing uncommonly large .... Litosiinae
   Head not broad as above, forewing not so long and hindwing moderately large .... Micrarctiinae

Subfamily Arctiinae

Genus *Diacrisia* Hübner

1827. *Diacrisia* Hübner, *Verz. bek. Schmett.*, p. 169.

1901. *Diacrisia*, Hampson, *Cat. Lep. Phal. Brit. Mus*, **3** : 256.

Key to species of the genus *Diacrisia* Hübner

1. Hindwing with ground colour whitish or buff ..... *mona*
   Hindwing with ground colour orange or yellow..... 2
2. Hindwing with black suffusion in and below cell ..... *gopara*
   Hindwing without black suffusion in and below cell ..... *multiguttata*

*1. *Diacrisia mona* (Swinhoe)

1885. *Spilosoma mona* Swinhoe, *Proc. zool. Soc. London*, p. 295, pl. 20, fig. 3, 4.

1901. *Diacrisia mona*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 280-281.

Material examined : 2 exs. : Shillong, 1977. (Coll. J.N. Sachan), 1 ex. : Cherrapunji Circuit House compound, 14. ix. 1988 (Coll. A.R. Lahiri & Party).

Distribution : India : Meghalaya (East Khasi Hills), Maharashtra (Bombay and Mahabaleswar).

2. *Diacrisia gopara* (Moore)

1859. *Spilosoma gopara* Moore, *Lep. E.I.C.* , p. 356, pl. 9a, fig. 11.

1901. *Diacrisia gopara*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 293.

Material examined : 1 ex. : Cherrapunji, no. other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Assam.

*3. *Diacrisia multiguttata* (Walker)

1855. *Hypercompa multiguttata* Walker, *Cat. Lep. Het. Brit. Mus.*, **3** : 657.

1901. *Diacrisia multiguttata*, Hampson, *Cat. Lep. Phal. Brit Mus.*, **3** : 292.

Material examined : 1 ex. : Meghalaya, (West Garo Hills), Shibbari P.W.D.I. Bunglow, 13.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills), Sikkim, N.W. Himalayas, Jammu and Kashmir, Himachal Pradesh (Simla and Kulu). Elsewhere : Nepal, Burma and Cambodia.

**4. *Diacrisia impleta* (Walker)

1864. *Hypercompa impleta* Walker, *Cat. Lep. Het. Brit. Mus.*, **31** : 286.

1901. *Diacrisia impleta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 313, pl. 66, fig. 12.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam.

5. *Diacrisia sikkimensis* (Moore)

1879. *Euchaetes sikkimensis* Moore, *Lep. Atk.*, p. 39, pl. 2, fig. 12.

1901. *Diacrisia sikkimensis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 311.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam.

Genus *Baroa* Moore

1878. *Baroa* Moore, *Proc. zool. Soc. London*, p. 28.

1901. *Baroa*, Hampson, *Cat. Lep. Phal. Het. Brit. Mus.*, **3** : 478.

**6. *Baroa vatala* Swinhoe

1894. *Baroa vatala* Swinhoe, *Ann. Mag. nat. Hist. Soc.*, (6) **14** : 436.

1901. *Baroa vatala* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 479.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim. Elsewhere : Bhutan and Hongkong.

Genus *Amsacta* Walker

1855. *Amsacta* Walker, *Cat. Lep. Het. Brit. Mus.*, **4** : 804.

1901. *Amsacta*, Hampson, Cat. Lep. Phal. Brit. Mus., **1** : 322.

*7. *Amsacta lineola* (Fabricius)

1793. *Bombyx lineola* Fabricius, *Ent. Syst.*, **3** (1) : 465.

1901. *Amsacta lineola*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 324-325.

Diagnostic characters : Head and thorax : white, tinged with pink; abdomen: crimson whitish below; forewing : white, tinged with pink, a crimson fascia on costa, a black fascia below the cell from middle to extremity continued upto below vein M_3, a short sub-terminal streak below vein M_2.

Material examined : ex. Meghalaya, West Garo Hills, Tura, 290 m., 14.x.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (West Garo Hills), Assam, Manipur, N.W. Himalayas, South India, West Bengal; Elsewhere : Nepal, Sri Lanka.

**8. *Amsacta negrita* (Hampson)

1894. *Creatonotus negrita* Hampson, *Fauna Brit. India*, Moths, **2** : 28.

1901. *Amsacta negrita*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 329.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Alphaea* Walker

1855. *Alphaea* Walker, *List Lep. Insects Br. Mus.*, **3** : 683.

1982. *Alphaea*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p. 17.

**9. *Alphaea quadriramosa* (Kollar)

1844. *Euprepia quadriramosa* Kollar, *In Hugels Kaschmir und das Reich der Siek.*, **4** (2) : 468.

1982. *Alphaea quadriramosa*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, p. 17 - 18, pl. 2, fig. 11.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, Arunachal Pradesh, Jammu & Kashmir, Himachal Pradesh (Kangra and Dalhousie).

Genus *Arctia Schrank*

1802. *Arctia* Schrank, *Fauna Boica*, **2** (2) : 152.

1901. *Arctia*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 463.

10. *Arctia caja* (Linnaeus)

1758. *Bombyx caja* Linnaeus, *Syst. Nat.*, **1** : 500.

1901. *Arctia caja*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **3** : 463-464.

Distribution : India : Meghalaya (Khasi Hills), Assam, (Sibsagar), Himachal Pradesh (Dalhousie), Uttar Pradesh (Allahabad), N.W. Himalayas, Jammu and Kashmir. Elsewhere : Europe, Britain, France, Germany, Switzerland, Greece, Armenia.

Subfamily Nyctemeriinae

Key to genera of the subfamily Nyctemeriinae

Forewing with long areole, second joint of palpi reaching vertex of head.....***Dilemera***
Forewing with short areole, second joint of palpi not reaching vertex of head ..... ***Nyctemera***

Genus *Dilemera* Hübner

1818. *Dilemera* Hübner, *Verz. bek. Schmett.*, p. 178.

1894. *Dilemera*, Hampson, *Fauna Brit. India, Moths*, **2** : 45.

11. *Dilemera arctata* (Walker)

1856. *Nyctemera arctata* Walker, *Cat. Lep. Het. Brit. Mus.*, **6** : 1664.

1894. *Dilemera arctata*, Hampson, *Fauna Brit. India, Moths*, **2** : 45 - 46.

Diagnostic character – Head, thorax, abdomen : yellow, abdomen with short segmental bands above and two pairs of lateral spots; forewing : white with some black spots near base, broad fuscous streaks along costa and inner margin from base to medial muculate band, a broad marginal fuscous band of more or less conjoined streaks; hindwing : white with a marginal series of rounded fuscous spots which are elongated towards anal angle.

Material examined - 4 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Nagaland (Naga Hills).

Genus *Nyctemera* Hübner

1820. *Nyctemera* Hübner, *Verz. bek. Schmett.*, p. 178.

1983. *Nyctemera*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p.3.

Key to species of the genus *Nyctemera* Hübner

1. Antennae in male with short pectinations. Hindwing with vein Rs and M_1 not stalked ..... *varians*

Antennae in male with long pectination. Hindwing with vein Rs and M_1 stalked.....2

2. Abdomen yellowish, with transverse black band on each segment, both wings without discocellular spots ..... *cenis*

Abdomen whitish, with dorsal, lateral and subventral black spots, both wings with discocellular spots ..... *adversata*

*12. *Nyctemera varians* Walker

1854. *Nyctemera varians* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 400-401.

1982. *Nyctemera varians*, Arora & Chaudhury, Tech. Monogr., no. 6, p. 7-8, pl. 1, figs. 3, 3a, 3b.

Material examined : 4 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim, Arunachal Pradesh, Jammu & Kashmir. Elsewhere : Burma.

13. *Nyctemera cenis* (Cramer)

1779. *Phalaena cenis* Cramer, *Pap. Exot.*, **2** : 82, pl. 147, fig. E.

1982. *Nyctemera cenis*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.8, pl. 1, fig. 4.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam (Sibsagar), Sikkim, Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Uttar Pradesh, West Bengal. Elsewhere : Burma and Bangladesh.

14. *Nyctemera adversata* (Schaller)

1788. *Phalaena (Geometra) adversata* Schaller, *Naturforscher*, **23 : 52.**

1982. *Nyctemera adversata*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.8-9, pl.1, figs.5, 5a.

Material examined - 1 ex. : Cherrapunji, no other data; 1 ex. Umiam, 1000 m., 19.ix.1991; 2 exs. Tyura, on way to Shello, 850 m., 22.ix. 1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh), ex. Williamnagar, Samphalangiri, 10.iii.1991 (Coll. B.C.Das).

Distribution : Throughout India including Meghalaya (East Khasi Hills and West Khasi Hills). Elsewhere : Bangladesh, Hongkong, Tonkin, South China, Indo-China, Japan, Sumatra and Malaysia.

Subfamily Callimorphinae

Genus *Callimorpha* Latreille

1809. *Callimorpha* Latreille, *Genera Crustecerorum et. Insectorum*, **4** : 200.

1982. *Callimorpha*, Arora and Chaudhury, *Tech. Monogr*, no. 6, p. 3.

Key to species of the genus ***Callimorpha*** Latreille

Head, thorax and abdomen orange; forewing with yellow spots, hindwing orange ... *plagiata*
Head, thorax and abdomen crimson, forewing with white spots; hindwing white ..... *equitalis*

15. *Callimorpha plagiata* (Walker)

1855. *Hypercompa plagiata* Walker, *List Lep. Insects Brit. Mus.*, **3** : 655.

1982. *Callimoprha plagiata*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, pp. 5-6, pl.1, figs.1 (F-G), 2.

Material examined - 1 ex. : Cherrapunji, 1 ex. : Khasi Hills, no other data; 1 ex.: Shillong, 12.ix.1926 (Coll. B.N. Chaterjee); 2 exs. : Khasi Hills, Nongstein, 21.ix.1988 (Coll. A.R. Lahiri and party), 1 ex. : Shillong alt. 1410 m., 31.iii.1991 (Coll. S.K. Ghosh and party); 1 ex. : Shillong, Polobazar, 1380 m., 19.ix.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Arunachal Pradesh, Jammu and Kashmir. Elsewhere : China and Bangladesh.

16. *Callimorpha equitalis* (Kollar)

1848. *Euprepia equitalis* Killar, *In. Hugels Kashmir und das Reich der Siek*, **4** : 465, pl. 20. fig. 3.

1894. Callimorpha equitalis, Hampson, Fauna Brit. India, Moths, **2** : 36.

Material examined : 1 ex. : Cherrapunji Circuit House, 1300 m., 3.iv.1991, (Coll. S.K. Ghosh and Party).

Distribution : India : Meghalaya (East Khasi Hills), Himalayas from Simla to Sikkim. Elsewhere : Burma.

Subfamily Spilosominae

Key to genera of the subfamily Spilosominae

1. Antennae ciliate in both sexes; hind legs with one pair of tibial spurs 2
   Antennae minutely serrate or pectinate in male; hind legs with two pairs of tibial spurs, rarely middle pair extremely reduced 3
2. Thorax marked, legs with coxae and femora pale yellow above, tibiae and tarsi dark brown but unmarked ..... ***Creatonotos***
   Thorax unmarked; legs with coxae and femora yellow, tibiae and tarsi ivory white, marked with dark brown stripe ..... ***Phissama***
3. Fore tibiae with curved apical claw, hind legs with medial spurs shorter than terminal spurs ..... ***Aloa***
   Fore tibia without curved apical claw..... 4

4. Head, thorax and abdomen with large wooly hair; antennae about half the length of costa; proboscis extremely short not exceeding width of head ..... ***Spilarctia***
Head thorax and abdomen smoothly scaled; antennae less than half the length of costa; proboscis exceeding width of head ..... ***Areas***

Genus *Creatonotos* Hübner

1816. *Creatonotos* Hubner, *Verz. bek, Schmett.*, p. 169.

1982. *Creatonotos*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, p. 14.

17. *Creatonotos gangis* (Linnaeus)

1764. *Phalaena gangis* Linnaeus, *Amoen. Acad.*, 6 : 410.

1982. *Creatonotos gangis*, Arora and chaudhury, *Tech. Monogr.*, no. 6, p. 14.

Diagnostic characters - Male : Head and thorax : pinkish grey; legs : black, femora orange; abdomen : crimson above, with dorsal and lateral series of black spots, ventral surface black; forewing : pinkish grey with black points at each angle of cell, a fascia narrowed at base, broad at extremity below the cell near base to middle of vein Cu1a, a wedge-shaped patch from lower angle of cell to vein M_1 near termen; hindwing : whitish to fuscous brown, darker at termen, a dark subterminal spot above vein M_2. Female: head, thorax and forewing pale brownish ocherous; ventral surface of abdomen and femora brown; hindwing : ochreous white with three subterminal black spots.

Material examined : 1 ex. : West Garo Hills, Kherapara, 19.vi.1988 (Coll. R.K. Ghosh and Party).

Distribution : India : Throughout India including Meghalaya (West Garo Hills). Elsewhere : Sri Lanka, Malaysia (Singapore), Nepal, Pakistan, Eastern Asia, Taiwan, and North Australia.

Genus *Phissama* Moore

1859. *Phissama* Moore, *Lep. East. India Comp.*, 362.

1982. *Phissama*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p. 15.

*18. *Phissama transiens* (Walker)

1855. *Spilosoma transiens* Walker, *List Lep. Insecta Brit. Mus.*, 3 : 675.

1982. *Phissaa transiens*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, p. 15-16.

Diagnostic characters - Abdomen : orange above, the extremity of anal tuft and ventral surface ivory white; wings : both wings dark grey brown in male, except the costa of forewing which is ivory white, four minute discocellular spots present

on each inner and outer side of upper and lower angle of cell in female, hindwing more diaphanous.

Diagnosis : 1 ex. : Meghalaya, West Garo Hills, Shibbari P.W.D.I. Banglow, 13.vii.1988; 1 ex. : Kherapara, 19.vii. 1988; 4 exs. : Kherapara P.W.D.I. Banglow, 21. vii. 1988 (Coll. R.K. Ghosh & Party); 4 exs. : Williamnagar, 300 m., 1.ix.1991 (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh).

Distribution : India : Meghalaya (West Garo Hills), Assam, Sikkim, Arunachal Pradesh and West Bengal. Elsewhere : China, Indonesia and the Philippines.

Genus *Aloa* Walker

1855. *Aloa Walker, List Lep. Insecta Brit. Mus.*, 3 : 699.

1982. *Aloa*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p. 16.

*19. *Aloa lactinea* (Cramer)

1777. *Bombyx lactinea* Cramner, *Pap. Exot.*, 2 : 58, 149, p. 133, fig. D.

1982. *Aloa lactinea*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 16-17.

Diagnostic characters : Palpi : crimson, black at tips; forewing : white with crimson fascia on costa; hindwing : white with black discoidal lunule and four subterminal spots, any of which may be absent; legs : fore-and mid tibiae striped with black, tarsi white with segmental black bands.

Material examined : 1 ex. : Shillong, no other data; 1 ex : Khasi Hills (Coll. A.C.B.); 2 exs. : East Khasi Hills, Cherrapunji, alt. 1299 m., 23.iv.1979 (Coll. J.K. Jonathan & Party); 1 ex. : West Garo Hills, Bolehugiri, E. of Tura, 12.x.1988 (Coll. K.K. Roy & Party).

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), Assam, Arunachal Pradesh, West Bengal, Jammu & Kashmir, Maharashtra, Kerala, Tamil Nadu. Elsewhere : Sri Lanka, Japan, China, East Asia and Indonesia.

Genus *Spilarctia* Butler

1875. *Spilarctia* Butler, *Cist. Ent.*, 2 : 39.

1983. *Spilarctia*, Arora, *Rec. zoo. Surv. India*, Occ. Paper, no. 60, p. 18.

Key to the species of the genus *Spilarctia* Butler

Palpi dark at base. Antennae pale brown but strongly bipectinate ..... *casigneta*

Palpi crimson at base. Antennae dark but weakly bipectinate ..... *obliqua*

20. *Spilarctia casigneta* (Kollar)

1844. *Euprepia casigneta* Kollar, *In Hugel's Kashmir und das Reich der Siek*, **4** (2) : 469.

1982. *Spilarctia casigneta*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p. 19-20, pl. 2, fig. 13.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Nagaland, Manipur, Sikkim, Arunachal Pradesh, Tamil Nadu (Nilgiris) and N.W. Himalayas. Elsewhere : Bhutan, Western China and East Asia.

21. *Spilarctia obliqua* (Walker)

1855. *Spilosoma obliqua* Walker, *List Lep. Insects Brit. Mus.*, **3** : 679.

1982. *Spilarctia obliqua*, Arora & Chaudhury, *Tech. Monogr.*, no.6 p. 19, pl. 2, fig. 12.

Material examined : 1 ex. : Shillong, no other data.

Distribution : Throughout India including Meghalaya (East Khasi Hills). Elsewhere : Bhutan, Japan, Eastern Asia, China and Nepal.

**22. *Spilarctia flavens* (Moore)

1879. *Alpenus flavens* Moore, *Descr. Indian Lep. Atk.* p. 39.

1983. *Spilarctia flavens*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60 : 18.

Distribution : India : Meghalaya (Khasi Hills), Assam and Andamans. Elsewhere : Japan.

**23. *Spilarctia melanosoma* (Hampson)

1894. *Thyrgorina melanosoma* Hampson, *Fauna Brit. Indian Moths*, **2** : 15.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim, N.W. Himalayas, Uttar Pradesh.

**24. *Spilarctia rubilinea* (Moore)

1865. *Spilosoma rubilinea* Moore, *Proc. zool. Soc. London*, p. 810.

1887. *Spilarctia rubilinea* Cotes & Swinhoe, *Cat. Moths, India*, Part II, p. 131.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim. Elsewhere : Burma, West China.

Ψ**25. *Spilarctia nigrifrons* (Walker)

1865. *Icambodida nigrifrons* Walker, *List. Lep. Het. Brit. Mus.*, **32** : 401.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim.

Genus *Areas* Walker

1855. *Areas* Walker, *List Lep. Insects Brit. Mus.*, 3 : 658.

1982. *Areas*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.20.

26. *Areas galactina* (Hoeven)

1840. *Chelonia galactina* Hoeven, *Tijdschr. Nat. Ges. Phys.*, 7 : 280, pl. VI, fig. 5.

1982. *Areas galactina*, Arora & Chaudury, *Tech. Monogr.*, no. 6, p. 20-21, pl. 2, fig. 14.

Diagnostic characters : Abdomen : crimson, marked with a series of large black patches dorsally and spots laterally, ventrally pale yellowish and with a series of sub-ventral black spots; forewing : dark brown, marked with large white patches; hindwing : pale yellowish, with a spot on discal area, two in inner area and one in submarginal area; patagia and tegulae : with large rounded black spots; thorax : with broad elongate patch.

Material examined : 5 exs. : East Khasi Hills, Cherrapunji (Coll. O. Moller); 2 exs. : Meghalaya Circuit House, 7.v.1979; 1 ex. : around Barapani, 21.v.1979 (Coll. G.K. Srivastava & Party).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Arunachal Pradesh, Nagaland (Naga Hills), N.W. Himalayas. Elsewhere : Indonesia (Borneo), Sarawak, West China, Eastern Asia and South America.

Subfamily Lithosiinae

Key to genera of the subfamily Lithosiinae

1. Forewing without vein M_2 2
— Forewing with vein M_2 5
2. Hindwing with cell open; a recurrent vein in cell..... ***Chrysorabdia***
— Hindwing with cell closed; no recurrent vein in cell 3
3. Forewing in male with secondary sexual character or both wings without secondary sexual character 4
— Bothwings in male with secondary sexual character ..... ***Zadadra***
4. Male genitalia with scaphium..... ***Strysopha***
— Male genitalia without scaphium..... ***Eilema***
5. Forewing with areole, vein R_2 stalked with R_3 ..... ***Agylla***
— Forewing without areole, vein R_2 free 6
6. Forewing vein R_3 stalked in female, R_3-R_4 absent in male ..... ***Cyana***
— Forewing vein R_3-R_5 stalked in both sexes 7
7. Forewing vein R_1 free 9

— Forewing vein R_1 not free 8
8. Forewing vein R_1 anastomosing with Sc ..... ***Asura***
— Forewing vein R_1 stalked with Sc..... ***Asuridia***
9. Palpi porrect 10
— Palp upturned 11
10. Forewing vein M_1 stalked with R_5, hindwing vein Cu1a from near angle..... ***Stigmatophora***
— Forewing vein M_1 not stalked with R_5, hindwing vein Cu1a from before angle... ***Miltochrista***
11. Hindwing vein Cu1a and M_3 coincident, vein M_2 from cell not stalked with M_3.....***Siccia***
Hindwing vein Cu1a and M_3 not coincident, vein M_2 shortly stalked with M_3 ....***Oonistis***

Genus *Chrysorabdia* Butler

1877. *Chrysorabdia* Butler, *Trans. ent. Soc. London*, p. 357.

1982. *Chrsorabdia*, Arora & Chadury, *Tech. monogr.*, no.6, p.26.

*27. *Chrysorabdia viridata* (Walker)

1864. *Lithosia viridata* Walker, *List Lep. Insects Brit. Mus.*, **31** : 225.

1982. *Chrysorabdia viridata*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.26-27, pl.3, fig. 16.

Diagnostic characters : Head and tegulae : Yellow; patagia : yellow edged with black; forewing : yellow, with black broad fascia along costa and below cell nearly upto margin; thorax : black; hindwing : pale yellow.

Material examined : 1 ex. : Shillong, no other data; 1 ex. : Around Barapani, 21. v. 1979 (Coll. G. K. Srivastava & Party).

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam, Arunachal Pradesh, West Bengal and Himachal Pradesh. Elsewhere : Bhutan, Bangladesh and China.

**28. *Chrysorabdia bivitta* (Walker)

1856. *Lithosia bivitta* Walker, *List Lep. Insects Brit. Mus.*, **7** : 1682.

1900. *Chrysorabdia bivitta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 183-184.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim, N.W. Himalayas (Simla and Dalhousie).

**29. *Chrysorabdia aurantiaca* Hampson

1898. *Chrysorabdia aurantiaca* Hampson, *Journ. Bombay nat. Hist. Soc., p. 297.*

1900. *Chrysoarabdia aurantiaca*, Hampson, Cat. Lep. Phal. Brit. Mus., **2** : 184.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Zadadra* Moore

1878. *Zadadra* Moore, *Proc. zoo. Soc. London*, p. 572.

1982. *Zadadra*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.39-40.

30. *Zadadra distorta* (Moore)

1872. *Lithosia distorta* Moore, *Proc. zool. Soc. London*, p.572.

1982. *Zadadra distorta*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.40, figs. 3, G - 1.

Diagnostic characters : Head : blackish; thorax : dull orange; forewing : fuscous grey, costal area ochreous with a round black spot beyond middle, an obscure oblique curved fuscous band from it to inner margin which is narrowly ochreous; hindwing : pale yellow, tinged with fuscous towards apex.

Material examined : 3 exs. : Meghalaya, East Khasi Hills, Cherrapunji Circuit House compound, 19.ix.1988 (Coll. A.R. Lahiri and Party).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim, Naga Hills, Arunachal Pradesh. Elsewhere : Nepal, China.

Genus *Strysopha* Arora & Chaudhury

1982. *Strysopha*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 27-28.

*31. *Strysopha tortricoides* (Walker)

1862. *Lithosia tortricoides* Walker, *Journ. Proc. Linn. Soc. Zool.*, **6** : 107.

1982. *Strysopha tortricoides*, Arora & Chaudury, *Tech. Monogr.*, no.6, p.28, figs. 2A-C.

Diagnostic characters : Abdomen : grey, extremity yellow; forewing : 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.

Material examined : 1 ex. : Meghalaya, West Garo Hills, Shibbari P.W.D.I. Bunglow, 7.vii.1988 (Coll. *R.K. Ghosh & Party).*

Distribution : India : Meghalaya (West Garo Hills), Sikkim, Arunachal Pradesh, Tamil Nadu (Nilgiris). Elsewhere : Bhutan, Indonesia, Malaysia and China.

Genus *Eilema* Hübner

1827. *Eilema* Hübner, *Verz. Bek. Schmett.* p. 165.

1983. *Eilema* Arora, *Rec. zool. Surv. India*, Occ. Paper, no. 60, p. 22-23.

Key to species of the genus *Eilema* Hübner

1. Antennae and tip of palpi black 2
— Antennae and tip of palpi not black 4
2. Forewing with a quadrate black patch ..... *tetragona*
— Forewing without black patch 3
3. Forewing orange yellow, without costal fascia; legs black ..... *vogesa*
— Forewing leaden grey with yellow costal fascia; legs leaden grey ..... *vicaria*
4. Forewing with areole, and yellow costal fascia ..... *griseola*
Forewing without areole and yellow costal fascia ..... *auriflua*

* 32. *Eilema tetragona* (Walker)

1854. *Lithosia tetragona* Walker, *List Lep. Insects Brit. Mus.*, **2** : 510.

1982. *Eilema tetragona*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p. 33-35, pl.3, figs. 19, 19a, 3A-C.

Material examined : 6 exs. : Meghalaya, East Garo HIlls, Williamnagar, 25.v.1990 (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (East Garo Hills), Assam, Arunachal Pradesh, Nagaland, Kerala. Elsewhere : Bangladesh, Indonesia, Malaysia, Kampuchia and China.

33. *Eilema vagesa* (Moore)

1859. *Lithosia vagesa* Moore, *Lep. East Ind. Comp.*, p. 304.

1922. *Eilema vagesa*, Strand, Lep. Catalogus, Pars 26, p. 591.

Material examined - 6 exs : Meghalaya, Jaintia Hills, Jawai, 19. v. 1990 (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills, Assam, Sikkim, N.W. Himalayas. Elsewhere : Nepal and Burma.

* 34. *Eilema vicaria* (Walker)

1854. *Lithosia vicaria* Walker, *List Lep. Het. Brit. Mus.*, **2** : 505.

1983. *Eilema vicaria*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 24.

Material examined : 2 exs. : Meghalaya, West Garo Hills), Shibbari P.W.D.I. Banglow, 19.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills), Sikkim, Assam, Arunachal Pradesh, West Bengal, Maharashtra (Bombay) and Andaman. Elsewhere : Bhutan, Sri Lanka, Indonesia, Malaysia, West Africa and China.

Ψ* 35. *Eilema griseola* (Hübner)

1827. *Bombyx griseola* Hübner, *Eurr. Schmett.*, 2, figs. 97.

Material examined : 1 ex. : Shillong; no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Manipur. Elsewhere : Nepal, Tibet, North China, Japan, Amur, Italy, Finland, Burma, Indonesia and West Africa.

** 36. *Eilema cucullata* (Moore)

1878. *Katha cucullata*, Moore, *Proc. zool. Soc. London*, p.10.

1983. *Eilema cucullata* Arora, *Rec. zool. Surv. India, Occ. Paper*, No. 60, p.24.

Distribution : India : Meghalaya (Khasi Hills), Assam & Andamans.

Ψ**37. *Eilema fuscistriga* (Hampson)

1894. *Prabhasa fuscistriga* Hampson, *Fauna Brit. India, Moths*, 2 : 77.

Distribution : India : Meghalaya (Khasi Hills), Assam. Elsewhere : Burma, Bernardmyo.

Ψ**38. *Eilema cana* (Hampson)

1896. *Prabhasa cana* Hampson, *Fauna Brit. India, Moths*, 4 : 495.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Ψ**39. *Eilema nigripes* (Hampson)

1900 *Illema nigripes* Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 175, pl. 23, fig. 6.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

Genus *Agylla* Walker

1854. *Agylla* Walker, *List Lep. Insects Brit. Mus.*, 2 : 552.

1982. *Agylla*, Arora & Chaudhury, Tech. Monogr., no.6, p. 41.

40. *Agylla ramelana* (Moore)

1865. *Lithosia ramelana* Moore, *Proc. zool. Soc. London*, p. 798.

1982. *Agylla ramelana*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.43.

Diagnostic characters : Body : pure white; wings : with purplish brown post-medial band expanding between vein M_2 and Cu1b in both sexes.

Material examined : 4 exs. : Shillong, Khasi Hills, no other data; 1 ex. : Around Arunachal Rest House, 20.v.1979 (Coll. G.K. Srivastava & Party), 2 exs. : Jaintia Hills, Jawai camp, 19.v.1990, (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Sikkim, Assam, Arunachal Pradesh. Elsewhere : Indonesia.

**41. *Agylla semirufa* (Hampson)

1896. *Macrobrochis semirufa* Hampson, Fauna Brit. India, Moths, **4** : 493.

1900. *Agylla semirufa*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 198.

Distribution : India : Meghalaya (Khasi Hills), and Assam.

Genus *Cyana* Walker

1854. *Cyana* Walker, *List Lep. Het. Brit. Mus.*, **2** : 528.

1983. *Cyana*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no.60, p.29-30.

Remarks : Hampson (1900) cited several generic names as synonyms including the genus *Cyana* Walker under *Chionaema* Herrich-Schäffer. Roepke (1944) following Neave (1939) believes that the correct year of publication of *Chionaema* is 1855 and not 1850, whereas that of the genus *Cyana* being 1854, so that the latter genus has a priority over *Chionaema* and has been followed in recent publication by Arora (1983). In this paper, all the species have been described under the genus *Cyana*.

Key to species of the genus *Cyana* Walker

1. Forewing of male with trifid lobe; hindwing white ..... *signa*
— forewing of male without trifid lobe; hindwing not white.....2
2. Forewing of male with single lobe; hindwing crimson 3
— Forewing of male with bifid lobe; hindwing yellow.....*puer*
3. Forewing without black edging scarlet band 4
Forewing with black edging scarlet band 5
4. Palpi yellowish; both sexes with three black spots ..... *dudgeoni*
Palpi scarlet; male with three and female with one black spot ..... *catorhoda*
5. Forewing with black-edged postmedial band straight ..... *coccinea*
Forewing with black-edged postmedial band sinuous ..... *bianca*

42. *Cyana signa* (Walker)

1854. *Bizone signa* Walker, *List. Lep. Het. Brit. Mus.*, **2** : 550.

1894. *Cyana signa*, Hampson, *Fauna Brit. India, Moths*, **2** : 58-59.

Material examined : 4 exs. : N. Khasi Hills, no other data.

Distribution : India : Meghalaya (North Khasi Hills) and Assam. Elsewhere : Burma.

43. *Cyana puer* (Elwes)

1890. *Bizone puer* Elwes, *Proc. zool Soc. London*, p.392, pl.32, fig.8.

1894. *Cyana puer*, Hampson, *Fauna Brit. India, Moths*, **2** : 59.

Material examined : 1 ex. : Meghalaya, Polo bazar, 2.ix.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim and Nagaland (Naga Hills).

44. *Cyana dudgeoni* Hampson

1895. *Cyana dudgeoni* Hampson, *Trans. ent. Soc. London*, p. 293.

1982. *Cyana dudgeoni*, Arora & Chaudhury, *Tech. Monogr.*, no.6 : 46.

Material examined : 1 ex. : Meghalaya, West Garo Hills, Kherapara Inspection Bunglow, 10.x.1988 (Coll. K.K. Roy & Party).

Distribution : India : Meghalaya (Khasi Hills and West Garo Hills), Sikkim, Assam, Arunachal Pradesh. Elsewhere : Bhutan.

45. *Cyana catorhoda* Hampson

1897. *Cyana catorhoda* Hampson, *Journ. Bombay nat. Hist. Soc.*, **11** : 296.

Material examined : 3 exs. : Meghalaya, East Khasi Hills, Cherrapunji, 1250 m., 22.ix.1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (East Khasi Hills) and Assam. Elsewhere : Burma.

**46. *Cyana coccinea* (Moore)

1878. *Bizone coccinea* Moore, *Proc. zool. Soc. London*, p. 28, pl. 3, fig. 14.

1983. *Cyana coccinea*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 35-36.

Material examined : 2 exs. : Meghalaya, West Garo Hills, Shibbari, P.W.D.I. Banglow, 13.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills), Sikkim, Andaman. Elsewhere : Burma.

*47. *Cyana bianca* (Walker)

1856. *Bizane bianca* Walker, *List. Lep. Het. Brit. Mus.*, **7** : 1684.

1983. *Cyana bianca*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 35.

Material examined - 1 ex. : Meghalaya, East Garo Hills, Tasek F.R.H.I.B., Songok, 2.vii.1988; 2 exs. : Rongrengiri F.R.H., 9.vii. 1988 (Coll. R.K. Ghosh and Party).

Distribution : India : Meghalaya (East Garo Hills), Assam, Sikkim, Andaman. Elsewhere : Burma and Malaysia.

**48. *Cyana molleri* (Elwes)

1890. *Bizone molleri* Elwes, *Proc. zool. Soc. London*, p.395.

1894. *Cyana molleri*, Hampson, *Fauna Brit. India, Moths*, **2** : 60.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim. Elsewhere : Burma.

**49. *Cyana khasiana* Hampson

1897. *Cyana khasiana* Hampson, *Journ. Bombay nat. Hist. Soc.*, **9** : 296.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

**50. *Cyana arama* (Moore)

1859. *Bizone arama* Moore, *Cat. Lep. E.I.C.*, p. 306, pl.71, fig. 10.

1894. *Cyana arama*, Hampson, *Fauna Brit. Indian, Moths*, **2** : 62.

Distribution : India : Meghalaya (Jaintia Hills and Jawai Hills), Sikkim, Assam and Naga Hills.

**51. *Cyana dohertyi* (Elwes)

1890. *Bizone dohertyi* Elwes, *Proc. zool. Soc. London*, p. 394, pl. 32, fig. 4.

1894. *Cyana dohertyi*, Hampson, *Fauna Brit. Indian, Moths*, **2** : 62.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim and N.W. Himalayas.

**52. *Cyana detrita* Walker

1854. Cyana detrita Walker, *List. Lep. Het. Brit. Mus.*, **2** : 529.

1894. *Cyana detrita*, Hampson, *Fauna Brit. India, Moths*, **2** : 60.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim, Nagaland (Naga Hills), N.W. Himalayas.

**53. *Cyana alborosea* Walker

1864. *Lithosia alborosea* Walker, *List Lep. Insects Brit. Mus.*, **31** : 230.

1896. *Cyana alborosea*, Hampson, *Fauna Brit. India, Moths*, **4** : 492.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim. Elsewhere : Bhutan, Burma, Hongkong.

**54. *Cyana gelida* (Walker)

1854. *Doliche gelida* Walker, *List Lep. Het. Brit. Mus.*, **2** : 529.

1894. *Cyana gelida*, Hampson, *Fauna Brit. Indian, Moths*, **2** : 60.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim and N.W. Himalayas.

Genus *Asura* Walker

1854. *Asura* Walker, *List Lep. Het. Brit. Mus.*, 2 : 484.

1983. *Asura*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p.36.

Key to species of the genus *Asura* Walker

1. Forewing with postmedial line highly and irregularly dentate 2
— Forewing with postmedial line not highly dentate 3
2. Forewing with subterminal and terminal series of black points ..... *undulosa*
— Forewing with only subterminal series of black points, terminal series wanting ..... *obsoleta*
3. Forewing without distinct postmedial line, wings white ..... *frigida*
— Forewing with distinct postmedial line, wings not white 4
4. Forewing with medial line more or less straight ..... *strigipennis*
Forewing with medial line not straight 5
5. Forewing with medial line connected to postmedial line by streaks ..... *euprepiodes*
Forewing with medial line not connected to postmedial line 6

6. Forewing with terminal black line, postmedial line not broad but strongly excurved from costa to vein M3 ..... *conjunctana*
   Forewing without terminal black line, a very broad brown-edged fuscous post medial band with sinuous inner edge, not excurved ..... *nebulasa*

*55. *Asura undulosa* (Walker)

1854. *Cyllene undulosa* Walker, *List Lep. Insects Brit. Mus.*, 2 : 545.

1982. *Asura undulosa*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p. 49.

Material examined : 1 ex. : Cherrapunji, October, 1961, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Assam and Arunachal Pradesh. Elsewhere : Bhutan and Burma.

56. *Asura obsoleta* (Moore)

1878. *Lyclene obsoleta* Moore, *Proc. zool. Soc. London*, p.32, pl.3, fig. 7.

1982. *Asura obsoleta*, Arora & Choudury, *Tech. Monogr.*, no.6, p.49.

Material examined - 1 ex. : West Garo Hills, Kherapara P.W.D.I. Bunglow, 20.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills), Sikkim, Assam, Arunachal Pradesh, West Bengal, South India. Elsewhere : Bhutan and South China

*57. *Asura frigida* (Walker)

1854. *Doliche frigida* Walker, *List Lep. Insects Brit. Mus.*, 2 : 530.

1982. *Asura frigida*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.49-50.

Material examined : 1 ex. : Meghalaya, East Garo Hills, Rongrengiri F.R.H. alt., 300 m., 3.vii.1988 (Coll. R.K. Ghosh & Party); 1 ex. : East Khasi Hills, Uniam, 1000 m., 19.ix. 1991 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (East Garo Hills and East Khasi Hills), Sikkim, Assam and Arunachal Pradesh. Elsewhere : Burma, Indonesia and Malaysia.

58. *Asura strigipennis* (Herrich-Schäffer)

1855. *Paidia strigipennis* Herrich-Schäffer, *Aussereur. Schmett.* : 21, pl. 437.

1982. *Asura strigipennis*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, p. 50.

Material examined - 1 ex. : Meghalaya, West Garo Hills, Kherapara, 19.vii.1988 (Coll.

R.K. Ghosh & Party), 3 exs. East Garo Hills, Williamnagar. 25.v.1990 (Coll. M.S. Shishodia & Party), 2 exs. : Jaintia Hills, Jawai, 1300 m., 24.ix.1991 (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh).

Distribution : India : Meghalaya (Khasi Hills, East & West Garo Hills, Jaintia Hills), Sikkim, Assam and Arunachal Pradesh. Elsewhere : Bhutan, Burma and Indonesia.

*59. *Asura eruprepiodes* (Walker)

1862. *Hypropia euprepioides* Walker, *Journ. Proc. Linn. Soc. Zool.*, **6** : 102.

1982. *Asura euprepioides*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.51, pl. IV fig. 25.

Material examined - 1 ex. : Meghalaya, West Garo Hills, Tura, 290 m., 14.x.191 (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (West Garo Hills), Assam, Sikkim, Nagaland (Naga Hills). Elsewhere : Bruma, Indonesia, Malaysia and Philippines.

60. *Asura conjunctana* (Walker)

1866. *Conchylis conjunctana* Walker, *List Lep. Insects Brit. Mus.*, **35** : 1788.

1982. *Asura conjunctana*, Arora and Chaudhury, *Tech. Monogr.*, no. 6, p. 51.

Material examined : 2 exs. : Jaintia Hills, Jawai, 20.5.1990 (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (Jaintia and Khasi Hills), Sikkim, Assam, Arunachal Pradesh, Nagaland (Naga Hills). Elsewhere : Bhutan.

* 61. *Asura nebulosa* (Moore)

1878. *Setina nebulosa* Moore, *Proc. zool. Soc. London*, p.35.

1900. *Asura nebulosa*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 452, pl. 31, fig. 11.

Material examined : 1 ex. : N. Khasi Hills, no other data.

Distribution : India : Meghalaya (North Khasi Hills), and Sikkim.

* 62. *Asura discisigna* (Moore)

1878. *Setina discisigna* Moore, *Proc. zool. Soc. London*, p. 35.

1900. *Asura discisigna*, Hamspon, *Cat. Lep. Phal. Brit. Mus.*, **2** : 460-461.

Distribution : India : Meghalaya (Khasi Hills) and Assam; Elsewhere : Labaun, Borneo and KinaBalu.

** 63. *Asura dasara* (Moore)

1859. *Setina dasara* Moore, *Lep. East Ind. Camp.*, p. 303.

1900. *Asura dasara*, Hampson, *Cat. lep. Phal. Brit. Mus.*, **2** : 432-433.

Distribution : India : Meghalaya (Khasi Hills), Assam, Sikkim, N.W. Himalayas, Tamil Nadu (Nilgiris). Elsewhere : Sumatra.

** 64. *Asura pudibunda* (Snell)

1880. *Setina pudibunda* Snell, *Veth's Middon Sumatra Lep.*, p. 38, pl. 3, fig. 16.

1900. *Asura pudibunda*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 438.

Distribution : India : Meghalaya (Khasi Hills), and Assam. Elsewhere : Sumatra.

** 65. *Asura umbrosa* (Hampson)

1896. *Miltochrista umbrosa* Hampson, *Fauna Brit. India, Moths*, **4** : 501.

1900. *Asura umbrosa*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 452.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Asuridia* Hampson

1900. *Asuridia* Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 412.

** 66. *Asuridia metaphaea* Hampson

1900. *Asuridia metaphaea* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 413.

Diagnostic characters : Forewing : ochreous, irrorated with black scales, costa black towards base, an antemedial slightly sinuous line incurved to costa, an oblique medial line angled inwards almost to the medial line in cell, a discodial point, the postmedial line very oblique from costa to vein M_3, where it is very acutely angled, then retracted to lower angle of cell, veins beyond it broadly streaked with black to near termen, a fine terminal black line; hindwing : fuscous black, the base, inner margin and cilia ochreous.

Material examined : 1 ex. : Meghalaya, East Garo Hills, Tasek, F.R.H., Songsok, 5.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (East Garo Hills) and Sikkim.

Genus *Stigmatophora* Staudinger

1881. *Stigmatophora* Staudinger, *Stett. ent. Zeit.*, 62 : 399.

1900. *Stigmatophora*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2: 550.

* 67. *Stigmatophora palmata* (Moore)

1878. *Lyclene palmata* Moore, *Proc. zool. Soc. London*, p.34, pl. 3, fig. 5.

1900. *Stigmatophora palmata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 550-551.

Diagnostic characters : Thorax : mesothorax with a pair of black spots; tibia : fore tibiae banded with black; forewing : 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 in end of cell; hindwing : with three subterminal short streaks below apex followed by four and five spots.

Material examined : 2 exs. : Meghalaya, West Garo Hills, Kherapara P.W.D.T. Bunglow, 20.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills), Assam and N.W. Himalayas.

Genus *Miltochrista* Hübner

1876. *Miltochrista* Hübner, *Verz bek. Schmett.*, p. 166.

1983. *Miltochrista*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 38.

Key to species of the genus *Miltochrista* Hübner

1. Forewing of male with median nervure bent upwards at extremity, discocellular short ..... *strigivenata*
— Forewing of male normal 2
2. Forewing with cilia blackish 3
— Forewing with cilia not blackish 5
3. Forewing with medial line strongly angled inwards in submedian fold .... *cuneonotata*
— Forewing with medial line not angled inwards in submedian fold 4
4. Forewing suffused with crimson; hindwing yellowish, apical and terminal area tinged with crimson ..... *cruciata*
— Forewing not suffused with crimson; hindwing not yellowish, apical and terminal area not tinged crimson ..... *multistriata*
5. Forewing with veins and terminal area streaked with black 6
— Forewing with veins and terminal area not streaked with black ..... *magna*

6. Forewing pure white with medial yellow band, two curved antemedial series of five yellow spots ..... *eccentropis*
— Forewing yellowish, without medial band, a curved antemedial series of three spots ..... *.radians*

* 68. *Miltochrista strigivenata* Hampson

1894. *Miltochrista strigivenata* Hampson, *Fauna Brit. India, Moths*, **2** : 197.

1900. *Miltochrista strigivenata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 473, pl. 32, fig. 32.

Material examined : 1 ex. : Shillong, no other data 1 ex. : Jaintia Hills, Jawai Camp, 21.v. 1990 (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Assam and Nagaland (Naga Hills).

* 69. *Miltochrista cuneonotata* (Walker)

1855. *Ammatho cuneonotata* Walker, *List Lep. Insects Brit. Mus.*, **3** : 759.

1983. *Miltochrista cuneonotata*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.55, pl. 4, fig. 27.

Material examined : 1 ex. : Meghalaya, East Garo Hills, Rongrengiri, F.R.H., 1300 ft., 6.vii.1988; West Garo Hills, Kherapara, 19.vii.1988, (Coll. R.K. Ghosh & Party), 3 exs.: East Khasi hills, Polobazar, 1300 m., 23.ix.1991, (Coll. R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (East Khasi Hills and East & West Garo Hills), Sikkim, Nagaland (Naga Hills) and Arunachal Pradesh. Elsewhere : Sri Lanka, Malaysia, Indonesia and the Phillipines.

70. *Miltochrista cruciata* (Walker)

1862. *Hypoprepia cruciata* Walker, *Journ. Proc. Linn. Soc. Zool.*, **6** : 101.

1982. *Miltochrista cruciata*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p.54-55, pl.4, fig.26.

Material examined : 1 ex. : Meghalaya, West Garo Hills, Sibbari P.W.D.I. Bunglow, 17.vii.1988, (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (West Garo Hills and Khasi Hills), Sikkim, Assam and Arunachal Pradesh. Elsewhere : Indonesia and Malaysia.

* 71. *Miltochrista multistriata* Hampson

1894. *Miltochrista multistriata* Hampson, *Fauna Brit. India, Moths*, 2 : 109.

1900. *Miltochrista miltistriata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 486.

Material examined : 1 ex. : Jaintia Hills, Jawai Camp, 21.v.1990 (Coll. M.S. Shishodia & Party).

Distribution : India : Meghalaya (Jaintia Hills), Assam and Nagaland (Naga Hills).

* 72. *Miltochrista magna* Hampson

1894. *Miltochrista magna* Hampson, *Fauna Brit. India Moths*, **2** : 112.

1982. *Miltochrista magna*, Arora and Chaudhury, *Tech. Monogr.*, no.6, p.57, pl.4, fig.29.

Material examined : 1 ex. : Meghalaya, East Garo Hills, Rongrengiri F.R.H., 1300 m., 6.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (East Garo Hills), Arunachal Pradesh and Manipur.

* 73. *Miltochrista eccentropis* Meyrick

1894. *Miltochrista eccentropis* Meyrick, *Trans. ent. Soc. London*, p.3.

1900. *Miltochrista eccentropis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 490.

Material examined : 1 ex. : Shillong, I.C.A.R. Complex, 13.iii.1978 (Coll. - Nil).

Distribution : India : Meghalaya (East Khasi Hills) and Assam. Elsewhere : Burma.

* 74. *Miltochrista radians* (Moore)

1878. *Lyclene radians* Moore, *Proc. zool. Soc. London*, p.30, pl.3, fig.2.

1900. *Miltochrista radians*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : p. 491.

Material examined - 5 exs. : Meghalaya, West Garo Hills, Kherapara P.W.D.I. Bunglow, 19, 20.vii.1988; 3 exs. : East Garo Hills, Tasek F.R.H. 1 Bunglow, 3, 4.vii.1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (East and West Garo Hills), Assam, Sikkim and West Bengal.

** 75. *Miltochrista prominens* (Moore)

1878. *Lyclene prominens* Moore, *Proc. zool. Soc. London*, p.31, pl.3, fig.3.

1982. *Miltochrista prominens*, Arora & Chaudhury, *Tech. Monogr.*, no.6, p.56-57.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim and Arunachal Pradesh.

** 76. *Miltochrista spilosomoides* (Moore)

1878. *Lyclene spilosomoides* Moore, *Proc. zool. Soc. London*, p.33.

1900. *Miltochrista spilosomoides*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 494.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam and North West India.

** 77. *Miltochrista phaeoxanthia* Hampson

1900. *Miltochrista phaeoxanthia* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 493.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 78. *Miltochrista gratiosa* (Guérin-Méneville)

1843. *Euchelia gratiosa* Guérin-Méneville, *Deless. Souv. Inde.*, **2** : 90, pl.26, fig.1.

1983. *Miltochrista gratiosa*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 39.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam (Cachar), Tamil Nadu (Nilgiris), N.W. Himalayas, Himachal pradesh (Dharamsala) and Andamans. Elsewhere : Indonesia, Sri Lanka, Burma, Japan and China.

** 79. *Miltochrista delicia* (Swinhoe)

1891. *Barsine delicia* Swinhoe, *Trans. ent. Soc. London*, p. 477, pl. 19, fig. 12.

1900. *Miltochrista delicia*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 485-486.

Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Sumatra.

** 80. *Miltochrista mesortha* Hampson

1897. *Miltochrista mesortha* Hampson, *Journ. Bombay nat. Hist. Soc.*, **9** : 440.

1900. *Miltochrista mesortha* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 485.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 81. *Miltochrista inflexa* (Moore)

1878. *Barsine inflexa* Moore, *Proc. zool. Soc. London*, p. 29, pl. 3, fig. 17.

1982. *Miltochrista inflexa*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 55-56, pl. 4, fig. 28.

Distribution — India : Meghalaya (Khasi Hills), Sikkim, Assam, and Arunachal Pradesh.

** 82. *Miltochrista cardinalis* Hampson

1900. *Miltochrista cardinalis* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 480, pl. 32, fig. 8.

1982. *Miltochrista cardinalis*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 53-54.

Distribution —India : Meghalaya (Khasi Hills), Sikkim, Assam and Arunachal Pradesh.

** 83. *Miltochrista dentifascia* Hampson

1894. *Miltochrista dentifascia* Hampson, *Fauna Brit. India, Moths*, **2** : 108.

1900. *Miltochrista dentifascia*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 470.

Distribution — India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Burma.

Genus *Siccia* Walker

1854. *Siccia* Walker, *List Lep. Insects Brit. Mus.*, **2** : 539

1900. *Siccia*, Hampson, *Cat Lep. Phal. Brit. Mus.*, 2 : 389.

** 84. *Siccia taprobanis* (Walker)

1854. *Aemene taprobanis* Walker, *List Lep. Insects Brit. Mus.*, 2 : 542.

1900. *Siccia taprobanis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 391.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Assam, Nagaland (Naga Hills), N.W. Himalayas, Maharashtra (Bombay). Elsewhere : Sri Lanka and Malay.

* 85. *Siccia seriata* Hampson

1900. *Siccia seriata* Hampson, *Cat. Lep. Phal. Brit. Mus.*, 2 : 395-396.

Diagnostic characters : Head and thorax : grey white; tegulae, patagia and metathorax : with black spots; forewing : grey white with five black spots on costa, a subbasal black point, antenal and post medial black points below costa, a series of five spots between middle of cell and termen; hindwing : fuscous, with obscure discoidal spot.

Material examined — 1 ex. : Shillong, no date (Coll. J.N. Sachan).

Distribution ; India : Meghalaya, ((East Khasi Hills), Assam and Nagaland (Naga Hills).

Genus *Oeonistis* Hübner

1827. *Oeonistia* Hübner, *Verz. bek. Schmett.*, p. 165.

1982. *Oeonistis*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 57-8.

* 86. *Oeonistis entella* (Cramer)

1779. *Phalaena entella* Cramer, *Pap. Exot.*, **3** : 27, pl. 208, fig. D.

1982. *Oeonistis entella*, Arora & Chaudhury, *Tech. Monogr.*, no. 6, p. 58, pl. 4, fig. 30, 30a.

Diagnostic characters : Forewing : costa, medial and postmedial bands metallic green, medial band expanding below cell towards base and postmedial band expanding below M_1 towards terminal margin, hindwing : pale yellow.

Material examined : 1 ex. : Meghalaya, West Garo Hills, Tura, Inspection Bunglow, 10. x. 1988 (Coll. K.K. Roy & Party).

Distribution : India : Meghalaya (West Garo Hills), Arunachal : Pradesh, Maharashtra, Tamil Nadu. Elsewhere : South China, Sri Lanka and Indonesia.

Genus *Prabhasa* Moore

1878. *Prabhasa* Moore, *Proc. zool. Soc. London*, p. 25.

1983. *Prabhasa*, Arora, *Rec. zool. Surv. India, Occ. Paper.* no. 60, p. 24-25.

** 87. *Prabhasa costalis* Moore

1878. *Prabhasa costalis* Moore, *Proc. zool, Soc. London*, p. 26.

1983. *Prabhasa costalis*, Arora, *Rec. zool, Surv. India, Occ. Paper*, no. 60, p. 25.

Distribution : India : Meghalaya (Khasi Hills), Assam, Andamans. Elsewhere : Burma and North China.

** 88. *Prabhasa flavicosta* Moore

1878. *Prabhasa flavicosta* Moore, *Proc. zool. Soc. London*, p. 26, pl. 2, fig. 17.

Distribution : India : Meghalaya (East Khasi Hills), Assam and Arunachal Pradesh.

Genus *Hyposiccia* Hampson

1900. *Hyposiccia* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 406.

** 89. *Hyposiccia amnaea* (Swinhoe)

1894. *Aemene amnaea* Swinhoe, *Ann. Mag. nat. Hist. Soc.*, (6) **14** : 437.

1900. *Hyposiccia amnaea*, Hampson, *Cat Lep. Phal. Brit. Mus.*, **2** : 406.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 90. *Hyposiccia mesozonata* (Hampson)

1898. *Aemene mesozonata* Hampson, *Journ. Bombay nat. Hist. Soc.*, **9** : 438.

1900. *Hyposiccia mesozonata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 407.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Parasiccia* Hampson

1900. *Parasiccia* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 407.

** 91. *Parasiccia nocturna* Hampson

1900. *Parasiccia nocturna* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 410.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Macaduma* Walker

1866. *Macaduma* Walker, *List Lep. Insects Brit. Mus.*, **35** : 1704.

1900. *Macaduma*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 266.

** 92. *Macaduma tortricella* Walker

1866. *Macaduma tortricella* Walker, *List Lep. Insects Brit. Mus.*, **35** : 1705.

1900. *Macaduma tortricella*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 266-267.

Distribution : India : Meghalaya (Khasi Hills) and Assam; S.W.N. Guinea and Java.

Genus *Halone* Walker

1854. *Halone* Walker, *List Lep. Insects Brit. Mus.*, **2** : 540.

1900. *Halone*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 276.

** 93. *Halone flavescens* (Hampson)

1897. *Aemene flavescens* Hampson, *Journ. Bombay nat. Hist. Soc.*, p. 439.

1900. *Halone flavescens*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 276.
Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 94. *Halone diffusifascia* (Swinhoe)

1896. *Aemene diffusifascia* Swinhoe, *Ann. Mag. nat. Hist. Soc.*, (6) **17** : 362.

1900. *Halone diffusifasica*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 279.
Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Scaptesyle* Walker

1854. *Scaptesyle* Walker, *List Lep. Insects Brit. Mus.*, **2** : 378.

1900. *Scaptesyle*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 283.

** 95. *Scaptesyle bicolor* Walker

1864. *Scaptesyle bicolor* Walker, *List Lep. Insects Brit. Mus.*, **31** : 182.

1900. *Scaptesyle bicolor*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 285.
Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Borneo and Pulolaut.

Genus *Siculifer* Hampson

1896. *Siculifer* Hampson, *Fauna Brit. India, Moths.* **4** : 497.

1900. *Siculifer*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 291.

** 96. *Siculifer bilineatus* Hampson

1896. *Siculifer bilineatus* Hampson, *Fauna Brit. India Moths*, **4** : 497.

1900. *Siculifer bilineatus*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 291.
Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Meteugoa* Hampson

1900. *Meteugoa* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 335.

** 97. *Meteugoa ochrivena* (Hampson)

1898. *Eugoa ochrivena* Hampson, *Journ. Bombay nat. Hist. Soc.*, **9** : 439.

1900. *Meteugoa ochrivena*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 335.

Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Borneo, Pulolaut.

Genus *Pareugoa* Hampson

1900. *Pareugoa* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 405.

** 98. *Pareugoa multistrigata* (Hampson)

1897. *Eugoa multistrigata* Hampson, *Journ. Bombay nat. Hist. Soc.*, **9** : 439.

1900. *Pareugoa multistrigata*, Hampson, *Cat Lep. Phal. Brit. Mus.*, **2** : 405.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Poliosia* Hampson

1900. *Poliosia* Hampson, *Cat. Lep. Phal. Bit. Mus.*, **2** : 106.

** 99. *Poliosia muricolor parva* (Moore)

1878. *Collita parva* Moore, *Proc. zool. Soc. London*, p. 16, pl. 1, Fig. 13.

1900. *Poliosia muricolor parva*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 108.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

** 100. *Poliosia brunnea* Moore

1878. *Dolgoma brunnea* Moore, *Proc. zool. Soc. London, p. 20, pl. 2, fig. 8.*

1900. *Poliosia brunnea*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 108.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

Genus *Nudaria* Hawarth

1803. *Nudaria* Howarth, *Lep. Brit.*, p. 156.

1900. Nudaria, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 533.

** 101. *Nudaria suffusa* Hampson

1894. *Nudaria suffusa* Hampson, *Fauna Brit. India, Moths,* **2** : 123.

1900. *Nudaria suffusa,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 535-536.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam.

** 102. *Nudaria fumidisca* Hampson

1896. *Nudaria fumidisca* Hampson, *Fauna Brit. India, Moths,* **4** : 502.

1900. *Nudaria fumidisca,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 536.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

** 103. *Nudaria discipuncta* Hampson

1897. *Nudaria discipuncta* Hampson, *Journ. Bombay nat. Hist. Soc.,* **2** : 440.

1900. *Nudaria discipuncta,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 536.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam. Elsewhere : Pulolaut.

Genus *Gymnochroma* Hampson

1900. *Gymnochroma* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 537.

** 104. *Gymnochroma fulvipicta* (Hampson)

1896. *Nudaria fulvipicta* Hampson, *Fauna Brit. India, Moths,* **4** : 501.

1900. *Gymnochroma fulvipicta,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 537.

Distribution : India : Meghalaya (Khasi Hills), and Assam.

Genus *Diduga* Moore

1887. *Diduga* Moore, *Lep. Ceyln.,* **3** : 535.

1900. *Diduga,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 539.

** 105. *Diduga rufidisca* Hampson

1897. *Didiga rufidisca* Hampson, *Journ. Bombay nat. Hist. Soc., p. 439.*

1900. *Diduga rufidisca,* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 542.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Tropacme* Hampson

1894. *Tropacme* Hampson, *Fauna Brit. India, Moths,* **2** : 101.

1900. *Tropacme* Hampson, *Cat. Lep. Phal. Brit. Mus.,* **2** : 555.

** 106. *Tropacme cupreimargo* Hampson

1894. *Tropacme cupreimargo* Hampson, *Fauna Brit. India, Moths,* **2** : 101.

1900. *Tropacme cupreimargo,* Hampson, *Cat. Lep. phal. Brit. Mus.,* **2** : 555-556.

Distribution : India Meghalaya (Khasi Hills) and Assam. Elsewhere : Burma.

Genus *Macrobrochis* Herrich-Schäffer

1856. *Macrobrochis* Herrich-Schäffer, *Samml. aussereur. Schmett.,* p. 72.

1894. *Macrobrochis,* Hampson, *Fauna Brit. India, Moths,* 2 : 65.

** 107. *Macrobrochis gigas* (Walker)

1854. *Lithosia gigas* Walker, *List Lep. Insects. Brit. Mus.,* **2** : 494.

1894. *Macrobrochis gigas,* Hampson, *Fauna Brit. India, Moths,* **2** : 65-66.

Distribution : India : Meghalaya (East Khasi Hills) and Sikkim. Elsewhere : Bangladesh.

Subfamily Micrarctinae

Key to genera of the subfamily Micrarctinae

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***

— Palpi upturned; antennae of male ciliated, tibiae with normal spurs; hindwing normal ..... ***Utetheisa***

Genus *Argina* Hübner

1816. *Argina* Hübner, *Verz bek. Schmett.,* p. 167.

1983. *Argina,* Arora, *Rec. zool. Soc. India, Occ. Paper,* no. 60, p. 9.

Key to species of the genera ***Argina*** Hübner

Head, thorax and forewing orange yellow or whitish, abdomen and hindwing bright orange..... ***astrea***

— Head, thorax and forewing scarlet or brownish red, abdomen and hindwing scarlet ..... ***argus***

108. *Argina astrea* (Drury)

1773. *Phalaena astrea* Drury, *Illust. nat. Hist. exot. Insects.*, **2** : Index 2, pl. 6, fig. 3.

1983. *Argina astrea*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 9-10.

Material examined : 1 ex. : Meghalaya, West Garo Hills, Kherapara Inspection Bunglow, 10.x.1988 (Coll. K.K. Roy & Party).

Distribution : India : Throughout India including Meghalaya (West Garo Hills) : Elsewhere : China; Sri Lanka; Burma; New Guinea; Samoan Island; Mauritius and the Philippines.

109. *Argina argus* (Kollar)

1844. *Euprepia argus* Kollar, *In : Hugel's Kaschmir. Und das Reich der Sick*, **4** : 467, pl. 21, fig. 3.

1983. *Argina argus*, Arora & Chaudhury, *Tech. Monogr.*, no. 6. 11.

Material examined : 3 exs. : Shillong; 1 ex. : Khasi Hills, no date (Coll. A.K.B.).

Distribution : Throughout India including Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Burma and Eastern Asia.

Genus *Utetheisa* Hübner

1816. *Utetheisa* Hübner, *Verz. bek. Schmett.*, p. 168.

1985. *Utetheisa*, Arora, *Rec. zool. Surv. India, Occ. Paper*, no. 60, p. 10-11.

110. *Utetheisa pulchella* (Linnaeus)

1758. *Tinea pulchella* Linnaeus, *Syst. Nat.*, **1** : 534.

1901. *Utetheisa pulchella*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 483-484.

Diagnostic characters : Forewing : white with five interrupted scarlet band and with series of black spots between them, and marginal series of black spots; hindwing : semi-diaphanous white, a very irregular black submarginal band, broad at apical area and between veins Cu1a and 2A.

Material examined : 1 ex. : Khasi Hills, no other data; 1 ex. : Khasi Hills, no other data; 1 ex. : West Garo Hills, Tura, 600 m., 30.iv.1979 (Coll. J.K. Jonathan & Party).

Distribution : India : Throughout India including Meghalaya (West Garo Hills and Khasi Hills). Elsewhere : Sri Lanka, The philippines, Malaya Archipelago, New Guinea, Australia and the Pacific groups.

Subfamily Nolinae

Genus *Celama* Walker

1864. *Celama* Walker, *List Lep. Insects Brit. Mus.*, **32** : 500.

1900. *Celama*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 7.

** 111. *Celama tesselata* (Hampson)

1896. *Nola tesselata* Hampson, *Fauna Brit. India, Moths.*, **4** : 504.

1900. *Celama tesselata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 8.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Nola* Leach

1815. *Nola* Leach, *Edinb. Encycl.*, **9** : 135.

1900. *Nola*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 31.

** 112. *Nola melanota* Hampson

1900. *Nola melanota* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 35-36.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim.

** 113. *Nola tristicta* Hampson

1900. *Nola tristicta* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 37.

Distribution : India : Meghalaya (Khasi Hills), Sikkim and Assam.

** 114. *Nola microphasma* Butler

1885. *Nola microphasma* Butler, *Cist. Ent.*, **3** : 117.

1900. *Nola microphasma*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 37.

Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Bhutan; Borneo, Sarawak, Pulo Laut and Japan.

Genus *Roesalia* Hübner

1827. *Roesalia* Hübner, *Verz. bek. Schmett.*, p. 397.

1900. *Roesalia* Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 51.

** 115. *Roesalia triangularis* (Leech)

1888. *Nola triangulalis* Leech, *Proc. zool. Soc. London*, p.608, pl. 31, fig. 12.

1900. *Roesalia triangulalis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 57.

Distribution : India : Meghalaya (Khasi Hills), Assam and Sikkim. Elsewhere : Japan.

** 116. *Roesalia argyria* (Hampson)

1894. *Pisara argyria* Hampson, *Fauan Brit. India, Moths*, **2** : 145.

1900. *Roesalia argyria*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 57, pl. 19, fig. 26.

Distribution : India : Megalaya (Khasi Hills), Assam and Sikkim.

Genus *Zia* Walker

1863. *Zia* Walker, *List Lep. Insecta Brit. Mus.*, **27** : 109.

1900. *Zia*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **2** : 75.

**117. *Zia lunisigna* (Hampson)

1898. *Nola lunisigna* Hampson, *Journ. Bombay nat. Hist. Soc.*, **11** : 441.

1900. *Zia lunisigna*, Hampson, *Cat. Lep. Phal Brit. Mus.*, **2** : 77.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Meghalaya*	Jaintia Hills
1.	*Diacrisia mona* (Swinhoe)	+						
2.	*Diacrisia gopara* (Moore)	+						
3.	*Diacrisia multiguttata* (Walker)				+			
4.	*Diacrisia impleta* (Walker)					+		

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Meghalaya*	Jaintia Hills
5.	*Diacrisia sikkimensis* (Moore)					+		
6.	*Baroa vatala* Swinhoe					+		
7.	*Amsacta lineola* (Fabricius)				+			
8.	*Amsacta negrita* (Hampson)					+		
9.	*Alphaea quadriramosa* (Kollar)					+		
10.	*Arctia caja* (Linnaeus)					+		
11.	*Dilemera arctata* (Walker)	+						
12.	*Nyctemera varians* Walker	+						
13.	*Nyctemera cenis* (Cramer)	+						
14.	*Nyctemera adversata* (Schaller)	+						
15.	*Callimorphs plagiata* (Walker)	+						
16.	*Callimorpha equitalis* (Kollar)	+						
17.	*Creatonotos gangis* (Linnaeus)				+			
18.	Phissama transiens (Walker)				+			
19.	*Aloa lactinea* (Cramer)	+			+			
20.	*Spilarctia casigneta* (Kollar)	+						
21.	*Spilarctia obliqua* (Walker)	+						
22.	*Spilarctia flavens* (Moore)					+		
23.	*Spilarctia flavens* (Moore)					+		
24.	*Spilarctia melanosoma* (Hampson)					+		
25.	*Spilarctia rubilinea* (Moore)	+						
26.	*Spilarctia nigrifrons* (Walker)					+		
27.	*Areas galactina* (Hoeven)	+						
28.	*Chrysorabdia viridata* (Walker)	+						
29.	*Chrysorabdia bivitta* (Walker)					+		
30.	*Chrysorabdia aurantiaca* Hampson					+		
31.	*Zadadra distorta* (Moore)	+						
32.	*Strysopha tortricoides* (Walker)				+			
33.	*Eilema tetragona* (Walker)			+				

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Meghalaya*	Jaintia Hills
34.	*Eilema vagesa* (Moore)				+		+	
35.	*Eilema vicaria* (Walker)				+			
36.	*Eilema griseola* (Hübner)	+						
37.	*Eilema cucullata* (Moore)					+		
38.	*Eilema fuscistriga* (Hampson)					+		
39.	*Eilema cana* (Hampson)					+		
40.	*Eilema nigripes* (Hampson)					+		
41.	*Agylla ramelana* (Moore)	+						+
42.	*Agylla semirufa* (Hampson)					+		
43.	*Cyana signa* (Walker)		+					
44.	*Cyana puer* (Elwes)	+						
45.	*Cyana dudgeoni* Hampson				+	+		
46.	*Cyana catorhoda* Hampson	+						
47.	*Cyana coccinea* (Moore)				+			
48.	*Cyana bianca* (Walker)			+				
49.	*Cyana molleri* (Elwes)					+		
50.	*Cyana khasiana* Hampson					+		
51.	*Cyana arama* (Moore)							+
52.	*Cyana dohertyi* (Elwes)					+		
53.	*Cyana detrita* Walker					+		
54.	*Cyana alborosea* Walker					+		
55.	*Cyana gelida* (Walker)					+		
56.	*Asura undulosa* (Walker)	+						
57.	*Asura obsoleta* (Moore)				+			
58.	*Asura frigida* (Walker)	+		+				
59.	*Asura strigipennis* (Herrich-Schäffer)			+	+	+		+
60.	*Asura euprepioides* (Walker)				+			
61.	*Asura conjunctana* (Walker)					+		+
62.	*Asura nebulosa* (Moore)		+					

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Meghalaya*	Jaintia Hills
63.	*Asura discisigna* (Moore)					+		
64.	*Asura dasara* (Moore)					+		
65.	*Asura pudibunda* (Snell)					+		
66.	*Asura umbrosa* (Hampson)					+		
67.	*Asuridia metaphaes* Hampson			+				
68.	*Stigmatophora palmata* (Moore)				+			
69.	*Miltochrista strigivenata* Hampson	+						
70.	*Miltochrista cuneonotata* (Walker)	+		+	+			
71.	*Miltochrista cruciata* (Walker)				+	+		
72.	*Miltochrista multistriata* Hampson							
73.	*Miltochrista magana* Hampson			+				
74.	*Miltochrista eccentropis* Meyrick	+						
75.	*Miltochrista radians* (Moore)			+	+			
76.	*Miltochrista prominens* (Moore)							
77.	*Miltochrista spilosomoides* (Moore)					+		
78.	*Miltochrista phaeoxanthia* Hampson					+		
79.	*Miltochrista gratiosa* (Guérin-Méneville)							
80.	*Miltochrista delicia* (Swinhoe)					+		
81.	*Miltochrista mesortha* Hampson					+		
82.	*Miltochrista inflexa* (Moore)					+		
83.	*Miltochrista cardinalis* Hampson					+		
84.	*Miltochrista dentifascia* Hampson					+		
85.	*Siccia taprobanis* (Walker)					+		
86.	*Siccia seriata* Hampson	+						
87.	*Oeonistis entella* (Cramer)				+			
88.	*Prabhasa costalis* Moore					+		
89.	*Prabhasa flavicosta* Moore	+						
90.	*Hyposiccia amnaea* (Swinhoe)					+		

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills*	Meghalaya*	Jaintia Hills
91.	*Hyposiccia mesozonata* (Hampson)					+		
92.	*Parasiccia nocturna* Hampson					+		
93.	*Macaduma tortricella* Walker					+		
94.	*Halone flavescens* (Hampson)					+		
95.	*Halone diffusifascia* (Swinhoe)					+		
96.	*Scaptesyle bicolor* Walker					+		
97.	*Siculifer bilineatus* Hampson					+		
98.	*Meteugoa ochrivena* (Hampson)					+		
98.	*Pareugoa multistrigata* (Hampson)					+		
100.	*Poliosia muricolor parva* (Moore)					+		
101.	*Poliosia brunnea* Moore					+		
102.	*Nudaria suffusa* Hampson					+		
103.	*Nudaria fumidisca* Hampson					+		
104.	*Nudaria discipuncta* Hampson					+		
105.	*Gymnochroma fulvipicta* (Hampson)					+		
106.	*Diduga rufidisca* Hampson					+		
107.	*Tropacme cupreimargo* Hampson					+		
108.	*Macrobrochis gigas* (Walker)	+						
109.	*Argina astrea* (Drury)				+			
110.	*Argina argus* (Kollar)	+						
111.	*Utetheisa pulchella* (Linnaeus)				+	+		
112.	*Celama tesselata* (Hampson)					+		
113.	*Nola melanota* Hampson					+		
114.	*Nola tristicta* Hampson					+		
115.	*Nola microphasma* Butler					+		
116.	*Roesalia triangularis* (Leech)					+		
117.	*Roesalia argyria* (Hampson)					+		
118.	*Zia lunisigma* (Hampson)					+		

SUMMARY

The paper incorporates a systematic account, coupled with a brief review on earlier investigation of the family Arctiidae from Meghalaya. Altogether 117 species distributed over 46 genera and 7 subfamilies are dealt with of which 28 species constitute new locality records. Keys to taxa examined, literature review of 66 species, distribution of species in India and other zoogeographical regions of the world and also a table showing the distribution of species in different districts of Meghalaya have been provided in the paper.

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INSECTA : LEPIDOPTERA : CTENUCHIDAE, LIMACODIDAE AND HYPSIDAE

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INTRODUCTION

The study is based on the collections of Ctenuchidae, Limacodidae and Hypsidae of the Order Lepidoptera from Meghalaya. This study was made on the material brought by different survey parties of Zoological Survey of India and also the material lying in the National Zoological Collections.

The family Ctenuchidae includes small to medium-sized moths of largely tropico-diurnal habit. Many of them are brilliantly coloured and mimic the hymenopteran aculeata and other insects by virtue of their largely transparent wings including other features. This family is represented by about 2000 Indian species. The family Limacodidae and Hypsidae are represented by only 94 and 28 Indian species respectively. Altogether 21 species in 3 genera of Ctenuchidae, 5 species in 4 genera of Limacodidae and 6 species in a single genera of the family Hypsidae from Meghalaya are dealt with in the paper. Amongst these species, 5 species of Ctenuchidae and a couple of species of each family of Limacodidae and Hypsidae constitute new locality records (marked*) from the state. Literature review (marked **) of 10 species of Ctenuchidae and three of Hypsidae has been incorporated in the paper.

Cotes and Swinhoe (1887, 1889), Hampson (1892) and Seitz (1933) reported quite a number of Indian species of the aforesaid three families of Lepidoptera from Meghalaya. However, Hampson (1898) and Swinhoe (1891-94) also made valuable contributions on the family Ctenuchidae from the State.

In the paper, keys to taxa of the material examined, literature review of the species not studied, distribution of the species with generic and species references have been included. The table showing the distribution of species in different districts of Meghalaya has also been provided

Key to Families

1. Hindwing vein Sc+R_1 present 2
— Hindwing vein Sc+R_1 aborted ..... Ctenuchidae
2. Hindwing vein Sc+R_1 anastomosing shortly with Rs ..... Limacodidae

— Hindwing vein Sc+R1 connected with Rs by a bar or touching it near middle of cell ..... Hypsidae

Family Ctenuchidae
Key to genera of the family Ctenuchidae

1. Hindwing without Cu1a ..... ***Ceryx***
— Hindwing with Cu1a 2
2. Hindwing vein M_2 arising from lower angle of cell or stalked with Cu1a ..... ***Syntomis***
— Hindwing vein M_2 arising well from above angle of cell ..... ***Eressa***

Genus ***Ceryx*** Wallengren

1863. *Ceryx* Wallengren, Wien. Ent. Mon., **7** : 140.

1898. *Ceryx* Hampson, Cat. Lep. Phal. Brit. Mus., **1** : 35.

Key to species of the genus ***Ceryx*** Wallengren

Hindwing with narrow terminal black band ..... *godartii*
— Hindwing with broad terminal black band extending nearly to cell.....*imaon*

*1. ***Ceryx godartii*** (Boisduval)

1829. *Syntomis godartii* Boisduval, Mon. Zyg., 115, pl.7, fig. 3.

1898. *Ceryx godartii*, Hampson, Cat. Lep. Phal. Brit. Mus., **1** : 43-44.

Material examined : 3 exs. : Khasi Hills, nongpoh, Circuit House compound, 28.ix.1989. (Coll. A.R. Lahiri & Partly); 1 ex. : Cherrapunji, 1250 m., 23.ix.1991, (Coll. R.K. Varshney, I.J. Gupta and S.K. Ghosh); lex. West Garo Hills, Bangladesh border at Bagmashi, 30.iv.1991 (Coll. B.N. Das & party); lex; Songsok, 1 km. S. of I.B., 19.ix.1975 (Coll. N. Muraleedharan & Party).

Distribution : India : Meghalaya (East Khasi and West Garo Hills), Sikkim, Assam, West Bengal and South India. Elsewhere : Burma, Malaya and Sumatra.

2. ***Ceryx imaon*** (Cramer)

1780. *Sphnix imaon* Cramer, Pap. Exot., **3** : 94, pl. 248E.

1898. *Ceryx imaon*, Hampson, Cat. Lep. Phal. Brit. Mus., **1** : 44.

Material examined : 2 exs. : Khasi Hills, Cherrapunji Circuit House Compound, 14.ix.1988 (Coll. A.R. Lahiri & Party); 1 ex. : East Garo Hills, Dainadula I.B., 15.ix. 1975, 2 exs. : Dainadula Chima Bongshai, 12.ix.1975 (Coll. N. Muraleedharan & Party); 2 exs. : West Garo Hills, Rongra, 29.iv.1991 (Coll. B.N. Das & party).

Distribution : India : Meghalaya (East Khasi Hills, East and West Garo Hills), Assam, Himachal Pradesh, Maharashtra, Tamil Nadu, West Bengal, Andaman. Elsewhere : Sri Lanka, Burma and Indonesia.

**3. *Ceryx ginorea* (Swinhoe)

1894. *Eressa ginorea* Swinhoe, *Ann. Mag. nat. Hist.*, (6) **14** : 441.

1898. *Ceryx ginorea*, Hampson, Cat. Lep. Phal. Brit. Mus., **1** : 37.

Distribution : India : Meghalaya (Khasi Hills), and Assam.

** 4. *Ceryx cherra* (Moore)

1879. *Syntomis cherra* Moore, Lep. Atk., 12.

1898. *Ceryx cherra*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 41.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Syntomis* Ochsenheimer

1808. *Syntomis* Ochsenheimer, *Eur. Schmett.*, **2** : 103.

1898. *Syntomis*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 59.

Key to species of the genus *Syntomis* Ochsenheimer

1. Abdomen with two bands 2
— Abdomen with more than two bands 4
2. Collar without orange ring 3
— Collar with orange ring ..... *cyssea*
3. Metathorax with orange patch ..... *sperbius*
— Metathorax without orange patch ..... *bicincta*
4. Forewing without black bar across submedian interspaces ..... *melaena*
— Forewing with black bar across submedian interspaces 5

5. Frons orange 6
— Frons white ..... *divisa*
6. Abdomen with five orange bands ..... *compta*
— Abdomen with seven orange bands ..... *berinda*

* 5. *Syntomis cyssea* (Stoll)

1782. *Sphinx cyssea* Stoll, *Pap. Exot.*, 4; 124, pl. 355 B.

1898. *Syntomis cyssea*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 105.

Material examined : 2 exs. : Khasi Hills, Shillong, Barapani, 7.ix.1975 (Coll. N. Muraleedharan & Party); 1 ex. : West Garo Hills, Sibbari, 26.iv.1991 (Coll. B.N. Das & Party).

Distribution : India : Meghalaya (East Khasi Hills and West Garo Hills), West Bengal, Maharashtra (Bombay), N.W. Himalayas (Kangra), Tamil Nadu (Nilgiris). Elsewhere : Nepal, Sri Lanka, Burma and Pakistan.

* 6. *Syntomis sperbius* (Fabricius)

1787. *Zygena sperbius* Fabricius, *Mant. Ins.*, 2 : 103.

1898. *Syntomis sperbius*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 106.

Material examined : 2 exs. : West Garo Hills, Songsok, 1 km. East of I.B., 20.ix.1975 (Coll. N. Muraleedharan & Party).

Distribution : India : Meghalaya (West Garo Hills), Assam and Sikkim. Elsewhere : Burma.

7. *Syntomis bicincta* Kollar

1844. *Syntomis bicincta* Kollar, *In Hugel's Kaschmir und das Reich der Siek.*, 4 : 460, pl. 19, fig.8.

1898. *Syntomis bicincta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 106-107.

Material examined : 1 ex. : Khasi Hills, no other data.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, West Bengal, N.W. Himalayas, Uttar Pradesh (Dehradun). Elsewhere : China.

8. *Syntomis melaena* (Walker)

1854. *Syntomis melas* Walker, *List Lep. Insect Brit. Mus.*, 1 : 133.

1898. *Syntomis melaena*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 96.

Material examined : 3 exs. : Khasi Hills, (Coll. A.W.B.), 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Hills), Assam and Sikkim. Elsewhere : Burma and Nepal.

9. *Syntomis divisa* Walker

1854. *Syntomis divisa* Walker, *List. Lep. Insect. Brit. Mus.*, 1 : 131.

1898. *Syntomis divisa*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 98-99.

Material examined : 1 ex. : Khasi Hills, Soil Conservation Test House, Polo Bazar, 1400 m., 7.iv.1991; 2 exs. : Nr. Mara, Polo Hills Forest, 1500 m., 10.iv.1991 (Coll. S.K.Ghosh & Party); 4 exs. : Polobazar, 1380 m., 20.ix.1991 (Coll. R.K. Varshney, I.J. Gupta & S. Ghosh).

Distribution : India : Meghalaya (East Khasi Hills), Assam and Sikkim. Elsewhere : Bangladesh (Sylhet) and Burma.

10. *Syntomis compta* Walker

1869. *Syntomis compta* Walker, *Char. Undescr. Het.* : 89.

1898. *Syntomis compta*, Hampson, Cat. Lep. Phal. Brit. Mus., 1 : 99.

Material examined : 1 ex. Garo Hills, .xi.1922, (Coll. S.Kemp & B. Chopra).

Distribution : India : Meghalaya (Khasi and Garo Hills) and Assam.

*11. *Syntomis berinda* Moore

1878. *Syntomis berinda* Moore, *Proc. zool. Soc. Lond.*, 845, pl. 53, fig.8.

1898. *Syntomis berinda*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, 1 : 98.

Material examined : 1 ex : West Garo Hills, Tura, 290 m., 3.x.1991 (Coll. R.K. Varsheney, I.J. Gupta and S. Ghosh).

Distribution : India : Meghalaya (West Garo Hills) and Assam.

(Sibsagar and Caetar) Elsewhere : Burma.

**12. *Syntomis diaphana* Kollar

1844. *Syntomis diaphana* Kollar, *In Hugel's Kaschmir und das Reich der Siek*, 4 : 460, pl. 19, fig.7.

1898. *Syntomis diaphana*, Hampson, *Cat. Lep. Phal Brit. Mus.* 1 : 67.

Distribution : India : Meghalaya (Khasi Hills), Assam (Sibsagar), Uttar Pradesh, N.W. Himalayas and Kashmir. Elsewhere : Burma.

** 13. *Syntomis baiaea* (Swinhoe)

1891. *Hydrusa baiaea* Swinhoe, *Trans. ent. Soc. Lond.*, 473, pl. 19, fig.10.

1898. *Syntomis baiaea*, Hampson, *Cat. Lep. phal. Brit. Mus.*, **1** : 67-68.

Distribution : India : Meghalaya (Khasi Hills), and Assam. Elsewhere : Borneo, Java, Salak and Kina Balu.

** 14. *Syntomis era* (Swinhoe)

1891. *Hydrusa era* Swinhoe, *Trans. ent. Soc. Lond.*, : 473, pl. 19, fig.15.

1898. *Syntomis era*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 68.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 15. *Syntomis serrata* Hampson

1892. *Syntomis serrata* Hampson, *Fauna Brit. India, Moths*, **1** : 221.

1898. *Syntomis serrata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 70.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

** 16. *Syntomis flavifrons* Hampson

1892. *Syntomis flavifrons* Hampson, *Fauna Brit. India, Moths*, **1** : 215.

1898. *Syntomis flavifrons*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 101.

Distribution : India : Meghalaya (Khasi Hills), Assam. Elsewhere : Burma.

**17. *Syntomis khasiana* Butler

1876. *Syntomis khasiana* Butler, *Journ. Linn. Soc. Zool.*, **12** : 345.

1898. *Syntomis khasiana*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 103.

Distribution : India : Meghalaya (Khasi Hills) and Assam.

Genus *Eressa* Walker

1854. *Eressa* Walker, *List Lep. Insects Brit. Mus.*, **1** : 149.

1898. *Eressa*, Hampson, *Cat, Lep. Phal. Brit. Mus.*, **1** : 115.

Key to species of the genus *Eressa* Walker

Antennae of male bipectinate; abdomen with dorsal and lateral series of orange yellow spots ..... *confinis*

Antennae of male serrate; abdomen crimson with dorsal series of blue bands and lateral series of blue black spots. ..... *multigutta*

18. *Eressa confinis* (Walker)

1854. *Glaucopis confinis* Walker, *List Lep. Insects. Brit. Mus.* **1** : 149.

1898. *Eressa confinis*, Hampson, *Cat. Lep. Phal. Brit. Mus* **1** : 116.

Material examined : 1 ex. : West Khasi Hills, Nongstein P.W.D. I.B., 20.ix.1988 (Coll. A.R. Lahiri & Party); 1 ex. : East Garo Hills, Rongringiri F.R.H., 7.vii.1988 (Coll. R.K.Ghosh & Party); 2 exs. : Williamnagar Circuit House Camp, 18.i.1991. (Coll. B. Nandi & Party).

Distribution : India : Meghalaya (West Khasi Hills and East Garo Hills), West Bengal, Maharashtra, Tamil Nadu, N.W.Himalayas. Elsewhere : Bhutan, Sri Lanka and Burma.

* 19. *Eressa multigutta* (Walker)

1854. *Syntomis multigutta* Walker, *List Lep. Insects Brit. Mus.*, **1** : 134.

1898. *Eressa multigutta*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 120-121.

Material examined : 4 exs. : Khasi Hills, Nongpoh, Circuit House Compound, 3.x.1988 (Coll. A.R. Lahiri & Party).

Distribution : India : Meghalaya (Khasi Hills) and Sikkim; Elsewhere : Burma, China, Nepal and Tibet.

**20. *Eressa subaurata* (Walker)

1854. *Glaucopis subaurata* Walker, *List Lep. Insects Brit. Mus.*, **1** : 149.

1898. *Eressa subaurata*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 117. 121

Distribution : India : Meghalaya (Khasi Hills), West Bengal. Elsewhere : Sri Lanka.

** 21. *Eressa discinota* (Moore)

1879. *Syntomis discinota* Moore, *Lep. Atk.*, : 13.

1898. *Eressa discinota*, Hampson, *Cat. Lep. Phal. Brit. Mus.*, **1** : 123.

Distribution : India : Meghalaya (Khasi Hills) and Assam. Elsewhere : Burma.

Family Limacodidae

Key to genera of the family Limacodidae

1. Palpi not reaching beyond frontal tuft ..... *Miresa*
— Palpi reaching beyond frontal tuft 2
2. Forewing vein R_5 stalked with R_3 and R_4 ..... *Parasa*
— Forewing vein R_5 not stalked with R_3 and R_4 3
3. Forewing vein R_5 from below angle of cell ..... *Oxyplax*
— Forewing vein R_5 from angle of cell ..... *Natada*

Genus *Miresa* Walker

1855. *Miresa* Walker, *Cat. Lep. Het. Brit. Mus.*, **5** : 1123.

1892. *Miresa*, Hampson, *Fauna Brit. India, Moths*, 1 : 385.

1. *Miresa argentifera* Walker

1865. *Miresa argentifera* Walker, *Cat. Lep. Het. Brit. Mus.* **5** : 124.

1892. *Miresa argentifera*, Hampson, *Fauna Brit. India, Moths*, **1** : 386.

Diagnostic characters : Head : Yellow; forewing : red brown, a broken ill defined postmedial silvery line curved from costa to vein Culb then straight and more prominent to inner margin, some silvery scales towards outer margin, a series of silvery marginal spots.

Material examined : 1 ex. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam (Sibsagar), Karnataka (North Kanara). Elsewhere : Sri Lanka.

Genus *Parasa* Moore

1859. *Parasa* Moore, Lep. E.I.C., : 413.

1892. ***Parasa*, Hampson,** *Fauna Brit. India, Moths*, **1** : 387.

Key to species of the genus ***Parasa*** Moore

1. Forewing pea green in both sexes ..... *bicolor*
— Forewing dark purplish brown in male, dark brown in female ..... *herbifera*

* 2. ***Parasa bicolor*** (Walker)

1855. *Neoera bicolor* Walker, *Cat. Lep. Het. Brit. Mus.*, **5** : 1142.

1892. *Parasa bicolor*, Hampson, *Fauna Brit. India, Moths*, **1** : 390.

Material examined : 1 ex. : West Garo Hills, Tura, 290 m., 3.x.1991 (Coll R.K. Varshney, I.J. Gupta and S. Ghosh).

Distribution : Throughout continental India, including Meghalaya (West Garo Hills) and Sikkim. Elsewhere : Burma.

* 3. ***Parasa herbifera*** (Walker)

1855. *Nyssia herbifera* Walker, *Cat. Lep. Het. Brit. Mus.*, **5** : 1136.

1892. *Parasa herbifera*, Hampson, *Fauna Brit. India, Moths*, **1** : 390.

Material examined : 2 exs. : Shillong, I.C.A.R. Complex, 13.vii.1978, Coll. nil.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh (Simla), Tamil Nadu (Nilgiris). Elsewhere : Nepal.

Genus ***Oxyplax*** Hampson

1892. *Oxyplax* Hampson, *Fauna Brit. India, Moths*, **1** : 376.

4. ***Oxyplax ochracea*** (Moore)

1882. *Aphendala ochracea* Moore, *Lep. Ceyl.*, **2** : 129, pl. 129, figs. 3, 3a.

1892. *Oxyplax ochracea*, Hampson, *Fauna Brit. India, Moths*, **1** : 376-377.

Diagnostic character : Forewing : fulvous, suffused with fuscous below basal part of costa and towards outermargin; a curved white line from apex to centre of inner margin.

Material examined : 2 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Sri Lanka.

Genus *Natada* Walker

1855. *Natada* Walker, *Cat. Lep. Het. Brit. Mus.*, **5** : 1108.

1892. *Natada*, Hampson, *Fauna Brit. India, Moths*, **1** : 380.

5. *Natada ocellata* (Moore)

1879. *Monema ocellata* Moore, *Deser. Ind. Lep. Atk.*, **1** : 74.

1892. *Matada ocellata*, Hampson, *Fauna Brit. India, Moths*, **1** : 382.

Diagnostic characters : Forewing : Ochreous brown, irrorated with black, especially below costa, a purplish grey patch beyond lower angle of cell with a deep red brown mark beyond it; a fine submarginal black line; hindwing, suffused with fuscous.

Material examined : 5 exs. : Shillong, no other data.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal (Darjeeling) and Nagaland (Naga Hills). Elsewhere : Burma.

Family Hypsidae

Genus *Hypsa* Hübner

1818. *Hypsa* Hübner, *Verz. Bek. Schmett.*, : 172.

1892. *Hypsa*, Hampson, *Fauna Brit. India, Moths* **1** : 498.

Key to species of the genus *Hypsa* Hübner

1. Palpi with 3rd joint of moderate length ..... *marmorea*
— Palpi with 3rd joint very long 2
2. Palpi with black lateral stripes on 2nd joint, 3rd joint black, forewing with orange patch 3
— Palpi with black lateral stripes on both 2nd and 3rd joints, 3rd joint not black, forewing with white patch ..... *complana*
3. Hindwing with a large black spot at end of cell and with a marginal black band ..... *heliconia*
Hindwing with a fuscous spot at end of cell and with a broad marginal fuscous band 4
4. Forewing orange yellow with five black spots near base arranged in round shape,

veins streaked with yellow ..... *egens*

— Forewing fuscous with five black spots not arranged in round shape, veins streaked with white ..... *monycha*

1. *Hypsa marmorea* Walker

1856. *Hypsa (Euplocia) marmorea* Walker, *Cat. Lep. Het. Brit. Mus.*, **7** : 1674.

1892. *Hypsa marmorea*, Hampson, *Fauna Brit. India, Moths*, **1** : 498-499.

Material examined : 2 exs : Shillong Mus., no other data.

Distribution : Throughout North East India including Meghalaya (East Khasi Hills). **Elsewhere** : Burma and Java.

* 2. *Hypsa complana* Walker

1864. *Hypsa complana* Walker, *Cat. Lep. Het. Brit. Mus.*, **31** : 213.

1892. *Hypsa complana* Hampson, *Fauna Brit. India, Moths*, **1** : 500-501.

Material examined : 1 ex : Shillong Mus., no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim, Orissa and Tamil **Nadu (Nilgiris)**; Elsewhere : Sri Lanka, Rangoon, Singapore, Bourer and Timor.

* 3. *Hypsa heliconia* (Linnaeus)

1758. *Phalaena heliconia* Linnaeus, *Syst. Nat. edx.*, : 511.

1892. *Hypsa heliconia*, Hampson, *Fauna Brit. India, Moths*, **1** : 501.

Material examined : 1 ex. : Shillong Mus., no other data.

Distribution : India : Meghalaya (East Khasi Hills), Assam and Sikkim, Bangladesh **(Sylhet)**. Elsewhere : Burma, Thailand, Singapore, Borneo, Ceram, New Guinea.

4. *Hypsa egens* Walker

1854. *Hypsa (Damalis) egens Walker, Cat. Lep. Het. Brit. Mus.*, **2** : 453.

1892. *Hypsa egens*, Hampson, *Fauna Brit. India, Moths* **1** : 501.

Material examined : 1 ex : Shillong, no other data.

Distribution : Throughout North East India including Meghalaya (East Khasi Hills).

Elsewhere : Burma, Taiwan, Singapore, Thailand and Malayan Subregion.

5. *Hypsa monycha* (Cramer)

1777. *Phalaena monycha* Cramer, *Pap. Exot.*, 2 pl. 131, fig. C.

1892. *Hypsa monycha*, Hampson, *Fauna Brit. India, Moths*, **1** : 500-501.

Material examined : 1 ex. : Shillong, no other data.

Distribution : Throughout North East India including Meghalaya (East Khasi Hills), Nicobar. Elsewhere : Taiwan, Burma, Java, Amboina, Australia and Solomons.

**6. *Hypsa dominia* (Cramer)

1779. *Phalaena domina* Cramer, *Pap. Exot.*, 3, pl. 263, figs. A, B.

1892. *Hypsa dominia*, Hampson, *Fauna Brit. India, Moths*, **1** : 499.

Distribution : India : Meghalaya (Cherrapunji, Khasi Hills), Sikkim, Assam, South India. Elsewhere : Bangladesh (Sylhet), Burma and Java.

TABLE SHOWING THE DISTRIBUTION OF SPECIES IN MEGHALAYA
Family Ctenuchidae

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills	Megha-laya	Jaintia Hills
1.	*Ceryx godartii* (Boisduval)	+			+			
2.	*Ceryx imaon* (Cramer)	+		+	+			
3.	*Ceryx ginorea* (Swinhoe)					+		
4.	*Ceryx cherra* (Moore)					+		
5.	*Syntomis cyssea* (Stoll)	+			+			
6.	*Syntomis sperbius* (Fabricius)				+			
7.	*Syntomis bicincta* Kollar					+		
8.	*Syntomis melaena* (Walker)					+		
9.	*Syntomis divisa Walker*					+		
10.	Syntomis compta Walker					+	+	
11.	*Syntomis berinola* Moore				+			

Sl. No.	Name of the species	East Khasi Hills	North Khasi Hills	East Garo Hills	West Garo Hills	Khasi Hills	Megha-laya	Jaintia Hills
12.	*Syntomis diaphana* Kollar					+		
13.	*Syntomis baiaea* (Swinhoe)					+		
14.	*Syntomis era* (Swinhoe)					+		
15.	*Syntomis serrata* Hampson					+		
16.	*Syntomis flavifrons* Hampson					+		
17.	*Syntomis khasiana* Butler					+		
18.	Eressa confinis (Walker)		+	+				
19.	*Eressa multigutta* (Walker)					+		
20.	*Eressa subaurata* (Walker)					+		
21.	*Eressa discinota* (Moore)					+		
	Family : Limacodidae							
1.	*Miresa argentifera* Walker	+			+			
2.	*Parasa bicolor* (Walker)				+			
3.	*Parasa herbifera* (Walker)	+						
4.	*Oxyplax ochracea* (Moore)	+						
5.	Natada ocellata (Moore)	+						
	Family : Hypsidae							
1.	*Hypsa marmorea* Walker	+						
2.	Hypsa complana Walker	+						
3.	*Hypsa heliconia* (Linnaeus)	+						
4.	*Hypsa egens* Walker	+						
5.	*Hypsa monycha* (Cramer)	+						
6.	*Hypsa dominia* (Cramer)	+						

District not mentioned

SUMMARY

The paper incorporates the taxonomic account and geographical distribution of the species of the family Ctenuchidae, Limacodidae and Hypsidae in the state of Meghalaya as well as other zoogeographical regions of the World. Keys to taxa of the examined material and the literature review of the species not studied have been provided. Thus

an account of 21 species of Ctenuchidae, 5 species of Limacodidae and 6 species of Hypsidae has been furnished in the paper. Amongst a total of 32 species, 5 species of Ctenuchidae and a couple of species of each family of Limacodidae and Hypsidae constitute new locality records for the state.

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INSECTA : LEPIDOPTERA : SPHINGIDAE, NOCTUIDAE AND GEOMETRIDAE

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INTRODUCTION

In continuation with the preceding chapter dealing wth the bombycoid and noctuoid fauna, this work presents the systematic account of Sphingidae, Noctuidae and Geometridae from Meghalaya. The Sphingidae is represented by 120 species in 59 genera from India and 60 species in 35 genera from the state of Meghalaya. The Notctuidae is known by 1500 species in about 300 genera from India and 320 species in 150 genera from the state, while the Geometridae comprises 1100 species in over 260 genera from India and 460 species in 208 genera from the state.

The material brought to the Survey comprise 110 exs. in 84 species of all the three foregone families taken together and represent about 10% of the known state fauna. As apparent from the very poor percentage of material at hand, the faunal resources under study should be legally protected in the natural habitats of the country.

The pioneering work on the faunatic studies of Noctuidae in particular from Meghalaya dates back to Swinhoe (1895). Subsequently, Sevastopulo (1939, 1956) made further studies on Noctuidae over and above the Sphingidae and Geometridae from Shillong.

The morphological features, habits, etc., have already been briefed for the Sphingidae and Geometridae in the earlier papers on the *State Fauna Series, West Bengal* (*Vide* Mondal & Maulik and Mondal & Ghosh, *in* press). As to the Noctuidae (from the Latin *nox* = night), the members are usually stout-bodied and night-flying in habit and popularly known as Owl Moths, Brocade, Coronet, Wainscot Moths, Army Worm Moths, Turntails Moths, Snout Moths, etc. These have dull and cryptic fore wing markings escaping detection in daytime on tree-trunks, boulders, in leaf litters etc. Males of many species have scent and stridulatory organs. The larvae are normally foliage feeders on plants of economic importance. This very large and dominant family has two main divisions, viz., Trifid group of subfamilies and Quadrifid group of sub-families. The trifid group, with obsolescent M_2 on hind wing, inhabits chiefly the temperate regions and less in the mountainous districts of the tropical and subtropical zones. The quadrifid group, with well developed M_2 on hind wing, is very largely represented in the torrid zones, i.e., land between the two tropics.

The present paper deals with the systematic account of the Sphingidae, Noctuidae and Geometridae from Meghalaya. Amongst the species examined, the Sphingidae comprises

nine including three as new records, the Noctuidae, 22 including 9 as new records and the Geometridae, 53 including 19 as new records for the state. Of these, such species as *Calothysanis amata, Scopula costata, Sterrha cossurata, Cidaria corollaria, Loxaspilates graeseri* and *Ourapteryx sambucaria* are reported for the first time from India. Distribution of all the species examined is shown by map-plotting their serial number as in the systematic list of taxa. The systems of the aforesaid families in order have been followed after Bell & Scott (1937), Hampson (1903, 1905, 1906, 1908, 1909, 1910a, 1910b, 1912, 1913a, 1913b) and Prout (1912, 1913, 1914, 1915, 1934, 1935) along with modifications adopted by Inoue (1982, 1987) for the Geometridae.

SYSTEMATIC ACCOUNT

For information on the general morphology, illustrations, collection and preservation methods together with keys to taxa (mostly for the Sphingidae and Geometridae), references have already been cited in the preceding works (*vide* Mondal & Ghosh, *in* press; Mondal & Maulik, *in* press). Keys to those taxonomic categories, that were not included earlier, are only given in this paper.

LIST OF TAXA

(* —Recorded new for Meghalaya; ** — new for India).

Order Lepidoptera

1. Superfamily Bombycoidea

Family Sphingidae

(a) Division Sphingidae-Asemanophorae

Subfamily Acherontiinae

Tribe Acherontiini

Genus ***Acherontia*** Laspeyres

1. *lachesis* (Fabricius)
2. *styx* (Westwood)

ssp. *styx* (Westwood)

Genus ***Herse*** Oken

3. *convolvuli* (Linnaeus)

ssp. *convolvuli* (Linnaeus)

Subfamily Ambulicinae

Genus ***Leucophlebia*** Westwood

*4. *lineata* Westwood

(b) Division Sphingidae-Semanophorae

Subfamily Philampelinae

Tribe Nephelini

Genus ***Elibia*** Walker

5. *dolichus* (Westwood)

Genus ***Macroglossum*** Scopoli

*6. *aquila* (Boisduval)

Genus ***Rhopalopsyche*** Butler

7. *nycteris* (Kollar)

ssp. *nycteris* (Kollar)

Subfamily Choerocampinae

Genus ***Hippotion*** Hübner

8. *rafflesi* (Butler)

Genus ***Theretra*** Hübner

*9. *nessus* (Drury)

2. Superfamily Noctuoidea

Family Noctuidae

Subfamily Heliothinae

Genus ***Helicoverpa*** Hardwick

*10. *armigera* (Hübner)

Subfamily Agrotinae

Genus ***Agrotis*** Ochsenheimer

11. *segetum* (Schiffermüller)

12. *ypsilon* (Rottenburg)

Genus ***Amathes*** Hübner

13. *c-nigrum* (Linnaeus)

Subfamily Hadeninae

Genus ***Polia*** Ochsenheimer

14. *costigera* (Moore)

Genus ***Cirphis*** Walker

*15. *compta* (Moore)
Subfamily Acronyctinae
Genus ***Prodenia*** (Guenée)
*16. *litura* (Fabricius)
Subfamily Sarrothripinae
Genus ***Hyblaea*** Fabricius
17. *puera* Cramer
Subfamily Catocalinae
Genus ***Sypna*** Guenée
*18. *caliginosa* (Walker)
Genus ***Mocis*** Hübner
19. *undata* (Fabricius)
Genus ***Erebus*** Latreille
20. *crepuscularis* (Linnaeus)
21. *albicincta* Kollar
Subfamily Ophiderinae
Genus ***Ramadasa*** Moore
*22. *pavo* (Walker)
Genus ***Othreis*** Hubner
*23. *fullonica* (Linnaeus)
Genus ***Oraesia*** (Guenée)
*24. *emarginata* (Fabricius)
Genus ***Ischyja*** Hübner
*25. *manlia* (Cramer)
Genus ***Hulodes*** Guenée
26. *caranea* (Cramer)
Genus ***Oxyodes*** Guenée
*27. *scrobiculata* (Fabricius)
Subfamily Mominae
Genus ***Trisuloides*** Butler
28. *sericea* Butler

Subfamily Plusiinae
Genus ***Diachrysia*** Hübner
29. *orichalcea* (Fabricius)
Subfamily *Noctuinae*
Genus ***Dichromia*** Guenée
30. *triplicalis* Walker
Subfamily Hypeninae
Genus ***Adrapsa*** Walker
31. *despecta* (Walker)
3. Superfamily Geometroidea
Family Geometridae
Subfamily Geometrinae
Genus ***Archaeobalbis*** Prout
*32. *usneata* (Felder)
Genus ***Terpna*** Herring-Schäffer
*33. *haemataria* Herring-Schäffer
Genus ***Dysphania*** Hübner
34. *militaris* (Linnaeus)
Genus ***Aporandria*** Warren
*35. *specularia* (Guenée)
Genus ***Thalassodes*** Guenée
*36. *quadraria* Guenée
37. *falsaria* Prout
Genus ***Eretmopus*** Turner
38. sp. indet.
Genus ***Oenospila*** Swinhoe
39. *strix* (Butler)
*40. *flavifusata* (Walker)
Genus ***Cyclothia*** Prout
41. *disjuncta* (Walker)
Genus ***Diplodesma*** Warren

42. sp. indet

Subfamily Sterrhinae

Genus ***Rhodostrophia*** Hübner

43. *vinacearia* (Moore)

Genus ***Synegiodes*** Swinhoe

44. *hyriarius* (Walker)

Genus ***Calothysanis*** Hübner

**45. *amata* (Linnaeus)

46. *responsaria* (Moore)

Genus ***Scopula*** Schrank

*47. *emissaria* (Walker)

48. *pulchellata* (Fabricius)

49. *aspilataria* (Walker)

*50. *intensata* (Moore)

**51. *costata* (Moore)

*52. *remotata* (Guenée)

Genus ***Problepsis*** Lederer

53. *vulgaris* Butler

Genus ***Sterrha*** Hübner

**54. *cossurata* (Millière)

Subfamily Larentiinae

Genus ***Cidaria*** Treitschke

**55. *corollaria* Herring-Schäffer

Subfamily Ennominae

Genus ***Petelia*** Herring-Schäffer

*56. *medardaria* Herring-Schäffer

Genus ***Rhynchobapta*** Hampson

57. *flaviceps* (Butler)

Genus ***Macaria*** Curtis

58. *effusata* Guenée

Genus ***Dalima*** Moore

59. *schistacearia* Moore
ssp. *schistacearia* Moore

Genus ***Zamarada*** Moore

60. *cosmiaria* Swinhoe

Genus ***Hypochrosis*** Guenée

61. *iris* (Butler)

Genus ***Spilopera*** Warren

62. *gracilis* Butler

Genus ***Cusiala*** Moore

63. *bengaliaria* (Guenée)

Genus ***Medasina*** Moore

*64. *Creataria* (Guenée)

65. *albidaria* (Walker)

66. sp. indet.

Genus ***Hemerophila*** Stephens

67. *subplagiata* Walker

68. *delineata* (Walker)

Genus ***Boarmia*** Treitshcke

69. *crepuscularia* Hübner

*70. *bhurmitra* Walker

71. *semialba* (Moore)

72. *alienaria* Walker

Genus ***Chorodna*** Walker

73. *erebusaria* Walker

Genus ***Percnia*** Guenée

74. *belluaria* Guenée

75. *felinaria* Guenée

Genus ***Obeidia*** Walker

*76. *tigrata* (Guenée)

Genus ***Alcis*** Curtis

77. *perspicuata* Moore

Genus ***Arichanna*** Moore

78. *hamiltonia* Swinhoe

Genus ***Ascotis*** Hübner

79. *selenaria* (Schiffermüller)

Genus ***Xandrames*** Moore

*80. *dholaria* Moore

Genus ***Gnophos*** Treitschke

81. sp. indet.

Genus ***Loxaspilates*** Warren

**82. *graeseri* Prout

Genus ***Ourapteryx*** Leach

83. *ebuleata* Guenée

**84. *sambucaria* (Linnaeus)

Order LEPIDOPTERA

Key to the superfamilies

1. Antennae acuminate or, if clavate, frenulum present. Tympanal organs absent ..... Bombycoidea
   [Forewing wing M_2 nearer M_1 than M_3. Frenulum present. Antennae gradually clavate, apex pointed and usually hooked] ..... Sphingidae
   Antennae never clavate. Frenulum always present. Tympanal organs present 2
2. Tympanal organs in metathorax. Fore wing M_2 and M_3 basally approximated .... Noctuidae
   Fore wing M_2 nearer M_3 than M_1; Cu_2 absent. Hind wing Sc + R_1 remote from Rs after origin of Rs and M_1; Sc + R_1 anastomosing shortly with Rs near base] ..... Noctuidae
   Tympanal organs in abdomen. Fore wing M_2 and M_3 basally apart ..... Geometroidea
   [Fore wing M_2 nearer M_1 than M_3. Hind wing with a precostal spur at extreme base. Abdominal typanal organs antero-ventrally located]..... Geometridae

1. Superfamily Bombycoidea

   Family Sphingidae

   (a) Division: Sphingidae-Asemanophorae

Subfamily Acherontiinae

Tribe Acherontiini

Genus *Acherontia* Laspeyres, 1809

1809. *Acherontia* Laspeyres, *Jen. Allg. Litt.-Zeit.*, **4** : 99.

1937. *Acherontia* : Bell & Scott, *Fauna Brit. India, Moths*, **5** : 52, fig. 9.

1. *Acherontia lachesis* (Fabricius, 1798)

In press. *Acherontia lachesis* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Khasi hills, 8.iv.1981, J. P. Sati & party coll. *Wing expanse* : 110 mm.

Distribution : India : Meghalaya (Khasi hill district). Elsewhere : Weedy in the Oriental Region.

2. *Acherontia styx* (Westwood, 1848)
A. s. styx (Westwood, 1848)

In press. *Acherontia styx styx* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 1 ♂, Khasi hills, 6.vi.1973. A. K. Ghosh & party coll. *Wing expanse* : 100 mm.

Distribution : India : Meghalaya (Khasi hill district). Elsewhere : Throughout the Indian subregion; also extends to the Malayan belt.

Genus *Herse* Oken, 1815

1815. *Herse* Oken, *Lehrb. Naturg.*, **3** (1) : 762.

1937. *Herse* : Bell & Scott, *Fauna Brit. India, Moths*, **5** : 60, fig. 10.

3. *Herse convolvuli* (Linnaeus, 1758)

H. c. convolvuli (Linnaeus, 1758)

In press. *Herse convolvuli convolvuli* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Lumping, 16.vii.1973, *R. S. Giri* & party coll. *Wing expanse* : 90 mm.

Distribution : India : Meghalaya (East Khasi hills district); throughout the rest of mainland. Elsewhere : Eastern Hemisphere except the higher latitudes. Rare in Siberia and Europe.

Subfamily Ambulicinae

Genus *Leucophlebia* Westwood, 1848

1848. *Leucophlebia* Westwood, *Cab. Or. Ent.*, p. 46.

1937. *Leucophlebia* : Bell & Scott., *Fauna Brit. India, Moths*, 5 : 156, fig. 32.

* 4. *Leucophlebia lineata* Westwood, 1848

In press. *Leucophlebia lineata* : Mondal & Maulik *in State Fauna Series, West Bengal.*

Material examined : One ♂, Rongrong Giri, East Garo hills, "at light", 6.vii. 1988, *R. K. Ghosh* & party coll. *Wing expanse* : 76 mm.

Diagnosis : Mid-tibiae spiny; hind tibiae with 2 pair of spurs. Fore wing bright pink, with a broad upper and a narrow lower longitudinal maize-yellow streaks. Hind wing tawny.

Distribution : India : Meghalaya (East Garo hill district); Assam; West Bengal; northern and southern Peninsula; West Himalaya. Elsewhere : Nepal; Sri Lanka; Sino-Malayan.

Remarks : The species is a new record for Meghalaya.

(b) Division: Sphingidae-Semanophorae

Subfamily Philampelinae

Tribe Nephelini

Genus ***Elibia*** Walker, 1856

1856. *Elibia* Walker, *List. Lep. Ins. Brit. Mus.*, 8 : 148.

1937. *Elibia* : Bell & Scott, *Fauna Brit. India*, Moths, 5 : 285.

5. *Elibia dolichus* (Westwood, 1848)

In press. *Elibia dolichus* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Garo hills, 15.x.1983, J. R. B. Alfred & party coll. *Wing expanse* : 125 mm.

Distribution : India : Meghalaya (Garo hills district; Khasi hills district); Assam; Sikkim; West Bengal. Elsewhere : Bangladesh; Bhutan; Sundaland to Palawan.

Remarks : The species was earlier reported from the Khasi hills by Bell & Scott (1937).

Genus *Macroglossum* Scopoli, 1777

1777. *Macroglossum* Scopoli, *Intr. Hist. Nat.*, p. 414.

1937. *Macroglossum* : Bell & Scott, *Fauna Brit. India*, Moths, **5** : 345.

* 6. *Macroglossum aquila* (Boisduval, 1875)

In press. *Macroglossum aquila* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Pig hills Cab, 7.vii.1973, R. S. Giri & party coll. *Wing expanse* : 50 mm.

Diagnosis : Fore wing subapical spot prominent. Hind wing costal margin dilated into an antemedian lobe.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal. Elsewhere : Indochina and Malayan.

Remarks : This rare species is a new record for Meghalaya.

Genus *Rhopalopsyche* Butler, 1875

1875. *Rhopalopsyche* Butler, *Proc. zool. Soc. London*, p. 239.

1937. *Rhopalopsyche* : Bell & Scott, *Fauna Brit. India, Moths*, **5** : 393.

7. *Rhopalopsyche nycteris* (Kollar, 1848)

Ssp. *nycteris* (Kollar, 1848)

1848. *Macroglossa nycteris* Kollar, *in* Hügel, *Kasch. Reich Seik.*, **4** : 458, pl. 19, fig. 5.

1937. *Rhopalopsyche nycteris nycteris* : Bell & Scott., *Fauna Brit. India, Moths*, **5** : 394, pl. 10, figs. 12, 13; pl. 12, fig. 3.

Material examined : One ♂, Arcuilla, Garo hills district, 6.iii.1975, *S. Biswas* & party coll. *Wing expanse* : 48 mm.

Diagnosis : Antennae with end-segment elongate and without prolonged cilia. Hind wing band maize-yellow. Abdominal side-patches also maize-yellow.

Distribution : India : Meghalaya (East Khasi and Garo hills districts); Sikkim; north-west Himalaya. Elsewhere : Bangladesh; Bhutan; Myanmar; China.

Remarks : The moth, which was bred in the Khasi hills by Bell & Scott (1937), was known to be very common from *c* 900 to 2000 metres wherever the food-plants like *Galium* species and *Rubia corifolia* (Rubiaceae) grow. It is a fast-flier of crepuscular habit. The specimen examined shows a rather appreciably larger wing expanse as compared to that mentioned by Bell & Scott (*loc cit.*).

Subfamily Choerocampinae

Genus *Hippotion* Hübner, 1822

1822. *Hippotion* Hübner, *Verz. bek. Schmett.*, p. 134.

1937. *Hippotion* : Bell & Scott, *Fauna Brit. India, Moths*, **5** : 413.

8. *Hippotion rafflesi* (Butler, 1877)

1877. *Chaerocampa rafflesi* Butler, *Trans. zool. Soc. London*, **9** : 556.

1937. *Hippotion rafflesi* : Bell & Scott, *Fauna Brit. India,, Moths*, **5** : 422, figs. 105, 108, pl. 5.

Material examined : One ♂, Pig hills Cab, 6.viii.1979, R. S. Giri & party coll. *Wing expanse* : 65 mm.

Diagnosis : Body and wings washed with red; hind wing not black at base. First segment of palpus with a prominent white lateral line close to eye.

Distribution : India : Meghalaya (Khasi hills district); southern Peninsula. Elsewhere : Sri Lanka and Myanmar to Malaya and South China.

Remarks : This is a very common species in the Khasi Hills at an elevation of c 1500 metres. It seems to prefer wet forest areas to dry open country. Food plants are *Impatients* (Geraniaceae). It is also known to be readily attracted by flowers and light as well.

Genus *Theretra* Hübner, 1822

1822. *Theretra* Hübner, *Verz. bek. Schmett.*, p. 135.

1937. *Theretra* : Bell & Scott., *Fauna Brit. India, Moths*, 5 : 427.

*9. *Theretra nessus* (Drury, 1773)

In press. *Theretra nessus : Mondal & Maulik, in State Fauna Series, West Bengal.*

Material examined : One ♂, Risa colony, East Khasi hills district, 16.v.1974, *S. N. Prasad* & party coll. *Wing expanse* : 120 mm.

Distribution : India : Meghalaya (East Khasi hills district); rest of East Himalaya; West Himalaya; southern and western Peninsula; Andaman Islands. *Elsewhere* : *vide* Mondal & Maulik (*in* press).

Remarks : The species is a new record for Meghalaya.

2. Superfamily Noctuoidea

Family Noctuidae

Key to the subfamilies

1. Hind wing M_2 obsolescent 2
   Hind wing M_2 well developed 5
2. Tibiae spined 3
   Tibiae not spined 4
3. Fore tibiae without spur; mid-and hind tibiae spined ..... Agrotinae
   Fore tibiae with a cleaning spur; only hind tibiae spined ..... Heliothinae
4. Eyes hairy ..... Hadeninae
   Eyes not hairy ..... Acronyctinae
5. Hind wing M_2 not parallel to M_3. Palpi normal 6
   Hind wing M_2 parallel to M_3. Palpi extremely long and abnormally structured with heavily scaled processes ..... Hypeninae
6. Male retinaculum barred. Fore wing costa and dorsum highly arched near base and with raised buttons of scales in cell ..... Sarrothripinae
   Male retinaculum not barred. Forewing shape and pattern not as above 7
7. Mid-tibiae spined ..... Catocalinae
   Mid-tibiae not spined 8
8. Tip of proboscis armed with minute teeth and spines ..... Ophiderinae
   Tip of proboscis without teeth and spines 9
9. Eyes hairy ..... Mominae
   Eyes not hairy 10
10. Eyes with long overhanging cilia ..... Plusiinae
    Eyes not ciliated. Hind wing M_2 from close to lower angle of cell ..... Noctuinae

Subfamily Heliothinae

Genus *Helicoverpa* Hardwick, 1965

1816. *Heliothis* Ochsenheimer, *Schemett.Eur.*, **4** : 91. (non deser).

1965. *Helicoverpa* Hardwick, *Mem. Ent. Soc. Canada*, **40** : 9.

*10. *Helicoverpa armigera* (Hübner, 1827)

1827. *Noctua armigera* Hübner, *Samml. Eur. Schmett. Noct.*, **2** : 180, pl. 79, fig. 370.

1965. *Helicoverpa armigera* : Hardwick, *Mem. Ent. Soc. Canada*, **40** : 91, figs. 38, 39.

Material examined : 2♂, 3♀, Cherrapunji and Shillong, *c* 1300- 1410 metres, "at light", 1-2.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 35-38 mm.

Diagnosis : Fore tibiae with one claw on inner side and one on the outer. Fore wing reniform stigma obsolescent; postmedial line indistinct and strongly dentate. Hind wing basal area pale.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Jammu and Kashmir; Himachal Pradesh; Punjab; Uttar Pradesh; Madhya Pradesh; Gujarat; Maharashtra; Tamil Nadu. Elsewhere : Afghanistan; Pakistan; Sri Lanka. Malayan; Australia; New Zealand; China; Taiwan; Japan; Ethiopian; Middle-East; Europe; America; Hawaii.

Remarks : The species, of which the larval foodplants comprise corn, cotton, tomatoes, rosebuds, etc., is a new record for Meghalaya.

Subfamily Agrotinae

Key to the genera

Fore tibial spines stout ..... ***Agrotis***
Fore tibial spines slender..... ***Amathes***

Genus *Agrotis* Ochsenheimer, 1816

1816. *Agrotis* Ochsenheimer, *Schmett. Eur.*, **4** : 66.

1971. *Agrotis* : Kapur & Arora, *Rec. zool. Surv. India*, **65** (1-4) : 96.

Key to the Species

Frons sub-rounded, smooth. Fore wing orbicular elliptical.....*ypsilon*
Frons with a conical prominence, not smooth.
Fore wing orbicular round ..... *segetum*

11. *Agrotis segetum* (Schiffermüller, 1776)

1776. *Noctua segetum* Schiffermüller, *Wien. Verz.*, p. 81, figs. 3a, b.

1971. *Agrotis segetum* : Kapur & Arora, *Rec. zool. Surv. India*, **65** (1-4) : 101, pl. 1; figs. 4a-e.

Material examined : 2♂, 1♀, Polobazar, Shillong, *c* 1400 metres, "At light", 6-8.iv.1991. S. K. Ghosh & party coll. *Wing expanse* : ♂, 39 - 41 mm; ♀, 48 mm.

Diagnosis : *Vide key.*

Distribution : India : Meghalaya (East Khasi hills dist.); throughout the rest of mainland. Elsewhere : Myanmar; Sri Lanka; Europe; South Russia; Middle-East; Africa; Japan; Amur; Korea; China; Afghanistan.

Remarks : The species, earlier treated under *Euxoa* Hübner by Hampson (1903), feeds on the roots of cabbage and also other plants as cited under the host-range by Kapur & Arora (1971).

12. *Agrotis ypsilon* (Rottenburg, 1776)

1776. *Noctua ypsilon* Rottenburg, *Naturf.*, **11** : 141.

1971. *Agrotis ypsilon* : Kapur & Arora, *Rec. zool. Surv. India*, **65** (1-4) : 112, pl. 1; figs. 1,2,8.

Material examined : 2♂, 1♀, Cherrapunji, *c* 1300 metres "at light", 3.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 40-45 mm.

Diagnosis : *Vide* Key.

Distribution : India : Meghalaya (East Khasi hills district); Jammu & Kashmir; Himachal Pradesh; Uttar Pradesh; Bihar; West Bengal; Orissa; Sikkim. Elsewhere : Canada; U.S.A.; Guatemala; Costa Rica; Venezuela; Brazil; Peru; Chile; Argentina; Europe; Syria; Africa; Japan; China; Tibet; Java; Australia; New Zealand; Hawaii.

Remarks : The species, which was earlier known from Cherrapunji (*vide* Swinhoe, 1900), is a general feeder along with a host range already cited by Kapur & Arora (1971). It is a serious pest of agricultural crops and plants of forest and medicinal importance.

Genus *Amathes* Hübner, 1822

1822. *Amathes* Hübner, *Verz. bek. Schmett.*, p. 222.

1971. *Amathes* : Kapur & Arora, *Rec. zool. Surv. India*, **65** (1-4) : 124.

13. *Amathes c-nigrum* (Linn., 1758)

1758. *Noctua c-nigrum* Linnaeus, *Syst. Nat.*, ed. **10** : 516.

1971. *Amathes c-nigrum* : Kapur & Arora, *Rec. zool. Surv. India*, **65** (1-4) : 126, pl. 1, figs. 1g, 12 a-e.

Material examined : One ♂, Sibbari P.W.D.I.B., West Garo hills, "at light", 17.vii.1988, R. K. Ghosh & party coll. *Wing expanse* : 29 mm.

Diagnosis : Fore wing pale grey tinged purplish, with cell filled up with colour between base and stigmata; orbicular v- shaped with centre ochreous and open; claviform small; without circular ring. Hind wing ochreous white.

Distribution : India : Meghalaya (East Khasi hills district, West Garo hills district); North-West Himalayas; Punjab; Bihar; Maharashtra; Tamil Nadu; Sikkim. Elsewhere : America; Europe; Russia; C. & N. Asia; Japan; Korea; W. China.

Remarks : Earlier reported from the Khasi hils by Hampson (1894), the species has the wing expanse rather much smaller than that cited by Hampson (1903) and Kapur & Arora (1971). It feeds on *Platanus orientalis* and *Solanum tuberosum*.

Subfamily Hadeninae

Key to the genera

Thorax clothed with scales. Abdomen with a dorsal series of crests. Fore wing broad triangular; R_3 arising from R_2 and anastomosing with R_4 to form an areole ..... *Polia*

Thorax clothed with hairs. Abdomen with dorsal crest on 1st segment only .... *Cirphis*

Genus *Polia* Ochsenheimer, 1816

1816. *Polia* Ochsenheimer, *Schmett. Eur.*, **4** : 73.

1905. *Polia* : Hampson, *Cat. Lep. Phal. Brit. Mus*, **5** : 60.

14. *Polia costigera* (Moore, 1881)

1881. *Agrotis costigera* Moore, *Proc. zool. Soc. London*, p. 350.

1905. *Polia costigera* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, **5** : 109, pl. 81, fig. 11.

Material examined : One ♀, Shillong, *c* 1400 metres, "at light", 31.iii.1991, S. K. Ghosh & party coll. *Wing expanse* : 32 mm.

Diagnosis : Fore wing without black streak below base of cell; ground colour dark purplish grey; costal area pinkish ochreous.

Distribution : India : Meghalaya (East Khasi hills district); Himachal Pradesh; Punjab.

Remarks : The species was earlier reported from the Khasi hills by Hampson (1905). It has the wing expanse rather much smaller than that cited by Hampson (*loc. cit.*).

Genus *Cirphis* Walker, 1865

1865. *Cirphis* Walker, *Cat. Lep. Het. Brit. Mus.*, **32** : 622.

1905. *Cirphis* : Hampson, *Cat. lep. Phal. Brit. Mus.*, **5** : 478.

*15. *Cirphis compta* (Moore, 1881)

1881. *Leucania compta* Moore, Proc. zool. Soc. London, p. 336, pl. 37, fig. 8.

1905. *Cirphis compta* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, 5 : 531.

Material examined : 2 ♀, Cherrapunji, 1300 metres, "at lights", 3.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 32- 33 mm.

Diagnosis : Fore wing postmedial line reduced to points; with a small dark patch beyond lower angle of cell.

Distribution : India : Meghalaya (East Khasi hills district); Orissa; Karnataka; Tamil Nadu. Elsewhere : Restricted to the tropical Orient.

Remarks : The species hitherto remained unrecorded from the East Himalaya.

Subfamily Acronyctinae

Genus *Prodenia* Guenée, 1852

1852. *Prodenia* Guenée, *Hist. nat. Ins. Lep. Noct*, 1 : 159.

1909. *Prodenia* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, 8 : 240.

*16. *Prodenia litura* (Fabr., 1775)

1775. *Noctua litura* Fabricius, *Syst. Ent..*, p. 601.

1909. *Prodenia litura* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, 8 : 245.

Material examined : One ♀, Cherrapunji, *c* 1300 metres, "at light", 2.iv.1991. S. K. Ghosh & party coll. *Wing expanse* : 38 mm.

Diagnosis : Fore wing renifrom produced to a short white tip; mid-dorsum without curved white streak, this on Cu1b ending at postmedian line which is bent outwards from submedian fold to dorsum.

Distribution : India : Meghalaya (East Khasi hills distr.). *Elsewhere* : *Vide* Mondal & Ghosh, 1991; Mondal & Maulik, 1991.

Remarks : The species is a new record for Meghalaya.

Subfamily Sarrothripinae

Genus *Hyblaea* Fabricius, 1794

1794. *Hyblaea* Fabricius, *Ent. Syst.*, 3 (2) : 127.

1900. *Hyblaea* : Swinhoe, *Cat. East. Austral. Lep. Het.*, 2 : 79.

17. *Hyblaea puera* (Cramer, 1777)

1777. *Phalaena puera* Cramer, *Pap. Exot.*, pl. 103, figs. D, E.

1900. *Hyblaea puera* : Swinhoe, *Cat. East. Austral. Lep. Het.*, **2** : 79.

Material examined : 2♂, Cherrapunji, *c* 1300 metres, "at light", 2-3.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 35 - 36 mm.

Diagnosis : Ground-colour brown. Fore wing irrorated with a few dark specks; termen evenly curved. Hind wing orange band curved, with scarlet edges from cell to anal angle; also a short marginal band. Hind wing orange towards anal angle and with a yellow spot.

Distribution : India : Meghalaya (East Khasi hills distr.); almost throughout the rest of mainland. Elsewhere : Myanmar; Sri Lanka; Java; Papua; Bangladesh; China; W. Indies; South Africa; South America.

Remarks : The species was earlier reported from Shillong by Sevastopulo (1956).

Subfamily Catocalinae

Key to the genera

1. Fore and hind tibiae never spined. Abdomen with dorsal tufts ..... *Sypna*
   Hind tibiae always spined. Abdomen without dorsal tuft 2
2. Fore tibiae spined. Hind wing cell very short. Cilia of wings crenulate ..... *Erebus*
   Fore tibiae not spined. Hind wing cell of normal length. Cilia of wings non-crenulate ..... *Mocis*

Genus *Sypna* Guenée, 1852

1852. *Sypna* Guenée, *Hist. nat. Ins. Lep. Noct.*, **3** : 144.

1894. *Sypna* : Hampson, *Fauna Brit. India, Moths*, **2** : 446.

*18. *Sypna caliginosa* (Walker, 1865)

1865. *Tavia caliginosa* Walker, *Cat. Lep. Het. Brit. Mus.*, **33** : 940.

1894. *Sypna caliginosa* : Hampson, *Fauna Brit. India, Moths*, **2** : 448.

Material examined : One♀, Lashamire, East Khasis hills, 9.vii.1964, A. R. Srinivasan & party coll. *Wing expanse* : 50 mm.

Diagnosis : Mid-tibae without spine. Ground colour fuscous brown tinged chestnut-red. Wings with sinuous submarginal line; ante-marginal series of white specks.

Distribution : India : Meghalaya (East Khasi Hills); Sikkim.

Remarks : The species is a new record for Meghalaya. It is endemic in the East Himalaya.

Genus *Mocis* Hübner, 1827

1827. *Mocis* Hübner, *Verz. bek. Schmett.*, p. 267.

1913. *Mocis* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, **13** : 76.

19. ***Mocis undata*** (Fabricius, 1775)

1775. Noctua undata Fabricius, *Syst. Ent.*, p. 600.

1913. *Mocis undata* : Hampson, *Cat. Lep. Phal. Brit. Mus.*, **13** : 91, fig. 25.

Material examined : One ♂, Tura, West Garo hills district, "at light", 7.x.1988, K. K. Ray & party coll. *Wing expanse* : 49 mm.

Diagnosis : Femora, and mid-and hind tibiae of male fringed with long hair. Wings on underside strongly clothed with silky hair to beyond middle; fore wing antemedial line oblique.

Distribution : India : Meghalaya (East Khasi hills and West Garo hills distrcts); Elsewhere : *vide* Mondal and Ghosh, 1991; Mondal and Maulik, 1991.

Remarks : The species was earlier reported from Shillong by Hampson (1913a).

Genus *Erebus* Latreille, 1810

1810. *Erebus* Latreille, *Ord. Nat. Crust. & Ins.*, p. 365.

1981. *Erebus* : Barlow, *Intr. Moths S.E. Asia*, p. 102.

Key to the species

Ground colour brown. Fore wing stigma 'inverted comma'-shaped, with black edges and 'head' bilobed, surmounted by a few blue scales. Both wings with submarginal black line irregularly lunulate ..... *crepuscularis*

Ground colour metallic blue-black. Fore wing stigma whorl-shaped, with brick-red centre and 'head' simple, surmounted by a blue patch, two white specks and a few white scales. Both wings with submarginal white band regularly angled ..... *albicincta*

20. ***Erebus crepuscularis*** (Linnaeus, 1759)

1759. *Phalaena-Attacus crepuscularis* Linnaeus, *Syst. Nat.*, **1** (2) : 811.

1810. *Erebus crepuscularis* : Latreille, *Ord. Nat. Crust. & Ins.*, p. 365.

Material examined : One ♂, East Khasi hills, 23.x.1973, K.K. Deb & party coll. *Wing expanse* : 100 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills distr.); Sikkim; Assam; Himachal Pradesh; Madhya Pradesh; Karnataka; Tamil Nadu; Kerala; Andaman Islands. Elsehwere : Bangladesh; Sri Lanka; Myanmar; Malayan; Malagasy; Japan.

Remarks : The species, earlier treated under the genus *Nyctipao* Hübner by Hampson (1894, 1913a), consists of several synonyms, of which *N. ephesperis* Hübner has been revalidated as a good species of *Erebus* by Barlow (1982).

21. *Erebus albicincta* Kollar, 1848

1848. *Erebus albicincta* Kollar, in Hügel, *Kasch. Reich Seik.*, 4 : 474, pl. 22.

Material examined : One ♀, Shillong, 25.ix.1978, Asket Singh & party coll. *Wing expanse* : 130 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Himachal Pradesh; Nilgiris. Elsehwere : Bangladesh.

Subfamily Ophiderinae
Key to the genera

1. Hind wing cell very short. Legs in male densely hairy; tibiae unspined. Fore wing apex falcate 2
   Hind wing cell of normal length 3
2. Hind wing outer margin crenulate and angled at M_3 ..... ***Hulodes***
   Hind wing outer margin rounded ..... ***Ischyja***
3. Fore wing termen angled at M_3. Antennae of male unipectinate. Palpi with 3rd joint pointed ..... ***Oraesia***
   Fore wing termen not angled 4
4. Fore wing costa rather straight; termen obliquely rounded. Palpi smooth, upturned, with 3rd joint minute. Antennae smooth at base, with minute bristles towards tip ..... ***Ramadasa***
   Fore wing costa highly arched towards apex 5
5. Fore wing dorsum without lobe or hair tuft; apex produced. Palpi with 3rd joint acuminate ..... ***Oxyodes***
   Fore wing dorsum lobed near base and with a tuft of hair at outer angle; apex acute. Palpi with 3rd joint clubbed ..... ***Othreis***

Genus *Ramadasa* Moore, 1877

1877. *Ramadasa* Moore, *Proc. zool. Soc. Lond*, p. 603.

1982. *Ramadasa* : Barlow, *Intr. moths S.E. Asia*, p. 103.

* 22. *Ramadasa pavo* (Walker, 1856)

1856. *Chasmina pavo* Walker, *Cat. Lep. Het. Brit. Mus.*, **9** : 147.

1982. *Ramadasa pavo* : Barlow, *Intr. moths S.E. Asia*, p. 103, pl. 34, fig. 2.

Material examined : One ♀, Kherapara, West Garo hills, "at light", 19.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 52 mm.

Diagnosis : Thorax and base of fore wing grey mottled brown, scales broadly banded with black before tip; hind wing and abdomen orange.

Distribution : India : Meghalaya (West Garo hills district); Sikkim; the Andamans. Elsewhere : Sri Lanka; Malayan.

Remarks : The species is a new record for Meghalaya.

Genus *Othreis* Hübner, 1822

1822. Othreis Hübner, *Verz. bek. Schmett.*, p. 264.

1982. *Othreis* : Barlow, *Intr. moths S.E. Asia*, p. 106.

* 23. Othreis fullonica (Linnaeus, 1759)

1759. *Phalaena-Noctua fullonica* Linnaeus, *Syst. Nat.*, **2** : 812.

1963. *Othreis fullonica* : Bhasin, *Indian Forest Leaflet*, no. **121** (1-4) : 522.

Material examined : One ♂, Parark, East Khasi hills, 13.vii.1962, S.N. Prasad & party coll. *Wing expanse* : 90 mm.

Diagnosis : Head, thorax and fore wing red-brown. Abdomen and hind wing orange. Fore wing postmedial line curved and met by an oblique streak from apex. Hind wing with a large black lunule beyond lower angle of cell and a marginal black band.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : Almost all over the Old World Tropics.

Remarks : The species, which remained hitherto unrecorded from Meghalaya, was treated as *O. fullonia* Clerck by Barlow (1982). But Clerck (1764) described the species as *Phalaena fullonica* which was subsequently put in the synonymy list of *Ophideres fullonica* by Swinhoe (1900). The species is known to pierce the skin of

juicy fruits with their proboscis and to feed on the larval food plants belonging to Menispermaceae.

Genus *Oraesia Guenée*, 1852

1852. *Oraesia* Guenée, *Hist. nat. Ins. Lép. : Noct.*, **2** : 362.

1900. *Oraesia* : Swinhoe, *Cat. East & Austr. Lep. Het.*, **2** : 177.

* 24. *Oraesia emarginata* (Fabr., 1794)

1794. *Noctua emarginata* Fabricius, *Ent. Syst.*, **3** (2) : 82.

1900. *Oraesia emarginata* : Swinhoe, *Cat. East & Austr. Lep. Het.*, **2** : 177.

Material examined : One ♂, Kherapara, West Garo hills, "at light", 16.x.1988, K.K. Ray & party coll. *Wing expanse* : 40 mm.

Diagnosis : Head orange. Thorax and fore wing red-brown; hind wing ochreous white. Adomen fuscous. Fore wing median vein dark streaked; with an oblique double line from apex to dorsum and outer area suffused golden.

Distribution : India : Meghalaya (West Garo hills district); West Bengal; Himachal Pradesh; Madhya Pradesh; Maharashtra. Elsewhere : Bangladesh; Sri Lanka; Myanmar; China.

Remarks : The species constitutes new locality record for the state of Meghalaya.

Genus *Ischyja* Hübner, 1816

1816. *Ischyja* Hübner, *Verz. bek. Schmett.*, p. 265.

1982. *Ischyja* : Barlow, *Intr. moths S.E. Asia*, p. 107.

* 25. *Ischyja manlia* (Cramer, 1779)

1779. *Phalaena-Noctua manlia* Cramer, *Pap. Exot.*, **1** : pl. 92, fig. A.

1982. *Ischyja manlia* : Barlow, *Intr. Moths S.E. Aisa*, p. 238.

Material examined : One ♂, Garo hills, 15.x.1983, J.R.B. Alfred & party coll. *Wing Expanse* : 90 mm.

Diagnosis : Ground colour brown. Fore wing with a dark horizontal streak from base of cell to a light brown median line; reniform and orbicular on a longitudinal black band and also on that posterior to cell. Hind wing with a black spot with a pale streak on it above anal angle and a broad purplish-blue medial band.

Distribution : India : Meghalaya (Garo hills); Sikkim; Himachal Pradesh; Uttar Pradesh; Gujarat; Maharashtra; the Andaman Islands. Elsewhere : Bhutan; Bangladesh; Myanmar; Sri Lanka; Sino-Malayan.

Remarks : The species is a new record for Meghalaya.

Genus *Hulodes* Guenée, 1852

1852. *Hulodes* Guenée, *Hist nat. Ins. Lép. : Loét.*, 3 : 207.

1900. *Hulodes* : Swinhoe, *Cat. East. & Austr. Lép. Het.*, 2 : 116.

26. *Hulodes caranea* (Cramer, 1782)

1782. *Phalaena-Noctua caranea* Cramer, *Pap. Exot.*, 3 : pl. 269, figs. E, F.

1982. *Hulodes caranea* : Barlow, *Intr. moths S.E. Asia*, p. 107, pl. 36, figs. 6, 7.

Material examined : One ♂, Happy Valley, E. Khasi hills, 29.vii.1975, R. S. Giri & party coll. *Wing expanse* : 85 mm.

Diagnosis : Fuscous brown. Wings purplish up to the curved submarginal line which runs from apex of fore pair to anal margin of the hind pair; terminal area ochreous brown with a series of specks.

Distribution : India : Meghalaya (East Khasi hills district); Assam; Sikkim; Himachal Pradesh; Madhya Pradesh; Maharashtra; Nilgiris. Elsewhere : Bhutan; Bangladesh; Sri Lanka; Myanmar; Malayan; Taiwan.

Remarks : The species was reported from Shillong by Cotes & Swinhoe (1888) and known to feed on the plants belonging to Acanthaceae and Apocynaceae.

Genus *Oxyodes* Guenée, 1852.

1852. *Oxyodes Guenée, Hist. nat. Ins. Lep. : Noct.*, 3 : 128.

1982. *Oxyodes* : Barlow, *Intr. moths S.E. Asia*, p. 113.

*27. *Oxyodes scrobiculata* (Fabr., 1781)

1781. *Noctua scrobiculata* Fabricius, *Sp. Ins.*, 2 : 212.

1982. *Oxyodes scrobiculata* : Barlow, *Intr. moths S.E. Asia*, p. 113, pl. 38, fig. 19.

Material examined : One ♂, Polo Bazar, Shillong, "at light" 10.iv.1991, *S. K. Ghosh* & party coll. *Wing expanse* : 55 mm.

Diagnosis : Ochreous brown. Fore wing orbicular and reniform black; underside with a large diffused black spot at tornus. Hind wing with a broad black fascia below costa.

Distribution : India : Meghalaya (East Khasi hills district); almost throughout the rest of the mainland. Elsewhere : Bangladesh; Sri Lanka; Myanmar; Sino-Malayan; up to Fiji.

Remarks : The species is a new record for Meghalaya.

Subfamily Mominae

Genus *Trisuloides* Butler, 1881

1881. *Trisuloides* Butler, *Ann. Mag. nat. Hist.*, (5) 7 : 36.

1894. *Trisuloides* : Hampson, *Fauna Brit. India, Moths*, 2 : 436.

28. *Trisuloides sericea* Butler, 1881

1881. *Trisuloides sericea* Butler, *Ann. Mag. nat. Hist.*, (5) 7 : 36.

1894. *Trisuloides sericea* : Hampson, *Fauna Brit. India*, Moths, 2 : 436.

Material examined : 2 ♀, Jowai, Jaintia hills, "at light", 15,19.v.1990, M. S. Shishodia & party coll. *Wing expanse* : 57-60 mm.

Diagnosis : Palpi and thorax hairy. Abdomen with dorsal tufts. Ground colour grey-brown. Tegulae with 2 black bars. Fore wing with the lines waved, a black ring-spot at end-cell. Hind wing with a broad medial yellow band.

Distribution : India : Meghalaya (Jaintia hills and East khasi hills districts); Sikkim; West Bengal (Darjiling); North West Himalaya.

Remarks : The species, which is endemic in the Himalaya, was earlier reported from Shillong by Cotes & Swinhoe (1887) and Hampson (1894).

Subfamily Plusiinae (= Phytometrinae)

Genus *Diachrysia* Hübner, 1827

1809. *Phytometra* Haworth, *Lep. Brit.*, p. 254.

1827. *Diachyrsia* Hübner, *Verz. bek Schmett*, p. 252.

1961. *Diachrysia* : Kostrowicki, *Acta zool. Cracov. Cracow*, 6.

29. *Diachrysia orichalcea* (Fabr., 1775)

1775. *Noctua orichalcea* Fabricius, *Syst. Ent.*, p. 607.

1961. *Diachrysia orichalcea* : Kostrowicki, *Acta zool. Cracov, Cracow*, **6** : 385.

Material examined : 3♂, 3 ♀, Lower Cherrapunji, "at light", 2-4.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 35-42 mm.

Diagnosis : Antennae of male ciliated; 3rd joint of palpi short; hind femora of male not tufted with long hair; fore wing tornus hooked, orbicular and reniform white-outlined and terminal area except dorsum with a brassy golden patch.

Distribution : India : Meghalaya (East Khasi hills); Madhya Pradesh. Elsewhere : *Vide* Mandal & Maulik, 1991.

Remarks : The species feeds on *Coreopsis* during the larval stage. It was earlier reported from Shillong by Sevastopulo (1956).

Subfamily Noctuinae

Genus *Dichromia* Guenée, 1854

1854. *Dichromia* Guenée, *Hist. nat. Ins. Lep. : Delt. et. Pyral.*, p. 18.

1900. *Dichromia* : Swinhoe, *Cat. East & Austral. Lep. Het.*, **2** : 208.

30. *Dichromia triplicalis* Walker, 1858

1858. *Dichromia triplicalis* Walker, *Cat. Lep. Het. Brit. Mus.*, **16** : 16.

1900. *Dichromia triplicalis* : Swinhoe, *Cat. East & Austral. Lep. Het.*, **2** : 208.

Material examined : One ♀, Cherrapunji, *c* 1250 metres, "at light", 21.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 36 mm.

Diagnosis : Palpi with 2nd joint long, 3rd short and pointed. Body black-brown. Fore wing with an oblique line beyond the postmedial line which is white and erect.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim. Elsewhere : Bhutan.

Remarks : This East Himalayan endemic species was earlier known from several localities of the East Khasi hills district. Sevastopulo (1956) reported the moth to be "common in both 1938 and 1941"

Subfamily Hypeninae

Genus *Adrapsa* Walker, 1858

1857. *Lusia* Walker, *Cat. Lep. Het. Brit. Mus.*, **13** : 1113 (praeocc.)

1858. *Adrapsa* Walker, *Cat. Lep Het. Brit. Mus.*, **16** : 169.

1900. *Adrapsa* : Swinhoe, *Cat. East & Austral. Lep. Het.*, **2** : 593.

31. *Adrapsa despecta* (Walker, 1865)

1865. *Badiza ? despecta* Walker, *Cat. Lep. Het. Brit. Mus.*, 33 : 1058 (O.s. unseen).

1894. *Adrapsa despecta* : Hampson, *Fauna Brit. India, Moths*, 3 : 37.

Material examined : One ♂, Rongrengiri, East Garo hills, "at light", 7.vii.1988, R. K. Ghosh & party coll. *Wing expanse* : 30 mm.

Diagnosis : Hind wing cell short; Rs and M_1 stalked. Palpi with long hair and a tuft. Antennae knotted and shortly tufted up to middle. Body fuscous black. Fore wing with a prominent ochreous white subapical patch.

Distribution : India : Meghalaya (East Garo and East Khasi hills district); Nilgiris. Elsewhere : Sri Lanka; Myanmar.

Remarks : Hampson (1894) reported the species from the Khasis.

3. Superfamily Geometroidea

Family Geometridae
Subfamily Geometrinae (=Hemitheinae)

Key to the genera

1. Fore wing R_1 from cell. Hind wing Rs diverging from near base of cell. Male antennae simple ..... ***Archaeobalbis Prt.***
   Fore wing R_1 not from cell 2
2. Hind wing without basal expansion; frenulum present in both sexes 3
   Hind wing with marked basal expasnion; female frenulum always absent or non-functional 5
3. Fore wing with fovea; wing much elongated in male ..... ***Dysphania Hbn.***
   Fore wing without fovea 4
4. Hind tibia without median spur. Abdominal crests prominent. Frons protuberant. Hind wing margin crenate ..... ***Terpna H.-Sch.***
   Hind tibia with median spurs. Abdomen not crested. Frons tufted. Hind wing with subdiaphanous basal patch ..... ***Aporandria Warr.***
5. Male hind tibia without spur. Antenna bipectinate ..... ***Eretmopus Turn.***
   Male hind tibia with spurs. Antenna not always bipectinate 6
6. Male hind tibia with 2 spurs and female, four 7
   Male hind tibia with 4 spurs. Hind wing discocellular continuously and extremely oblique ..... ***Thalassodes Guen.***
7. Male hind tibia with terminal spurs absent ..... ***Oenospila Swh.***
   Male hind tibia with median spurs present. Antenna not bipectinate 8
8. Female hind tibia with all spurs. Fore wing R_1 stalked and running into Sc. Hind wing margin neither crenate nor excised ..... ***Diplodesma Warr.***

Female hind tibia without median spur. Fore wing R_1 from cell and not running into Sc. Hind wing tailed. Abdomen with small crests ..... *Cyclothea Prt.*

Genus *Archaeobalbis* Prout, 1912

1912. *Archaeobalbis* Prout, *Gen. Ins.*, **129** : 24.

1987. *Archaeobalbis* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 216.

*32. *Archaeobalbis usneata* (Felder, 1875)

1875. *Scotopteryx usneata* Felder, *Reise Nov., Lep Het.*, pl. 125, fig. 12.

1987. *Archaeobalbis usneata* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 216.

Material examined : One ♀, Kherapara, West Garo hills, "at light", 21.vii. 1988, *R. K. Ghosh* & party coll. *Wing expanse* : 64 mm.

Diagnosis : Ground colour sage-green with some grey on the lines of fore wing. Both fore and hind wings with a prominent series of submarginal spots.

Distribution : India : Meghalaya (West Garo hills distrct); Sikkim. Elsewhere : Eastern Nepal.

Remarks : The species, popularly called one of the series of Emerald Moths, constitutes new locality record for Meghalaya.

Genus *Terpna* Herring-Schäffer, 1854

1854. *Terpna* Herring-Schäffer, *Samml. Aussereur. Schmett.*, **1** : 26.

1913. *Terpna* : Prout, *Lep. Cat.*, **14** : 15.

* 33. *Terpna haemataria* Herring-Schäffer, 1854

1854. *Terpna haemataria* Herring-Schäffer, *Samml. Aussereur. Schmett.*, **1** : pl. 41, figs. 205, 206.

1913. *Terpna haemataria* : Prout, *Lep. Cat.*, **14** : 16.

Material examined : 1 ♂, Shillong, East Khasi hills, 13.vii.1964, S. Biswas & party coll., 1 ♂, Garampani, Jaintia hills, 22.v.1990, M. S. Shishodia & party coll. *Wing expanse* : 55 mm.

Diagnosis : Ground colour white suffused brownish. Fore wing outer subbasal line with a prominent striae extending along costa up to crenulate postmedial line, an apical patch and terminal series of strigae; hind wing postmedial line atrophied; both wings with discal line.

Distribution : India : Meghalaya (East Khasi and Jaintia hills district); Assam; Sikkim.

Remarks : Endemic in the East Himalaya, the species has hitherto remained unrecorded from Meghalaya.

Genus *Dysphania* Hübner, 1816

1816. *Euschema* Hübner, *Verz. bek. Schmett.*, p. 175.

1816. *Dysphania* Hübner, *Verz. bek. Schmett.*, p. 175.

1913. *Dysphania* : Prout, Lep. Cat., **14** : 24.

34. *Dysphania militaris* (Linnaeus, 1758)

1758. *Phalaena militaris* Linnaeus, *Syst. Nat.*, ed. **10** : 505.

1913. *Dysphania militaris* : Prout, *Lep. Cat.*, **14** : 29.

Material examined : One ♂, Wagagi, Garo hills, 8.iv.1973, S. Biswas & party coll. *Wing expanse* : 76 mm.

Diagnosis : Ground colour golden yellow with purplish bands. Fore wing outer half deep purple, with 2 costo-basal spots, 3 antemedial conjoined spots and 2 terminal blue bands. Hind wing largely spotted.

Distribution : India : Meghalaya (East Khasi hills and Garo hills districts); Assam; Nagaland; West Bengal; Maharashtra; Andaman & Nicobar Islands. Elsewhere : Bangladesh; Myanmar; China; Cochin China; Sundaland; Western Malaysia.

Remarks : The species was earlier reported from the East Khasi hills district by Cotes & Swinhoe (1888).

Genus *Aporandria* Warren, 1894.

1894. *Aporandria* Warren, *Nov. zool.*, **1** : 385.

1982. *Aporandria* : Barlow, *Intr. moths S. E. Asia*, p. 121.

*35. *Aporandria specularia* (Guenée, 1858).

1858. *Geometra specularia* Guenée, *Spec. Gen. Lep.*, **9** : 342.

1982. *Aporandria specularia* : Barlow, *Intr. moths S.E. Asia*, p. 121, pl. 40, fig. 15.

Material examined : One ♂, Sibbadi, "at light", 13.vii.1988, R. K. Ghosh & party coll; 1 ♂, Tura, West Garo hills, 7.x.1988, K. K. Ray & party coll. *Wing expanse* : 51-57 mm.

Diagnosis : Ground colour pea-green. Fore wing with a dark end-cell speck. Hind wing with a large lunulate pink mark at end-cell. Underside of both wings basally silvery white.

Distribution : India : Meghalaya (West Garo hills district); Assam; Kerala. Elsewhere : Bangladesh; Sri Lanka; Malayan.

Remarks : The species, which is known to feed on the larval food-plant, *Mangifera indica*, constitutes new locality record for Meghalaya.

Genus *Thalassodes* Guenée, 1857

1857. *Thalassodes* Guenée, *Hist. nat. Ins., Lep. : Uran. et Phal.*, **1** : 359.

1913. *Thalassodes* : Prout, *Lep Cat.*, **14** : 95.

Key to the species

Frons red. Palpus with 3rd joint very minute. Hind tibial spurs shorter. Hind wing marginal angle at Cula more pronounced. Both wings with cilia ochreous ..... *quadraria*

Frons green. Palpus with 3rd joint half as long as the 2nd. Hind tibial spurs longer. Hind wing marginal angle at Cula less pronounced. Both wings with cilia fulvous ..... *falsaria*

*36. *Thalassodes quadraria* Guenée, 1857

1857. *Thalassodes quadraria* Guenée, *Hist. nat. Ins. Lep. : Uran. et. Phal.*, **1** : 360.

1913. *Thalassodes quadraria* : Prout, *Lep. Cat.*, **14** : 97.

Material examined : One ♂, Sansak, 13.vii.1988. R. K. Ghosh & party coll.; 1 ♀, William Nagar, East Garo hills, 1.x.1991, R. K. Varshney & party coll.; 7 ♂, Tura, West Garo hills, 7.x.1988, K. K. Ray & party coll.; 1 ♀, Cherrapunji, East Garo hills, "at light", c 1250 metres, 21.ix.1991, R. K. Varshney & party coll. *Wing expanse* : ♂, 35-39 mm., ♀ 28 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi, East and West Garo hills districts); West Bengal; Sikkim; Himachal Pradesh; Madhya Pradesh; Maharashtra. Elsewhere : Myanmar; Australia.

Remarks : The species is a new record for Meghalaya. Quite a few elements like *dissita* (Walker), *digressa* (Walker), etc., have been split from the Hampsonian synonymy list of *T. quadraria* and given status of good species by Prout (1912, 1913). The female from the East Garo hills shows variations in respect of palpi reddish white with tip red, hind wing antemedial line continued to that of fore wing that crosses the cell medially but not touching the costa of the latter. The expanse of both the females examined is appreciably smaller than that mentioned by Hampson (1895).

37. *Thalassodes falsaria* Prout, 1912

1912. *Talassodes falsaria* Prout, *Gen. Ins.*, **129** : 13.

1982. *Thalassodes falsaria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **18** : 133.

Material examined : One ♂, Jowai, Jaintia hills, "at light", 21.v. 1990, M. S. Shishodia & party coll. *Wing expanse* : 41 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (Jaintia and East Khasi hills districts); Nagaland; Nilgiris. Elsewhere : Sri Lanka; Java; Eastern Nepal.

Remarks : The species was described from the Khasi hills by Prout (1912). Prout (*loc.cit.*) rightly guessed the fact that *T. falsaria* proves to be the true *veraria* Guenée. He, however, gave the provisional name of the species under report.

Genus *Eretmopus* Turner, 1910.

1910. *Eretmopus* Turner, *Proc. Linn. Soc. N.S. Wales*, **35** : 588.

1913. *Eretmopus* : Prout, *Lep. Cat.*, **14** : 98.

38. *Eretmopus* sp. indet.

Material examined : One ♀, Shillong, East Khasi hills, 19.iv.1979, J. K. Jonathon & party coll. *Wing expanse* : 28 mm.

Remarks : The species could not be identified, as the specimen has been brought to the survey in a badly damaged condition.

Genus *Oenospila* Swinhoe, 1892

1892. *Oenospila* (Warren, MS) Swinhoe, *Trans. ent. Soc. Lond.*, **1892** : 5.

1913. *Oenospila* : Prout, *Lep. Cat.*, **14** : 105.

Key to the species

Fore wing with a series of crimson specks on cilia. Hind wing with a large blackish blotch on mid-anal margin ..... ***strix***

Fore wing with a series of adnervular white specks on marginal crimson line. Hind wing without blotch on anal margin ..... ***flavifusata***

39. *Oenospila strix* (Butler, 1889)

1889. *Racheospila strix* Butler. *Ill. Het. Brit-Mus.*, **7** : 105, pl. 136, fig. 8.

1913. *Oenospila strix* : Prout, *Lep Cat.*, **14** : 106.

Material examined : One ♂, Shillong, c 1380 metres, East Khasi hills, "at light", 17.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 32 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Himachal Pradesh.

Remarks : The specimen examined has fore wing costa dirty white and not snow-white.

*40. *Oenospila flavifusata* (Walker, 1861)

1861. *Thalera flavifusata* Walker, *Cat. Lep. Het. Brit. Mus.*, **22** : 596.

1913. *Oenospila flavifusata* : Prout, Lep. Cat., **14** : 105.

Material examined : One ♂, Tura, West Garo hills, c 300 metres, 3.x.1991, R. K. Varshney & party coll. *Wing expanse* : 28 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (West Garo hills district); Sikkim. Elsewhere : Sri Lanka; Java; Borneo; Solomons; N. Australia.

Remarks : The species is a new record for Meghalaya.

Genus *Cyclothea* Prout, 1912

1912. *Cyclothea* Prout, *Gen. Ins.*, **129** : 181.

1913. *Cyclothea* : Prout, *Lep. Cat.*, **14** : 124.

41. *Cyclothea disjuncta* (Walker, 1861)

1861. *Thalera disjuncta* Walker, *Cat. Lep. Het. Brit. Mus.*, **22** : 595.

1913. *Cyclothea disjuncta* : Prout, *Lep. Cat.*, **14** : 124.

Material examined : One ♂, West Garo hills, c 300 metres, 5.x.1992, "at light", R. K. Varshney & party coll. *Wing expanse* : 26 mm.

Diagnosis : Ground colour emerald-green. Frons and palpi red. Vertex of head and shaft of antennae white. Fore wing costa ochreous and dark-speckled. Both fore-and hind wings with brown cell-spots and a series of adnervular marginal white specks.

Distribution : India : Meghalaya (East Khasi and West Garo hills districts); Sikkim; Orissa; Karnataka; Nilgiris. Elsewhere : Sri Lanka; Taiwan; Sumatra; Japan.

Remarks : Hampson (1895) reported the species from the Khasi hills.

Genus *Diplodesma* Warren, 1896

1896. *Diplodesma* Warren, *Nov. Zool.*, **3** : 289.

1913. *Diplodesma* : Prout, *Lep. Cat.*, **14** : 125.

42. *Diplodesma* sp. indet.

Material examined : One ♂, Cherrapunji, East Khasi hills, c 1250 metres, "at light", 22.ix.1991. R. K. Varshney & party coll. *Wing expanse* : 22 mm.

Remarks : The specimen examined is very much allied to *D. xanthochlora* (Swinhoe) from the Khasi hills, but differs from the latter by the absence of hair tuft beyond cell on M_2 on the underside of fore wing and non-hyaline texture on the baso-costal area of hind wing. This unidentified species seems to be very rare in its distributional range surveyed.

Subfamily Sterrhinae

Genus *Rhodostrophia* Hübner, 1825

1825. *Rhodostrophia* Hübner, *Verz. bek. Schmett*, p. 300.

1934. *Rhodostrophia* : Prout, *Lep. Cat.*, **61** (1) : 7.

43. *Rhodostrophia vinacearia* (Moore, 1867)

1867. *Anisodes vinacearia* Moore, *Proc. zool. Soc. Lond.*, p. 642.

1934. *Rhodostrophia vinacearia* : Prout, *Lep Cat.*, **61** (1) : 21.

Material examined : One ♂, Shillong, Old collection. *Wing expanse* : 27 mm.

Diagnosis : Palpi short. Female hind tibia with 4 spurs. FW R_2 stalked, anastomosing with R_1 and then with R_{3-4} to form double areole. Hind wing Rs and M_1 stalked. Ground colour ochreous. Legs yellow. Fore wing median line simple. Hind wing median line double. Both wings with terminal line sinuous.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal.

Remarks : The specimen examined seems to be very rare in the habitat surveyed. Several subspecies, viz., *stigmatica* Butler, *curvata* Warren and *sinensis* Prout, have not been considered as conspecific of *R. vinacearia* in the subsequent work by Prout (1934).

Genus *Synegiodes* Swinhoe, 1892

1892. *Synegiodes* Swinhoe, *Trans. ent. Soc. Lond.*, p. 11.

1934. *Synegiodes* : Prout, *Lep. Cat.*, **61** (1) : 47.

44. *Synegiodes hyriaria* (Walker, 1866)

In press. *Synegiodes hyriaria* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Polobazar, Shillong, *c* 1350 metres, East Khasi hills, "at light", 18.ix.1991. R. K. Varshney & party coll. *Wing expanse* : 34 mm.

Diagnosis : *Vide* Mondal & Ghosh (*in* press).

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : *Vide* Mondal & Ghosh (*in* press). Also found in Eastern Nepal (*vide* Inoue, 1982).

Remarks : The species was earlier reported from the Khasi hills by Hampson (1895). For other details, *vide* Mondal & Ghosh (*in* press).

Genus *Calothysanis* Hübner, 1825

1825. *Calothysanis* Hübner, *Verz. bek. Schmett.*, p. 301.

1934. *Calothysanis* : Prout, *Lep. Cat.*, **61** (1) : 51.

Key to species

Ground colour brown irrorated with grey. Fore wing cell-spot indistinct or absent; a thick grey line overlaid with rose pink, running obliquely from apex of fore wing to mid-anal margin of hind wing. Sexes similar ..... *amata*

Ground colour fulvous irrorated with fuscous. Fore wing cell-spot prominent; a diffused pink line similarly running from apex of fore wing to mid-anal margin of hind wing. Sexes dissimilar, with oblique band of fore-and hind wings darker and broadly diffused ..... *responsaria*

**45. *Calothysanis amata* (Linn., 1758)

1758. *Phalaena ? amata* Linnaeus, *Syst. Nat, ed.* **10** (1) : 524.

1934. *Calothysanis amata* : Prout, *Lep. Cat.*, **61** (1) : 51.

Material examined : 4♂, 3♀, Cherrapunji, *c* 1250 metres, East Khasi Hills, "at light", 22-23.x.1991, R. K. Varshney & party coll. *Wing expanse* : 19-26 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : Europe; Mongolia; North Africa; U.S.S.R.; Korea; Japan; China.

Remarks : A new record for India, the species has its distribution dealt with by Prout (1913) and Prout (1934). It is common in status and known to feed on seeds of coarse weed. It is bivoltine in habit, with one brood occurring in June and another during August - October. The moth frequents weedy places at the edges of fields or borders of woods and hides by day in hedges. It flies weakly near ground between crepuscular and mid-night hours. The specimens examined have appreciably smaller wing expanse which is correlated to the wet-season brood of this moth. The Indian species, *amataria* (Linn.), treated under the genus *Timandra* Duponchel by Hampson (1895), is sunk into the synonymy list of *C. convectaria* (Walker) by Prout (1934), who earlier (1913) treated *amataria* as a synonym of the species under report.

46. *Calothysanis responsaria* (Moore, 1888)

1888. *Timandra responsaria* Moore, *Lep. Coll. Atk., p. 255.*

1934. *Calothysanis responsaria* : Prout, *Lep. Cat.*, **61** (1) : 55.

Material examined : 2♂, 1♀, Cherrapunji, c 1250 metres, East Khasi hills, "at light", 22.ix.1991, R. K. Varshney & party coll. *Wing expanses : 23-26 mm.*

Diagnosis : Submarginal line of fore wing reduced to specks towards apex and becoming postmedial on hind wing. Rest as cited in the key.

Distribution : India : Meghalaya (East Khasi hills district); Madhya Pradesh; Nilgiris. Elsewhere : Bhutan; Vietnam.

Genus *Scopula* Schrank, 1802

1802. *Scopula* Schrank, *Fauna Boica*, **2** (2) : 162.

1934. *Scopula* : Prout, *Lep. Cat.*, **61** (1) : 167.

Key to species

1. Hind legs non-functional; tibiae dilated with a fold containing tuft of long hairs 2
   Hind legs functional; tibiae not dilated nor with hair-tuft. Fore wing apex produced and postmedial band quite narrow, reaching apex..... *emissaria*
2. Hind wing outer margin angled at M_3. Ground colour ochreous. Fore wing postmedial line sinuous and much excurved below costa, and submarginal markings blue grey..... *pulchellata*

Hind wing outer margin rounded 3

3. Fore wing with costal fascia fulvous, postmedial bands oblique and narrow, cell-speck and a terminal band followed by a series of specks ..... *costata*

Fore wing without costal fascia 4

4. Fore wing with obliquely waved diffused postmedial line continued as the antemedial line on hind wing; submarginal line prominently dentate. Both wings with a series of black marginal specks ..... *remotata*

Fore wing postmedial line not as above; submarginal line not dentate 5

5. Ground colour creamy. Frons black. Both wings with a series of minute marginal specks ..... *aspilataria*

Ground colour white irrorated fuscous. Frons fuscous. Both wings with a terminal line and no series of specks ..... *intensata*

*47. *Scopula emissaria* (Walker, 1861)

1861. *Acidalia emissaria* Walker, *Cat. Lep. Het. Brit. Mus.*, **22** : 751.

1934. *Scopula emissaria* : Prout, *Lep. Cat.*, **61** (1) : 173.

Material examined : One ♀, Cherrapunji, *c* 1250 metres, East Khasi hills, "at light", 22.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 20 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Himachal Pradesh; Orissa. Elsewhere : Myanmar; Sri Lanka; Taiwan; Philippines; Sulawesi; Sumatra; Sambawa; China; Japan; Australia; New South Wales.

Remarks : The species is a new record for Meghalaya.

48. *Scopula pulchellata* (Fabr., 1794)

In press. *Scopula pulchellata* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Cherrapunji, East Khasi hills, "at light", 22.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 22 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : *vide* Mondal & Ghosh (*in* press).

49. *Scopula aspilataria* (Walker, 1861)

In press. *Scopula aspilataria* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : 2♂, Cherrapunji, East Khasi hills, "at light", 22-23.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 20 - 21 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : *vide* Mondal & Ghosh (*in* press).

*50. *Scopula intensata* (Moore, 1887)

1887. *Idaea intensata* Moore, *Lep. Ceylon*, 3 : 453, pl. 200, fig. 7.

1934. *Scopula intensata* : Prout, *Lep. Cat.*, 63 (2) : 206.

Material examined : One♂, Cherrapunji, "at light", 21.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 25 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Nilgiris. Elsewhere : Sri Lanka.

Remarks : The species hitherto remained unrecorded from the state of Meghalaya.

**51. *Scopula costata* (Moore, 1887)

1887. *Deilinia costata* Moore, *Lep. Ceylon*, 3 : 463, pl. 204, fig. 3.

1934. *Scopula costata* : Prout, *Lep. Cat.*, 63 (2) : 241.

Material examined : One♀, West Garo hills, *c* 225 metres, 5.x.1991, R. K.Varshney & party coll. *Wing expanse* : 25 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (West Garo hills district). Elsewhere : Sri Lanka.

Remarks : The species hitherto remained unrecorded from India.

*52. *Scopula remotata* (Guenée, 1857)

In press. *Scopula remotata* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : One♂, Walbakgiri, Tura, c 220 metres, West Garo hills, 5.x.1991, R. K. Varshney & party coll. *Wing expanse* : 22 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (West Garo hills district). Elsewhere : *Vide* Mondal and Ghosh (*in* press).

Remarks : The species, apparently rare in status, is a new record from Meghalaya. The specimen examined has rather appreciably a smaller wing expanse.

Genus *Problepsis* Lederer, 1852

1846. *Caloptera* Friv., K. Magyar Term. Tars. Evkon., **1** : 185 (nom. praeocc.).

1852. *Problepsis* Lederer, *Verh. zool.-bot. Ver. Wien.*, **2** : 74.

1934. *Problepsis* : Prout, *Lep. Cat.*, **61** (1) : 152.

53. *Problepsis vulgaris* Butler, 1889

In press. *Problepsis vulgaris* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Cherrapunji, East Khasi hills, *c* 1250 metres, "at light", 22.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 34 mm.

Distribution : India : Meghalaya (East Khasi hills district). For other localities, *vide* Mondal & Ghosh, (*in* press).

Remarks : The species was earlier recorded from Shillong by Sevastopulo (1956) as *P. delphiaria* (Guenée). The distribution of *P. delphiaria* in "N. India", as cited by Barlow (1982), seems to be doubtful.

Genus *Sterrha* Hübner, 1826

1826. *Sterrha* Hübner, *Verz. bek. Schmett.*, p. 309.

1934. *Sterrha* : Prout, *Lep. Cat.*, **63** (2) : 297.

** 54. *Sterrha cossurata* (Millière, 1875)

1875. *Eupithecia cossurata* Millière, *Bull Soc. ent. Italy*, **7** : 254.

1934. *Sterrha cossurata* : Prout, *Lep. Cat.*, **63** (2) : 354.

Material examined : 2 ♂, Shillong, 1 ♂, Cherrapunji, East Khasi hills district, "at light", 2, 18.ix.1991, R. K. Varshney & party coll. *Wing expanse* : 22-24 mm.

Diagnosis : Ground colour whitish. Fore wing antemedian, median and postmedian lines arising from large blackish costal spots; subterminal line bordered by a strong dark band. Hind wing distal margin strongly convex.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : Italy.

Remarks : The species, which was described by a single female from Pantellaria of Sicily

and subsequently confirmed by other specimens from Mt. Etna by Prout (1913), is a new break-through in India. The specimens examined have very feebly excised wings; but the fore wing terminal line neither thick black nor interrupted by white adnervular spots.

Subfamily Larentiinae

Genus *Cidaria* Treitschke, 1828

1828. *Cidaria* Treitschke, *Schm. Eur.*, **6** (2) : 140.

1914. *Cidaria* : Prout, *Macrolep. World*, **4** : 214.

**55. *Cidaria corollaria* H.-Sch., 1846

1846. *Cidaria corollaria* Herrich-Schäffer, *Syst. Schmett. Eur.*, **3** : 152.

1914. *Cidaria corollaria* : Prout, *Macrolep. World*, **4** : 246, pl. 10a.

Material examined : One ♀, Cherrapunji, 1350 metres, East Khasi hills district, "at light", 2.iv.1991. S. K. Ghosh & party coll. *Wing expanse* : 28 mm.

Diagnosis : Fore wing yellowish white with basal patch and median band dark brown, and a large black cell-spot; subterminal line followed by a pair of confluent dark spots between radials.

Distribution : India : Meghalaya (East Khasi hills). Elsewhere : Asia Minor; Balkan Peninsula; North Syria; Trans-Caucasia.

Remarks : The species hitherto remained unknown from India.

Subfamily Ennominae

Key to the genera

1. Hind wing tailed at M_1. Palpi porrect and hairy. Frontal tuft present. Fore wing R_2 absent ..... *Ourapteryx*
   Hind wing not tailed 2
2. Scaling smooth. Body moderately hairy 3
   Scaling rough. Body thickly hairy 12
3. Palpi porrect 4
   Palpi with 2nd joint obliquely upturned and thickly clothed with hair, 3rd naked and porrect 11
4. Palpi not reaching beyond frons and clothed with short hair. Fore wing R_{3-5} stalked, R_2 absent. Wings mostly hyaline ..... *Zamarada*
   Palpi reaching beyond frons and clothed with long hair 5

5. Hind wing with outer margin not angled at M_1 6
   Hind wing with outer margin angled at M_1 10
6. Fore wing apex not produced, outer margin suberect 7
   Fore wing apex produced, outer margin very oblique 8
7. Abdomen not reaching far beyond hind wing. Male with fovea ..... *Percnia*
   Abdomen very long and slender. Antenna thickened by appressed serrations in male ..... *Obeidia*
8. Fore wing R_1 connected by a bar with Sc and stalked with R_2. Antenna bipectinate ..... *Hypochrosis*
   Fore wing R_1 not connected by bar with Sc 9
9. Fore wing M_2 from mid-disco cellular. Male with fovea. Size large and stout ..... *Dalima*
   Fore wing M_2 from above mid-discocellular. Male antenna thickened and flattened. Palpi long. Fore wing R_{2-5} stalked ..... *Loxaspilates*
10. Fore wing R_2 present ..... ***Spilopera***
    Fore wing R_2 absent. Male with fovea ..... ***Macaria***
11. Outer margin of both wings rounded. Male hind wing without fovea; Sc + R_1 approximated to Rs up to middle of cell ..... ***Petelia***
    Outer margin of fore wing rounded, of hind wing angled at M_1 ..... ***Rhynchobapta***
12. Palpi upturned and fringed with hair in front. Fore wing R_1 from Sc ..... ***Chorodna***
    Palpi porrect 13
13. Wings broad; fore wing outer margin suberect 14
    Wings narrow; both wings outer margin oblique 15
14. Forewing R_{2-5} stalked, R_1 free; apex rounded; fovea in male; cilia non-crenulate ..... *Xandrames*
    Fore wing R_{3-5} stalked; apex quadrate; no fovea in male; cilia crenulate ..... *Gnophos*
15. Hind wing cell extending to $^2/_3$rd length of wing. Palpi short. Antenna of male with very short branches having fasciculated cilia at ends ..... *Cusiala*
    Hind wing cell extending to $^1/_2$ length of wing. Palpi long 16
16. Fore wing R_1 not from Sc 17
    Fore wing R_1 from Sc ..... *Medasina*
17. Wings with outer margin non-crenulate; fore wing R_1 free; fovea in male ..... *Arichanna*
    Wings with outer margin crenulate 18
18. Hind tibia of male not dilated. Fore wing of male of normal breadth ..... *Boarmia*
    Hind tibia of male dilated 19
19. Antenna of male minutely serrate and fasciculate ..... *Ascotis*
    Antenna of male bipectinate 20
20. Fovea in male ..... *Alcis*
    No fovea in male ..... *Hemerophila*

Genus *Petelia* Herrich-Schäffer, 1854

1854. *Petelia* Herrich-Schäffer, *Samml. äusser. Schmett.*, p. 84.

1982. *Petelia* : Barlow, *Intr. moths S. E. Asia*, p. 133.

56. Petelia medardaria Herr.-Sch., 1854

1854. *Petelia medardaria* Herrich-Schäffer, *Samml. äusser. Schmett*, pl. 94, fig. 534.

1982. *Petelia medardaria* : Barlow, *Intr. moths S. E. Asia*, 133, pl. 46, fig. 5.

Material examined : One ♂, Khasi hills, *Old colln. Wing expanse* : 35 mm.

Diagnosis : Ground colour Grey brown irrorated with fuscous. Fore wing antemedial line straight. Both wings medial line also straight; submarginal band rufous, waved, indistinct; marginal series of black specks; *underside* whitish, with prominent black cell-spots.

Distribution : India : Meghalaya (East Khasi hills district); Maharashtra; Madhya Pradesh; Karnataka. Elsewhere : Sri Lanka; Myanmar; Australian region.

Remarks : The species, earlier treated under the genus *Dilinia* Hübn. by Hampson (1895), is a new record for Meghalaya. Barlow (1982) mentioned the moth as a defoliator of *Zizyphus oenoplia, Z. incurva, Z. mauritiana, Hovenia dulcis* and *Gouania leptostachia* (Rhamnaceae) in India. The specimen examined has a rather smaller wing expanse than that mentioned by Hampson (1895).

Genus *Rhynchobapta* Hampson, 1895

1895. *Rhynchobapta* Hampson, *Fauna Brit. India, Moths*, **3** : 194.

1915. *Rhynchobapta* : Prout, *Macrolep, World*, **4** : 345.

57. *Rhynchobapta flaviceps* (Butler, 1881)

1881. *Phanauta flaviceps* Butler, *Trans. ent. Soc. London*, p. 419.

1915. *Rhynchobapta flaviceps* : Prout, *Macrolep. World*, **4** : 345, pl. 18 e.

Material examined : One ♀, Cherrapunji, 1250 metres, East Khasi hills, 24.ix.1991. R. K. Varshney & party coll. *Wing expanse* : 28 mm.

Diagnosis : Ground colour purplish grey with dark striations. Fore wing with a rufous line from apex to inner margin of hind wing; marginal cilia rufous and white-tipped.

Distribution : India : Meghalaya (East Khasi hills district). Elsewhere : Japan; West China.

Genus *Macaria* Curtis, 1823

1823. *Macaria* Curtis, *Brit. Ent.*, **6** : 132.

1915. *Macaria* : Prout, *Macrolep. World.* **4** : 376.

58. *Macaria effusata* Guenée, 1857

1857. *Macaria effusata* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 87.

1895. *Macaria effusata* : Hampson, *Fauna Brit. India, Moths*, **3** : 206.

Material examined : One ♂, Shillong, 6.iv.1991, "at light", S. K. Ghosh & party coll. *Wing expanse* : 36 mm.

Diagnosis : Ground colour ochreous, irrorated with dark brown. Wings with end-cell speck and *underside* suffused dark beyond postmedian line.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Himachal Pradesh.

Genus *Dalima* Moore, 1867

1867. *Dalima* Moore, *Proc. zool. Soc. Lond.*, p. 614.

1900. *Dalima* : Swinhoe, *Cat. East. Austr. Lep. Het.*, (2) : 261.

59. *Dalima schistacearia* Moore, 1867

1867. *Dalima schistacearia* Moore, *Proc. zool. Soc. Lond.*, p. 615.

1895. *Dalima schistacearia* : Hampson, *Fauna Brit. India, Moths*, **3** : 239.

Material examined : One ♂, Shillong, 18.v.1979, M. S. Zyrwa & party coll. *Wing expanse* : 60 mm.

Diagnosis : Ground colour sericeous red-brown. Fore wing with 3 black spots on costa; hind wing with a median line; both wings *underside* orange-red, prominently fuscus-striated; cilia rufous.

Distribution : India : Meghalaya (East Khasi hills district); W. Bengal (Darjiling).

Remarks : The species, which seems to be endemic in the East Himalaya, is represented by the nominal subspecies, being recognised by more purplish fore wing and in female ground colour redder, without black spot on dorsum. The specimen examined is rather much smaller in wing expanse as compared to that cited by Hampson (1895).

Genus *Zamarada* Moore, 1887

1887. *Zamarada* Moore, *Lep. Ceylon*, **3** : 432.

1900. *Zamarada* : Swinhoe, *Cat. East. Austr. Lep. Het.*, (2) : 266.

60. *Zamarada cosmiaria* Swinhoe, 1893

1893. *Zamarada cosmiaria* Swinhoe, *Ann.. Mag. nat. Hist.*, (6) **12** : 155.

1900. *Zamarada cosmiaria* : Swinhoe, *Cat. East. Austr. Lep. Het.*, (2) : 266.

Material examined : 2 ♀, Cherrapunji, *c* 1250 metres, 21-22.ix.1991, "at light", R. K. Varshney & party coll. *Wing expanse* : 20-25 mm.

Diagnosis : Deep green hyaline. Both wings with marginal band narrow and red; this band on fore wing moderately indented between M_1 and Cu1b, but not so on hind wing.

Distribution : India : Meghalaya (East Khasi hills district); Nagaland.

Remarks : This species, endemic in the East Himalaya, was described from the Khasia hills by Swinhoe (1893). One of the specimens examined has a much smaller wing expanse as compared to that cited by Hampson (1895).

Genus *Hypochrosis* Guenée, 1857

1857. *Hypochrosis* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 536.

1900. *Hypochrosis* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 240.

61. *Hypochrosis iris* (Butler, 1880)

1880. *Phoenix iris* Butler, *Ann. Mag. nat. Hist.*, (5) **6** : 122.

1895. *Hypochrosis iris* : Hampson, *Fauna Brit. India, Moths*, **3** : 171.

Material examined : One ♀, Kherapara, West Garo hills, "at light", 19.vii. 1988, *R.K. Ghosh* & party coll. *Wing expanse* : 35 mm.

Diagnosis : Purple. Fore wing pink-striated; with a green band from apex to middle of hind wing anal margin. *Underside* pink-orange. Abdomen with a green band at middle.

Distribution : India : Meghalaya (East Khasi and West Garo hills districts); Sikkim; Khyeng hills.

Remarks : Like other members of the genus (*vide* Barlow, 1982), this species may be attracted to saline secretions around the eyes of large mammals and to sweat. The specimen examined is much smaller in wing expanse (*cf.* Hampson, 1895).

Genus *Spilopera* Warren, 1893

1893. *Spilopera* Warren, *Proc. zool. Soc. London*, p. 402.

1915. *Spilopera* : Prout, *Macrolep. World*, **4** : 345.

62. *Spilopera gracilis* Butler, 1880

1880. *Spilopera gracilis* Butler, *Ann. Mag. nat. Hist.*, (5) **4** : 371.

1915. *Spilopera gracilis* : Prout, *Macrolep. World*, **4** : 345.

Material examined : One ♂, Jowai, Jaintia hills, "at light", 15.v.1990, M.S. Shishodia & party coll. *Wing expanse* : 33 mm.

Diagnosis : Brown ochreous. Fore wing with a black cell-speck; postmedial oblique fuscous band and a dark patch on outer margin below apex.

Distribution : India : Meghalaya (East Khasi and Jaintia hills districts); Assam. Elsewhere : Japan; Taiwan.

Remarks : This species was earlier reported from the Khasi hills by Hampson (1895). The specimen examined has the fore wing with R_2 not free (*cf.* Hampson, *loc. cit.*), but stalked with R_{3-5}.

Genus *Cusiala* Moore. 1887

1887. *Cusiala* Moore, *Lep. Ceylon*, 3 : 407

1900. *Cusiala* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 277.

63. *Cusiala bengaliaria* (Guenée, 1857)

1857. *Amphidaris bengaliaria* Guenée, *Hist. nat. Ins. Lep. Phal.*, **1** : 210, pl. 4, fig. 2.

1900. *Cusiala bengaliaria* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 277.

Material examined : One ♀, Shillong, 5.v.1973, "at light", M.S. Jayrwa coll. [E. Reg. Stn.]; 1 ♂, East Garo hills, 25.v.1990, "at light", M.S. Shishodia & party coll. *Wing expanse* : ♂, 68 mm. ♀, 80 mm.

Diagnosis ; White, striated with fuscous. Fore wing antemedial line black and curved and proximally banded ochreous; both wings postmedial black line angled and a diffused band beyond.

Distribution : India : Meghalaya (East Khasi and East Garo hills districts); West Bengal. Elsewhere : Bangladesh.

Remarks : The species, earlier known under the genus *Biston* Leach, was bred in Shillong

by Sevastopulo (1939), who also subsequently (1956) mentioned its status and abundance as "common both in 1938 and 1941". *Biston contectaria* (Walker) from Solan and Nepal, included in the synonymy list of *C. bengaliaria* by Hampson (1895), is a good species (*vide* Swinhoe, 1900; Inoue, 1982).

Genus *Medasina* Moore, 1887

1887. *Medasine* Moore, *Lep. Ceylon*, **3** : 409.

1987. *Medasina* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 256.

Key to species

Reddish brown, black-striated. Both wings with curved crenulate postmedial and submarginal lines, and a marginal series of black striae, there being no costal patch; *underside* with submarginal band broad fuscous and white patch at apex, the patch being also present at mid-termen of fore wing ..... ***creataria***

White, pale brown spotted. Both wings with waved antemedial, medial and submarginal lines, and a marginal series of black specks, postmedial line with a black mark between M_3 and Cu1a only on fore wing, bearing blackish costal patches; *underside* of latter with black cell-spot and three lunulate subapical marks ..... ***albidaria***

*64. *Medasina creataria* (Guenée, 1857)

1857. *Hemerophila creataria* Guenée, *Hist. nat. Ins. Lep. Phal.*, **1** : 217.

1987. *Medasina creataria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom.* Univ., **23** : 256.

Material examined : One ♂, Jaintia hills, "at light", 21.v.1990, M. S. Shishodia & party coll. *Wing expanse* : 80 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (Jaintia hills district); West Bengal (Darjiling); Assam. Elsewhere : Nepal.

Remarks : The species constitutes new locaility record for Meghalaya. The specimen examined is much smaller in expanse (*cf.* Hampson, 1895).

65. *Medasina albidaria* (Walker, 1866)

1866. *Boarmia albidaria* Walker, *Cat. Lep. Het. Brit. Mus.*, **35** : 1582.

1987. *Medasina albidaria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 256.

Material examined : One ♀, Shillong, "at light", 5.iv.1991, *S. K. Ghosh* & party coll. *Wing expanse* : 55 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal; Himachal Pradesh. Elsewhere : Nepal.

66. *Medasina* sp., indet.

Material examined : One ♀, Rongrengiri Forest, East Garo hills, "at light", 7.vii.1988, R. K. Ghosh & party coll. *Wing expanse* : 47 mm.

Remarks : The single specimen examined could not be identified up to the species, but it is very much allied to *M. parisnattei* (Walker) from Bihar and elsewhere. The species under sutdy differs from the latter by the fore wing termen black-spotted and *underside* apex white, cell-spot prominent and vertical lines from costa contiguous forming distinct bands; hind wing *underside* with outer margin whitish at middle.

Genus *Hemerophila* Stephens, 1829

1829. *Hemerophila* Stephens, *Ill. Brit. Ent. Haust.*, **3** : 189.

1915. Hemerophila : Prout, *Macrolep. World*, **4** : 362.

Key to species

Fore wing antemedial line twice acutely angulated.
Hind wing *underside* in both sexes not clothed with hair below mid-cell ..... *subplagiata*
Fore wing antemedial line not so. Hind wing *underside* in male clothed with long rough hair and scales below mid-cell ..... *delineata*

67. *Hemerophila subplagiata* Walker, 1860

1860. *Hemerophila subplagiata* Walker, *Cat. Lep. Het. Brit. Mus.*, **21** : 319.

1915. *Hemerophila subplagiata* : Prout, *Macrolep. World*, **4** : 362, pl. 20b.

Material examined : One ♀, Cherrapunji, *c* 1250 metres, "at light", 21.ix.1991, *R. K. Varshney* & party coll. *Wing expanse* : 44 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); West Bengal (Darjiling); Sikkim; North-West Himalaya. Elsewhere : China; Japan; Nepal.

Remarks : The species has been considered under the genus *Menophra*, Sato by Inoue (1987), but provisionally placed here under *Hemerophila*.

68. *Hemerophila delineata* (Walker, 1860)

1860. *Boarmia delineata* Walker, *Cat. Lep. Het. Brit. Mus.*, **21** : 387.

1900. *Hemerophila delineata* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 296.

Material examined : One ♀, Elephant Falls, Upper Shillong, *c* 1700 metres, 30.iii.1991, S. K. Ghosh & party coll. *Wing expanse* : 38 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Nilgiris. Elsewhere : Sri Lanka; Borneo.

Remarks : This species apparently resembles in facies *H. abruptaria* Thnbg. from Europe and Africa.

Genus *Boarmia* Treitschke, 1825

1825. *Boarmia* Treitschke, *Eur. Schmett.*, **5** (2) : 433.

1915. *Boarmia* : Prout, *Macrolep. World*, **4** : 364.

Key to species

1. Ground colour whitish with rufous band on 2nd abdominal segment. Fore wing antemedial line with rufous band inside; both wings cell-spot centrally pure white ..... *alienaria*

   Ground colour brown. Fore wing termen with a series of specks 2

2. Grey to deep brown. Fore wing ante- and postmedial lines double waved and submarginal line crenulate 3

   Vinous brown. Fore wing ante- and postmedial lines angled and submarginal line waved; hind wing semihyaline white, with a marginal striated band ..... *semialba*

3. Grey brown irrorated with fuscous. Coincident veins R_{1-2} in female from cell..... *crepuscularia*

   Deep brown. Conincident veins R_{1-2} in female from R_{3-5}..... *bhurmitra*

69. *Boarmia crepuscularia* Hübner

1805-24. *Boarmia crepuscularia* Hübner, *Samml. Eur Schmett. Geom.*, fig. 158 (O.s. unseen).

1915. *Boarmia crepuscularia* : Prout, *Macrolep. World*, **4** : 376, pl. 21g.

Material examined : One ♂, Shillong, *Old colln. Wing. expanse* : 40 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Himachal Pradesh; Maharashtra. Elsewhere : China; Japan; Europe; Russia.

Remarks : The species, which was earlier treated as *Ectropis dentilineata* (Moore), *partim*, from the Andaman Islands and elsewhere (*vide* Cotes & Swinhoe, 1888; Swinhoe, 1900), was reported to be very variable in facies and to feed on various decidous trees during June-August (*vide* Prout, 1915).

*70. *Boarmia bhurmitra* Walker, 1860

1860. *Boarmia bhurmitra* Walker, *Cat. Lep. Het. Brit. Mus.*, **21** : 381.

1895. *Boarmia bhurmitra* : Hampson, *Fauna Brit. India, Moths*, **3** : 260.

Material examined : One ♂, Shillong, *Old Colln. Wing expanse* : 43 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; Punjab; Maharashtra; Nilgiris; Andaman Is. Elsewhere : Nepal; Sri Lanka; Java; Solomons.

Remarks : The species is a new record for Meghalaya. It has been placed under the genus *Ectropis* Hübner by Swinhoe (1900).

71. *Boarmia semialba* (Moore, 1887)

1887. *Pseudocoremia semialba* Moore, *Descr. Indian Lep. colln. Atkinson*, p. 241.

1895. *Boarmia semialba* : Hampson, *Fauna Brit. India, Moths*, **3** : 266.

Material examined : One ♀ , Quinton Road, Shillong, "at light", 5.iv.1991, S. K. Ghosh & party coll. *Wing expanse* : 35 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal (Darjiling); North-West Himalaya.

72. *Boarmia alienaria* Walker, 1860

In Press. *Boarmia alienaria* : Mondal & Ghosh, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Cherrapunji, c 1300 metres, "at light", 3.iv.1991, *S. K. Ghosh* & party coll. *Wing expanse* : 42 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); for further distribution *vide* Mondal & Ghosh (*in* press).

Genus *Chorodna* Walker, 1860

1860. *Chorodna* Walker, *Cat. Lep. Het. Brit. Mus.*, **21** : 314.

1900. *Chorodna* : Swinhoe, *Cat. East. Austr. Lep. Het.* **2** : 280.

73. *Chorodna erebusaria* Walker, 1860

1860. *Chorodna erebusaria* Walker, *Cat. Lep. Het. Brit. Mus.*, **21** : 314.

1900. *Chorodna erebusaria* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 280.

Material examined : One ♀, Garampani, Jaintia hills, 22.v.1990, *M.S. Shishodia* & party coll. *Wing expanse* : 90 mm.

Diagnosis : Whitish, suffused pale brown and irrorated black. Fore wing with a line from mid-costa, twice angled at cell and then oblique to subbasal area; reniform spot present; hind wing with a black end-cell spot; both wings with a pale patch in terminal area.

Distribution : India : Meghalaya (East Khasi and Jaintia hills districts); West Bengal (Darjiling); Sikkim.

Remarks : The species, which was earlier recorded from Shillong by Cotes & Swinhoe (1888), is endemic in the East Himalay. The specimen examined shows variations particularly in the orientation of forewing reniform which is not extended up to costa.

Genus *Percnia* Guenée, 1857

1857. *Percnia* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 216.

1987. *Percnia* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 257.

Key to species

Ground colour pale grey. Wings with much smaller spots. Hind wing Rs from upper angle of cell ..... *belluaria*

Ground colour gey-fuscous. Wings with much larger spots. Hind wing Rs from well before upper angle of cell ..... *felinaria*

74. *Percnia belluaria* Guenée, 1857

1857. *Percnia belluaria* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 217.

1987. *Percnia belluaria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 257.

Material examined : One ♂, Khasi hills, Old Colln.; 1 ♂, Risa colony, 9.vi.1972, K. K. Deb coll.; 1 ♂, Happy valley, 31.vii.1975, M.S. Jarwa coll. *Wing expanse* : 62-65 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal; Himachal Pradesh. Elsewhere : Nepal.

75. *Percnia felinaria* Guenée, 1857

1857. *Percnia felinaria* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 216, pl. 19, fig. 1.

1987. *Percnia felinaria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 257.

Material examined : One ♂, Muktapur, Jaintial hills, 21.v.1990, *M.S. Shishodia* coll. *Wing expanse* : 90 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi and Jaintia hills districts); Sikkim; Nagaland; Assam. Elsewhere : Bangladesh; Nepal.

Remarks : The species was earlier mentioned from the Khasi hills by Cotes & Swinhoe (1888).

Genus *Obeidia* Walker, 1862

1862. *Obeidia* Walker, *Cat. Lep. Het. Brit. Mus.*, **24** : 1139.

1915. *Obeidia* : Prout, *Macrolep. World*, **4** : 307.

*76. *Obeidia tigrata* (Guenée, 1857)

1857. *Abraxas tigrata* Guenée, *Hist. nat. Ins. Lep. Phal.*, **2** : 202.

1915. *Obeidia tigrata* : Prout, *Macrolep. World*, **4** : 307, pl. 14g.

Material examined : One ♀, Khasi hills, *Old colln. Wing expanse* : 50 mm.

Diagnosis : Orange fulvous, spotted black. Fore wing ante- and postmedial series of large spots; both wings basal and terminal spots small and numerous.

Distribution : India : Meghalaya (East Khasi hills district); Sikkim; West Bengal; Nagaland. Elsewhere : China.

Remarks : The species is a new record for Meghalaya. Distribution of this species to other Indian states is only referred to by Hampson (1895). The specimen examined has a much larger expanse as compared to that in Hampson (*loc. cit.*).

Genus *Alcis* Curtis, 1829

1829. *Alcis* Curtis, *Brit. Ent.*, pl. 113.

1987. *Alcis* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 259.

77. *Alcis perspicuata* (Moore, 1867)

1867. *Boarmia perspicuata* Moore, *Proc. zool. Soc. Lond.*, p. 630.

Material examined : One ♂, 1 ♀, Shillong, "at light, 5 - 6.iv.1991, S.K.Ghosh & party coll. *Wing expanse* : 41-44 mm.

Diagnosis : Ground colour bright ocherous brown. Wings with median and postmedian lines acutely angulated; *underside* dark borders strong. Antennal pectinations long and less in number.

Distribution : India : Meghalaya (East Khasi hills district); West Bengal (Darjiling); Himachal Pradesh. Elsewhere : Central China.

Remarks : The species was treated in the synonymy list of *Boarmia admissaria* Guenée by Hampson (1895) and Prout (1915). But on further examination, it is observed to fit well in the genus *Alcis* which was also treated as congeneric with *Boarmia* Treitschke by the aforesaid authorities and subsequently segregated as a good genus by Inoue (1987).

Genus *Arichanna* Moore, 1867

1867. *Arichanna* Moore, *Proc. zool. Soc. Lond.*, p. 658.

1987. *Arichanna* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 257.

78. *Arichanna hamiltonia* Swinhoe, 1892

1892. *Arichanna hamiltonia* Swinhoe, *Trans. ent. Soc. Lond.*, p. 17, pl. 1, fig. 5.

1895. *Arichanna hamiltonia* : Hampson, *Fauna Brit. India, Moths*, **3** : 294.

Material examined : One ♀, Shillong, 26.vi.1976, M.S. Jarwa coll. *Wing expanse* : 68 mm.

Diagnosis : Purplish grey. Abdomen orange-banded. Fore wing spotted, with a post-medial white band; hind wing without fuscous on inner area.

Distribution : India : Meghalaya (East Khasi hills district); Assam; Nagaland.

Remarks : The species is endemic in the East Himalaya.

Genus *Ascotis* Hübner, 1816

1816. *Ascotis* Hübner, *Verz. bek. Schmett.*, p. 313.

1987. *Ascotis* : Inoue, *Bull Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 267.

79. *Ascotis selenaria* (Schiffermüller, 1776)

1776. *Geometra selenaria* Schiffermüller, *Wien. Verz.*, p. 101.

1900. *Ascotis selenaria* : Swinhoe, *Cat. East. Austr. Lep. Het.*, **2** : 288.

Material examined : One ♀, Jaintia hills, "at light", 19. v. 1990, M.S. Shishodia & party coll. ***Wing expanse*** : 57 mm.

Diagnosis : White, slightly irrorated brown. Fore wing median line waved and curved, being straight antemedian on hind wing; both wings end-cell lunule grey-centred, postmedian line prominent and crenulate.

Distribution : India : Meghalaya (East Khasi and Jaintia hills districts); West Bengal; Sikkim; North-west Himalaya; Madhya Pradesh. Elsewhere : Sri Lanka; Nepal; China; Japan; Korea; Amur; Middle East; Africa; Europe.

Remarks : This weedy species is known by several geographical forms (*vide* Prout, 1915); he mentioned one of these, i.e., ssp. *dianaria* (Hübner), from the "warmer latitudes" of South Europe and elsewhere, differing little from the Indian specimens. Swinhoe (1900), however, referred to the only f. *promptaria* (Walker) from India, which the authors have not seen. Reportedly, the species lives on low plants. It was earlier reported from the Khasis by Hampson (1895), Swinhoe (1900) and Sevastopulo (1956).

Genus *Xandrames* Moore, 1867

1867. *Xandrames* Moore, *Proc. zool. Soc. Lond.*, p. 634.

1987. *Xandrames* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 267.

* 80. *Xandrames dholaria* Moore, 1867

1867. *Xandrames dholaria* Moore, *Proc. zool. Soc. Lond.*, p. 634.

1987. *Xandrames dholaria* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 267.

Material examined : One ♂, Jaintia hills, 21.v.1990, M.S. Shishodia & party coll. ***Wing expanse*** : 68 mm.

Diagnosis : Brown. Fore wing end-cell lunale dark, white band broad and dark striated; hind wing terminal area striated black, extending as a band.

Distribution : India : Meghalaya (Jaintia hills district); West Bengal; Sikkim; Nagaland; Himachal Pradesh. Elsewhere : China; Japan.

Remarks : The species is a new record for Meghalaya. It was confused with *X. latiferaria* Walker by Hampson (1895).

Genus *Gnophos* Treitschke, 1827

1827. *Gnophos* Treitschke, *Eur. Schmett.*, **6** (1) : 160.

1987. *Gnophos* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 267.

81. *Gnophos* sp. indet.

Material examined : One ♂, Shillong, Old Colln. *Wing expanse* : 50 mm.

Remarks : The specimen examined is very much allied to *G. eolaria* Guenée from the Khasi hills, but differs by the ground colour reddish brown and fore wing submarginal area with three distinct dark brown patches, viz., subapical, middle and subtornal. Antennae of the specimen is missing.

Genus *Loxaspilates* Warren, 1893

1893. *Loxaspilates* Warren, *Proc. zool. Soc. Lond.*, p. 413.

1987. *Loxaspilates* : Inoue, *Bull Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 269.

** 82. *Loxaspilates graeseri* Prout, 1915

1915. *Loxaspilates graeseri* Prout, *Macrolep. World*, **4** : 410, pl. 24g.

Material examined : One ♀, Tasek, Songsok, East Garo hills, 1.vii.1989, R.K. Ghosh & party coll. *Wing expanse* : 46 mm.

Diagnosis : Palpi long. Fore wing with margin oblique, straight and Sc free; hind wing without cell-spot.

Distribution : India : Meghalaya (East Garo hills district). Elsewhere : Tibet.

Remarks : The species, not earlier known from India, differs from the Tibetan specimens by the absence of cell-spot on hind wing. *L. graeseri* (Püngler in literature) is a new name *sensu* Prout (1915) for *boarmiaria* Püngler (nec Graeser).

Genus *Ourapteryx* Leach, 1814

1814. *Ourapteryx* Leach, *Zool. Misc.*, **1** : 79.

1987. *Ourapteryx* : Inoue, *Bull. Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 270.

Key to species

Pale primrose-yellow. Face white. Fore wing apex not falcate, strigulation strong but costa without striae; hind wing lines thick and with grey shading between spots at tail ..... *ebuleata*

Pale yellow. Face ochreous brown. Fore wing apex falcate. Hind wing lines fine and without grey shading between spots at tail ..... *sambucaria*

83. *Ourapteryx ebuleata* Guenée, 1857

1857. *Ourapteryx ebuleata* Guenée, *Hist. nat. Ins. Lep. Phal.*, **1** : 32.

1987. *Ourapteryx ebuleata* : Inoue, *Bull Fac. domest. Sci. Otsuma Wom. Univ.*, **23** : 270.

Material examined : One ♂, Shillong, "at light", 21.v.1979, G.K. Srivastava & party coll.; 1 ♂, Tura, West Garo hills, 12.viii.1988, K.K. Roy & party coll. *Wing expanse* : 44-52 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi and West Garo hills districts); West Bengal; Sikkim; Jammu & Kashmir. Elsewhere : Nepal; Pakistan; West China.

Remarks : The specimens are appreciably smaller in wing expanse.

**84. *Ourapteryx sambucaria* (Linn., 1758)

1758. *Phalaena sambucaria* Linnaeus, *Syst. Nat.*, ed. **10** : 519.

1915. *Ourapteryx sambucaria* : Prout, *Macrolep. World*, **4** : 334, pl. 17c.

Material examined : One ♂, Happy valley, Shillong, 23.x.1974, *Old colln.*; 1 ♂, Jowai, Jaintia hills, 19.v.1990, *M.S. Shishodia* coll. *Wing expanse* : 51-53 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi and Jaintia hills districts). Elsewhere : Europe to Altai; West China; Trans-Caucasia to Japan.

Remarks : The species was not hitherto known from India.

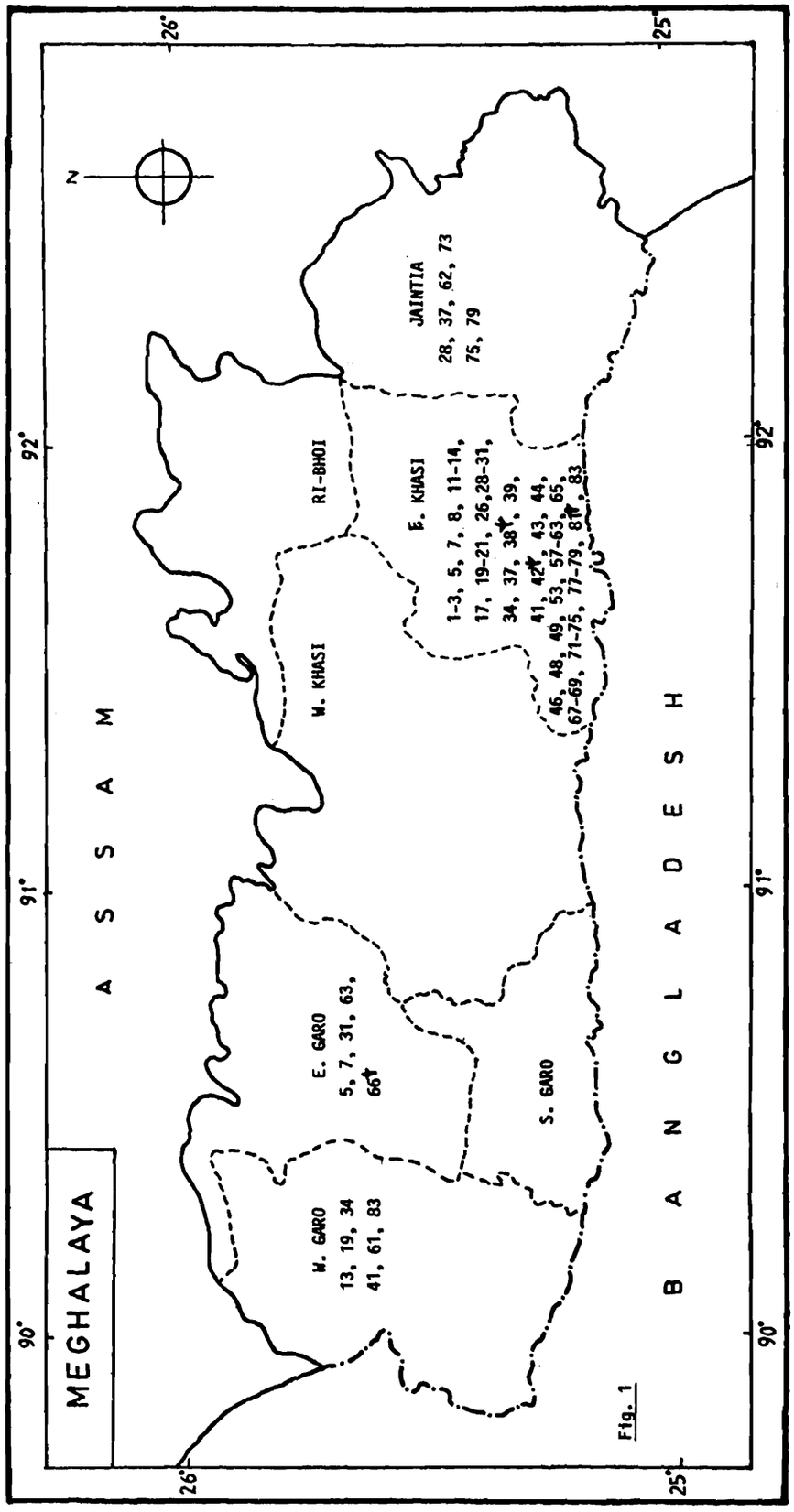

Fig. 1. Map showing inter-district distribution of species examined from Meghalaya : all (but the species *indet.* marked) earlier recorded in literature from the state.

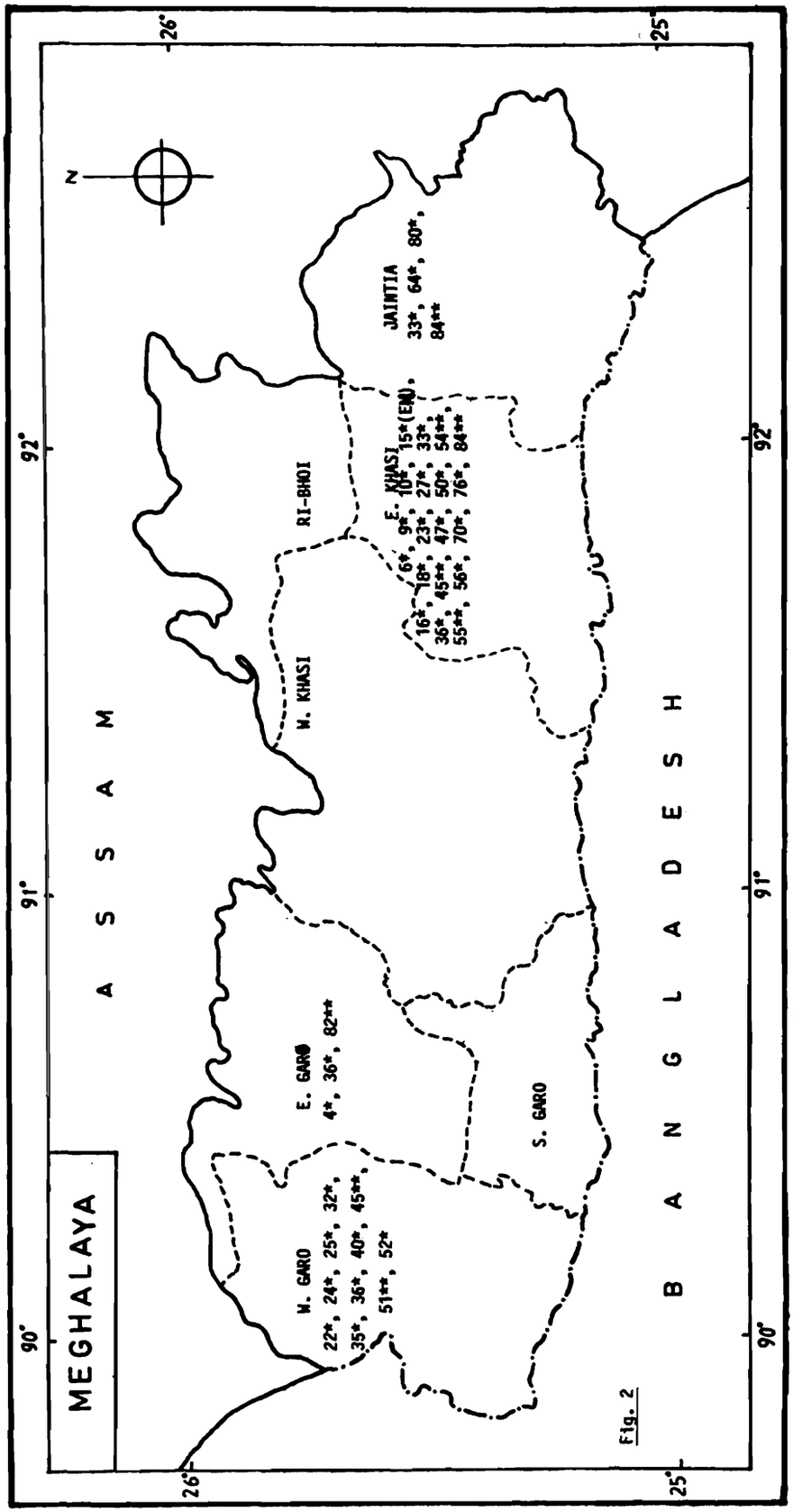

Fig. 2

Fig. 2. Map showing inter-district distribution of species recorded new for Meghalaya*, East Himalaya *(EH) and India **.

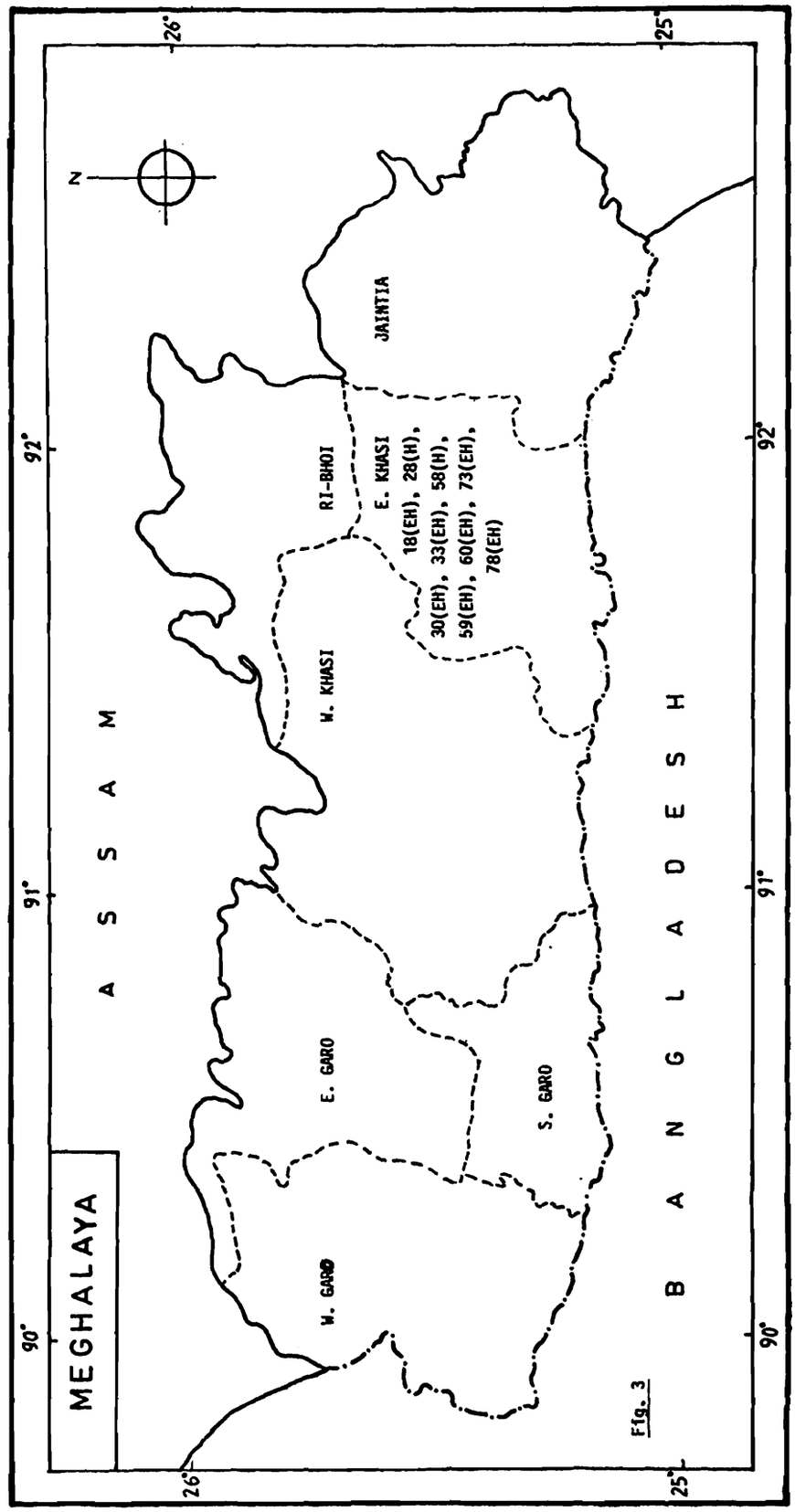

Fig. 3. Map showing distribution of species examined from the E. Khasi hills as endemic in the East Himalaya (EH) and Himalaya (H).

TABLE. DISTRICT-WISE DISTRIBUTION OF MOTHS EXAMINED FROM MEGHALAYA
[+, known distribution; *, new record for the state; **, new for India]

Sl. No.	Name of species as cited in the text	DISTRICTS OF MEGHALAYA						
		West Garo	East Garo	South Garo	West Khasi	East Khasi	Ri-Bhoi	Jaintia
1.	*Acherontia lachesis*					+		
2.	*A. styx*					+		
3.	*Herse convolvuli*					+		
4.	*Leucophlebia lineata*		*					
5.	*Elibia dolichus*		+			+		
6.	*Macroglossum aquila*					*		
7.	*Rhopalopsyche nycteris*		+			+		
8.	*Hippotion rafflesi*					+		
9.	*Theretra nessus*					*		
10.	*Helicoverpa armigera*					*		
11.	*Agrotis segetum*					+		
12.	*A. ypsilon*					+		
13.	*Amathes c-nigrum*	+				+		
14.	*Polia costigera*					+		
15.	*Cirphis compta*					*		
16.	*Prodenia litura*					*		
17.	*Hyblaea puera*					+		
18.	*Sypna caliginosa*					*		
19.	*Mocis undata*	+				+		
20.	*Erebus crepuscularis*					+		
21.	*E. albicincta*					+		
22.	*Ramadasa pavo*	*						
23.	*Othreis fullonica*					*		
24.	*Oraesia emarginata*	*						
25.	*Ischyja manilia*	*						
26.	*Hulodes caranea*					+		
27.	*Oxyodes scrobiculata*					*		
28.	*Trisuloides sericea*					+		+

Sl. No.	Name of species as cited in the text	West Garo	East Garo	South Garo	West Khasi	East Khasi	Ri-Bhoi	Jaintia
29.	*Diachrysia orichalcea*					+		
30.	*Dichromia triplicalis*					+		
31.	*Adrapsa despecta*		+			+		
32.	*Archaeobalbis usneata*	*						
33.	*Terpna haemataria*					*		*
34.	*Dysphania militaris*	+				+		
35.	*Aporandria specularia*	*						
36.	*Thalassodes quadraria*	*	*			*		
37.	*T. falsaria*					+		+
38.	*Eretmopus sp.*					+		
39.	*Oenospila strix*					+		
40.	*O. flavifusata*	*						
41.	*Cyclothia disjuncta*	+				+		
42.	*Diplodesma sp.*					+		
43.	*Rhodostrophia vinacearia*					+		
44.	*Synegiodes hyriaria*					+		
45.	*Calothysanis amata*					**		
46.	*C. responsaria*					+		
47.	*Scopula emissaria*					*		
48.	*S. pulchellata*					+		
49.	*S. aspilataria*					+		
50.	*S. intensata*					*		
51.	*S. costata*	**						
52.	*S. remotata*	*						
53.	*Problepsis vulgaris*					+		
54.	*Sterrha cossurata*					**		
55.	*Cidaria corollaria*					**		
56.	*Petelia medardaria*					*		
57.	*Rhynchobapta flaviceps*					+		
58.	*Macaria effusata*					+		
59.	*Dalima schistacearia*					+		

Sl. No.	Name of species as cited in the text	West Garo	East Garo	South Garo	West Khasi	East Khasi	Ri-Bhoi	Jaintia
60.	*Zamarada cosmiaria*					+		
61.	*Hypochrosis iris*	+				+		
62.	*Spilopera gracilis*					+		+
63.	*Cusiala bengaliaria*		+			+		
64.	*Medasina creataria*							*
65.	*M. albidaria*					+		
66.	*Medasina sp.*		+					
67.	*Hemerophila subplagiata*					+		
68.	*H. delineata*					+		
69.	*Boarmia crepuscularia*					+		
70.	*B. bhurmitra*					*		
71.	*B. semialba*					+		
72.	*B. alienaria*					+		
73.	*Chorodna erebusaria*					+		+
74.	*Percnia belluaria*					+		
75.	*P. felinaria*					+		+
76.	*Obeidia tigrata*					*		
77.	*Alcis perspicuata*					+		
78.	*Arichanna hamiltonia*					+		
79.	*Ascotis selenaria*					+		+
80.	*Xandrames dholaria*							*
81.	*Gnophos sp.*					+		
82.	*Loxaspilates graeseri*		**					
83.	*Ourapteryx ebuleata*	+				+		
84.	*O. sambucaria*					**		**

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INSECTA : LEPIDOPTERA : LASIOCAMPIDAE, LYMANTRIIDAE AND RATARDIDAE

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INTRODUCTION

In continuation with the authors' preceding part of studies on the butterfly fauna, this work presents a systematic account of three families of moths from Meghalaya. The account is based on the material of Lasiocampidae and Lymantriidae available in both the old and fresh collections made during the last decade by different parties of the Zoological Survey of India. The Lasiocampidae is represented by 49 species in 20 genera from India and 20 species in 14 genera from the state of Meghalaya. The Lymantriidae is known by 171 species in 28 genera from India and 93 species in 21 genera from the state, while the allied and very small family Ratardidae comprises only 3 Indian species in one genus, of which but a single is known to occur in the state.

The material brought to the Survey comprise 66 exs. in 28 species of Lasiocampidae taken together and represent about 25% of the known state fauna. Nothing definite is known about the status and abundance of majority of the species concerned, as these are yet to be included in the Schedules of the Indian Wildlife Act. Nevertheless, as it appears from the poor percentage of the material at hand, these faunal resources need strict protection from the clutches of continued degradation of natural habitats in India.

The pioneering work on the faunistics with particular reference to the Lasiocampidae and Lymantriidae from Meghalaya dates back to Swinhoe (1895); he worked on the collections from the Khasia Hills. Since then, there seems to be little consolidated work on the state fauna related to the concerned families.

The lasiocampids, popularly known as the Shaggy-haired Worms, Eggars, Lappet-moths, are represented by moderate to large-sized and densely-scaled members with stout body, prominent humeral lobe of hind wing, proboscis and ocelli absent and antenae bipectinate in both sexes. These are mostly tropical in distribution and noctural in habit. Certain species like *Trabala vishnou* (Lefebvre), particularly the male, shows unsteady and clumsy flight over bushes and meadows at day time, while others are quite sluggish and hide amidst the bush-wood. The Lymantriids, popularly known as the Tussock Moths, are mostly moderate-sized and rarely brilliantly coloured insects (eg. *Numenes* spp.). The bipectinate male antennae with branches terminally long-spined, absence of ocelli and

well developed anal tuft of hairs for covering egg-masses afford easily recognisable characters of this Tropico-temperate family which mostly shows noctural flight and prefers forest habitats. The ratardids constitute a very small group in the Oriental region, of which the habit and ecology are rather unknown; Imms (1960) considered the family under the superfamily Psychoidea.

The present paper deals with the systematic account of state fauna covering the foregone families. Amongst the species examined, the Lasiocampidae comprises five and the Lymantriidae, 23 including six as new records for the state (marked* in the text). Of the remaining 85 species, five of Lasiocampidae and 29 of Lymantriidae are common with the fauna of West Bengal (*vide* Mandal & Maulik, *in* press); besides, 10 of the former and 40 of the latter family along with one of Ratardidae - all not available in the collections from Meghalaya - are also appended after a comprehensive literature review. Distribution of the species examined is shown by map-plotting their serial number as in the systematic list of taxa. The systems of Lasiocampidae, Lymantriidae and Ratardidae have principally been followed after Coliier (1936), Bryk (1934) and Hering (1937) respectively.

SYSTEMATIC ACCOUNT

The general morphology along with illustrations of this well familiar group of moths under report has been given by Butler (1877, 1881), Hampson (1892), Strand in Seitz (1913-1933), Grünberg in Seitz (1923) and Imms (1960). Brief account of collection and preservation methods together with keys to taxa examined has mostly been provided in the authors' earlier work (*vide* Mandal & Maulik, *in* press). Keys to the superfamilies, genera and species, that were not included in the authors' earlier work cited above, are only given in this paper.

LIST OF TAXA

(* – marked species are new records for Meghalaya)

Order Lepidoptera

1. Superfamily Bombycoidea

Family Lasiocampidae

Genus ***Trabala*** Walker

1. sp. *vishnou* (Lefebvre)

Genus ***Lebeda*** Walker

2. sp. *nobilis* Walker

Genus ***Suana*** Walker

3. sp. *concolor* (Walker)

Genus ***Bhima*** Moore

4. sp. *undulosa* (Walker)

Genus ***Dendrolimus*** Germar

5. sp. *latipennis* (Walker)

2. Superfamily Noctuoidea

Family Lymantriidae

Subfamily Lymantriinae

(A) Group Areolatae

Genus ***Dasychira*** Stephens

* 6. sp. *grotei* Moore

7. sp. *horsfieldi (Saunders)*

*8. sp. *thwaitesi* Moore

9. sp. *lineata* (Walker)

Genus ***Aroa*** Walker

10. sp. *plana* (Walker)

Genus ***Pantana*** Walker

11. sp. *bicolor* (Walker)

12. sp. *albifascia* (Walker)

Genus ***Pida*** Walker

13. sp. *apicalis* Walker

Genus ***Numenes*** Walker

14. sp. *siletti* Walker

(B) Group Inareolatae

Genus ***Lymantria*** Hübner

15. sp. *serva* (Fabr.)

16. sp. *concolor* Walker

17. sp. *marginata* Walker

*18. sp. *subrosea* Swinhoe

Genus ***Porthesia*** Stephens

19. sp. *xanthorrhoea* (Kollar)

20. sp. *scintillans* (Walker)

Genus ***Euproctis*** Hübner

*21. sp. *latifascia* (Walker)

*22. sp. *icilia* (Stoll)

23. sp. *subfasciata* (Walker)

24. sp. *uniformis* (Moore)

25. sp. *magna* (Swinhoe)

*26. sp. *negrita* Hampson

27. sp. *divisa* (Walker)

28. sp. *guttata* (Walker)

Order LEPIDOPTERA

Key to the superfamilies

Tympanal organs absent. Frenulum absent or, if present, antennae other than bipectinate ..... **Bombycoidea**

Tympanal organs present in metathorax. Frenulum present. Antennae acuminate. Fore wing M_2 and M_3 basally approximated ..... **Noctuoidea**

1. Superfamily Bombycoidea

Family Lasiocampidae

Key to the genera

Antennal pectinations in male gradually decreasing to apex. Fore wing broad, with apex rounded; R_4 free from R_{2-3}. Hind wing costa excised ..... ***Lebeda*** Walker

Antennal pectinations in male abruptly shortening at middle. Fore wing narrow, with apex produced; R_4 stalked with R_{2-3}. Hind wing costa not excised .....***Bhima*** Moore

Genus *Trabala* Walker, 1856

1855. *Amydona* Walker, *List Lep. Het. Brit. Mus.*, **6** : 1413 (praeocc.).

1936. *Trabala* : Coliier, *Lep. Cat.*, **73** : 196.

1. *Trabala vishnou* (Lefebvre, 1827)

In press. *Trabala vishnou* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Immtocoy, 14.vi.1972, R.S. Giri & party coll.; 1 ♂, Sibbari, P.W.D. Inspection Bungalow, West Garo Hills district, 17.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : ♂ 55, ♀ 80 mm.

Distribution : India : Meghalaya (East Khasi; West Garo); almost throughout the rest of the mainland and the Andaman Islands. Elsewhere : China, Bhutan to the Sundaland.

Remarks : Swinhoe (1895) reported this species as common in Cherra Punji.

Genus *Lebeda* Walker, 1855

1855. *Lebeda* Walker, *List Lep. Het. Brit. Mus.*, **6** : 1453.

1936. *Lebeda* : Coliier, *Lep. Cat.*, **73** : 322.

2. *Lebeda nobilis* Walker, 1855

In press. *Lebeda nobilis* : Mandal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Sibbari, P.W.D. Inspection Bungalow, West Garo Hills district, 17.vii.1988; 1 ♂, Kench Trace, Shillong, 19.ix.1967, *R.K. Varshney* & party coll. ;1 ♀ Rynjah, 23.viii.1962, *S.N. Prasad* & party coll.; 1 Shillong, East Khasia Hills district, *Mus. Coll.* (Old colln.). *Wing expanse* ♂ 100, ♀ 120-150 mm.

Diagnosis : *MALE* : Body red-brown. Labial palpi ventro-laterally black. Fore wing with pale oblique lines, two postmedials with a dark streak from mid-cell to outer area and one submarginal lunulate. Hind wing with two pale curved postmedial lines. *FEMALE* : More uniform red-brown. Fore wing postmedial lines without the dark streak.

Distribution : India : Meghalaya (East Khasi; West Garo); almost throughout the rest of the Himalaya. Elsewhere : Bangladesh; Nepal.

Remarks : The species was earlier known from Cherra Punji.

Genus *Suana* Walker, 1855

1855. *Suana* Walker, *List Spec. Lep. Het. Brit. Mus.*, **6** : 1502.

1936. *Suana* : Coliier, *Lep. Cat.*, **73** : 324.

3. *Suana concolour* (Walker, 1855)

In press. *Suana concolour* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Shillong, East Khasia hills district, Mus. Coll. (Old Colln.).

Wing expanse : 160 mm.

Distribution : India : Meghalaya (East Khasia); almost throughout the mainland. Elsewhere : Sri Lanka; Sundaland to the philippines.

Remarks : The species was earlier known by one male and several females from Shillong and Cherra Punji.

Genus *Bhima* Moore, 1888

1855. *Poecilocampa* Walker, *List Lep. Het. Brit. Mus.*, **6** : 1474.

1936. *Bhima* : Coliier, *Lep. Cat.* **73** : 325.

4. *Bhima undulosa* (Walker, 1855)

1855. *Poecilocampa undulosa* Walker, *List. Lep. Het. Brit. Mus.*, **6** : 1477.

1936. *Bhima undulosa* : Coliier, *Lep. Cat.*, **73** : 326.

Material examined : One ♀ Shillong, East Khasia hills dist., Mus. Coll. (Old Colln.). *Wing expanse* : 80 mm.

Diagnosis : Frons red-brown. Wings suffused ochreous. Abdomen with a very large pale terminal tuft.

Distribution : India : Meghalaya (East Khasia); Manipur; Himachal Pradesh. Elsewhere : Nepal.

Remarks : The specimen examined is a female that differs from that in North-west Himalaya by the colouration of wings and abdominal tuft and also by the hind wing which is not crossed by postmedial lines. It also differs from the male by the colouration of frons and wings as well as by the appreciably large wing expanse. The species was earlier known by several examples from Cherra Punji.

Genus *Dendrolimus* Germar, 1811

1811. *Dendrolimus* Germar, *Prodr. Bomb. Spec.*, **2** : 48.

1936. *Dendrolimus* : Coliier, *Lep. Cat.*, **73** : 327.

5. *Dendrolimus latipennis* (Walker, 1855)

In Press. *Dendrolimus latipennis* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Sibbari, P.W.D. Inspection Bungalow, West Garo Hills district, 17.vii.1988, *R.K. Ghosh* & party coll.; 2♂, 1♀, Botanical Gardens, 18.vi.1961, 16.iii.1962, 20.viii.1962, 1♀, Shillong, Mus. Coll. (Old Colln.), 1♀ Maw Phlong, 23.vi.1963, East Khasia hills district; 1♀, Umshing, Ri-Bhoi district, 25.vi.1963, S.N. Prasad & party coll. *Wing*

expanse : ♂ 78-88, ♀, 95-125 mm.

Distribution : India : Meghalaya (West Garo, East Khasia, Ri-Bhoi); rest of East Himalaya up to Himachal Pradesh. Elsewhere : Burma, Sri Lanka and Sundaland.

Remarks : The species was earlier known by three males and one female from Cherra Punji.

2.	Superfamily	Noctuoidea
	Family	Lymantriidae
	Subfamily	Lymantriinae
(A)	Group	Areolatae

Key to the genera

1. Labial palpi porrect and extending beyond frons.
   Legs not heavly fringed with hair 2
   Labial palpi upturned and extending above vertex of head. Legs heavily fringed with hair ..... ***Pida***
2. Hind tibia with two pair of spurs ..... ***Aroa***
   Hind tibiae with one pair of spurs ..... ***Pantana***

Genus *Dasychira* Stephens, 1828

1823. *Olene* Hübner, *Zutr. exot. Schmett.*, **2** : 19.

1828. *Dasychira* Stephens, *Ill. Brit. Ent. Haust.*, **2** : 58.

Key to the species

♀ Antennal branches short. Fore wing antemedial, postmedial and submarginal lines indistinct and diffused. Both wings without marginal series of specks. Abdomen with dorsal anterior crests ..... *grotei*

♀ Antennal branches long. Fore wing antemedial line black and angled on median vein; postmedial and submarginal lines indistinct and dentate. Both wings with a marginal series of specks. Abdomen without dorsal crest ..... *lineata*

* 6. *Dasychira grotei* Moore, 1859

1859. *Dasychira grotei* Moore, *Cat. Lep. East India Co.*, p. 338.

1934. *Dasychira grotei* : Bryk, *Lep. Cat.*, **20** (62) : 19.

Material examined : One ♀, Shillong, East Khasia dist., 24.iii.1956, *Mus. Coll.* (Old colln.).
Wing expanse : 80 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasia). Elsewhere : Taiwan; West China.

Remarks : Hampson (1892) treated the species in the synonymy list of *D. horsfieldi* (Saunders), but Bryk (1934) considered it as a valid species with the distribution mentioned as " N. Indian" and elsewhere as cited above. This is a new record for Meghalaya.

7. *Dasychira horsfieldi* (Saunders, 1851)

In Press. *Dasychira horsfieldi* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Shillong, East Khasia dist., 24.iii.1956, Mus. coll. (Old colln.). *Wing expanse* : 65 mm.

Distribution : India : Meghalaya (East Khasia); West Bengal, Tamil Nadu. Elsewhere : Sri Lanka; Sundaland; Western Malaysia; Australia.

Remarks : The species was earlier reported from Shillong by Swinhoe (1895), whence several specimens in both sexes were known.

*8. *Dasychira thwaitesi* Moore (1883)

In press. *Dasychira thwaitest* : Mondal & Maulik, *in State Fauna Series,* West Bengal.

Material examined : One ♂, Shillong, East Khasia dist., 14.ix.1971, R.S. Giri & party coll. *Wing expanse* : 50 mm.

Distribution : India : Meghalaya (East Khasia); West Bengal, Kerala, Tamil Nadu. Elsewhere : Sri Lanka.

Remarks : The species is a new record for Meghalaya.

9. *Dasychira lineata* (Walker, 1855)

1855. *Lymantria lineata* Walker, *Cat. Lep. Het. Brit. Mus.,* **4** : 875.

1934. *Dasychira lineata* : Bryk, *Lep. Cat.,* **20** (62) : 26.

Material examined : One ♀, Nangwal, East Garo hills dist., 28.v.1990, *M.S. Shisodia* & party coll. *Wing expanse* : 90 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Garo; East Khasia); Assam; Sikkim; Nagaland; Madhya Pradesh. Elsewhere : Bangladesh; Burma; Sumatra.

Remarks : The species was earlier known by 2 males and one female from Cherra Punji.

Genus *Aroa* Walker, 1855

1837. *Gynaephora* Geyer, *Zutrage* **5** : 12.

1934. *Aroa* : Bryk : *Lep. Cat.*, **20** (62) : 84.

10. *Aroa plana* (Walker, 1855)

1855. *Orgyia plana* Walker, *Cat. Lep. Het. Brit. Mus.*, **4** : 786.

1934. *Aroa plana* : Bryk, *Lep. Cat.*, **20** (62) : 85.

Material examined : One ♂, Sibbari, West Garo hills dist., 17.vii.1988, R.K. Ghosh & party coll. ***Wing expanse*** : 35 mm.

Diagnosis : ♂ Ground colour bright ochreous; fore wing postmedial band prominent.

Distribution : India : Meghalaya (East Khasi hills; West Garo hills); Kerala; Jammu & Kashmir; Himachal Pradesh. Elsewhere : Sri Lanka.

Remarks : The species was earlier known by three males from Cherra Punji. It is very much allied to *A. major* Hampson from Sri Lanka and elsewhere (*vide* Hampson, 1892; Bryk, 1934). Reportedly, the female differs from male by the fuscous colouration of wings.

Genus *Pantana* Walker, 1855

1825. *Liparis* Hübner, *Zutr. exot. Schmett.*, **3** : 33.

1934. *Pantana* : Bryk, *Lep. Cat.*, **20** (62) : 133.

Key to the species

♂. Head and labial palpi orange. Thorax and abdomen basally white, latter terminally orange. Wings yellowish white and without band; hind wing outwardly suffused fuscous ..... *bicolor*

♂. Head and labial palpi fulvous. Thorax and abdomen fuscous. Fore wing basally and apically very dark and with an oblique median band; hind wing entirely dark brown ..... *albifascia*

11. *Pantana bicolor* (Walker, 1855)

In press. *Pantana bicolor* : Mondal & Maulik, *in State Fauna Series West Bengal.*

Material examined : One ♂, 1 ♀, Shillong, E. Khasi hills dist., 3.vi.1967, B.K. Tikader & party coll. ***Wing expanse*** : 42 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasia); throughout the rest of the East Himalaya;

Himachal Pradesh. Elsewhere : Bangladesh, Bhutan, Burma, Campuchea, Sundaland, Western Malaysia and Vietnam.

Remarks : The species was earlier known from the East Khasi hills.

12. *Pantana albifascia* (Walker, 1865)

In press. *Pantana albifascia* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 3♂, 5♀, Shillong, East Khasi hills dist., 3.vi.1967, B.K. Tikadar & party coll. *Wing expanse* : ○, 25-30 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasia hills dist.); West Bengal; Sikkim.

Remarks : The species, hitherto known as endemic in the East Himalaya, was earlier known from Shillong and Cherra Punji.

Genus *Pida* Walker, 1865

1865. *Pida* Walker, *Cat. Lep. Het. Brit. Mus.*, **32** : 399.

1934. *Pida* : Bryk, *Lep. Cat.*, **20** (62) : 137.

13. *Pida apicalis* Walker, 1865

In press. *Pida apicalis* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One♀, Jawai, Jaintia hills dist., 20.v.1990, M.S. Shishodia & party coll. *Wing expanse* : 60 mm.

Diagnosis : Labial palpi black, fringed with orange. Head and thorax brown. Abdominal anal tuft orange. Fore with with dark scales thickly oriented towards large apical yellow patch. Hind wing yellow, anal area with long brown hairs.

Distribution : India : Meghalaya (East Khasi; Jaintia); West Bengal; Sikkim. Elsewhere : Bangladesh; Nepal.

Remarks : The species was earlier known from the East Khasi hills.

Genus *Numenes* Walker, 1855

1855. *Pseudomesa* Walker, *Cat. Lep. Het. Brit. Mus* **4** : 923.

1934. *Numenes* Bryk, *Lep. Cat.*, **20** (62) : 138.

14. *Numenes siletti* Walker, 1855

1855. *Numenes siletti* Walker, *Cat. Lep. Het. Brit. Mus.*, **3** : 663.

1934. *Numenes siletti* Bryk, *Lep. Cat.*, **20** (62) : 140.

Material examined : One, ♀, Kherapara, West Garo Hills dist., 20.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 50 mm.

Diagnosis : ♀ Head and thorax black. Abdomen orange, with paired dorsal and ventral brown spots. Fore wing yellowish white, with a broad black fascia along anal margin which is met by oblique ante-and postmedial chocolate bands. Hind wing with a black-brown spot at anal angle.

Distribution : India : Meghalaya (West Garo hills; East Khasia); Assam; Sikkim; Jammu & Kashmir. Elsewhere : Bangladesh; Burma; Borneo; Java; Philippines.

Remarks : The species, earlier treated as *Pseudomesa quadriplagiata* Walker (1855), was already recorded from the East Khasis by Swinhoe (1895). It is sexually dimorphic, in which the male is known to differ from the female by the ground colour of body and wings dark brown, fore wing median band white and hind wing with a postmedian fascia and without anal spot. Bryk (1934) mentioned, apart from three Malayan subspecies, a few morphs including the f. *silettoides* Strand from Sylhet.

(B) Group Inareolatae

Genus ***Lymantria*** Hübner, 1818

1810. *Liparis* Ochsenheimer (nec Scopoli, 1777), Schmett. Eur., **3** : 186.

1934. *Lymantria* : Bryk, *Lep. Cat.*, **20** (62) : 144.

Key to the species

1. ♂ : Ground colour of fore wing brown, irrorated dark; all the lines double lunulate; spot absent in cell. ♀ : Abdomen wholly crimson and laterally black-spotted ..... *serva*

   ♂ : Ground colour of fore wing not brown; only the postmedial line double lunulate; spot may be present in cell. ♀ : Ground colour of abdomen never wholly crimson 2
2. ♂ : Fore wing fuscous; subbasal band broad and black; a spot near end of cell. ♀ : Wings white; fore wing markings broad, black and conjoined into blotches; hind wing with a broad marginal black band ..... marginata

   ♂ : Fore wing white; subbasal band and Cell-spot may be absent 3
3. ♂ : Fore wing antemedial line irregularly waved, with a black streak in cell. Hind wing outer band atrophied. ♀ : Abdomen yellow ..... *concolor*

   ♀ : Fore wing antemedial line lunulate; cell-streak absent. Hind wing outer band broad and smoky-black. Abdomen crimson, terminally whitish..... *subrosea*

15. *Lymantria serva* (Fabr., 1793)

In press. *Lymantria serva* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Sangsok, East Garo hills dist., 2.vii.1988. R.K. Ghosh & party coll. *Wing expanse* : 42 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Garo; Khasi hills); almost throughout the mainland. Elsewhere : China, Hong Kong, Maiaya, Philippines, Sri Lanka and Taiwan.

Remarks : Hampson (1892) treated the species as *L. obsoleta* Walker and mentioned that a form from the Khasis has the hind wing nearly pure white and not fuscous, as usual, and with an end-cell lunule and irregular outer band.

16. *Lymantria concolor* Walker,

1855. *Lymantria concolor* Walker, *Cat. Lep. Het. Brit. Mus.*, **4** : 876.

1934. *Lymantria concolor* : Bryk, *Lep. Cat.*, **20** (62) : 159.

Material examined : 3 ♂, 5 ♀, Shillong, 24.viii. 1962, 3.vi., 22.ix.1967, S.N. Prasad, B.K. Tikadar & parties coll. *Wing expanse* : ♂, 56-60, ♀, 80-90mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasia hills). Sikkim; Nagaland, Himachal Pradesh. Elsewhere : Bangladesh; Burma; Tonkin; Taiwan; Sze-chwan.

Remarks : The species was earlier recorded as *Lymantria superans* Walker from Shillong and Cherra Punji by Cotes & Swinhoe (1887).

17. *Lymantria marginata* Walker, 1855

In press. *Lymantria marginata* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 2 ♂, 3 ♀, Risa colony, 28.vii.1971, *M.R. Rynth* & party coll., Mophlong, Shillong, East Khasi hills dist., 2.iii.1973, A.K. Ghosh & party coll. *Wing expanse* : ♂ 46, ♀ 62mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasia); Sikkim; West Bengal; Himachal Pradesh. Elsewhere : Bangladesh, Burma and Java.

Remarks : The species was earlier known from the Khasi hills.

*18. *Lymantria subrosea* Swinhoe, 1903

1903. *Lymantria subrosea* Swinhoe, *Trans. ent. Soc. London*, p. 489.

1934. *Lymantria subrosea* : Bryk, *Lep. Cat.*, **20** (62) : 163.

Material examined : One ♀, William Nagar, East Garo hills dist., 11.ix.1983, J.R.B. Alfred & party coll. *Wing expanse* : 65 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Garo Hills); Assam. Elsewhere : Sri Lanka.

Remarks : The species, earlier known as *L. rosea* Hampson, hitherto remained unrecorded from the state of Meghalaya.

Genus *Porthesia* Stephens, 1829

1829. *Porthesia* Stephens, Ill. Brit. Ent. Haust., **2** : 65.

1934. *Porthesia* : Bryk, *Lep. Cat.*, **20** (62) : 202.

19. *Porthesia xanthorrhoea* (Kollar, 1842)

In press. *Porthesia xanthorrhoea* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One,♂, Botanical Gardens, 16. viii. 1967, R.K. Varshney & party, 2♂, 3♀, Shillong, East Khasia hills dist., 12.v.1959, Mus. Coll. (Old collns.). *Wing expanse* :♂, 26-28, ♀30-35 mm.

Distribution : India : Meghalaya (East Khasia); Sikkim; West Bengal; Assam; Himachal Pradesh; Jammu & Kashmir; Madhya Pradesh; Maharashtra; Punjab; Uttar Pradesh. Elsewhere : Burma Java, Nepal and Sri Lanka.

Remarks : This polyphenic species is represented by the f. *subnigra* (Moore) from the Khasia hills (cf. Bryk, 1934).

20. *Porthesia scintillans* (Walker, 1856)

In Press. *Porthesia scintillans* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One♂, 1♀ , Songsak, East Garo hills dist., 4.vii.1988, R.K. Ghosh & party coll. *Wing expanse* :♂30, ♀35 mm.

Distribution : India : Meghalaya (East Garo; East Khasia); Sikkim; West Bengal; Jammu & Kashmir, Himachal Pradesh; Maharashtra; Andaman & Nicobar Islands. Elsewhere : Pakistan, Burma, Sri Lanka, Java, Sulawesi, Philippines and Western Malaysia.

Remarks : The species was earlier known by five specimens from Cherra Punji of the East Khasi hills district.

Genus *Euproctis* Hübner, 1816

1816. *Euproctis* Hübner, *Verz. bek. Schmett.*, p. 159.

1934. *Euproctis* : Bryk, *Lep. Cat.*, **20** (62) : 215.

Key to the species

1. ♂. Body and fore wing black, latter white at base and without lines or bands. ♀. Fore wing white, outwardly suffused black ..... *negrita* Hampson

   ♂ ♀ Body and fore wind not black, latter usually with lines or pands 2

2. Body and fore wing whitish fuscous, latter with an ill-defined median band from lower angle of cell to dorsum ..... *subfasciata*

   Body and fore wing of different colour 3

3. Ground colour of fore wing uniformly dark irrorated vinous brown; hind wing with a broad marginal yellow band ..... *uniformis*

   Ground colour of fore wing bright orange yellow; hind wing without marginal band 4

4. Body bright orange. Fore wing base not purplish brown; end-cell spot orange; ante- and postmedial lines outlined red-brown; subtornal spot black; hairs on dorsum not prominent ..... *guttata* (Walker)

   Body fulvous. Fore wing base purplish brown, latter conjoined to the broad postmedial band below cell; end-cell spot black; antemedial band ferruginous, postmedial one excurved, bands obsolete in ♂; subtornal spot absent; hairs on dorsum long and prominent ..... *icilia* (Stoll)

*21. *Euproctis latifascia* (Walker, 1855)

In press. *Euproctis latifascia* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 2♂, 4♀, Shillong, Mus. Coll. (Old colln.), 1♂, Risa colony, East Khasi hills dist., 11.x.1963, A.K. Sen & party coll.; 3♀, 'at light', Songsak, East Garo hills dist., 4.iii., 3♂, 'at light', Sibbari, West Garo hills dist., 13.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : ♂ 35-38 mm.

Distribution : India : Meghalaya (East Khasi; West Garo hills; East Garo hills); Manipur. West Bengal; Jammu & Kashmir; Himachal Pradesh; Maharashtra. Elsewhere : Nepal; Hong Kong; Taiwan; Vietnam.

Remarks : The species is a new record for Meghalaya where it is apparently common in status. The female has smaller wing expanse as compared to that mentioned by Hampson (1892).

* 22. *Euproctis icilia* (Stoll, 1791)

1791. *Bombyx icilia* Stoll, *in* Cramer, *Pap. Exot.*, **5** : 158.

1934. *Euproctis icilia* : Bryk, *Lep. Cat.*, **20** (62) : 226.

Material examined : One ♂ William Nagar, East Garo hills district, 11.x.1983, J.R.B. Alfred coll. *Wing expanse* : 35 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Garo hills); North West Himalaya; Southern Peninsula.

Remarks : The species is a new record for Meghalaya. Earlier Hampson (1892) treated the sp. *decussata* (Moore) as synonym of *E. icilia*, but later Bryk (1934) considered the former as a good species from Sri Lanka.

23. *Euproctis subfasciata* (Walker, 1865)

In press. *Euproctis subfasciata* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♀, Shillong, 30.viii.1963, A.K. Sen & party coll., 2 ♂, Motinagar, 21.x.1971, R.Giri & party coll., 2 ♂, Risa Colony, 'at light', Shillong, East Khasi hills dist., 15.x.1974, *S.K. Gupta* & party coll.; 1 ♀, Songsak, East Garo hills dist., 4.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : ♂ 34-40 mm.

Diagnosis : *Vide* key.

Distribution : India : Meghalaya (East Khasi hills; E. Garo hills); West Bengal; Assam; Sikkim; Tamil Nadu. Elsewhere : Philippines; Vietnam.

Remarks : The specimens examined are of smaller wing expanse in both sexes, as compared to that mentioned by Hampson (1892).

24. *Euproctis uniformis* (Moore, 1879)

press. *Euproctis uniformis : Mondal & Maulik, in State Fauna Series, West Bengal.*

Material examined : One ♂, William Nagar, East Garo hills dist., 25.v.1990, M.S. Shishodia & party coll. *Wing expanse* : 50 mm.

Diagnosis : Vide key.

Distribution : India : Meghalaya (East Khasi hills; E. Garo hills); West Bengal; Sikkim. Elsewhere : Burma.

Remarks : The species was earlier known from Shillong by several specimens of female only.

25. *Euproctis magna* (Swinhoe, 1891)

In press. *Euproctis magna* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : One ♂, Songsak, East Garo hills dist., 4.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 35 mm.

Distribution : India : Meghalaya (East Khasi hills; East Garo hills); West Bengal. Elsewhere : Burma.

Remarks : The species was earlier known from Shillong by a couple of females. The wing expanse of the specimen examined is appreciably smaller.

*26. *Euproctis negrita* Hampson, 1892

1892. *Euproctis negrita* Hampson, *Fauna Brit. India*, Moths, **1** : 471.

1934. *Euproctis negrita* : Bryk, *Lep. Cat.*, **20** (62) : 238.

Material examined : One ♂, Jowai, Jaintia hills dist., 26.ix.1988, V.D. Srivastava & party coll. *Wing expanse* : 36 mm.

Diagnosis : *vide* key.

Distribution : India : Meghalaya (Jaintia hills); Sikkim.

Remarks : The species is a new record for Meghalaya.

27. *Euproctis divisa* (Walker, 1855)

In press. *Euproctis divisa* : Mondal & Maulik, *in State Fauna Series, West Bengal.*

Material examined : 2♂, 1♀, Risa colony, Shillong, East Khasi hills dist., 2.iv.1975, R. Zoramthamga & party coll. Wing expanse : ♂, 32-34, ♀ 40 mm.

Distribution : India : Meghalaya (East Khasi hills); West Bengal; Nagaland; Sikkim; Punjab. Elsewhere : Bangladesh; Nepal; West China; Vietnam.

Remarks : The species was earlier known from Cherra Punji by four males.

28. *Euproctis guttata* (Walker, 1855)

1855. *Artaxa guttata* Walker, *Cat. Lep. Het. Brit. Mus.*, **4** : 795.

1934. *Euproctis guttata* : Bryk, *Lep. Cat.*, **20** (62) : 239.

Material examined : One ♂, Sibbari, West Garo hills dist., 17.vii.1988, R.K. Ghosh & party coll. *Wing expanse* : 28 mm.

Diagnosis : *Vide* Key.

Distribution : India : Meghalaya (East Khasi hills; West Garo hills); Karnataka. Elsewhere : Sri Lanka; Burma.

Remarks : The species was earlier known from Cherra Punji by only one specimen. Its distribution has been cited by Hampton (1892) as "Throughout India, ..." which seems to be doubtful. Bryk (1934), on the other hand, did not mention any distribution of the species. *E. guttata* seems to be a rare element in India.

TABLE SHOWING DISTRIBUTION OF MOTHS EXAMINED FROM MEGHALAYA
[+, known distribution; N, new record for the state. For distribution of other spp. in the state, *vide* APPENDIX]

Sl. No.	Name of spp./subspp.	DISTRICTS OF MEGHALAYA						
		West Garo	East Garo	South Garo	West Khasi	East Khasi	Ri-Bhoi	Jaintia
1.	*Trabala vishnou*	+				+		
2.	*Lebeda nobilis*	+				+		
3.	*Suana concolor*					+		
4.	*Bhima undulosa*					+		
5.	*Dendrolimus latipennis*	+				+	+	
6.	*Dasychira grotei*					N		
7.	*D. horsfieldi*					+		
8.	*D. thwaitesi*					N		
9.	*D. lineata*		+			+		
10.	*Aroa plana*	+				+		
11.	*Pantana bicolor*					+		
12.	*P. albifascia*					+		
13.	*Pida apicalis*					+		+
14.	*Numenes siletti*	+				+		
15.	*L. serva*		+		+	+		
16.	*L. mantria concolor*					+		
17.	*L. marginata*					+		
18.	*L. subrosea*		N					
19.	*Porthesia xanthorrhoea*					+		
20.	*P. scintillans*		+			+		
21.	*Euproctis latifascia*	N	N			N		
22.	*E. icilia*		N					
23.	*E. subfasciata*		+			+		
24.	*E uniformis*		+			+		
25.	*E. magna*		+			+		
26.	*E. negrita*							N
27.	*E. divisa*					+		
28.	*E. guttata*	+				+		

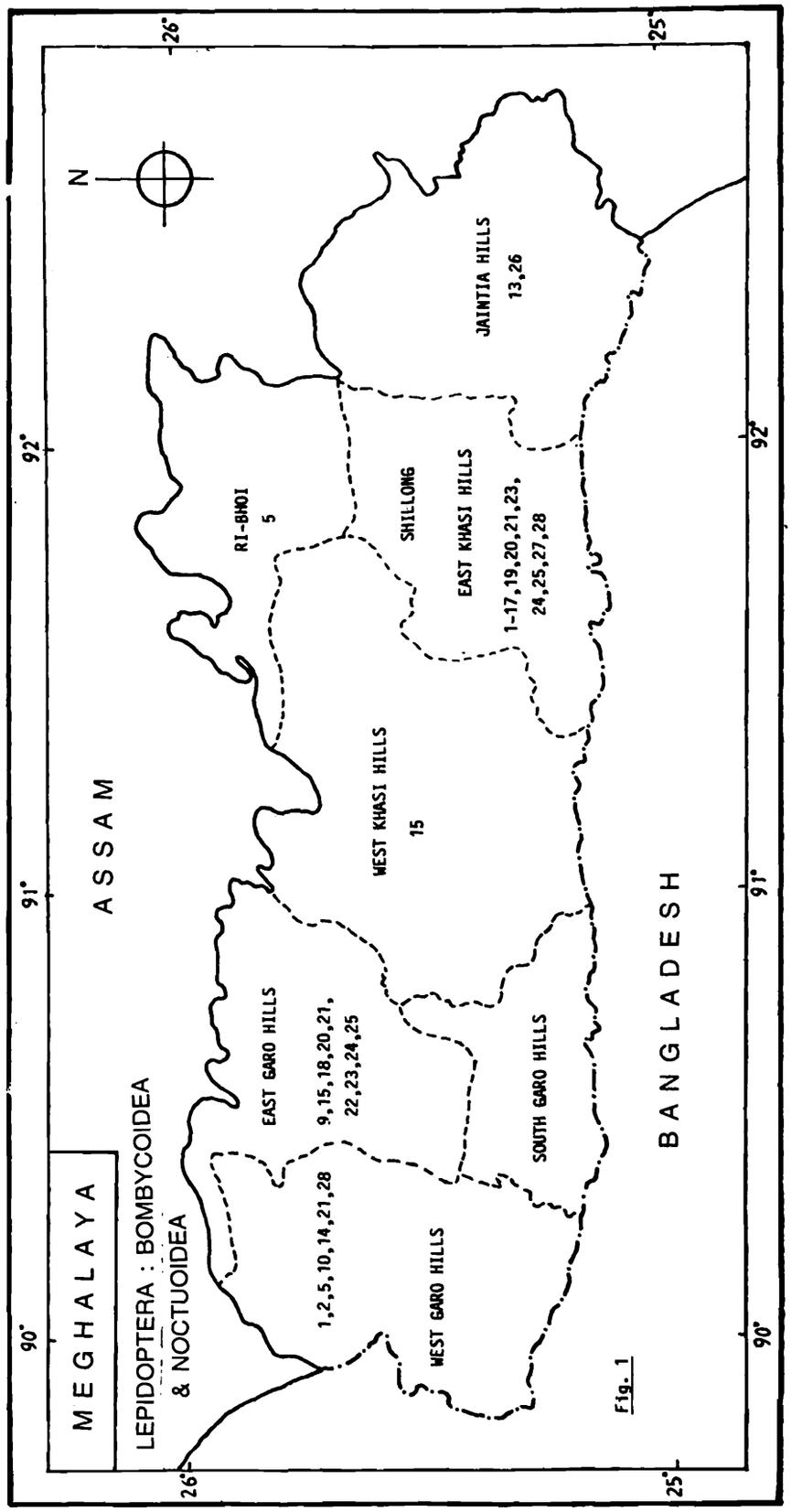
MEGHALAYA
LEPIDOPTERA : BOMBYCOIDEA & NOCTUOIDEA
ASSAM
BANGLADESH
N
26°
25°
90°
91°
92°
RI-BHOI
5
SHILLONG
EAST KHASI HILLS
1-17,19,20,21,23, 24,25,27,28
JAINTIA HILLS
13,26
WEST KHASI HILLS
15
EAST GARO HILLS
9,15,18,20,21, 22,23,24,25
SOUTH GARO HILLS
WEST GARO HILLS
1,2,5,10,14,21,28

Fig. 1

APPENDIX

The following species, not presently available for study, are known from Meghalaya, as cross-referred to Swinhoe (1895) and others cited in the text :–

LASIOCAMPIDAE

1. *Trichiura khasiana* Moore	Cherra Punji
2. *Crinocraspeda torrida* (Moore)	Shillong; Cherra Punji
3. *Kosala sanguinea* Moore	Cherra Punji
4. *Metanastria ampla* (Walker)	Shillong
5. *Metanastria lineata* (Moore)	Cherra Punji.
6. *Metanastria obliquifascia* Swinhoe	Shillong
7. *Metanastria repanda* (Walker)	Cherra Punji
8. *Paralebeda plagifera* (Walker)	Cherra Punji
9. *Dendrolimus aconyta* (Cramer)	Cherra Punji
10. *Dendrolimus hyrtaca* (Cramer)	Khasi hills
11. *Dendrolimus undans* (Walker)	Shillong
12. *Arguda decurtata* Moore	Cherra Punji
13. *Odontocraspis hasora Swinhoe*	Cherra Punji
14. *Cosmotriche fossa* (Swinhoe)	Jaintia hills
15. *Lenodora pallidochrea* Hampson	Khasi hills

LYMANTRIIDAE

16. *Dasychira pennatula* (Fabricius)	Cherra Punji (as *Psalis securis*)
17. *Dasychira inclusa* Walker	Shillong
18. *Dasychira dudgeoni* Swinhoe	Khasia hills
19. *Dasychira orimba* (Swinhoe)	Khasia hills
20. *Dasychira magnalia* Swinhoe	Khasia hills
21. *Dasychira strigata* Moore	Khasia hills
22. *Dasychira postfusca* Swinhoe	Khasia hills
23. *Dasychira angulata* Hampson	Khasia hills

24. *Dasychira chloroptera* Hampson	Khasia hills
25. *Dasychira bhana* (Moore)	Cherra Punji
26. *Orgyia nucula* Swinhoe	Cherra Punji
27. *Aroa atrella* Hampson	Shillong
28. *Aroa siena* Hampson	Khasia hills
29. *Aroa socrus* (Geyer)	Khasia hills
ssp. *substrigosa* Walker	
ssp. *pyrrhochroma* Walker	Jaintia hills; Cherra Punji
30. *Aroa atrescens* Hampson	Khasia hills
31. *Cifuna locuples* Walker	Khasia hills
32. *Cifuna cervina* (Moore)	Khasia hills
33. *Cifuna biundulans* Hampson	Khasia hills
34. *Laelia testacea* (Walker)	Shillong
35. *Laelia litura* (Walker)	Khasia hills
36. *Laelia atestacea* Hampson	Khasia hills
37. *Laelia prolata* Swinhoe	Khasia hills
38. *Laelia venosa* Moore	Khasia hills
39. *Laelia adalia* Swinhoe	Jaintia hills
40. *Stilpnotia cygna* (Moore)	Khasia hills
41. *Leucoma silhetica* (Walker)	Khasia hills
42. *Leucoma diaphana* Moore	Khasia hills
43. *Leucoma submarginata* (Walker)	Khasia hills
f. *hipparia* Swinhoe	
44. *Leucoma pellucida* Swinhoe	Khasia hills
45. *Pantana eurygania* Druce	Khasia hills
46. *Pantana luteiceps* Swinhoe	Khasia hills
47. Pantana interjecta Swinhoe	Khasia hills
48. *Pida strigipennis* (Moore)	Khasia hills
49. *Pida* decolorata (Walker)	Khasia hills
50. *Numenes patrana* Moore	Khasia hills
51. *Daplasa irrorata* Moore	Khasia hills
52. *Lymantria mathura* Moore	Khasia hills

53. *Lymantria rhodina* Walker	Khasia hills
54. Lymantria lepcha Moore	Khasia hills
55. Euproctis flevinata (Walker)	Khasia hills
56. *Euproctis lunata Walker*	Khasia hills
57. *Euproctis plana* Walker	Khasia hills
58. *Euproctis bipunctapex* (Hampson)	Khasia hills
59. *Euproctis varians* (Walker)	Khasia hills (as *pusilla*)
60. *Euproctis digramma* (Guérin) ssp. *unimacula* (Moore)	Khasia hills (as *unimacula*)
61. *Euproctis endoplagia* Hampson	Khasia hills
62. *Euproctis xanthopera* Hampson	Khasia hills
63. *Euproctis atripuncta* Hampson	Khasia hills
64. *Euproctis plagiata* (Walker)	Khasia hills
65. *Euproctis oreosaura* (Swinhoe)	Khasia hills
66. *Euproctis pelona* (Swinhoe)	Khasia hills
67. *Euproctis olivata* Hampson	Khasia hills
68. Euproctis lativitta (Moore)	Khasia hills (as *nigripennis*)
69. *Euproctis semivitta Moore*	Khasia hills
70. Euproctis phaea Hampson	Khasia hills
71. *Euproctis renifera* Swinhoe	Khasia hills
72. *Euproctis inconcisa* (Walker)	Khasia hills
73. *Euproctis basalis* (Moore)	Khasia hills
74. *Euproctis madana* Moore	Khasia hills
75. *Euproctis albescens* Swinhoe	Khasia hills (as *immaculata*)
76. *Euproctis bimaculata* Walker	Khasia hills (as *bigutta*)
77. *Pendria rinaria* (Moore) ssp. *dica* (Swinhoe)	Khasia hills (as *dica*)
78. *Dendrophlebs semihyalina* Hampson	Khasia hills
79. *Cobanilla plumbacea* Swinhoe	Khasia hills
80. *Imaus munda* (Walker)	Khasia hills
81. *Dura alba* Moore	Khasia hills

82. *Caviria sericea* (Moore) Khasia hills
83. *Caviria ochripes* (Moore) Khasia hills
84. *Medama diplaga* (Hampson) Khasia hills

RATARDIDAE

85. *Ratarda furvivestita* Hampson Khasia hills

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ZYGAENIDAE

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INTRODUCTION

The family Zygaenidae includes four subfamilies Zygaeninae, Chalcosiinae, Phaudinae and Himantopterinae. Out of nearly 150 species and subspecies known from India more than 70 species and subspecies are recorded from Meghalaya under this family. Walker (1854) described a few examples of Zygaenidae from Cherrapunji and Shillong, while Hampson (1892, 94) described some 25 species from Khasis mainly from Rev. W. Hamilton's collection in his work on *Fauna British India.* Swinhow (1891-95) described the moths of Khasis and published a Catalogue of Indian moths in collobaration with E.C. Cotes (1887-89). Jordan (1908) reported the Zygaenidae of Indo-Australian region. Fletcher (1925) published a Catalogue on the family Zygaenidae from Indian subregion.

This group of day flying moths are best available from North East India, including Sikkim.

The present paper includes the systematic account, keys, diagnostic characters, distribution etc. of 42 species and subspecies of Zygaenidae from Meghalaya along with 31 more species and subspecies with systematic account and distribution, added as appendix at the end. Of the 42 species and subspecies described, 2 species and subspecies *Cyclosia panthona* and *Erasmia pulchella pulchella* are recorded for the first time from Garo Hills and 2 species *Campylotes sikkimensis* and *Eterusia repleta* are recorded for the first time from Shillong and also from the state of Meghalaya.

SYSTEMATIC ACCOUNT

Family Zygaenidae

Key to the subfamilies of Zygaenidae

1. Mouth parts usually absent 2
— Mouth parts usually present 3

2. Retinaculam and frenulam aborted. Hind wing produced into a long thin tail ..... Himantopterinae
— Retinaculam and frenulam present. Hind wing not produced into a long thin tail ..... Phaudinae
3. Fore tibia without spur. Antennae flabellate at tip ..... Chalcosiinae
— Fore tibia with spur. Antennae not flabellate ..... Zygaeninae

Subfamily Zygaeninae

Key to the genera of Zygaeninae

1. Fore wing with R_4, R_5 and M_1 not stalked together 2
— Fore wing with R_4, R_5 and M_1 stalked together ..... ***Chalcosiopsis***
2. Fore wing with all the veins from cell 3
— Fore wing with all the veins not from cell 8
3. Hind wing M_1 present 4
— Hind wing M_1 absent 5
4. Abdomen not tufted at end ..... *Clelea*
— Abdomen tufted at end ..... *Lophosoma*
5. Wings broad ..... ***Phacusa***
— Wings narrow 6
6. Hind wing M_2 remote from R_5 7
— Hind wing M_2 arising close to R_5 ..... ***Arachotia***
7. Palpi long ..... ***Artona***
— Palpi very short ..... ***Tasema***
8. Fore wing with R_5, M_1 and M_2 stalked ..... ***Ephemeroidea***
— Fore wing with R_5, M_1 and M_2 free ..... ***Piarosoma***

Genus *Artona* Walker

1854. *Artona* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 439-440.

Eighteen species and subspecies are known to occur in India under this genus of which six are recorded from Meghalaya. Presently, we have only one species in the National Zoological Collection.

1. *Artona zebraica khasiana* Jordan

1876. *Artona zebraica* Butler, *J. Linn. Soc. Zool.*, **12** : 356.

1908. *Artona zebraica khasiana* Jordan, In Seitz's *Macrolep. World*, **10** : 43, pl. 8, fig. 13.

1925. *Artona zebraica khasiana*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 7.

Material examined : Material reviewed from the literature.

Diagnostic characters : Dark brown. Fore wing with subcostal and medial streak from base, a spot below end of cell and two postmedial spots. Hind wing yellow at base and a dark costal streak; outer margin dark. Wing exp. 20-24 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis and Shillong), also Nagaland.

Remarks : The details of the other five species *A. charista* Jordan, *A. flavigula* (Hampson), *A. flavipuncta* Hampson, *A. lugubris* Jordan and *A. microstigma* Jordan are appended at the end. Barlow (1982) described the species *zebrica* under the genus *Zeuxippa*.

Genus *Clelea* Walker

1854. *Clelea* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 465.

Eight species are known from India under this genus of which seven are recorded from Meghalaya. The National Zoological Collection represents only two species.

Key to the species of *Clelea*

Fore wing with short metallic blue streaks from base along the costa; inner margin also blue ..... *sapphirina*

Fore wing with short metallic green streaks from base along the costa; inner margin also green ..... *discriminis*

2. *Clelea sapphirina* Walker

1854. *Clelea sapphirina* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 465-466.

1925. *Clelea sapphirina*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 9.

Material examined : Material reviewed from the literature.

Diagnostic characters : Black. Abdomen brown, sometimes with blue segmental lines or the terminal segments blue. Underside of fore wing with some blue marginal streaks at apex; hind wing with blue streaks. Wing exp. ♂ 24, ♀, 30 mm.

Distribution : India : Meghalaya (E. Khasis, Shillong), North India, Sikkim; Elsewhere : Burma (Myanmar) and China.

Remarks : Swinhoe (1895) recorded the species from Shillong.

3. *Clelea discriminis* Swinhoe

1891. *Clelea discriminis* Swinhoe, *Trans. Ent. Soc.*, p. 475.

1925. *Clelea discriminis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 8.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide key. Differs from *sapphirina* in the marginal line and blue on hind wing being absent. Underside fore wing with a streak on median nervure; hind wing with several streaks. Wing exp. 27 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis and Shillong) also Nagaland, Sikkim and North India.

Remarks : The other species recorded from Meghalaya are *C. metacyanea* Hampson, *C. plumbeola* Hampson, *C. refulgens* Hampson, C. simplex Jordan and C. stipata (Walker).

Genus *Tasema* Walker

1856. *Tasema* Walker, *Cat. Lep. Het. Brit. Mus.*, 7 : 1597.

One species under this genus is recorded from India as well as Meghalaya.

4. *Tasema bipars* Walker

1856. *Tasema bipars* Walker, *Cat. Lep. Het. Brit. Mus.*, 7 : 1597.

1925. *Tasema bipars*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 11.

Material examined : Material reviewed from the literature.

Diagnostic characters : Small, black in colour. Hind wing hyaline; costal and marginal areas black. Wing exp. 16 mm.

Distribution : India : Meghalaya (East Khasis), Himachal Pradesh (Kangra, Simla) and Nagaland.

Remarks : Jordan (1908) recorded the species from Khasis.

Genus *Phacusa* Walker

1854. *Phacusa* Walker, *Cat. Lep. Het. Brit. Mus.*, 1 : 150.

Seven species under this genus are known from India of which one is recorded from Meghalaya.

5. *Phacusa khasiana* (Moore)

1879. *Northia khasiana* Moore, *Lep. Atk.*, p. 12.

1925. *Phacusa khasiana*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 13.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head, thorax, abdomen and antennae greenish black. Both wings hyaline; veins and marginal areas black. Wing exp. 36 mm.

Distribution : India : Meghalaya (Khasis and Shillong) also Nagaland.

Remarks : The type locality of the species is from Khasis.

Genus *Ephemeroidea* Hampson

1892. *Ephemeroidea* Hampson, *Fauna Brit. India*, Moths, **1** : 242.

Two species under this genus are known from India of which one is recorded from Meghalaya.

6. *Ephemeroidea cyanea* Jordan

1908. *Ephemeroidea cyanea* Jordan, In Seitz's *Macrolep. World*, **10** : 50, pl. 8, fig. i

1925. *Ephemeroidea cyanea*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 16.

Material examined : Material reviewed from the literature.

Distribution : India : Meghalaya (Khasis).

Remarks : The species in endemic to Khasis, Meghalaya. Due to paucity of material at hand further details of the species could not be given.

Genus *Lophosoma* Swinhoe

1892. *Lophosoma* Swinhoe, *Cat. Het. Mus. Oxon.*, **1** : 58.

Two species under this genus are known from India of whice one is recorded from Meghalaya.

7. *Lophosoma cuprea* (Walker)

1856. *Syntomis cuprea* Walker, *Cat. Lep. Het. Brit. Mus.*, **7** : 1596.

1925. *Lophosoma cuprea*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 16.

Material examined : Material reviewed from the literature.

Diagnostic characters : Antennae, head, thorax and fore wing dark brown, shot with blue. Fore wing hyaline streaks below base of costa and median nervure; a hyaline spot at end of cell, another below it. Hind wing hyaline. Wing exp. 24 mm.

Distribution : India : Meghalaya (Shillong), Andamans, Kulu, Sikkim and North India.

Remarks : The species is recorded from Shillong, Meghalaya.

Genus *Arachotia* Moore

1879. *Arachotia* Moore, *Lep. Atk.*, p. 14.

Three species under this genus are known from India of which two are recorded from Meghalaya. Due to nonavailability of material at hand, one species is dealt with here under.

8. *Arachotia flaviplaga* Moore

1879. *Arachotia flaviplaga* Moore, *Lep. Atk.*, p. 14.

1925. *Arachotia flaviplaga*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 17.

Material examined : Material reviewed from literature.

Diagnostic characters : Metallic blue-green in colour; antennae banded with white at tips. Fore wing with a subbasal band, a large hyaline spot at end of cell and two below, and seven streaks beyond. Hind wing with the costa white above, a hyaline patch in the middle, inner lobe black. Wing exp. ♂ 35 mm, ♀ 44 mm.

Distribution : India : Meghalaya (Cherrapunji), Nagaland, Sikkim and West Bengal (Darjiling).

Remarks : The species is recorded from Cherrapunji, East Khasis.

Genus *Piarosoma* Hampson

1892. *Piarosoma* Hampson, *Fauna Brit. India*, Moths, **1** : 243.

One species under this genus is known from India as well as Meghalaya.

9. *Piarosoma sizala* (Swinhoe)

1894. *Phacusa sizala* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) **14** : 441-442.

1925. *Piarosoma sizala*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 18.

Material examined : Material reviewed from literature.

Diagnostic characters : Head and thorax black; abdomen greenish black. Fore wing black with metallic blue streak below base of costa. Hind wing hyaline with the veins black. Wing exp. 28 mm.

Distribution : India : Meghalaya (Khasis, Shillong).

Remarks : The species is endemic to Khasis.

Genus *Chalcosiopsis* Swinhoe

1894. *Chalcosiopsis* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) **14** : 442.

One species under this genus is known from India as well as Khasis, Meghalaya. Second species *microsticta* Hampson (1897) being a doubtful species is not included here, vide Fletcher (1925).

10. *Chalcosiopsis variata* Swinhoe

1894. *Chalcosiopsis variata* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) **14** : 442-443.

1925. *Chalcosiopsis variata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 22.

Material examined : Material reviewed from literature.

Diagnostic characters : Black-brown in colour. Fore wing with two oblique white bands from costa to middle and near apex respectively. Hind wing with the base yellowish and a large white patch near end of cell; outer area black shot with mettalic blue. Wing exp. 36 mm.

Distribution : India : Meghalaya (Khasis, Shillong).

Remarks : The species is endemic to Khasis.

Subfamily Chalcosiinae

Key to the Genera of Chalcosiinae

1. Wings uniformly semi-transparent 2
   Wings not uniformly semi-transparent 3
2. Fore wing R1 anastomosing with Sc ..... ***Philopator***
   Fore wing R1 not anastomosing with Sc ..... ***Agalope***
3. Fore wing with no veinlets between Sc and the costa 4
   Fore wing with veinlets between Sc and the costa 14
4. Both the wings normal 5
   Both the wings not normal 7
5. Fore wing R_1 anastomosing with Sc ..... ***Cyclosia***
   Fore wing R_1 not anastomosing with Sc 6
6. Hind wing M_2 and M_3 not stalked ..... ***Chalcosia***
   Hind wing M_2 and M_3 stalked ..... ***Corma***
7. Wings long 8

Wings short ..... ***Arbudas***
8. Wings *Zygaeniform* ..... ***Trypanophora***
Wings not *Zygaeniform* 9
9. wings long and very broad 10
Wings long and not very broad 12
10. Fore wing with Cu1a not stalked with M_2 and M_3 11
Fore wing with Cu1a stalked with M_2 and M_3 ..... ***Campylotes***
11. Fore wing with R_2 stalked with R_3, R_4 and R_5 ..... ***Cadphises***
Fore wing with R_2 not stalked with R_3, R_4 and R_5 ..... ***Erasmia***
12. Fore wing with R_5 given off further from the cell than R_3 ..... ***Herpa***
Fore wing with R_5 given off nearer the cell than R_3 13
13. Fore wing with M_2 and M_3 stalked ..... *Eterusia*
— Fore wing with M2 and M3 from Cell ..... *Pidorus*
14. Hind wing rounded ..... ***Gynautocera***
Hind wing extremely produced ..... ***Histia***

Genus *Arbudas* Moore

1879. *Arbudas* Moore, *Lep. Atk.* pp. 19-20.

Three species under this genus are known from India of which two are recorded from Meghalaya.

Key to the species of *Arbudas* from Meghalaya

Hind wing with a large orange patch below apical half of costa ..... *leis* (Swinhoe)
Hind wing without a large orange patch below apical half of costa ..... *bicolor* Moore

11. *Arbudas bicolor* Moore

1879. *Arbudas bicolor* Moore, *Lep. Atk.*, p. 20.

1925. *Arbudas bicolor*, Fletcher, *Cat. Indian Ins.*,Pt. 9, Zygaenidae, pp. 26-27.

Material examined : Material reviewed from the literature.

Diagnostic characters : Both wings uniform fuscous with a purple tinge in male. Female hind wing pure white, with a broad dark outer margin. Wing exp. ♂ 22 mm, ♀ 32 mm.

Distribution : India : Meghalaya (Shillong), Sikkim, West Bengal (Darjiling); Elsewhere: Bhutan.

12. *Arbudas leis* (Swinhoe)

1894. *Heteropan leis* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) **14** : 442.

1925. *Arbudas leis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 27.

Material examined : Material reviewed from the literature.

Diagnostic characters : Colour dark green. Hind wing brownish black with a large orange patch below apex. Wing exp. 30 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong).

Remarks : The species is endemic to Khasis, Meghalaya.

Genus *Trypanophora* Kollar

1844. *Trypanophora* Kollar, *Hugel's Kaschmir*, **4** (2) : 457.

Two species under this genus are known from India of which one is recorded from Meghalaya.

13. *Trypanophora semihyalina* Kollar

1844. *Trypanophora semihyalina* Kollar, *Hugel's Kaschmir*, **4** (2) : 457, pl. 19, fig. 1-4.

1925. *Trypanophona semihyalina*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 28-29.

Material examined : Material reviewed from the literature.

Diagnostic characters : Blue black in colour. Abdomen 5th and 6th segments with orange bands. Fore wing with hyaline streaks at base and between veins M_3, Cu1a, Cu1b and Sc, R_1 R_2. Hind wing with costal area pale yellow; hyaline streaks at middle and at base. Wing exp. ♂ 31-36 mm; ♀ 38-50 mm.

Distribution : India : Meghalaya (Shillong), Himachal Pradesh (Kangra), Jammu and Kashmir, Orissa (Ganjam), Sikkim, West Bengal (Calcutta); Elsewhere : Bangladesh (Dacca) and East Pegu.

Remarks : Due to paucity of material the species is reviewed from literature.

Genus *Cyclosia* Hubner

1822. *Cyclosia* Hubner, *Verz. bek. Schmett.*, p. 177.

Five species under this genus are known from India and also recorded from Meghalaya of which two are present in the National Collection.

Key to the species of *Cyclosia*

Abdomen entirely blue-green ..... *panthona*
Abdomen black banded with white below..... *midamia*

14. *Cyclosia panthona* (Cramer)

1781. *Geometra panthona* Cramer, *Pap. Exot.*, **4**, pl. 322, fig. c.

1925. *Cyclosia panthona*, Fletcher, Cat. Indian Ins., Pt. 9, Zygaenidae, P. 33.

Material examined : Seven ♂ ♂, 1, ♀ Tura, East Garo, 3. v. 1979 (J.K. Jonathan & party coll.) also 4 exs. Shillong, E. Khasis (old collection from NZC with no other data); 12 ♂ ♂, 1 ♀ Kherapara, W. Garo Hills, 14, 16, 18, 20.X. 88 (K.K. Roy & party coll.) and 1 Gasuapara, W. Garo Hills, 28.iv.1991 (B.N.Das and party coll.).

Diagnostic characters : Fore wing dull brown with a greenish tinge. Hind wing purplish brown. A submarginal series of large white spots on both the wings. Wing exp. ♂ 40-60 mm, ♀ 60 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Assam (Cachar), Sikkim; Elsewhere : Burma; Hong Kong; Malacca; Sri Lanka and Thailand.

Remarks : The species is recorded for the first time from Tura, East Garo Hills, Meghalaya.

15. *Cyclosia midamia midamia* (Herrich-Schaffer)

1953. *Epyrgis midamia* Herr.-Schaffer, *Samml. aussereur. Schmett.*, 1 pl. 2, fig. 7(♂).

1925. *Cyclosia midamia midamia*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 32.

Material examined : One ♀, Khasi hills, 25.iv.1981 (J.P. Sati coll.) and 13 exs., Shillong, (old collection from NZC with no other details).

Diagnostic characters : Antennae metallic blue; head, thorax and abdomen black. Wings brilliant blue with two series of small white spots in male; female in addition two spots in the cell, two beyond and two below the cell. Wing exp. ♂ 74 mm, ♀ 86 mm.

Distribution : India : Meghalaya (Khasis), Assam, Nagaland, Sikkim, West Bengal (Darjiling); Elsewhere : Bangladesh; Bhutan; Borneo; Burma, Java; Malacca; Singapore; Sumatra; Thailand and Vietnam (Tong King).

Remarks : The species is a beautiful mimic of the blue *Euploeas*. The other three species recorded from Meghalaya are *Cyclosia cuprea* (Swinhoe), *C. imitans* (Butler) and *C. papilionaris* (Drury) are appended at the end.

Genus *Gynautocera* Guerin

1830. *Gynautocera* Guerin, Mag. Zool., p. 12.

One species under this genus is known from India and is also recorded from Meghalaya.

16. *Gynautocera papilionaria* Guerin

1830. *Gynautocera papilionaria* Guerin, *Mag. Zool.*, p. 12.

1925. *Gynautocera papilionaria*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 36.

Material examined : One example, Shillong, (old collection from NZC with no other data).

Diagnostic characters : Antennae metallic blue; head thorax and abdomen black; vertex of head and end of abdomen crimson. Fore wing black with a greenish tinge. Hind wing also black and shot with deep blue; a large white patch between veins Cu_{1b} and M_2. Base of wings below crimson. Wing exp. 84-96 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Assam, Jammu and Kashmir, Nagaland, Sikkim, Uttar Pradesh, West Bengal, the Himalayas; Elsewhere : Bangladesh (Sylhet); Burma; China (Hainan); Pegu (Bassein) and Vietnam (Annam and Tong King).

Remarks : The species has two forms, in *fraterna* the white patch of hind wing is larger while in *rara* it is smaller.

Genus *Histia* Hubner

1822. *Histia* Hubner, *Verz. bek. Schmett.*, p. 198.

One species under this genus is known from India and is also recorded from Meghalaya.

17. *Histia rhodope* (Cramer)

1775. *Bombyx rhodope* Cramer, *Pap. Exot.*, 1, pl. 30 fig. F.

1925. *Histia rhodope*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 36-37.

Material examined : Material reviewed from literature.

Diagnostic characters : Both wings long and narrow. Head, thorax and fore wing black; abdomen blue. Hind wing brilliant metallic blue or green to near end of cell, the distal portion blackish blue. Underside with the base of the wings crimson. Wing exp. 70-80 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis), Assam (Guahati), Nagaland, Sikkim, West Bengal; Elsewhere : Bhutan; Burma; and Hong Kong.

Remarks : Fletcher (1925) synonimised the species *flabellicornis* described by Hampson (1892) in *Fauna British India* with *rhodope* Cramer.

Genus *Hampsonia* Swinhoe

1894. *Hampsonia* Swinhoe, *Ann. Mag. Nat. Hist.*, (6) **14** : 443.

One species under this genus is recorded from India as well as Meghalaya.

18. *Hampsonia pulcherrima* Swinhoe

1894. *Hampsonia pulcherrima* Swinhoe, Ann. Mag. Nat. Hist., (6) **14** : 443.

1925. *Hampsonia pulcherrima*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 39.

Material examined : Material reviewed from literature.

Diagnostic characters : Head, thorax and abdomen very dark metallic blue. Fore wing black with a basal bluish, sub-basal golden-yellow band and four large spots. Hind wing black with a golden yellow fascia below cell at base and four large lunulate scarlet patches between the fascia and apex. Wing exp. 60 mm.

Distribution : India : Meghalaya (Cherrapunji and Khasis).

Remarks : Due to paucity of material at hand the genus is not included in the keys. Main generic characters are fore wing M2 and M3 stalked and much curved; R4, R5 stalked with R3, R1, R2 from long before end of cell. Hind wing M2 and M3 stalked and curved; RS and M1 from upper angle; Sc+R1 connected with Rs by a bar.

Genus *Campylotes* Westwood

1839. *Campylotes* Westwood, *Royle's Ill. Himal. Lep.*, p. 53.

Four species under this genus are known from India of which two are recorded from Meghalaya.

Key to the species of *Campylotes*

Fore wing all the spots towards the apex yellow..... *sikkimensis*
Fore wing all the spots towards the apex not yellow..... *histrionicus*

19. *Campylotes sikkimensis* Elwes

1890. *Campylotes sikkimensis* Elwes, *Proc. zool. Soc. Lond.*, p. 384, pl. 33, fig. 2.

1925. *Campylotes sikkimensis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 42.

Material examined : Two examples, Shillong (Old collection from NZC with no other data).

Diagnostic characters : Head thorax and wings blueblack. Abdomen also blue-black and banded with yellow below. Fore wing with two long red streaks below the costa, two in the cell, three below the cell; a red spot between Cu_{1a} and Cu_{1b}, a spot in the end of cell, a series of six spots beyond and two subapical spots. Hind wing a red streak below the costa; two in the cell and four below; a series of five streaks beyond the cell and a spot between M_2 and M_3. Wing exp. ♂ 44 mm, ♀, 62 mm.

Distribution : India : Meghalaya (Shillong), Assam and Sikkim.

Remarks : This is the first specific report of the species from Shillong, Meghalaya.

20. *Campylotes histrionicus* Westwood

1839. *Campylotes histrionicus* Westwood, *Royle's Ill. Himal.* Lep., p. 53, pl. 10, fig. 1.

1925. *Campylotes histrionicus*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 41.

Material examined : Three ♂♂, Shillong, 3.x.1971 (R. S. Pillai coll.), 2 exs., Shillong,

13.vi.1967 (R.K. Varshney coll.) and 2 exs., Shillong, 1 ex. Khasis, (old collection from NZC with no other data).

Diagnostic characters : Same as *sikkimensis*, vide key for differences. Wing exp. 51-56 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong), Jammu and Kashmir, Sikkim, Uttar Pradesh (Kumaun, Mussourie), North-West India, throughtout Himalayas Elsewhere : Afghanistan and West China.

Remarks : The species is well distributed in the Khasi hill area of Meghalaya.

Genus *Erasmia* Hope

1840. *Erasmia* Hope, *Trans. Linn. Soc.*, **18** : 446.

Three species under this genus are known from India of which two are recorded from Mghalaya.

Key to the species of *Erasmia*

Fore wing with an orange-red irregular oblique antemedial band and a similar metallic blue-green medial band ..... *pulchella*

Fore wing without an orange-red irregular oblique antemedial band and a similar metallic blue-green medial band ..... *sanguiflua*

21. *Erasmia pulchella pulchella* Hope

1840. *Erasmia pulchella* Hope, *Trans. Linn. Soc.*, **18** : 446, pl. 31, fig. 5.

1925. *Erasmia pulchella pulchella*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 43-44.

Material examined : One ♀, West Garo hills, 17.x.1983 (J.R.B. Alfred coll.) and 2 exs., Anogiri, W. Garo hills, 4 exs. Shillong, 2 exs. Cherrapunji (Old collection from NZC with no other data).

Diagnostic characters : Antennae, head, thorax metallic blue-green; abdomen whitish green. Fore wing black and white antemedial, medial and postmedial bands. Hind wing pale yellow. Wing exp. ♂80 mm., ♀90 mm.

Distribution : India : Meghalaya (Khasis), Assam, Nagaland, Sikkim, West Bengal; Elsewhere : Burma and Nepal.

Remarks : This is the first report of the species from Garo Hills, Meghalaya.

22. *Erasmia sanguiflua sanguiflua* (Drury)

1773. *Noctua sanguiflua* Drury, Ill. Exot. Ent., **2** : 55, pl. 20, figs. 1 and 2.

1925. *Erasmia sanguiflua sanguiflua*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 44.

Material examined : Four exs., Shillong (Old collection from NZC with no other data).

Diagnostic characters : Antennae blue, head thorax and abdomen black, tinged with blue or green. Wings black. Fore wing with five yellow basal spots and some subbasal bluish marks; four white spots below the costa two in and five beyond the cell. Hind wing with a broad brilliant blue apical marginal band narrowing to anal angle. Wing exp. 100-110 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Sikkim; Elsewhere : Bangladesh (Sylhet) and Burma.

Remarks : Hampson (1892) in *Fauna British India* described the species as *Amesia sanguiflua.*

Genus *Agalope* Walker

1854. *Agalope* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 437.

Five species under this genus are known from India of which two recorded from Meghalaya.

Key to the species of *Agalope*

Fore wing with an orange medial band edged with black ..... *bifasciata*
Fore wing without an orange medial band edged with black ..... *eronioides*

23. *Agalope bifasciata* (Hope)

1840. *Chelura bifasciata* Hope, *Trans. Linn. Soc.*, **18** : 444.

1925. *Agalope bifasciata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 46.

Material examined : One ♀, Shillong, 12.x.1973 (K. Deb coll.) and 2 exs. Cherrapunji, Oct. 1961 (No collector's name), 1 ex., Shillong, 20.x.1963 (S. Biswas coll.).

Diagnostic characters : Antennae, head, thorax and abdomen black. Both wings brownish hyaline with the veins black. Fore wing base black, a subbasal and a medial orange band edged with black. Wing exp. 80-90 mm.

Distribution : India : Meghalaya (Shillong), Assam, Sikkim, Uttar Pradesh (Nainital), N.W. India; Elsewhere : Bhutan; Burma and Nepal.

Remarks : The species is recorded for the first time from Cherrapunji.

24. *Agalope eronioides eronioides* (Moore)

1879. *Chelura eronioides* Moore, *Lep. Atk.*, p. 15.

1925. *Agalope eronioides*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 46.

Material examined : One ex. Cherrapunji (Old collection from NZC with no other data).

Diagnostic characters : Vide key for the differences from *bifasciata*. Wing exp. 64 mm.

Distribution : India : Meghalaya (Cherrapunji, Shillong), Assam, Sikkim and West Bengal (Darjiling).

Remarks : The distribution of the species is restricted to Eastern India only.

Genus *Philopator* Moore

1865. *Philopator* Moore, *Proc. zool. Soc. Lond.*, p 800.

Two species under this genus are known from India as well as Meghalaya.

Key to the species of *Philopator*

Wings not much shorter and rounder ..... *basimaculata*
Wings much shorter and rounder ..... *rotunda*

25. *Philopator basimaculata* Moore

1865. *Philopator basimaculata* Moore, *Proc. zool. Soc. Lond.*, p. 800, pl. 42, fig. 6.

1925. *Philopator basimaculata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 50.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head, thorax and abdomen yellow. Fore wing base yellow spotted with black, rest milky white, two spots at the end of the cell and marginal streaks. Hind wing similar to fore wing with a black spot on basal patch and one at the end of the cell. Wings narrower in male. Wing exp. ♂ 50 mm, ♀ 44-58 mm.

Distribution : India : Meghalaya (Cherrapunji), Manipur, Nagaland, Sikkim and West Bengal (Darjiling).

Remarks : The distribution of the species is restricted to eastern India only.

26. *Philopator rotunda* Hampson

1896. *Philopator rotunda* Hampson, *Fauna Brit. India*, Moths, **4** : 470.

1925. *Philopator rotunda*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 50.

Material examined : Material reviewed from the literature.

Diagnostic characters : Vide Key to differentiate from *basimaculata*. Wing exp. ♂ 40 mm, ♀ 48 mm.

Distribution : India : Meghalaya (Cherrapunji and Khasis), Manipur, Nagaland and Sikkim.

Remarks : The distribution of the species is restricted to eartern India only.

Genus *Cadphises* Moore

1865. *Cadphises* Moore, *Proc. zool. Soc. Lond.*, p. 800.

Three species under this genus are recorded from India of which two are reported from Meghalaya.

Key to the species of *Cadphises*

Hind wing inner margin bright yellow..... *maculata*

Hind wing inner margin purplish black ..... *moorei*

27. *Cadphises maculata* Moore

1865. *Cadphises maculata* Moore, *Proc. zool. Soc. Lond.*, p. 801, pl. 42, fig. 7.

1925. *Cadphises maculata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 51.

Material examined : Material reviewed from the literature.

Diagnostic characters : Antennae, head, thorax, abdomen and wings purplish black, spotted with white. Hind wing inner margin bright yellow. Wing exp. 70-90 mm.

Distribution : India : Meghalaya (Khasis), Sikkim and West Bengal (Darjiling).

Remarks : The distribution of the species is restricted to eastern India.

28. *Cadphises moorei moorei* Butler

1875. *Cadphises moorei* Butler, *Proc. zool. Soc. Lond.*, p. 392.

1925. *Cadphises moorei moorei*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 51.

Material examined : Material reviewed from the literature.

Diagnostic characters : Same as *maculata*, for difference vide key.

Distribution : India : Meghalaya (Khasis), Nagaland, Sikkim, West Bengal; Elsewhere Bhutan.

Remarks : The species is restricted to north east India.

Genus *Corma* Walker

1864. *Corma* Walker, *Cat. Lep. Het. Brit. Mus.*, **31** : 124.

Two species under this genus are known from India and is also recorded from Meghalaya.

Key to the species of *Corma*

Fore wing with spots below the cell one in number ..... *zenotia*
Fore wing with spots below the cell four in number ..... *maculata*

29. *Corma zenotia* (Doubleday)

1847. *Gynautocera zenotia* Doubleday, *Ann. Nat. Hist.*, **19** : 77, pl;. 7, fig. 2.

1925. *Corma zenotia*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 52.

Material examined : Material reviewed from the literature.

Diagnostic characters : Head and thorax dark greenish black; abdomen yellow with the lateral spots and the tip black. Fore wing with a fuscous band along the basal half of the costa : a spot at middle of cell and one on vein 1A : postmedial and marginal bands spotted. Hind wing white, with a fuscous large spot at end of cell and maculate apical band. Wing exp. ♂ 40 mm, ♀ 46 mm.

Distribution : India : Meghalaya (Khasis); Elsewhere : Burma; Thailand and Vietnam (Tong King).

Remarks : From India the species is recorded only from Khasis, Meghalaya.

30. *Corma maculata maculata* Hampson

1892. *Corma maculata* Hampson, *Fauna Brit. India*, Moths, **1** : 268.

1925. *Corma maculata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 51-52.

Material examined : One ♂, Shillong, 4.ix.1975 (N. Muralidharan and party coll.) and 1 ♂, Shillong, 1977 (J.M. Sachan coll.).

Diagnostic characters : Differs from *zenotia* in the spots in the cell being much larger. Hind wing with the spot in the cell obsolescent, but larger on underside; marginal markings larger. Wing exp. 56 mm.

Distribution : India : Meghalaya (Shillong); Elsewhere : Burma (Chin Hills).

Remarks : From India the species is recorded only from Shillong, Meghalaya.

Genus *Herpa* Walker

1854. *Herpa* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 442.

Three species under this genus are known from India of which one is recorded from Meghalaya.

31. *Herpa venosa venosa* Walker

1854. *Herpa venosa* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 442.

1925. *Herpa venosa venosa*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 55.

Material examined : Two examples, Cherrapunji (Old collection from NZC with no other data).

Diagnostic characters : Head black, thorax, abdomen and wings pale yellow with black markings. wing exp. 46 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis and Shillong); Elsewhere : Bangladesh (Sylhet).

Remarks : From India the species is recorded from Meghalaya only.

Genus *Eterusia* Hope

1840. *Eterusia* Hope, *Trans. Linn. Soc.*, **18** : 445.

Thirteen species under this genus are known from India of which nine species are recorded from Meghalaya. Due to paucity of material at hand six species are dealt with here under, other three are appended at the end.

Key to the species of *Eterusia*

1. Abdomen not yellow 2
   Abdomen yellow 4
2. Abdomen male black, female white with metallic blue bands ..... *Pulchella*
   Abdomen both sexes black 3
3. Hind wing with the apical band yellow ..... *circinata*
   Hind wing with the apical band spotted with metallic- blue ..... *repleta*
4. Abdomen with the first two segments black ..... *aedea*
   Abdomen with only the first segment black 5
5. Hind wing with a subbasal yellow band ..... *tricolor*
   Hind wing without a subbasal yellow band ..... *lativitta*

32. *Eterusia aedea edocla* (Doubleday)

1847. *Heterusia edocla* Doubleday, *Zoologist*, **3** : 469.

1925. *Eterusia aedea edocla*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 58-59.

Material examined : One ♂, West Garo hills, Bagmara C. House, 12.vii.1988; 1 ♀, Shibberi F. Bunglow, 13.vii.1988 (R.K. Ghosh and party coll.) and 2 exs. Shillong (Old collection from NZC with no other details).

Diagnostic characters : Head, thorax and first two segments of abdomen black. Fore wing purple brown with a slight greenish tinge; medial band with five spots. Hind wing with a pale yellow subbasal band. Wing exp. ♂ 66 mm, ♀ 75-80 mm.

Distribution : India : Meghalaya (Khasis, Shilling), Assam (Cachar), Nagaland, Sikkim, West Bengal; Elsewhere : Burma; Nepal and West China.

Remarks : *E. aedea edocla* has two aberrations *magnifica* Butler and *lepcha* Jordan of which the first one is represented in Meghalaya. The species is recorded for the first time from West Garo Hills.

33. *Eterusia circinata* Herrich-Schaffer

1854. *Heterusia circinata* Herrich-Schaffer, *Aussereur. Schmett.*, p. 57, figs. 156, 157.

1925. *Eterusia circinata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 61.

Material examined : One example, Khasis, (Old collection from NZC with no other details).

Diagnostic characters : Head, thorax and legs black. Abdomen black shot with blue. Fore wing black with a broad yellow oblique medial band. Hind wing black with an apical yellow band with four black spots on it. Wing exp. 63 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Assam and Sikkim.

Remarks : The distribution of the species is restricted to north east India.

34. *Eterusia lativitta* Moore

1879. *Eterusia lativitta* Moore, *Lep. Atk., p.* 15.

1925. *Eterusia lativitta*, Fletcher, Cat. Indian Ins., Pt. 9, Zygaenidae, p. 63.

Material examined : One example, Shillong, (Old collection from NZC with no other data).

Diagnostic characters : Abdomen banded with black above in male. Fore wing very dark green or dark brown with a basal yellow patch, wanting in male; a broad yellow band just before the middle and six subapical spots. Hind wing blackish brown, a yellow spot at end of cell and two or three metallic-blue spots beyond. Wing exp. 70 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Nagaland, Sikkim, West Bengal, Elsewhere : Bangladesh (Sylhet) and Burma (Tenasserim).

Remarks : The distribution of the species is restricted to north east India.

35. *Eterusia pulchella pulchella* (Kollar)

1844. *Chalcosia pulchella* Kollar, Hugel's *Kaschmir*, **4** (2) : 461.

1925. *Eterusia pulchella pulchella*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 64-65.

Material examined : Two examples, Cherrapunji; 2 exs. Khasis and 4 exs. Shillong (Old collection from NZC with no other data).

Diagnostic characters : Abdomen white in female, black in male. Male fore wing dark brown, a yellow triangular basal patch or narrow streak, a medial oblique band of four spots and spot beyond the end of cell. Hind wing yellow with the outer margin black or this may be reduced to spots. Female both wings yellow with one or two blue spots beyond end of cell. Both the sexes are variable in colour and pattern. Wing exp. ♂ 32-40mm, ♀ 40-50 mm.

Distribution : India : Meghalaya (Cherrapunji) Khasis, Shillong), Jammu and Kashmir, Uttar Pradesh and West Bengal; Elsewhere : Afghanistan; Bangladesh, Burma and China (West and Central).

Remarks : The larva is a pest of apple, rose, tea etc.

36. *Eterusia repleta* Walker

1864. *Eterusia repleta* Walker, *Cat. Lep. Het. Brit. Mus.*, **31** : 118.

1925. *Eterusia repleta*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 65-66.

Material examined : One ♂ Shillong Museum collection, (Old collection from NZC with no other data).

Diagnostic characters : Head and thorax green, antennae metallic blue-green, abdomen black shot with blue. Fore wing dark green with an oblique yellow band from costa. Hind wing black, inner area shot with metallic-blue and an apical metallic-blue band. Wing exp. ♂ 72 mm, ♀ 62-86. mm.

Distribution : India : Meghalaya (Shillong), Assam, Nagaland, Sikkim; Elsewhere : Bhutan; Burma and Cambodia.

Remarks : This is the first specific report of the species from Shillong, Meghalaya.

37. *Eterusia tricolar* Hope

1840. *Eterusia tricolar* Hope, *Trans. Linn. Soc.*, **18** : 445, pl. 31, fig. 8.

1925. *Eterusia tricolar*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 66-67.

Material examined : One ♂, Shillong, (Old collection from NZC with no other data available).

Diagnostic characters : Differs from *lativitta* in the spots of the fore wing being smaller. Hind wing black at base, followed by a yellow band; a large yellow spot at end of cell and two to four blue submarginal spots. Underside with the black area largely shot with blue. Wing exp. ♂ 60 mm, ♀ 75 mm.

Distribution : India : Meghalaya (Khasis), Assam, Nagaland, Sikkim; Elsewhere : Bangladesh; Bhutan; East and West China; East Pegu and Nepal.

Remarks : This is the first specific report of the species from Shillong, east Khasis, Meghalaya.

Genus *Pidorus* Walker

1854. *Pidorus* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 424.

Seven species under this genus are known from India of which five are reported from Meghalaya. Due to paucity of material at hand two species are delt with hereunder, other three species are appended at the end.

Key to the Species of *Pidorus*

Hind wing with an ochreous spot on the costa below the apex.....*circe*
Hind wing without an ochreous spot on the costa below the apex.....*glaucopis*

38. *Pidorus circe* (Herrich-Schaffer)

1853. *Chalcosia circe* Herrich-Schaffer, *Samml. aussereur. Schmett.*, fig. 2.

1925. *Pidorus circe*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 68.

Material examined : One ♀, Shillong, 25. vi. 1974 (M.S. Jyrwa coll.), 2♂♂, Khasis, 1 ♂, Cherrapunji and 5♂♂, 5♀♀, Shillong, (Old collection of NZC with no other data); 1♂, Umtyngar, Khasi Hills, 21.ix.91; 2 ♂♂, 2 ♀♀, Shillong, 20.ix.91 and 2♂♂, Cherrapunji, 21.ix.1991 (R.K.Varshney, I.J. Gupta and S.K. Ghosh coll.).

Diagnostic characters : Head and collar green. Fore wing bronzy green. Hind wing purplish brown with a whitish spot below the apex. Wing exp. 42-48 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong); Assam (Cachar), Nagaland, Sikkim; Elsewhere : Bangladesh (Sylhet).

Remarks : The species is recorded for the first time from Cherrapunji, east Khasis, Meghalaya.

39. *Pidorus glaucopis glaucopis* (Drury)

1773. *Bombyx glaucopis* Drury, *Ill. Exot. Ent.*, **2** : pl. 6, fig. 4.

1925. *Pidorus glaucopis glaucopis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 69.

Material examined : One ♂, Shillong, 21.x.1979 (G.K. Srivastava and party coll.) and 1♂, 1♀, Shillong, (Old collection from NZC with no other data).

Diagnostic characters : Head crimson; thorax, abdomen and legs blackish brown. Fore wing black-brown with an oblique white band from costa to outer angle. Hind wing blackish brown without any spot. Underside suffused with blue. Wing exp. 50-60 mm.

Distribution : India : Meghalaya (Khasis, Shillong), Assam (Cachar), Nagaland, Sikkim, West Bengal (Darjiling); Elsewhere : Bangladesh (Sylhet); Bhutan; Burma and Vietnam (Tong King).

Remarks : The distribution of the subspecies *glaucopis* is restricted mainly in the Indian subregion.

Genus *Chalcosia* Hubner

1822. *Chalcosia* Hubner, *Verz. bek. Schmett.*, p. 173.

Four species under this genus are known from India of which three are recorded from Meghalaya. Due to paucity of material at hand one species is dealt with hereunder.

40. *Chalcosia pectinicornis idaeoides* Herrich-Schaffer

1853. *Chalcosia idaeoides* Herrich-Schaffer, *Samml. aussereur. Schmett.*, p. 78, pl. 1, fig. 6.

1925. *Chalcosia pectinicornis idaeoides*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 73-74.

Material examined : One ♂, Shillong, 7.viii. 1987 (G.M. Gazbe coll.); 1♂ Nongthumai, 19.x.1982 (R. Mathew coll.); 2 ♂♂, 1♀ Khasi Hills, 17.vii.1973 (A.K. Ghosh coll.); 1♀, Shillong, 20.ix.1991 and 1♂, Mawstam, Jowai, Jaintia Hills, 26.ix.91 (R.K. Varshney, I.J. Gupta and S.K. Ghosh coll.) 1 ♂, Shillong, 29.x.1974 (S.K. Gupta and party coll.) also 1♂, Cherrapunji and 1♀, Shillong, (Both old collection of NZC with no other data).

Diagnostic characters : Head and collar crimson; thorax and abdomen blue-green. Fore with blue green with a broad white band from middle of costa to near anal angle; apical and marginal areas black and a subapical band of white spots. Hind wing pure white with a black apical marginal band. Both wings with the veins metallic blue. Wing exp. 52-72 mm.

Distribution : India : Meghalaya (Khasis, Shillong).

Remarks : The distribution of this subspecies is restricted to Meghalaya only. The species is recorded for the first time from Jaintia Hills, east Meghalaya.

Genus *Chalcophaedra* Jordan

1908. *Chalcophaedra* Jordan, Seitz's *Macrolep.* World, **10** : 39.

One species under this genus is known from India and is also recorded from Meghalaya.

41. *Chalcophaedra zuleika* (Doubleday)

1847. *Gynautocera zuleika* Doubleday, *Ann. Nat. Hist.*, **19** : 76, pl. 7, fig. 4.

1925. *Chalcophaedra zuleika*, Fletcher, *Cat.-Indian Ins.*, Pt. 9, Zygaenidae, p. 77.

Material examined : One ♂, 1 ♀, Cherrapunji, Nov. 1861, (Old collection from NZC with no other details).

Diagnostic characters : Fore wing basal area golden green, traversed by an orange band bordered with blue-black, a median similar band and a marginal broad band; interspaces pale yellow. Hind wing pale yellow or white. Wing exp. 50-60 mm.

Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong), Sikkim; Elsewhere : Bangladesh (Sylhet); Bhutan and Burma.

Remarks : The distribution of the species is restricted to the eastern region of India only. The genus is not included in the key of the genera.

Genus *Retina* Walker

1854. *Retina* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 438-439.

One species under this genus is known from India as well as Meghalaya.

42. *Retina rubrivitta* Walker

1854. *Retina rubrivitta* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 439.

1892. *Soritia rubrivitta*, Hampson, *Fauna Brit. India*, Moths, **1** : 252.

1925. *Retina rubrivitta*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 78-79.

Material examined : Material reviewed from the literature.

Diagnostic characters : Body greenish brown; collar crimson. Fore wing dark olive-green; a broad crimson fascia from base along the costa, downcurved at the outer angle. Hind wing dark brown. Wing exp. 34-38 mm.

Distribution : India : Meghalaya (Cherrapunji), Assam (Sibsagar), Sikkim; Elsewhere : Bangladesh (Sylhet).

Remarks : The genus is not included in the key of the genera

APPENDIX

Subfamily Zygaeninae

1. *Artona charista* Jordan

1908. *Artona charista* Jordan, In Seitz's *Macrolep. World*, **10** : 44, pl. 8, fig. c.

1925. *Artona charista*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 2.
Distribution : India : Meghalaya (Khasis).

2. *Artona flavigula* (Hampson)

1896. *Chrysartona flavigula* Hampson. *Fauna Brit. India*, Moths, **4** : 467.

1925. *Artona flavigula*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 3.
Distribution : India : Meghalaya (Khasis).

3. *Artona flavipuncta* Hampson

1900. *Artona flavipuncta* Hampson, *J. Bombay Nat. Hist. Soc.*, **13** : 225, pl. B. fig. 22.

1925. *Artona flavipuncta*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 4.
Distribution : India : Meghalaya (Khasis, Shillong).

4. *Artona lugubris* Jordan

1908. *Artona lugubris* Jordan, *In Seitz's Macrolep. World*, **10** : 44, pl. 8 fig. c.

1925. *Artona lugubris*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 4.
Distribution : India : Meghalaya (Khasis).

5. *Artona microstigma* Jordan

1908. *Artona microstigma* Jordan, In Seitz's *Macrolep. World*, **10** : 44, pl. 8. fig. c.

1925. *Artona microstigma*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 4.
Distribution : India : Meghalaya (Khasis).

6. *Clelea metacyanea* Hampson

1896. *Clelea metacyanea* Hampson, *Fauna Brit. India*, Moths, **4** : 467-468.

1925. *Clelea metacyanea*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 8.
Distribution : India : Meghalaya (Khasis).

7. *Clelea plumbeola* Hampson

1892. *Clelea plumbeola* Hampson, *Fauna Brit. India*, Moths, 1 : 240.

1925. *Clelea plumbeola*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 8.

Distribution : India : Meghalaya (Khasis); Elsewhere : Bhutan and Burma (Bernardmyo).

8. *Clelea refulgens* Hampson

1904. *Clelea refulgens* Hampson, *J. Bombay Nat. Hist. Soc.*, 16 : 193, pl. D, fig. 3.

1925. *Clelea refulgens* Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 8.

Distributon : India : Meghalaya (Khasis), Manipur; Elsewhere : Burma.

9. *Clelea simplex* Jordan

1908. *Clelea simplex* Jordan, In Seitz's *Macrolep. World*, 10 : 45.

1925. *Clelea simplex*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 9.

Distribution : India : Meghalaya (Khasis).

10. *Clelea stipata* (Walker)

1854. *Procris stipata* Walker, *Cat. Lep. Het. Brit. Mus.*, 1 : 114.

1925. *Clelea stipata*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 9.

Distribution : India : Meghalaya (Cherrapunji, Shillong), Sikkim, Uttar Pradesh (Kangra); Elsewhere : Burma (Bernardmyo); Java and West China.

11. *Arachotia euglenia* Jordan

1908. *Arachotia euglenia* Jordan, In Seitz's *Macrolep. World*, 10 : 50, pl. 8, fig. K.

1925. *Arachotia euglenia*, *Cat. Indian Ins.*, Pt., Zygaenidae, p. 17.

Remarks : The species is endemic to Meghalaya (Khasis).

12. *Chalcosiopsis microsticta* (Hampson)

1897. *Callartona microsticta* Hampson, *J. Bombay Nat. Hist. Soc.*, 11 : 284.

1925. *Chalcosiopsis microsticta*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 22.

Distribution : India : Meghalaya (Khasis).

Remarks : According to Jordan (1908) it belongs to Tineidae near species *Callartona purpurascens*.

Subfamily Chalcosiinae

13. *Cyclosia cuprea* (Swinhoe)

1891. *Isbarta cuprea* Swinhoe, *Trans. ent. Soc. Lond.*, p. 475.

1925. *Cyclosia cuprea*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 30.

Distribution : India : Meghalaya (Khasis, Shillong); Elsewhere : East Pegu.

14. *Cyclosia imitans* (Butler)

1881. *Epyrgis imitans* Butler, *Ill. Het. Brit. Mus.*, **5** : 24, pl. 84, fig. 1.

1925. *Cyclosia imitans*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 30.

Distribution : India : Meghalaya (Cherrapunji, Shillong), Sikkim; Elsewhere : Bhutan and Burma (Karen Hills).

15. *Cyclosia papilionaris* (Drury)

1773. *Noctua papilionaris* Drury, *Ill. Exot. Ent.*, **2** : 4, pl. 2, fig. 4.

1925. *Cyclosia papilionaris*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 33-34.

Distribution : India : Meghalaya (Cherrapunji, Khasis), Assam, Andaman and Nicobar Islands, Sikkim, South India; Elsewhere : Bangladesh, Bhutan; Burma; China; Java; Malacca; and Sumatra.

16. *Eterusia bicolor bicolor* (Moore)

1884. *Devanica bicolor* Moore, *Trans, ent. Soc. Lond.*, p. 355.

1925. *Eterusia bicolor bicolor*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 60-61.

Distribution : India : Meghalaya (Cherrapunji, Khasis), Assam, Nagaland; Elsewhere : Bangladesh.

17. *Eterusia dichroa* Jordan

1908. *Eterusia dichroa* Jordan, Seitz's *Macrolep. World*, **10** : 33.

1925. *Eterusia dichroa*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 62.

Distribution : India : Meghalaya (Khasis).

Remarks : The species is endemic to Khasis, Meghalaya.

18. *Eterusia nigribasalis* (Hampson)

1892. *Soritia nigribasalis* Hampson, *Fauna Brit. India*, Moths, **1** : 253.

1925. *Eterusia nigribasalis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 64.

Distribution : India : Meghalaya (Cherrapunji), Sikkim.

19. *Pidorus albifascia albifascia* (Moore)

1879. *Milleria albifascia* Moore, *Lep. Atk.*, P. 19.

1925. *Pidorus albifascia albifascia*, Fletcher, *Cat. Indian Ins.*, Pt., 9, Zygaenidae, pp. 67-68.

Distribution : India : Meghalaya (Cherrapunji, Khasis), Nagaland; Elsewhere : Bangladesh and Burma.

20. *Pidorus gemina* (Walker)

1854. *Laurion gemina* Walker, *Cat. Lep. Het. Brit. Mus.*, **2** : 427.

1925. *Pidorus gemina*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 68.

Distribution : India : Meghalaya (Khasis), Sikkim; Elsewhere : Bangladesh; Bhutan; Borneo; Burma; Cambodia; China and Hong Kong.

21. *Pidorus leno* Swinhow

1900. *Pidorus leno* Swinhoe, *Ann. Mag. Nat. Hist.*, (7) **6** : 305.

1925. *Pidorus leno*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 69.

Distribution : India : Meghalaya (Jaintia hills, Shillong), Assam; Elsewhere : China.

22. *Chalcosia adalifa adalifa* (Doubleday)

1847. *Gynautocera adalifa* Doubleday, *Ann. Nat. Hist.*, **19** : 76.

1925. *Chalcosia adalifa adalifa*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 70-71.

Distribution : India : Meghalaya (Khasis, Shillong), Sikkim, West Bengal; Elsewhere : Bangladsh; Bhutan; Burma; China and Vietnam.

23. *Chalcosia hamiltoni* (Swinhow)

1891. *Milbria hamiltoni* Swinhoe, *Trans. ent. Soc. Lond.*, pp. 475-476.

1925. *Chalcosia hamiltoni*, Fletcher, *Cat. Indian Ins.*, pt. 9, Zygaenidae, p. 72.

Distribution : India : Meghalaya (Khasis, Shillong).

24. *Phlebohecta eupoma* (Swinhoe)

1897. *Herpa eupoma* Swinhoe, *Ann. Mag. Nat. Hist.* (6) **19** : 166.

1925. *Phlebohecta eupoma*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 79.

Distribution : India : Meghalaya (Jaintia, Khasis).

25. *Phlebohecta fuscescens* (Moore)

1879. *Soritia fuscescens* Moore, *Lep. Atk.*, P. 16.

1925. *Phlebohecta fuscescesń*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 79.

Distribution : India : Meghalaya (Shillong), West Bengal (Darjiling), Sikkim; Elsewhere : Bhutan.

26. *Pseudoscaptesyle circumdata purpuralis* (Jordan)

1908. *Eterusia circumdata purpuralis* Jordan, Seitz's *Macrolep. World*, **10** : 33, pl. 6, fig. B.

1925. *Pseudoscaptesyle circumdata purpuralis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 80.

Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong).

Subfamily Phaudinae

27. *Phauda flammans* (Walker)

1854. *Euchromia (Phauda) flammans* Walker, *Cat. Lep. Het. Brit. Mus.*, **1** : 257.

1925. *Phauda flammans*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, pp. 81-82.

Distribution : India : Meghalaya (Cherrapunji), Bihar (Pusa), Himachal Pradesh (Simla), Sikkim; Elsewhere : Burma; Java and Pakistan (Lahore).

28. *Alophogaster rubribasis* Hampson

1892. *Alophogaster rubribasis* Hampson, *Fauna Brit. India, Moths*, **1** : 287, fig. 195.

1925. *Alophogaster rubribasis*, Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, p. 82.

Distribution : India : Meghalaya (Khasis), Nagaland.

29. *Phaudopsis igneola* Hampson

1900. *Phaudopsis igneola* Fletcher, *Cat. Indian Ins.*, Pt. 9, Zygaenidae, 83.

Distribution : India : Meghalaya (Khasis).

Subfamily Himantopterinae

30. *Himantopterus dohertyi elwesi* Jordan

1908. *Himantopterus dohertyi elwesi* Jordan, In Seitz's *Macrolep. World,* **10** : 6, pl. 1, fig. D.

1925. *Himantopterus dohertyi elwesi,* Fletcher, Pt. 9, Zygaenidae, p. 84.

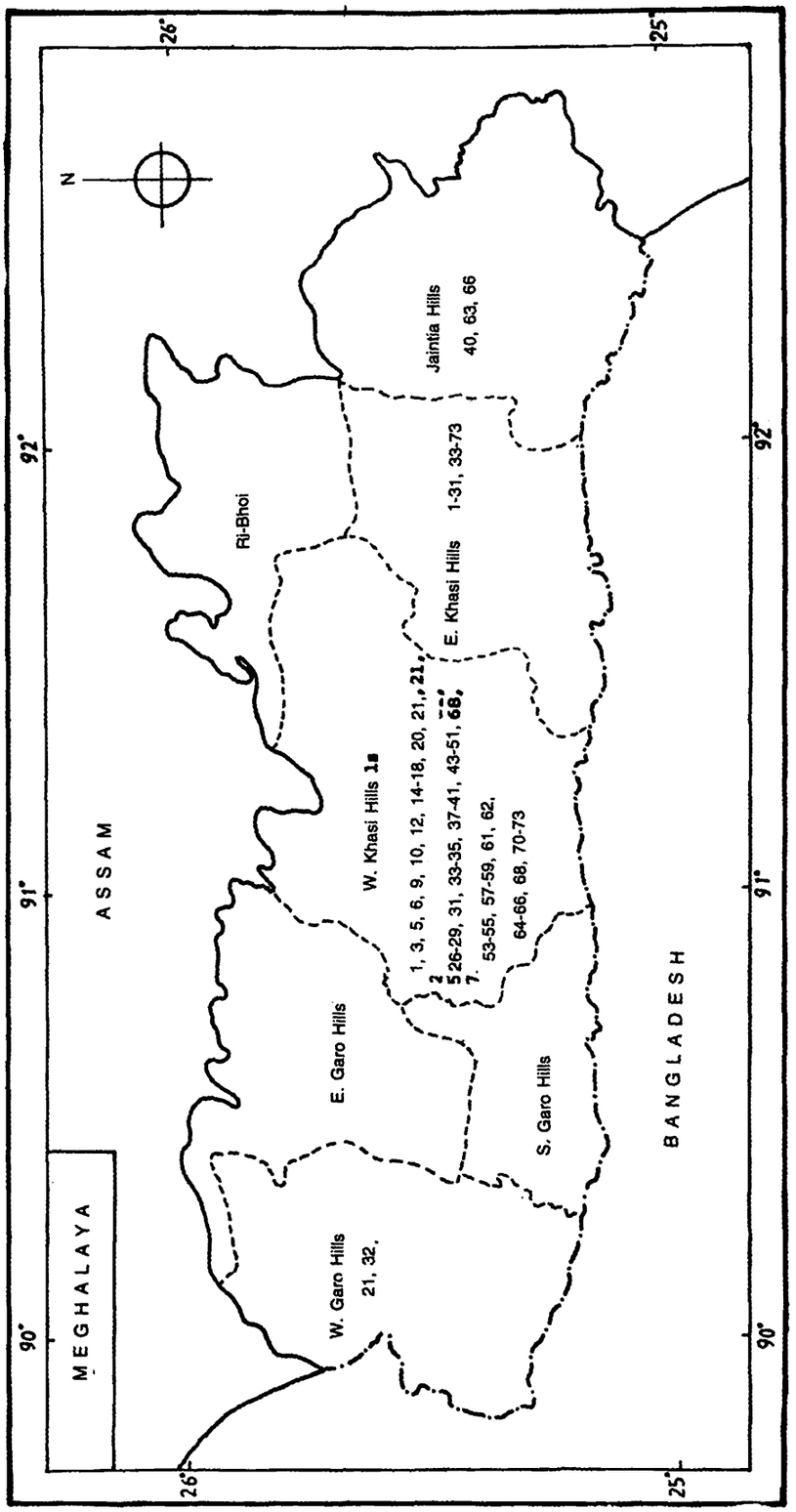
Distribution : India : Meghalaya (Cherrapunji, Khasis, Shillong).

31. *Himantopterus zaida zaida* (Doubleday)

1843. *Thymara zaida* Doubleday, *Zoologist,* **1** : 197.

1925. *Himantopterus zaida zaida,* Fletcher, *Cat. Indian Ins.,* Pt. 9, Zygaenidae, p. 85.

Distribution : India : Meghalaya (Cherrapunji, Khasis and Shillong).



Map showing distribution of Zygaenidae species in Meghalaya.

SUMMARY

The paper incorporates the systematic account, keys, diagnostic characters, distribution etc. of 42 species and subspecies of Zygaenidae of which two species and subspecies are recorded for the first time from Garo Hills and two species and subspecies from Shillong, east Khasis, which are also new records from the state of Meghalaya. Due to paucity of material at hand, a list of another 31 species and subspecies along with systematic account and distribution is also appended at the end.

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HYMENOPTERA : ACULEATA AND PARASITICA

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INTRODUCTION

Aculeate *Hymenoptera* belonging to the families Apidae, Bombidae, Xylocopidae, Eumenidae Pompilidae, Tenthredinidae and Parasitic Hymenoptera, relating to the families Aphididae, Chalcididae, Encyrtidae and Eurotomidae, are mainly recorded and discussed in this paper, with a view *to enlist the species known from Meghalaya*, recorded in "Fauna of India" by Bingham (1897) and Mani (1989) in "Memoir Manchester" by Cameron (1899) and in "Oriental Insects" by Stary and Ghosh (1975) [marked with estarik *], alongwith the species deposited in the National Collection of Zoological Survey of India, Calcutta, collected by Z.S.I. survey parties during 1916-1995.

SYSTEMATIC ACCOUNT

CLASS : INSECTA
ORDER:HYMENOPTERA
ACULEATA AND PARASITICA

LIST OF SPECIES OF ACULEATA AND PARASITICA FROM MEGHALAYA

Serial No.	Name of the species	Family	Locality
1.	*Apis (Megapis) dorsata* (Fabricius)	Apidae	Khasi Hills
2.	*Apis indica* Fabircius	Apidae	Jaintia Hills
3.	*Crocisa emarginata* Lepletier	Apidae	Khasi Hills
4.	*Xylocopa acutipennis* Smith	Xylocopidae	Khasi Hills
5.	*Xylocopa auripennis* Smith	Xylocopidae	Khasi Hills
6.	*Xylocopa latipes* (Drury)	Xylocopidae	Khasi Hills
7.	*Bombus eximius* Smith	Bombiidae	Khasi Hills
8.	*Bombus orientalis* Smith	Bombiidae	Khasi Hills

9.	*Bremus genalis* Friese	Bombiidae	Khasi Hills
10.	*Bremus mimeticus* Richards	Bombiidae	Khasi Hills
11.	*Odynerus sikkimensis* Bingham	Eumenidae	Khasi Hills
12.	*Pompilus zebra* Cameron	Pompilidae	Khasi Hills
13.	*Abia melanoceros* Cameron	Tenthredinidae	Khasi Hills
14.	*Allantus brunneus* Cameron	Tenthredinidae	Khasi Hills
15.	*Allantus marginiceps* Cameron	Tenthredinidae	Khasi Hills
16.	*Allmorpha pulchriceps* Cameron	Tenthredinidae	Khasi Hills
17.	*Allomorpha varicornis* Cameron	Tenthredinidae	Khasi Hills
18.	*Arge albocinctus* (Cameron)	Tenthredinidae	Khasi Hills
19.	*Arge luteiventris* (Cameron)	Tenthredinidae	Khasi Hills
20.	*Arge praesternalis* Malaise	Tenthredinidae	Garo Hills
21.	*Athalia proxima* Klug	Tenthredinidae	Khasi Hills
22.	*Athlophorus pilifrons* Cameron	Tenthredinidae	Garo Hills
23.	*Beldonea rugifrons* Cameron	Tenthredinidae	Khasi Hills
24.	*Bethyblepta procer* Konow	Tenthredinidae	Khasi Hills
25.	*Busarbia viridipes* Cameron	Tenthredinidae	Khasi Hills
26.	*Cibdela janthina* Cameron	Tenthredinidae	Garo Hills
27.	*Darjilingia gribodoi* Konow	Tenthredinidae	Khasi Hills
28.	*Emphytus maculiventris* Cameron	Tenthredinidae	Khasi Hills
29.	*Emphytus pilifrons* Cameron	Tenthredinidae	Khasi Hills
30.	*Emphytus rufipes* Cameron	Tenthredinidae	Khasi Hills
31.	*Eriocampa major* Cameron	Tenthredinidae	Khasi Hills
32.	*Eriocampa punctata* Cameron	Tenthredinidae	Khasi Hills
33.	*Hylotoma albobalteata* Cameron	Tenthredinidae	Khasi Hills
34.	*Hylotoma maculiventris* Cameron	Tenthredinidae	Khasi Hills
35.	*Monophatnus dilutipennis* Cameron	Tenthredinidae	Khasi Hills
36.	*Monophatnus laticarinatus* Cameron	Tenthredinidae	Khasi Hills
37.	*Neostromboceros assamensis* Rohwer	Tenthredinidae	Khasi Hills
38.	*Pachyprotasis violaceidorsata* Cameron	Tenthredinidae	Khasi Hills
39.	*Pampsilota sinensis* (Kirby)	Tenthredinidae	Khasi Hills

40.	*Rethrax carinata* Cameron	Tenthredinidae	Khasi Hills
41.	*Selandria coeruliceps* Cameron	Tenthredinidae	Khasi Hills
42.	*Selandria fuscinervis* Cameron	Tenthredinidae	Khasi Hills
43.	*Selandria pilicornia* Cameron	Tenthredinidae	Khasi Hills
44.	*Siobla ruficollis* Cameron	Tenthredinidae	Khasi Hills
45.	*Taxonus fulvipes* Cameron	Tenthredinidae	Khasi Hills
46.	*Taxonomus pulchripes* Cameron	Tenthredinidae	Khasi Hills
47.	*Tenthredella assamensis* Konow	Tenthredinidae	Khasi Hills
48.	*Tenthredella turneri* Rohwer	Tenthredinidae	Khasi Hills
49.	*Tenthredo annulitarsis* Cameron	Tenthredinidae	Khasi Hills
50.	*Tenthredo bicarinata* Cameron	Tenthredinidae	Khasi Hills
51.	*Tenthredo carinifrons* Cameron	Tenthredinidae	Khasi Hills
52.	*Tenthredo coerulea* Cameron	Tenthredinidae	Khasi Hills
53.	*Tenthredo compressicornis* Cameron	Tenthredinidae	Khasi Hills
54.	*Tenthredo khasiana* Cameron	Tenthredinidae	Khasi Hills
55.	*Tenthredo megacephala* Cameron	Tenthredinidae	Khasi Hills
56.	*Tenthredo sinensis* Cameron	Tenthredinidae	Khasi Hills
57.	*Tenthredo spinosa* Cameron	Tenthredinidae	Khasi Hills
58.	*Tenthredo violaceipennis* Cameron	Tenthredinidae	Khasi Hills
59.	*Tenthredo xanthoptera* Konow	Tenthredinidae	Khasi Hills
60.	*Brachymeria hattoriae shillongensis Joseph et al.*	Chalcididae	Khasi Hills
61.	*Spilochalcis fletcheri* Mani	Chalcididae	Khasi Hills
62.	*Spilochalcis indica* Mani	Chalcididae	Khasi Hills
63.	*Pentalitomastix nacoleiae* (Eady)	Encyrtidae	Khasi Hills
64.	*Eurytoma radhakrishnai* Narendran	Eurytomidae	Khasi Hills
65.	*Tryoxis (Betuloxys) assamenis* Stary	Aphididae	Khasi Hills
66.	*Tryoxis (Binodoxys) eutrichopsiphi* Stary	Aphididae	Khasi Hills
67.	*Tryoxis indicus* Subba Rao & Sharma	Aphididae	Khasi Hills
68.	*Aphidius matricariae* Haliday	Aphididae	Khasi Hills
69.	*Diaeretiella rapae* (M'Int.)	Aphididae	Khasi Hills
70.	*Diaeretus leucopterus* (Haliday)	Aphididae	Khasi Hills

71.	*Lipolexis scutellaris* Mackauer	Aphididae	Khasi Hills
72.	*Pauesia laricis* (Haliday)	Aphididae	Khasi Hills
73.	*Toxares shigai* Takada	Aphididae	Khasi Hills

HYMENOPTERA : ACULEATA

FAMILY I. APIDAE

1. *Apis (Megapis) dorsata* (Fabricius)

1793. *Apis dorsata* Fabricius.*Ent. Syst.*, **2** : 328.

1985. *Apis (Megapis) dorsata*: Roy and Kundu, *Rec. zool. Surv. India*, **82** *(1-4) : 221.*

Material examined: I ex. ♀; West Khasi Hills (Nongstein), Coll. A.R. Lahiri, 24.ix. 1988.

Diagnostic Characters: Body length 16-21 mm.; basal 3 abdominal segments honey-yellow, while the legs and apical 3 abdominal segments are black.

Distribution : India : Meghalaya. Elsewhere: Sri Lanka, Myanmar, China, Malaysia, Indonesia.

2. *Apis indica* Fabricius

1798. *Apis indica* Fabricius. *Ent. Syst.* (Suppl.), p. 274.

1985. *Apis indica* Fabricius: Roy and Kundu, *Rec. Zool. Surv. India*, **82**(1-4) : 221.

Material examined: 5 ♀ ♀, Jayantia Hills (Jarain), Coll. K.K. Ray, 10. III. 1991.

Diagnostic . Characters: Body-length 11-16 mm.; head, thorax and apical abdominal segment honey-yellow; scutellum and basal 5 abdominal segments testaceous-yellow; legss rufo-fuscous.

Distribution: : India : Meghalaa. Elsewhere : Sri Lanka, Myanmar, Malaysia, Madgascar.

3. *Crocisa emarginata* Lepletier

1841. *Crocisa decora* Lepletier, *Hum.*, **2** : 449.

1897. *Crocisa emarginata* Lepletier : Bingham, *Fauna Brit. India* (Hymenoptera), **1** : 517.

Material examined: 1 example, Khasi Hills (Shillong), Coll. La Trobe.

Diagnostic Characters: Forewing fuscuous with a few hyaline spots on disc; scutellum posteriorly with a shallow shaped emargination; pubescence blue.

Distribution: India : Meghalaya, West Bengal, Sikkim, Maharastra. Elsewhere : Sri Lanka, Myanmar, China, Malaysia, South Africa.

FAMILY II. XYLOCOPIDAE

1. *Xylocopa auripennis* Lepeletier

1841. *Xylocopa auripennis* Lepeletier *Hym.*, **2** : 181.

1897. *Xylocopa auripennis* Lepeletier : Bingham, *Fauna Brit. India* (Hymenoptera), **1** : 538.

Material examined: 1 example, Khasi Hills (Shillong).

Diagnostic Characters: Body with black or sooty-brown pubescence; wings fuscous purple at base, turning to metallic-green at apex.

Distribution: India : Meghalaya, Sikkim, West Bengal. Elsewhere : Myanmar, China.

2. *Xylocopa acutipennis** Smith

1853. *Xylocopa acutipennis* Smith. *Cat.* **2** : 355.

1897. *Xylocopa acutipennis* Smith : Bingham, *Fauna Brit. India* (Hymenoptera), **1** : 537.

Diagnostic Characters: Body with black or sooty-brown pubescence; wings fuscuous; body-length under 30 mm.

Distribution : India : Meghalaya (Khasi Hills), Sikkim. Elsewhere : Bangladesh, Myanamar.

3. *Xylocopa latipes* (Drury)

1770. *Apis latipes* Drury. *Ill. Exot. Ins.*, **2.**

1897. *Xylocopa latipes* Drury : Bingham, *Fauna Brit. India*, **1** : 536.

Material examined: 1 ex. ♂ , Khasi Hills (Cherrapunji), Coll. A.R. Lahiri, 16.IX. 1988.

Diagnostic Characters: Body with black or sooty-brown pubescence; length 30 mm and over; antennal scape flattened and very broad at apex.

Distribution: India : Meghalya, West Bengal, Sikkim, Assam, Uttar Pradesh, Madhya Pradesh, Kerala. Elsewhere : Myanmar, China, Malaysia.

FAMILY III. BOMBIIDAE

1. *Bombus eximius* Smith

1852. *Bombus eximius* Smith. *Trans. Ent. Soc.* (n.s.), **2** : 47.

1897. *Bombus eximius* Smith : Bingham, *Fauna Brit. India* (Hymenoptera), **1** : 549.

Material examined: 1 ex. ♀, Khasi Hills (Shillong); Coll. Godwin-Austin.

Diagnostic Characters: Body with black pubescence; mesonotum without a transverse of pubescence; legs bright-testaceous.

Distribution: India : Meghalaya, Sikkim, Darjiling (West Bengal). Elsewhere : Bangladesh, Myanmar, China.

2. *Bombus orientalis* Smith

1852. *Bombus orientalis* Smith. *Cat.*, 2 : 402.

1897. *Bombus orientalis* Smith : Bingham, *Fauna Brit. India* (Hymenoptera), 1 : 555.

Material examined: 1 ex. ♀, North Khasi Hills (Umling), Coll. A.R. Lahri, 1.X. 1988.

Diagnostic Characters: Mesonotum without a transverse band of pubescence; basal 2 abdominal segments with yellow pubescence.

Distribution: India : Meghalaya, West Bengal, Sikkim.

3. *Bremus genalis* Friese

1935. *Bremus genalis* Friese. *Rec. Indian Mus.*, 37 : 353.

Material examined: 1 example, Khasi Hills (Shillong); Coll. Godwin-Austin.

Distribution: India : Meghalaya.

4. *Bremus mimeticus* Richards

1935. *Bremus mimeticus* Richards. *Rec. Indian Mus.*, 37 : 349.

Material examined: 2 ♀ ♀ , Khasi Hills (Cherrapunji), Coll. Warren, 19.V.1909.

Distribution: India : Meghalaya.

FAMILY IV. POMPILIDAE

1. *Pompilus zebra** Cameron

1891. *Pompilus zebra* Cameron. *Mem. Manch. L. Ph. Soc.*, (4) 4 : 460, 475.

1897. *Pompilus zebra* Cameron : Bingham, *Fauna Brit. India* (Hymenoptera), 1 : 162.

Diagnostic Characters: Wings fusco-hyaline; mesonotum black; abdomen red and black.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

FAMILY V. EUMENIDAE

1. *Odynerus sikkimensis* Bingham

1897. *Odynerus sikkimensis* Bingham. *Fauna Brit. India* (Hymenoptera), 1 : 363.

Material examined: 1 example, Coll. Godwin-Austin, North Khasi Hills.
Distribution: India : Meghalaya (Khasi Hills), Sikkim.

FAMILY VI. TENTHREDINIDAE

1. *Abia melanoceros** Cameron

1899. *Abia melanoceros** Cameron *Mem. Manchr. Soc.*, **43** (3) : 6.
Material examined: 1 example, Coll. Godwin-Austin, North Khasi Hills.
Distribution: India : Meghalaya (Khasi Hills).

2. *Allantus brunneus** Cameron

1899. *Allantus brunneus* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 26.
Distribution: India : Meghalaya (Khasi Hills).

3. *Allantus margininceps** Cameron

1899. *Allantus margininceps* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 25.
Distribution: India : Meghalaya (Khasi Hills).

4. *Allmorpha pulchirceps** Cameron

1899. *Allmorpha pulchirceps* Cameron. *Mem. Manchr. Soc.*, **43**(3) : 30.
Distribution: India : Meghalaya (Khasi Hills).

5. *Allomorpha varicornis** Cameron

1899. *Allomorpha varicornis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 29.
Distribution: India : Meghalaya (Khasi Hills).

6. *Arge albocinctus** (Cameron)

1876. *Hylotoma albocincta* (Cameron). *Trans. Ent. Soc. London*, p. 459.

1915. *Arge albocinctus* (Cameron), *Rohwer, Rec. Indian Mus.*, **11** : 41.
Distribution: India : Meghalaya (Khasi Hills; Shillong).

7. *Arge luteiventris** (Cameron)

1899. *Hylotoma luteiventris* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 10.

1915 *Arge luteiventris* (Cameron). Rohwer, *Rec. Indian Mus.*, **11** : 41.

Distribution: India : Meghalaya (Khasi Hills).

8. *Arge praesternalis** Malaise

1934. *Arge praesternalis* Malaise. *Rec. Indian Mus.*, **36** : 474.

Distribution: India : Meghalaya (Garo Hills; Tura).

9. *Athalia proxima** Klug

1915. *Athalia proxima* Klug : Rohwer, *Rec. Indian Mus.*, **11** : 46.

Distribution: India : Meghalaya (Khasi Hills : Shillong).

10. *Athalia pilifrons** Cameron

Material examined: 1 example, Coll. S.W. Kemp. 5.XI. 1915, Tura.

Distribution: India : Meghalaya (West Garo Hills).

11. *Beldonea rugifrons** Cameron

1899. *Beldonea rugifrons* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 36.

Distribution: India : Meghalaya (Khasi Hills).

12. *Bethyblepta procer** Konow

1906. *Bethyblepta procer* Konow. *Zs. Hympt.*, **6**.

Distribution: India : Meghalaya (Khasi Hills).

13. *Busarbia viridipes** Cameron

1899. *Busarbia viridipes* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 38.

Distribution: India : Meghalaya (Khasi Hills).

14. *Cibdela janthina** Klug

1934. *Cibdela janthina* Klug. Malaise, *Rec. Indian Mus.*, **36** : 472.
Distribution: India : Meghalaya (West Garo Hills; Tura).

15. *Darjilingia gribodoi** Konow

1899. *Taxonomus pulchripes* Cameron. *Mem. Manchr. Soc.*, **43** (3).

1934. *Darjilingia gribodoi* Konow. Malaise, *Rec. Indian Mus.*, **36** : 468.
Material examined: 1 ♂, Coll. H.S. Rao, 15. XI. 1930, Khasi Hills, Shillong.
Distribution: India : Meghalaya (Khasi Hills).

16. *Emphytus maculiventris** Cameron

1899. *Emphytus maculiventris* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 41.
Distribution: India : Meghalaya (Khasi Hills).

17. *Emphytus pilifrons** Cameron

1899. *Emphytus pilifrons* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 40.
Distribution: India : Meghalaya (Khasi Hills).

18. *Emphytus rufipes** Cameron

1899. *Emphytus rufipes* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 42.
Distribution: India : Meghalaya (Khasi Hills).

19. *Eriocampa major** Cameron

1899. *Eriocampa major* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 47.
Distribution: India : Meghalaya (Khasi Hills).

20. *Eriocampa punctata** Cameron

1899. *Eriocampa punctata* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 46.
Distribution: India : Meghalaya (Khasi Hills).

21. *Hylotoma albobalteata** Cameron

1899. *Hylotoma albobalteata* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 8.
Distribution: India : Meghalaya (Khasi Hills).

22. *Hylotoma maculiventris** Cameron

1899. *Hylotoma maculiventris* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 9.
Distribution: India : Meghalaya (Khasi Hills).

23. *Monophatnus dilutipennis** Cameron

1899. *Monophatnus dilutipennis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 49.
Distribution: India : Meghalaya (Khasi Hills).

24. *Monophatnus laticarinatus** Cameron

1899. *Monophatnus laticarinatus* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 48.
Distribution: India : Meghalaya (Khasi Hills).

25. *Neostromboceros assamensis* Rohwer

1913. *Neostromboceros assamensis* Rohwer. *Proc. U.S. Nat. Mus.*, **45** : 279.
Material examined: 1 ♂, Coll. H.S. Rao, 15.XI. 1930, Khasi Hills, Shillong.
Distribution: India : Meghalaya (Khasi Hills).

26. *Pachyprotasis violaceidorsata** Cameron

1899. *Pachyprotasis violaceidorsata* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 34.
Distribution: India : Meghalaya (Khasi Hills).

27. *Pampsilota sinensis* (Kirby)

1876. *Hylotoma microcephala* Cameron. *Trans. Ent. Soc. London*, p. 406.

1915. *Pampsilota sinensis* (Kirby) : Rohwer *Rec. Indian Mus.*, **11** : 40.
Material examined: 1 example, Coll. S.W. Kemp, 15 VII 1917, West Garo Hills, Tura.
Distribution: India : Meghalaya (Garo Hills).

28. *Rethrax carinata** Cameron

1899. *Rethrax carinata* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 32.
Distribution: India : Meghalaya (Khasi Hills).

29. *Selandria coeruliceips** Cameron

1899. *Selandria coeruliceips* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 45.
Distribution: India : Meghalaya (Khasi Hills).

30. *Selandria fuscinervis* Cameron

1899. *Selandria fuscinervis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 44.
Distribution: India : Meghalaya (Khasi Hills).

31. *Selandria pilicornia** Cameron

1899. *Selandria pilicornis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 43.
Distribution: India : Meghalaya (Khasi Hills).

32. *Siobla ruficollis** Cameron

1899. *Siobla ruficollis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 27.
Distribution: India : Meghalaya (Khasi Hills).

33. *Taxonus fulvipes** Cameron

1899. *Taxonus fulvipes* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 32.
Distribution: India : Meghalaya (Khasi Hills).

34. *Taxonomus pulchripes** Cameron

1899. *Taxonomus pulchripes* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 32
Distribution: India : Meghalaya (Khasi Hills).

35. *Tenthredella assamensis* Konow

1915. *Tenthredella assamensis* Konow. *Rec. Indian Mus.*, **11** : 44.
Material examined: 1 example, Coll. Godwin-Austin.
Distribution: India : Meghalaya (Khasi Hills).

36. *Tenthredella turneri** Rohwer

1915. *Tenthredella turneri* Rohwer. *Rec. Indian Mus.*, **11** : 44.
Distribution: India : Meghalaya (Khasi Hills; Shillong).

37. *Tenthredo annulitarsis** Cameron

1899. *Tenthredo annulitarsis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 13.
Distribution: India : Meghalaya (Khasi Hills).

38. *Tenthredo bicarinata* Cameron

1899. *Tenthredo bicarinata** Cameron. *Mem. Manchr. Soc.*, **43** (3) : 17.
Distribution: India : Meghalaya (Khasi Hills).

39. *Tenthredo carinifrons** Cameron

1899. *Tenthredo carinifrons* Cameron. *Mem. Manchr. Soc.*, **43** (30) : 18.
Distribution: India : Meghalaya (Khasi Hills).

40. *Tenthredo coerules** Cameron

1899. *Tenthredo coerules* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 11.
Distribution: India : Meghalaya (Khasi Hills).

41. *Tenthredo compressicornis** Cameron

1899. *Tenthredo compressicornis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 19.
Distribution: India : Meghalaya (Khasi Hills).

42. *Tenthredo khasiana* Cameron

1899. *Tenthredo khasiana* Cameron. *Mem. Manchr. Soc.*, **43** : 15.
Distribution: India : Meghalaya (Khasi Hills).

43. *Tenthredo megacephala** Cameron

1899. *Tenthredo megacephala* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 22.
Distribution: India : Meghalaya (Khasi Hills).

44. *Tenthredo sinensis** Cameron

1899. *Tenthredo sinensis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 15.
Distribution: India : Meghalaya (Khasi Hills).

45. *Tenthredo spinosa** Cameron

1899. *Tenthredo spinosa* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 12.
Distribution: India : Meghalaya (Khasi Hills).

46. *Tenthredo violaceipennis** Cameron

1899. *Tenthredo violaceipennis* Cameron. *Mem. Manchr. Soc.*, **43** (3) : 20.
Distribution: India : Meghalaya (Khasi Hills).

47. *Tenthredo xanthoptera* Konow

1898. *Tenthredo xanthoptera* Konow. *Ent. Natr.*, **24** : 89-92.

1934. *Tenthredo xanthoptera* Konow : Malaise, *Rec. Indian Mus.* **36** : 455.
Material examined: 1 example, Coll. S.W. Kemp, 5.XI.1915, West Garo Hills, Tura.
Distribution: India : Meghalaya (Garo Hills).

HYMENOPTERA : PARASITICA

FAMILY VI. CHALCIDIDAE

1. *Brachymeria hattoriae shillongensis* Joseph *et al.*

1973. *Brachymeria hattoriae shillongensis* Joseph *et al. Calicut Univ. Zool. Mon.*, **1** : 138.

1989. *Brachymeria hattoriae shillongensis* Joseph : Mani, *Fauna India*, Pt. **1** : 292-293.
Diagnostic Characters: Postorbital carina branched; hind tibia black or brown.
Distribution: India : Meghalaya (Khasi Hills : Shillong).

2. *Spilochalcis fletcheri* Mani

1936. *Spilochalcis fletcheri* Mani. *Rec. Indian Mus.*, **38** : 340.

1989. *Spilochalcis fletcheri* Mani : Mani, *Fauna India*, Pt. I : 375-376.
Material examined: 1 example ♀, Coll. Fletcher, IV. 1917.

Diagnostic Characters: Body spotted, brick-red; propodeum without paired toothed processes on either side of insertion of petiole.

Distribution: India : Meghalaya (Khasi Hills : Shillong).

3. *Spilochalcis indica* Mani

1935. *Spilochalcis indica* Mani. *Rec. Indian Mus.*, **37** : 252.

1989. *Spilochalcis indica* Mani : Mani, *Fauna India*, Pt. I : 376-377.

Material examined: 1 ♀, Coll. H.S. Rao, 15. XI. 1930.

Diagnostic Characters: Body with yellow spots and markings; proodeum with a pair of short, stout, obtuse processes on either side of insertion of petiole.

Distribution: India Meghalaya (Khasi Hills; Shillong).

FAMILY VII. ENCYRTIDAE

1. *Pentalitomastix nacoleiae** (Eady)

1960. *Pentalitomastix nacoleiae* (Eady). *Bull. Ent. Res.*, **50** : 667.

1989. *Pentalitomastix nacoleiae** (Eady) : Mani, *Fauna India*, Pt. I : 881.

Diagnostic Characters: Head and scutum green; abdomen metallic-fuscuous-green; legs brownish-yellow.

Distribution: India : Meghalaya (Khasi hills; Shillong). Elsewhere : Malaysia, New Guinea.

FAMILY VIII. EURYTOMIDAE

1. *Eurytoma radhakrishnai** Narendran

1990. *Eurytoma radhakrishnai* Narendran. *Proj. rept. Annex.*, VII : 14.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

FAMILY IX. APHIDIDAE

1. *Tryoxis (Betuloxys) assamensis** Stary

1975. *Tryoxis (Betuloxys) assamenis* Stary. *Oriental Ins.*, **9** (3) : 346.

Diagnostic Characters: Propodeum with wide, irregular, pentagonal central aerola; pterostigma of forewing 3 times as long, as wide: abdomen dark brown; legs yellow.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

2. *Tryoxis (Binodoxys) eutrichopsiphi** Stary

1975. *Tryoxis (Binodoxys) eutrichopsiphi* Stary. *Oriental Ins.*, 9 (3) : 347-348.

Diagnostic Characters: Mesoscutum with notaulices distinct in the ascendent part, effaced on the disc; thorax and abdomen dark brown; legs yellowish.

Distribution : India : Meghalaya (Khasi Hills : Shillong).

3. *Tryoxis indicus** Subba Rao & Sharma

1975. *Tryoxis indicus* Subba Rao & Sharma : Stary and Ghosh, *Oriental Ins.* 9 (3) : 348.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

4. *Diaeretiella rapae** (M'Int.)

1975. *Diaeretiella rapae* (M'Int.) : Stary and Ghosh, *Oriental Ins.*, 9 (3) : 343.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

5. *Diaeretus leucopterus** (Haliday)

1975. *Diaeretus leucopterus* (Haliday) : Stary and Ghosh, *Oriental Ins.*, 9 (3) : 343.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

6. *Lipolexis scuterllaris** Mackauer

1975. *Lipolexis scuterllaris* Mackauer : Stary and Ghosh, *Oriental Ins.*, 9 (3) : 346.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

7. *Pauesia laricis** (Haliday)

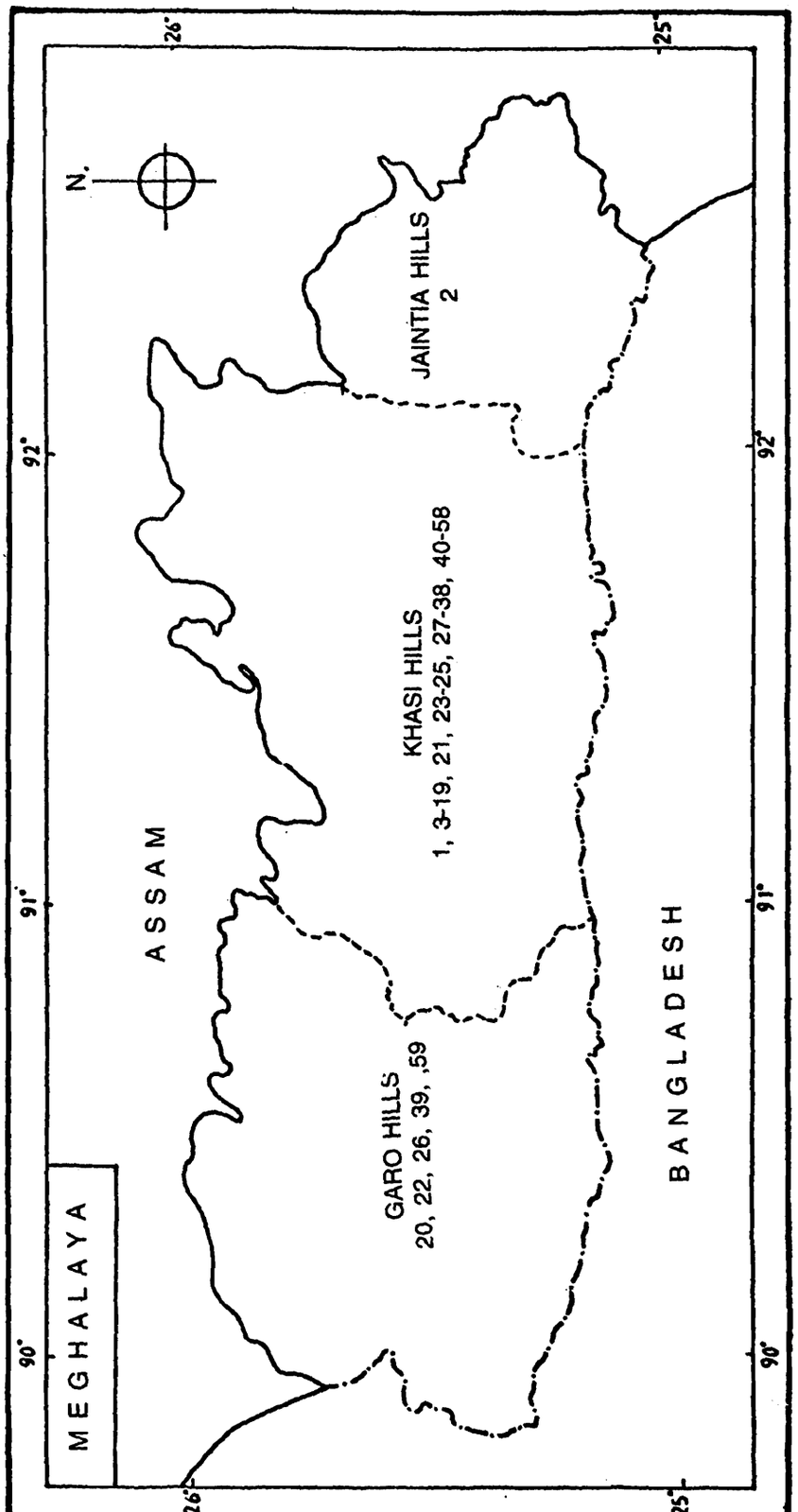
1975. *Pauesia laricis** (Haliday) : Stary and Ghosh, *Oriental Ins.*, 9 (3) : 346.

Distribution: India : Meghalaya (Khasi Hills; Shillong).

8. *Toxares shigai** Takada

1975. *Toxares shigai** Takada : Stary and Ghosh, *Oriental Ins.*, 9 (3) : 346.

Distribution: India : Meghalaya (Khasi Hills; Shillong).



Map 1. Distribution of the species of Aculeate and Parasitic Hymenoptera in Meghalaya. No. indicates the name of the taxa as treated in the text.

SUMMARY

A total of 73 species belonging to 43 genera and 10 families has been recorded in this paper from the state of Meghalaya, for Aculeate and Parasitic Hymenoptera.

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